

Handbook of Research on

# SDGs for Economic Development, Social Development, and Environmental Protection



Cristina Raluca Gh. Popescu



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# Handbook of Research on SDGs for Economic Development, Social Development, and Environmental Protection

Cristina Raluca Gh. Popescu

*University of Bucharest, Romania & The Bucharest University of Economic  
Studies, Romania*

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The editor would like to dedicate this book entitled *Handbook of Research on SDGs for Economic Development, Social Development, and Environmental Protection*, published by IGI Global – International Academic Publisher, to all the people that have dedicated their activities to promoting healthier lifestyles, to fostering well-being, and to enhancing sustainable practices in a highly challenged world that is due to find better solutions to cope with the new requirements of the Post-COVID-19 Era.

Also, the editor would like to dedicate this book entitled *Handbook of Research on SDGs for Economic Development, Social Development, and Environmental Protection*, published by IGI Global – International Academic Publisher, to all the IGI Global team members, as a sign of respect for the outstanding work that has accompanied the processes related to the publication and the promotion of this marvelous scientific book.

**Cristina Raluca Gh. Popescu**

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of Economic Studies, Romania*

The COVID-19 pandemic declared at the beginning of 2020 affected all citizens to a greater or lesser extent. In addition to the health crisis, fundamental labor rights were also impacted by the same order of magnitude. In the case of Ecuador, the crisis was severe, and part of its labor system was subverted in favor of a new order based on economic precepts and investment guarantees. This study examined the depth and scope of relative historical changes in an attempt to establish the relationships between the various governments before, during, and after the COVID-19 crisis, matching their actions, on the one hand, and the consequences for society, on the other. The research analyzed how legislation, such as the organic law on the creation of opportunities, economic development, and social sustainability, altered labor rights that the Constitution of Ecuador is supposed to guarantee. There is clear evidence of a lack of a solid welfare state and a preponderance of economic rights precisely at a time when there was a need for protections for the most vulnerable sectors of the population.

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This chapter analyzes the processes of economic violence as a social problem that is often hidden and accepted by women, families, or society in general. Consequently, it is a type of violence ignored by policy and little known by the public, especially in rural areas, where it has become normalized. There was a clear need to assess the impact of creating rural spaces for association that contribute to the improvement of the condition of women victims of economic violence. To this end, an interpretative and phenomenological approach to a life-story and case study was used to describe and analyze the present situation by means of in-depth interviews with three members of the Santa Marta Women's Association. The analysis shows the importance of providing the women of the association with economic tools that allow them to insulate themselves from any aggression of this type. Therefore, it is necessary to promote the associative sector as both a tool for specific circumstances and as a key element in public policy.

### Chapter 3

Importance and Implications of Influential, Powerful, and Remarkable Economic Policy Mix: Pre-Pandemic and Post-Pandemic Challenges in Building Inclusive Global Knowledge Societies..... 46

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These days, specialists believe there is an overbearing synergistic relationship between the COVID-19 pandemic changes and COVID-19 crisis challenges that have led to an undeniable desideratum to create the optimum economic policy mix meant to support resources allocation, increase international economic cooperation, and achieve sustainable international fiscal and monetary policies. The post-COVID-19 era brings to light several pivotal questions that require immediate actions and answers: How can international wealth can be created as a result of economic policy mix and sustainability? In what manner can the fiscal and monetary discipline can be maintained in order to support sustainable development? Which are the new values that the society should embody in order to support development, economic growth, sustainability, and responsibility? All in all, building inclusive global knowledge societies implicates stronger sustainable development policies, beneficial policies for enterprise development and economic progress, and decisive economic policies oriented towards social needs.

### Chapter 4

Distancing From a Stigmatized Identity: Explaining Hostility by Marginalized Racial Groups Toward New Immigrants..... 66

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Discrimination is perceived as stemming from outgroups. The UN Sustainable Development Goal 10 focused on reducing inequalities calls attention also to intragroup hostilities. In the US, intragroup hostilities between Latinos/as might occur if disassociation from a stigmatized sub-group protects one's status. This chapter tests potential disassociation effects by examining whether US Latinos/as distance themselves from a stigmatized identity by supporting adverse policies regarding Latino/a immigrants. Two studies (n=273 and n=8634) found that citizenship status was linked to support for adverse policies: more US-born Latinos/as considered immigrants a burden than Latinos/as of unknown status or non-citizens. Some Latino/a citizens might cut off reflected failure associated with being an immigrant

because distancing might support coping with cultural demands of US residence and distancing from recent immigrants might prevent transference of negative stereotypes. As inequalities increase overall in the post-COVID-19 era, intragroup bias may worsen outcomes for stigmatized sub-groups.

## Chapter 5

COVID-19 and Wine Tourism: A Story of Heartbreak..... 90

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Several studies have addressed the role played by the Spanish wine routes in boosting the competitiveness of a territory, increasing wine production, improving the quality of life of citizens, and respecting the environment. However, to the authors' knowledge, the impact of COVID-19 on these wine routes has not been addressed in the academic literature. To overcome this research gap, this chapter aims to analyze the impact of the pathogen on the supply and demand of tourism activities through, on the one hand, the analysis of the evolution of the institutions adhered to the Spanish wine routes and, on the other hand, the study of the economic impact of the 32 routes that make up this tourism product.

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COVID-19 Pandemic: Impacts on Supply Chain Sustainability ..... 113

*Paulo Cesar Duarte Ferreira Jr., Fluminense Federal University, Brazil*

*Elaine Mara Marçal Machado, Fluminense Federal University, Brazil*

*Marcelo Jasmim Meiriño, Fluminense Federal University, Brazil*

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*Mirian Picinini Mexas, Fluminense Federal University, Brazil*

The present work aims to analyze the impacts of the COVID-19 pandemic with sustainability commitments in the supply chain, providing practices and tendencies. Through literature review and application of research questionnaire to 53 respondents, it was understood that robust and reliable relationships are essential to increase the resilience and safety of the supply chain. It was concluded that the COVID-19 pandemic re-signifies the supply chain, catalyzing existing visibility, resilience, digitalization, and risk management problems. Quality management has also been impacted, requiring adaptation to ensure the quality of services and supplies and support the companies' strategic decisions. In this sense, this chapter updates the COVID-19 pandemic impacts that occurred on the supply chain management sustainability, with lessons learned for mitigation of future crises and shows the limitations like applied questionnaires regarding different industries in different countries to analyze the challenges and impressions of different sectors and cultures.

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Explicating Sustainable Development Growth and Triumph: An Islamic-Based Sustainability Model ..... 128

*Noorliza Karia, Universiti Sains Malaysia, Malaysia*

The chapter provides valuable insight into the Islamic teachings in environmental conservation. Yet, the gaps exist in the study and understanding of environmental sustainability from the Islamic approach. This chapter identifies sustainable practices from Islamic views based on 12 articles derived from a



systematic review. Results reveal the documents emphasizing the principle of Tawhid, Khalifa (vicegerent), Fitra, Mizan (balance), and Islamic jurisprudence. The findings contribute to the conceptualization of sustainability and identifying sustainable practices from Islamic views. The study further constructs an Islamic-based sustainability model for enhancing sustainable development growth and triumph. Islam is concerned about the significance of the human-environment link on environmental protection and conservation. The human-environment connection is essential for future sustainable growth.

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*Prakash Mahto, Lovely Professional University, India*

With the advancement of automobile technology for last mile communication and other mediums of travel, railways and aeroplanes have made travelling a long distance easier and faster. Also, with more stable governments in most countries, the security of goods and returns increased. This created a global scenario of world trade, which we now call globalisation. India has embraced globalisation in a positive manner with an increase in growth rate and lower unemployment and shows opportunity for future growth, but proper central power and coordination between states can affect the growth of the nation. Thus, this study will investigate various factors and aspects of global economy and globalisation and also relate with the Indian economy. The study will also make a comparative literature study of global economy for different countries. As an outcome, the study will suggest some recommendations/strategies for the issues growing with the Indian economy.

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*Oğuz Yıldız, Istanbul Gelisim University, Turkey*

Today, companies' incremental innovations and reactive approaches remain insufficient to cope with shocks like the COVID-19 pandemic and the climate crisis. Thus, they need to start with a radical shift in their thinking to be responsible and sustainable at the minimum level. Furthermore, companies must build, transform, and adapt an innovation ecosystem with stakeholders who interact to create and diffuse innovation. The author suggests that 'organizational transformation', which emphasizes creating more shared value within society, and 'system building', which highlights the company that goes beyond the institutional borders and redefines the purpose of the company's mission in society, are essential innovation strategies in overcoming the shocks generated by the COVID-19 pandemic and climate crisis. This chapter aims to clarify the meaning of the innovation terms related to sustainability and provide responsible and sustainable business practices from traditional resources and gray literature based on organizational transformation and system building approaches.

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*Carla Maria Batista Ferreira Pires, University Universidade Lusófona de Humanidades e Tecnologias, Lisboa, Portugal*

Antimicrobial medicines are taken orally or parenterally. These molecules are primarily eliminated by kidneys. However, several studies indicate that the methods of wastewater treatment are not sufficient to effectively remove these drugs from the environment, such as excreted antibiotics and antifungals in urine.

Thus, antimicrobials can pollute the food chain. Mutations of bacteria and/or fungi may be responsible for the emergence of new drug resistances, with irreparable global consequences. The chapter's aim is to present a new and inventive purification device of human urine during treatment with antimicrobials. The regular use of this device by citizens during treatment with antimicrobials may lead to a reduction of more than 30% to 50% of these molecules in urine, with the reduction of antibiotic or antifungal pollution.

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SDG-4 is composed of seven outcome targets and three means of implementation, and early childhood education is one of them. It has been mentioned that by 2030, we should ensure that all children have access to quality early childhood upliftment, care, and pre-primary education so that children are prepared for primary education. Early childhood education aims at the overall development of a child's cognitive, social, and physical needs to a broader foundation for lifelong learning and wellbeing. Though India has taken some strategic policy to the development of early childhood education, the COVID-19 pandemic has disrupted all the ongoing processes. In this context, the main objective of this chapter is to analyze the early childhood education status in rural India. The study also focused on the impact of mother's education in early childhood education. Due to COVID-19, the childhood education has affected a lot, and hence, the authors analyze the pandemic's impact on early childhood education in India.

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<i>Bình Nghiệm-Phú, University of Hyogo, Japan</i>	

This study qualitatively examined the restriction process of addictive buying behaviors using information recalled by four ex-shopaholic Western women. The study identified two reasons why the women decided to regulate their behaviors, including the issues with their financial statuses and the problems they had with their partners and family members. It also found three factors that could support the regulation process in addition to four factors that could distract that process. Regarding the initial results of the regulation process, this study realized that the women had effectively dealt with their debts, improved their relationships with the closest and most important people, maximized the use of the existing physical products, and minimized the purchases of the unnecessary new ones. They seemed to be able to find an alternative lifestyle, frugality and simplicity, which could make them happier individuals. Finally, this study discussed some practical implications for more ethical and responsible business activities.

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<i>Zühre Aydın Yenioğlu, Republic of Turkey Energy Market Regulatory Authority, Turkey</i>	
<i>Züleyha Sara Belge, Mersin University, Turkey</i>	

The present study puts forward an approach that aids in the achievement of significant technical urban energy efficiency results and that identifies the coherence of different frontier methods through a case study. The aim of the study is to show the effects and results of deterministic and stochastic approaches in urban energy efficiency measurement and to evaluate how data envelopment analysis (DEA), stochastic data envelopment analysis (SDEA), and stochastic frontier analysis (SFA) can be used to derive measures

of efficiency and productivity change over time in complex multi-output multi-input contexts. With stochastic models, the authors aim to decrease the effect of extreme values on the efficiency frontier. It was found that nonparametric methods are sensitive to measurement error, while stochastic models have a more flexible frontier than deterministic models. This is the first study to put forward a novel approach to the measurement of urban energy efficiency of Turkey's metropolitans involving both deterministic and stochastic methods.

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*Nemanja Berber, Faculty of Economics in Subotica, The University of Novi Sad, Subotica, Serbia*

*Marko Aleksić, Faculty of Economics in Subotica, The University of Novi Sad, Subotica, Serbia*

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Corporate social responsibility (CSR), as a business concept that balances between economic, environmental, and social goals of a company, is usually seen as a good response to all mentioned challenges. Since the theory on CSR still does not prove an unambiguous conclusion on the role and importance of CSR for business success in developing economies, there is a need of investigating this concept and the level of its implementation. The main aim of this chapter is to investigate the concept of CSR, the level of its implementation, and the organizational-level predictors of CSR practice. The methodology is based on the analysis of the sample of 151 large private companies in Serbia. The authors used a specially designed questionnaire, based on the standardized ones, with respect to the context of Serbia, as a developing economy, in order to get responses on CSR. The single-respondent methodology was used, too. The data analysis is carried on in the SPSS program. The main conclusions, implications, and limitations of the research are given at the end of the chapter.

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*Esin Kişi, Süleyman Demirel University, Turkey*

*Mustafa Zihni Tunca, Süleyman Demirel University, Turkey*

The Sustainable Development Goals (SDGs) are universal actions that provide a common plan and agenda to maintain the balance of sustainability and development. This study is aimed to measure and analyze the sustainability performances of the European countries in the context of Sustainable Development Goals in three (social, economic, and environmental) dimensions. In this respect, it is aimed to cluster the countries within the scope of the European Economic Area according to their success in achieving each sustainable development goal with its social, environmental, and economic dimensions. This study highlights the similar European country groups based on social, economic, and environmental dimensions in terms of sustainable development. The study also enables us to identify the development topics where the clusters obtained as a result of the analysis are weak and strong. The findings of this chapter create a point of view to determine development politics for countries.

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*Nima Norouzi, Bournemouth University, UK*

As the world faces the COVID-19 pandemic, there has been an instinctive and abrupt change in the global energy portfolio. Traditional fossil fuels that serve as the foundation of the modern economy have found their demand has rapidly decreased across most categories due to strict lockdown and limiting measures that have been adopted to control the infection. These shifts consequently caused various clean energy advantages across the world in recent times. This article investigates these energy benefits and reversals that have been materialized in this unfolding situation due to the reduced demand for fossil fuels. Outcomes from the study insist that COVID-19 has delivered impressive changes in the global energy demand, with about 11–25% curtailment in all the impacts mentioned above in 2020 compared to their corresponding readings in 2019. Although these changes might have been short-term changes, the long-term impacts of the R&D investments on fossil fuels are essential role players of the future of the energy portfolio.

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COVID-19 and the Middle East Energy Industry: An Investigation on the Impacts of the Coronavirus Outbreak on the Energy Industry in the MENA Region..... 340  
*Nima Norouzi, Bournemouth University, UK*

Coronavirus caused several challenges to the energy industry. This chapter overviews the impacts and challenges of the Coronavirus outbreak on energy demand, supply, and market and illustrates energy-related lessons and emerging opportunities. The changes in energy industry requirements are compared and studied from multiple views according to available data and oil and gas information markets. In general, although the overall energy demand declines, the spatial and temporal variations are complicated. The energy intensity has presented apparent changes, the extra energy for coronavirus facing is not negligible for energy supply side, and the energy industry recovery in different regions presents significant differences. A crucial issue has been to allocate and find energy-related emerging opportunities for the post-pandemic. This study could offer a direction in opening a new perspective for increasing energy industry stability during emergencies such as pandemics or war in the Middle East region.

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Impacts of Pollutants in Different Sectors of the Economy on Healthcare Expenditures ..... 353  
*Nima Norouzi, Bournemouth University, UK*  
*Sajedeh Rabipour, Islamic Azad University, UAE*

This study aims to assess the effects of environmental pollutants (air pollutants) in various sectors on healthcare expenditures in Iran. The data are analyzed using the panel data method using SPSS 26 software for 2000-2020 Dickey-Fuller and Fisher's unit root tests indicate co-existence between variables. The results of the Hausman test show a fixed-effects model for long-term estimation. The effectiveness of emissions of industrial pollutants (carbon dioxide, nitrogen dioxide, and sulfur dioxide) in the studied industries is equal to 0.012. Also, the share of fossil fuels in greenhouse gas emissions in different sectors is equal to 0.056 and positive, and the logarithm of research and development costs is equal to -0.12, which by increasing the research and development budget can provide solutions to reduce pollution, as well as the transfer of new technologies and innovations, has significantly reduced the destructive effects of industrial, commercial, etc. pollution.

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*Sajedeh Rabipour, Islamic Azad University, UAE*

*Nima Norouzi, Bournemouth University, UK*

The World Bank defines good governance based on six indicators: accountability, political stability, government efficiency, quality of law and regulation, the rule of law, and corruption control. On the other hand, the ultimate goal is the development of human health and well-being. Given the importance of health in society, government investment in this area is recognized as one of the government's main tasks, and the lack or inadequacy in providing health services in any country is considered one of the weaknesses of governments. Therefore, examining the quality of governments in the health sector is of particular importance. This study also examines the effects of good governance on managing the severity of the COVID-19 crisis, considering the importance of public health, especially in control of the COVID-19 pandemic, using the new 2021 public health definition index. This study examines data from Southwest Asian countries from 2003 to 2021.

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*Molina Unidad Zapopan, Mexico*

*Jorge Armando López-Lemus, University of Guanajuato, Mexico*

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This chapter aims to analyze the implications between the green human resources and green organizational social responsibility and organizational green image. It is assumed that green organizational image is determinant of organizational social responsibility and in turn on green competitive advantage based on the green human resources management. The method employed is the analytical and reflective sustaining on a review of theoretical and empirical literature. It is concluded that the environmental green human resources management is a critical factor of organizations to achieve broader objectives in green organizational social responsibility practices, relevant to building green image, improving green brand reputation and stakeholder's engagement, which determine a positive impact in growth, enhancing green competitiveness.

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Implications Between the Green Product Consumption on Organizational Green Productivity and  
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*José G. Vargas-Hernández, Posgraduate and Research Department, Tecnológico Mario*

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*María F. Higuera-Cota, Autonomous University of Sinaloa, Mexico*

This study has the aim to analyze the consumption of green products and their effects and implications on the organizational green productivity and organizational performance strategies. It is assumed that the consumption of green products has effects on the production and supply chains that have an impact on the organizational productivity and organizational performance strategies. The methods employed are the

analytical-descriptive leading to the reflective inference based on the theoretical and empirical review of the literature. It is concluded that the organizational strategies of organizational green productivity and organizational performance must be based on the green products and services for the green consumption.

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**Organizational Green Culture Implications in Organizational Resilience and Green Behaviors ..... 427**

*José G. Vargas-Hernández, Tecnológico Mario Molina Unidad Zapopan, Mexico*

*Patricia Calderón-Campos, Instituto Tecnológico de México, Mexico*

This study has the aim to analyze the implications between the green culture and creativity in organizational resilience and green behaviors. The analysis assumes that environmentally responsible assumptions, beliefs, values, and behaviors shared by the organizational members through green entrepreneurial and transformational leadership skills, give support to the organizational resilience, green culture, and creativity. The method employed centers around the theoretical and empirical review of the literature to infer some reflective deductions around the state of the art. It is concluded that the organizational green culture and creativity has a direct influence in the organizational green behaviors, entrepreneurship, and transformational skills.

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## Foreword

The COVID-19 pandemic and of the COVID-19 crisis have had an unforgettable and an unprecedented impact on our society, even though the prominent leaders worldwide as well as powerful the governments all around the Globe have shown a great concern as well as a tremendous effort to find solutions able to cope for a better and a more sustainable future for all.

The Post-COVID-19 Era brings numerous uncertainties as well as numerous questions concerning the evolution of our increasingly threatened society as well as the future of our highly challenged economy.

Hence, the book suggestively entitled *Handbook of Research on SDGs for Economic Development, Social Development, and Environmental Protection*, published by IGI Global, proves to be a necessary and a remarkable scientific resource for academics, leaders, scientists, researchers, students, Ph.D. scholars, and postdoctoral students, since it brings to light the most fierce battles and the most pressing challenges that have occurred, so far, in our knowledge-based societies, which was seriously and severely affected by both the COVID-19 pandemic and of the COVID-19 crisis, as follows:

- Chapter 1 focuses on a complex and on a novel analysis of the Labor Reform during the COVID-19 pandemic and the COVID-19 crisis, while stressing the case of Ecuador, in a society that calls, on the one hand, for immediate measures to address the situation generated due to the COVID-19 pandemic and of the COVID-19 crisis, and that strives, on the other hand, to cope with the implications of targeting through well-planned actions the Sustainable Development Goals (SDGs) for the economic development, the social development, and the environmental protection.
- Chapter 2 addresses the case of women victims of economic violence, with the aid of an analysis of the associative sector through Santa Marta Women's Association, Manabí-Ecuador, in the attempt to raise awareness on the effects of economic violence these days on vulnerable groups.
- Chapter 3 stresses the importance and implications of influential, powerful, and remarkable Economic Policy Mix, while centering on the pre-pandemic and the post-pandemic challenges in building inclusive global knowledge societies, in a world that will never be the same after being scarred by the effects and the measures taken due to the COVID-19 pandemic and the COVID-19 crisis.
- Chapter 4 emphasizes the implications of distancing from a stigmatized identity, while explaining hostility by marginalized racial groups toward new immigrants, in an Era which promotes equality, equilibrium, and non-discriminatory practices.
- Chapter 5 connects to of the hottest subjects these days, namely the COVID-19 and the wine tourism, seen as “a story of heartbreak” through the eyes of the authors approaching this theme.

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- Chapter 6 brings to light the COVID-19 pandemic impacts on the supply chain sustainability, in a world which is intensely based on trade.
- Chapter 7 centers on explicating the sustainable development growth and the links with triumphing on the marketplace, while bringing into analysis and into discussion an Islamic-based sustainability model.
- Chapter 8 illustrates the importance of globalization and global economy, while underlining a literature study of India being part of global economy.
- Chapter 9 tackles a powerful subject represented by “How can business enterprises use sustainability-oriented innovations as a strategic tool?” in a society that promotes innovation and sustainable practices for the business environment.
- Chapter 10 makes precious and vital connections between our society and the evolution of mankind, sustainability, and technology, while addressing a theme on the mitigation of antibiotics in nature, with a case study of a purification device.
- Chapter 11 brings into discussion the scenario of early childhood education in rural India, in times in which going back to origins and trying to cope better with the future that we are currently living implicates accepting ourselves and learning to deal with our past.
- Chapter 12 embodies the restriction of addictive shopping behavior, while moving toward a more responsible consumption, in a world that has become so fragile and so unpredictable due to the lack of the resources, the pollution, and the climate change.
- Chapter 13 focuses on the urban energy efficiency assessment using stochastic and deterministic data analysis, in terms of a proposed sustainable urban energy assessment.
- Chapter 14 illustrates the organizational level analysis of the corporate social responsibility in Serbia in the light of COVID-19 pandemic.
- Chapter 15 stresses a triple bottom line approach based clustering study for the Sustainable Development Goals of the European Countries, emphasizing the sustainable development concept.
- Chapter 16 proposes an interesting analysis on the assessment of the overall impact of the COVID-19 epidemic on the energy system in China, in a world which is highly dependent on technology.
- Chapter 17 connects the COVID-19 and Middle East Energy Industry, portraying an investigation on the impacts of Coronavirus outbreak on the energy industry in MENA region.
- Chapter 18 describes the impacts of pollutants in different sectors of the economy on health care expenditures, in a society that prioritizes the relationship that exists between the Social Development Goals and health.
- Chapter 19 illustrates the relationship between governance quality and public health in the light of COVID-19 pandemic control, with a presentation of a case study for Southwest Asian countries.
- Chapter 20 brings to life the responsible practices of the Green Human Resources and its implications on green organizational social responsibility and organizational green image.
- Chapter 21 explains the implications that exist between the green product’s consumption on organizational green productivity and on the organizational performance strategies.
- Chapter 22 stresses the organizational Green Culture implications in terms of the organizational resilience and the green behaviors.

It is my expert opinion that the present book entitled so creatively as well as so bold the *Handbook of Research on SDGs for Economic Development, Social Development, and Environmental Protection*, published by IGI Global, will ultimately come to shed a new light and will definitely have the power to disseminate the most vital practices to the academics, the leaders, the scientists, the researchers, the students, the Ph.D. scholars, and the postdoctoral students, which will be able to devour the essential aspects with which our society has confronted itself as a result of the COVID-19 pandemic and of the COVID-19 crisis, thus being able to learn from the past, and move forward to a brighter future and a successful life supported by the auspices the Post-COVID-19 Era.

Since this is a festive occasion for all the involved parties in this process, namely the authors of the book chapters, the Editorial Advisory Board members, and the Editorial Review Board members, due to the fact that this scientific project came successfully to an end, and reached its initially proposed aims and its commencing declared objectives, I am entitled, on the one hand, to congratulate all of them and to wish them all the best in their present as well as the future activities, and I am privileged, on the other hand, to remark their exceptional dedication and their massive support in all the steps and at all the levels required.

In addition, it is my great belief both as professor and as researcher in the fields addressed by this current scientific work, that the editor of the “Handbook of Research on SDGs for Economic Development, Social Development, and Environmental Protection”, published by IGI Global, namely Professor Dr. Cristina Raluca Gh. Popescu, from the University of Bucharest, Bucharest, Romania, and The Bucharest University of Economic Studies, Bucharest, Romania, had an exceptional collaboration with the IGI Global team members as well as with the authors of the book chapters, the Editorial Advisory Board members, and the Editorial Review Board members, having the inspiration to bring the best from all the topics that have so perfectly and so coherently embodied the case of the Sustainable Development Goals (SDGs) for the economic development, the social development, and the environmental protection. Hence, I would like to take this opportunity to draw the attention to the advantages and to the provocations that the United Nations Sustainable Development Goals (SDGs) have raised in our society, and I would, also, like to point out that this marvelous book has focused so well on the regions and the countries implementation of the 2030 Agenda and the Sustainable Development Goals (SDGs). Besides, in the same line with the aforementioned affirmations, I would like to underline the fact that I was implicated on numerous occasions, so far, in other similar scientific projects undertaken by the editor, Professor Dr. Cristina Raluca Gh. Popescu, having a constructive collaboration and obtaining promising results every single time, which makes me entitled to state that I was highly impressed, as always, by the hard work, the determination, and the strength to achieve one’s end that characterized Professor Dr. Cristina Raluca Gh. Popescu actions and activities.

Moreover, the readers of this book should keep in mind at all times that education represents “a stand-alone goal” formulated explicitly as such by the 2030 Agenda and the Sustainable Development Goals (SDGs), which determines me to encourage all of you to pay particular attention to and to be particularly aware of the avenues that might arise and open in front of you as a result of your implication and as a consequence of your effort, especially when choosing to explore the power of information, the vitality of knowledge, and the endless possibilities that sustainability has to offer for the progress of our society and of our economy. The 2030 Agenda and the Sustainable Development Goals (SDGs) has underlined so, so beautifully and so, so wonderfully the role and the potential of education for all individuals, stressing that education might be considered “a goal in itself” and, in the same time, education could come to support all the other Sustainable Development Goals (SDGs) targeted at an international level.

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Furthermore, I would like to value this occasion accordingly, by mentioning that the “Handbook of Research on SDGs for Economic Development, Social Development, and Environmental Protection” comes to support leading research and outstanding practices that the editor, Professor Dr. Cristina Raluca Gh. Popescu, regards as the richest and the most influential assets that insightful knowledge might come to offer to all of us.

May you all guide yourselves after those principles that support life on our Planet Earth and may you all have an eye-opening and an insightful reading!

*Jarmila Duháček Šebestová*

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## Preface

The main objective of this reference book is to provide valuable insight of today's context concerning sustainability and the challenges that will govern the Post-COVID-19 Era, with a special focus on economic development, social development, and environmental protection. In this context, it should be mentioned that economic development, social development, and environmental protection are vital concerns for sustainability and sustainable development, especially as a result of the COVID-19 pandemic and the COVID-19 crisis. Thus, there are several vital questions that require immediate attention and that call for prompt answers: (1) How does globalization influence sustainability and sustainable development? (2) In what way are the nations worldwide expected to realize successful partnerships in order to support sustainability and sustainable development, while targeting sensible issues, such as the aspects concerning the environment and the environmental problems, the continuous consumption of resources and the technologies that are being used in order to exploit those resources, the gaps that exist between developing countries and developed countries, the unsustainable consumption patterns and production patterns, that are threatening the well-being and the health of humankind and our planet? (3) Which are the main objectives due to be followed on the long run by institutions in order to implement and to ensure the success of sustainable development programs and to develop environmentally sound programs and projects for all countries? This list of questions is a tentative list, since there are far more questions to be asked in order to be able to understand the importance of sustainability and sustainable development, and also there are far more answers to these questions that are due to be offered in order to be capable to foster sustainability and sustainable development for all.

This book aims at providing an updated view of the newest trends, novel practices and latest tendencies concerning the manner of supporting and ensuring sustainability and the challenges of Post-COVID-19 Era, while focusing on economic development, social development, and environmental protection.

The target audience is represented by academics, scientists, researchers, students, PhD scholars and Post - doctoral students. Also, this reference book will present important features concerning sustainability, sustainable development, the Sustainable Development Goals (SDGs), the challenges specific to the Post-COVID-19 Era, the economic development, the social development, and the environmental protection, which will prove to be extremely valuable for specialists, practitioners, governmental institutions, and policy makers' worldwide. Nevertheless, this scientific book will represent a well - documented and well - developed work for (potential) business leaders, entrepreneurs and managers, as well as highly prominent individuals involved in decision making processes.

The main objective of this reference book is to provide a platform for sharing researchers' and professionals' most recent ideas, findings and works concerning sustainability, sustainable development, the Sustainable Development Goals (SDGs), the challenges specific to the Post-COVID-19 Era, the

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economic development, the social development, and the environmental protection. In this context, researchers and professionals are kindly invited to submit their contributions in form of original research papers, case studies or essays, in particular on the following topics (but not limited to the following topics) highlighted below. It should also be stated that interdisciplinary and cross section contributions are welcomed as long as they fall in the area specific to sustainability and challenges of Post-COVID-19 era, with a special focus on economic development, social development, and environmental protection.

- Agricultural innovation
- Artificial Intelligence and the power to influence the future
- Business Excellence and Innovation
- Climate chance
- Circular economies
- Cybernetics
- Competency-based education
- Constructing modern knowledge
- COVID-19 domains
- Ecosystems Management and water and land preservation
- Energy transitioning to sustainability
- Entrepreneurship and Greening Economy
- Entrepreneurship measuring indicators
- Entrepreneurial finance
- Environmental sustainability and justice
- Financial security and safety
- Food security
- Future energy scenarios, with focus on smart energy markets
- Health education and awareness
- Health disparities
- Health management and trust in health systems
- Intellectual capital, sustainability and resilience
- International entrepreneurship
- intragroup relations and immigrants
- Intelligence
- New and sustainable agribusiness management models
- Pandemic-Related Domains
- Resiliency
- Risk Assessments for Coronavirus Threats
- Smart cities
- Stability
- Sustainable agriculture and organic farming
- Sustainable Conservation Management
- Sustainable Development in Business Reporting
- Sustainable Entrepreneurship
- Sustainable Entrepreneurship skills and competences
- Sustainable Human Resource Development



- Sustainable Rural Community Development
- Global Entrepreneurship
- Social Entrepreneurship
- Women Entrepreneurship
- Corporate social responsibility
- Creativity
- Creating an inclusive and competitive entrepreneurship
- Information technology
- Innovation
- Innovative Business Models
- Innovation for sustainable agriculture and food chains
- Intellectual capital
- Leadership
- Knowledge management
- Migration
- Organizational performance
- Public policies and influences on entrepreneurship
- Responsible Innovation, Performance and Excellence for a sustainable future
- Responsible consumption and production
- Social responsibility
- Sustainable entrepreneurial ecosystems
- Sustainable energy, with responsible consumption and production
- Sustainability practices
- Sustainable society, with responsible consumption and production
- Technologies and policies for a sustainable society
- Technological and social innovation for sustainable business
- Travel resilience and sustainability challenges
- Tourism resilience and sustainability challenges

## **ORGANIZATION OF THE BOOK**

The book is organized into 22 chapters. A brief description of each of the chapters may be found below, as it results based on the authors' own statements:

Chapter 1 focuses on a complex and on a novel analysis of the Labor Reform during the COVID-19 pandemic and the COVID-19 crisis, while stressing the case of Ecuador, in a society that calls, on the one hand, for immediate measures to address the situation generated due to the COVID-19 pandemic and of the COVID-19 crisis, and that strives, on the other hand, to cope with the implications of targeting through well-planned actions the Sustainable Development Goals (SDGs) for the economic development, the social development, and the environmental protection.

Chapter 2 addresses the case of women victims of economic violence, with the aid of an analysis of the associative sector through Santa Marta Women's Association, Manabí-Ecuador, in the attempt to raise awareness on the effects of economic violence these days on vulnerable groups.

## **Preface**

Chapter 3 stresses the importance and implications of influential, powerful, and remarkable Economic Policy Mix, while centering on the pre-pandemic and the post-pandemic challenges in building inclusive global knowledge societies, in a world that will never be the same after being scarred by the effects and the measures taken due to the COVID-19 pandemic and the COVID-19 crisis.

Chapter 4 emphasizes the implications of distancing from a stigmatized identity, while explaining hostility by marginalized racial groups toward new immigrants, in an Era which promotes equality, equilibrium, and non-discriminatory practices.

Chapter 5 connects to one of the hottest subjects these days, namely the COVID-19 and the wine tourism, seen as “a story of heartbreak” through the eyes of the authors approaching this theme.

Chapter 6 brings to light the COVID-19 pandemic impacts on the supply chain sustainability, in a world which is intensely based on trade.

Chapter 7 centers on explicating the sustainable development growth and the links with triumphing on the marketplace, while bringing into analysis and into discussion an Islamic-based sustainability model.

Chapter 8 illustrates the importance of globalization and global economy, while underlining a literature study of India being part of global economy.

Chapter 9 tackles a powerful subject represented by “How can business enterprises use sustainability-oriented innovations as a strategic tool?” in a society that promotes innovation and sustainable practices for the business environment.

Chapter 10 makes precious and vital connections between our society and the evolution of mankind, sustainability, and technology, while addressing a theme on the mitigation of antibiotics in nature, with a case study of a purification device.

Chapter 11 brings into discussion the scenario of early childhood education in rural India, in times in which going back to origins and trying to cope better with the future that we are currently living implicates accepting ourselves and learning to deal with our past.

Chapter 12 embodies the restriction of addictive shopping behavior, while moving toward a more responsible consumption, in a world that has become so fragile and so unpredictable due to the lack of the resources, the pollution, and the climate change.

Chapter 13 focuses on the urban energy efficiency assessment using stochastic and deterministic data analysis, in terms of a proposed sustainable urban energy assessment.

Chapter 14 illustrates the organizational level analysis of the corporate social responsibility in Serbia in the light of COVID-19 pandemic.

Chapter 15 stresses a triple bottom line approach based clustering study for the Sustainable Development Goals of the European Countries, emphasizing the sustainable development concept.

Chapter 16 proposes an interesting analysis on the assessment of the overall impact of the COVID-19 epidemic on the energy system in China, in a world which is highly dependent on technology.

Chapter 17 connects the COVID-19 and Middle East Energy Industry, portraying an investigation on the impacts of Coronavirus outbreak on the energy industry in MENA region.

Chapter 18 describes the impacts of pollutants in different sectors of the economy on health care expenditures, in a society that prioritizes the relationship that exists between the Social Development Goals and health.

Chapter 19 illustrates the relationship between governance quality and public health in the light of COVID-19 pandemic control, with a presentation of a case study for Southwest Asian countries.

Chapter 20 brings to life the responsible practices of the Green Human Resources and its implications on green organizational social responsibility and organizational green image.

Chapter 21 explains the implications that exist between the green product's consumption on organizational green productivity and on the organizational performance strategies.

Chapter 22 stresses the organizational Green Culture implications in terms of the organizational resilience and the green behaviors.

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# Chapter 1

## Analysis of Labor Reform During COVID–19: The Case of Ecuador

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### ABSTRACT

*The COVID-19 pandemic declared at the beginning of 2020 affected all citizens to a greater or lesser extent. In addition to the health crisis, fundamental labor rights were also impacted by the same order of magnitude. In the case of Ecuador, the crisis was severe, and part of its labor system was subverted in favor of a new order based on economic precepts and investment guarantees. This study examined the depth and scope of relative historical changes in an attempt to establish the relationships between the various governments before, during, and after the COVID-19 crisis, matching their actions, on the one hand, and the consequences for society, on the other. The research analyzed how legislation, such as the organic law on the creation of opportunities, economic development, and social sustainability, altered labor rights that the Constitution of Ecuador is supposed to guarantee. There is clear evidence of a lack of a solid welfare state and a preponderance of economic rights precisely at a time when there was a need for protections for the most vulnerable sectors of the population.*

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## **INTRODUCTION**

From a critical, propositional and historical point of view, the values and implicit principles of developed societies assume that both national and supranational labor law endogenously aim for the highest standards of protection and regulation, even if these aims often fall short in practice. The configuration of developed countries promotes changes in all relevant structures in order to guarantee employment of a sufficiently high level of quality and safety to generate certainty throughout the labor supply chain (International Labour Organization, 2020). Labor law is historically a process within society in general and develops in parallel with all forms of employment. It is part of the social right to protect the labor of citizens, who are positioned as the active subjects and economic protagonists within the social fabric. Article 23(1) of the Declaration of Human Rights states that “everyone has the right to work, to free choice of work, to just and favorable conditions of work and to protection from unemployment” (Commission on Human Rights, 1948). Currently, citizens across the globe are emerging from the COVID-19 pandemic, the consequences of which have affected not only human health but permeate every social and economic sphere. At the 109th International Labour Conference, ILO stakeholders—governments, workers and employers—adopted a universal call for a people-centered response to the COVID-19 crisis that is inclusive, sustainable and resilient (International Labour Organization, 2021).

In Ecuador, the economy has suffered a significant impact from the pandemic. Agriculture, the engine of the national economy, has been especially affected, leading to a steep increase in the prices of basic necessities (Ministry of Production, Foreign Trade, Investments and Fisheries, 2020; Álvarez et al., 2020). There is no doubt that the COVID-19 Pandemic has changed socio-economic relations in the long-term closure of schools, the weakening of public health services and a wholesale the violation of citizens’ rights (UNICEF, 2020). According to the Economic Commission for Latin America and the Caribbean, (2021), among those who have held on to their employment during the pandemic, a significant deterioration in working conditions has been observed while the number of self-employed workers has increased in comparison to those under contract. Similarly, informality within the labor force has grown, as has the proportion of workers unable to find stable employment (despite a willingness to work longer hours) (Luque, 2022). This has compounded a situation that was already evident: it is possible to have a job and be in a state of precariousness as well as poverty (Kalleberg, 2009; Standing, 2014).

From a classic political point of view, labor law is undoubtedly a tool of intentional implementation. Its ultimate goal is to adjust employment relations to improve the quality of life of all stakeholders. However, although regulations are instituted to promote and protect the integrity of the workforce, many stumbling blocks appear during the process of legal reform that prove that labor law is not enough to guarantee comprehensive stability and security. Indeed, various exogenous elements can compromise employment standards, such as the commitment and good faith of entrepreneurs (employers), the development of globalization processes, the growth of speculative behaviors, or the failure to incorporate collective bargaining processes into social dialogue, all of which may favor the interference of vested interests (Rosales, Garcia & Duran, 2019). According to Chiriboga, Jiménez & Toscanini, (2018, p. 231):

*The way in which Labor Law has been a political tool throughout history can also make it an effective instrument of economic reactivation, provided that respect for the perspective of public order and the common good is maintained as the greatest legal asset that is protected by legislation.*

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In Ecuador, the Labor Law or Labor Code of 2005<sup>1</sup> (along with its subsequent reforms) has become a political tool that has transcended purely electoral motivations. In fact, since its inception, it has served to improve social coexistence. It regulates the relationship between people in employment in a harmonious and balanced manner and contributes to resolving disputes between the employer and workers<sup>2</sup>. Previously, labor law had been minimized within Ecuadorian legislation since big business was intimately integrated into a political class who saw it as neither fair nor feasible for employees to have rights that regulated their remuneration and their conditions within an enterprise. Indeed, this situation can be seen around the globe, as exemplified by the lack of regulation that led to the collapse of the Rana Plaza building in Bangladesh, a factory full of textile workshops subcontracted by many major Western brands<sup>3</sup>, which resulted in more than 1,129 deaths. Mohammed Sohel Rana, the building's owner, escaped justice; he was also a senior member of the youth wing of the governing party, the Awami League (Luque, 2018).

## **HISTORICAL BACKGROUND**

In Ecuador, the labor reform of 1903 was responsible for improving the quality of work of citizens through the regulation of hours and days of work; it also established the principle that the state should undertake to protect the rights of workers and indicate that there must be equality between the employer and the employee. However, on November 15, 1922, workers from the port city of Guayaquil rose up in protest demanding a wage increase in the face of the rising cost of living and political instability. Led mainly by indigenous people and peasants, the main complaint was the pervasive unstable and precarious working conditions. The confrontation ended with the death of 1,000 strikers, who became martyrs for the cause of the freedom to fight for workers' rights (Milk, 1997). On July 13, 1925, the Ministry of Labor was created, through which significant labor reform and social reorganization was achieved and the first legal regulations of labor law were introduced in 1938. The workers' struggle for greater rights has continued since this time as have the discrepancies between the employer's capital (and its distribution) and the needs of employees. This struggle manifests itself continuously in the history of Ecuadorian labor legislation and consequently features as a political tool rather than as a social issue.

The effects of discrimination and inequality were thrown into stark relief when Ecuador slid into an economic crisis as a result of the protests against the government of Lucio Gutiérrez, beginning on April 26, 2005. This was one of the triggers of the fall of the government, which led to the political crisis of 2006. The Vice President of the Republic, Alfredo Palacios, took charge of an increasingly chaotic country and dysfunctional economy in which the quality of life of citizens declined in the face of failed state-development strategies (Correa, 2003). Rafael Correa succeeded Palacios as president in 2007 and the following year began work on the reform of the constitution of the Republic of Ecuador based on a national referendum that garnered public support for the proposed reforms. According to Estrella, (2007, p. 50-54):

*President Correa remitted a reform of the legal framework of the financial system to Congress to lower the costs of loans; although Congress marred the rationale of the project, at least the debate on the issue of the cost of money led the financial sector, under its own initiative, to be more efficient and lower the cost of borrowing.*

The monetary socio-economic policy pursued by Correa was aimed at ending unemployment. The creation of employment and self-employment opportunities was prioritized through the promotion of micro, small and medium-sized enterprises in the productive sector, the establishment of dedicated finance for industry, the creation of public procurement systems and national microfinance systems, the reduction of inputs and capital goods used in production and the protection of national industries. According to Samaniego, (2002, p. 10):

*The measures are like the diversification of overseas sectors and markets, they are policies that are strictly designed to promote employment opportunities and develop a full-employment economy.*

Narrowing the wage gap through measures such as reducing expenses, introducing fair rates in the energy sector, providing basic welfare and reducing the cost of enrollment in public educational institutions became a banner of the policy of coexistence. Other initiatives included a tariff and supply scheme, free school meals and health care schemes. The rationale for these economic reforms was to direct the supplier base to micro, small and medium producers and local industrialists to promote new enterprise and boost the local economy. Human rights formed the basis for the declaration of a better life in which workers' rights were implicit in the great reforms rather than marginalized as they had been in the previous legal framework. Correa concentrated all the government's attention on social rights. In 2006, the first electoral program of the Alianza País Party (2016) gave a foretaste of what was to be its determined social commitment by highlighting that "the profits of capital could not be achieved based on the hunger and misery of labor". In 2007, the former president Correa, implemented the "Citizen Revolution", which guided his political manifesto throughout his 10-year presidential term. At that time, the country was immersed in a prolonged economic crisis with unstable social relations (Larrea, 2000). From 2007, radical changes were made in the country's productive matrix, with an increase in non-oil income from USD 4,484 million in 1998 to USD 12,804 million by 2018 (Ecuadorian Federation of Exporters, 2019).

It is fair to say that Correa's administration was characterized by the desire for justice in the labor system, exemplified by the government's drive to eradicate the abuse of fixed-term contracts by business owners. Open-ended contracts (subject to a 90-day trial period) were established for the first time. Further to this, the most significant reforms were 1) the general wage increase, 2) the inclusion of the income of domestic workers in this type of wages, 3) the creation of the Labor Justice Law, whereby reforms were introduced to the labor law and the public service law, 4) the provision of null dismissal was created for pregnant women and union leaders, 5) the establishment of labor equity through the creation of salary limits, 6) the democratization of labor representation, including secret ballot for the election of union leaders or company committees and 7) the universalization of social security to include not only workers of public and private companies, but also domestic workers and other categories (Velasco, 2013; Public News Agency of Ecuador -Andes-, 2014). In a further move, with the introduction of Decree 813, whose main objective was the reform of the General Regulations to the Organic Law of Public Service (LOSEP), the disarticulation of public servants was attempted through mandatory dismissal with compensation, which would allow a significant reduction in the state bureaucratic apparatus. This would have eliminated the right to a guaranteed income, even for those with permanent civil service appointments, while those affiliated to public sector unions would have seen a reduction in their benefits. Subsequently, in a ruling of the Constitutional Court of 10/28/2020, the obligatory nature of such measures was declared unconstitutional.



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Following Correa's exit, within the period of Lenin Moreno's presidency, further labor reforms were implemented such as 1) the increase of the national basic salary to 400 dollars per month, 2) the inclusion of provisions for young persons' employment, for which programs such as Youth Employment and My First Job were created (Gonzales, 2020). The Youth Employment act created new models for hiring young people, encouraging entrepreneurship in tourism and the productive sector and came into effect from October 30, 2019. According to the Ministry of Labor of Ecuador, (2018, p. 6)

*These measures were created with the aim of boosting the employment sector and promoting the income of young people lacking experience with dignified conditions and equal opportunities that enhance their skills and knowledge through incentives to the private sector covered under the modality of youth contract, in order to contribute to the reduction of unemployment.*

However, during Moreno's term, there were falls in production, investment, employment and volatility of prices, in addition to the outflow of dollars resulting from the negative balance of payments, all of which pointed to the faltering Ecuadorian economic structure (Cajas, 2018). In order to improve government finances during this economic crisis, Decree 883 was drafted, which eliminated gasoline subsidies, leading to a national strike and an indigenous uprising between October 2 and 13, 2019. In order to understand the importance of the fuel subsidy, it should be borne in mind that it can take as long to travel from certain communities in the Amazon region to a hospital or a university as it takes by plane from Quito to Paris. Hence the importance of protecting basic services that underwrites the right to work and guarantee human rights. The attempt to remove the subsidy was overturned by popular pressure (Luque, Poveda & Hernández Zubizarreta, 2019), although the current president, Guillermo Lasso, has now increased fuel prices by 70% with respect to 2020<sup>4</sup>.

The presidential term of Lenin Moreno coincided with the COVID-19 pandemic and the associated public health emergency measures, such as mandatory quarantine, restrictions on freedom of movement and assembly and periodic full lockdowns as imposed by Executive Decree No. 1017 of March 17, 2020. The resulting economic stagnation was reflected not only in the sharp increase in unemployment, but also in the decrease in the rate of participation in the active workforce, so that the reduced employment pressures within the labor market partially compensated for the increase in unemployment (Esteves, 2020). According to Table No. 1, Unemployment Indicators, by late 2020 and the first half of 2021, when the pandemic crisis was at its deepest in Ecuador, the unemployment rate rose significantly while the country's economy declined.

*Table 1. National Indicators of Unemployment*

<b>National Indicators (as a % of the EAP)</b>	<b>Sep-20</b>	<b>May-21</b>	<b>Jul-21</b>	<b>Aug-21</b>	<b>Sep-21</b>
<b>Overall participation rate</b>	63,8	67,2	65,3	67,3	66,7
<b>Full employment rate</b>	30,8	30,2	31,8	32,4	33,5
<b>Underemployment rate</b>	24,4	23,2	24,6	22,1	22,7
<b>Unemployment rate</b>	6,2	6,3	5,2	4,9	4,9

Source: National Institute of Statistics and Censuses, 2022.

A recent ECLAC report (2021a) points to an ingrained crisis within the labor market, in which there has been a marked decrease in employment and participation that has also affected the jobs of women and adolescents within the informal sector. According to estimates by the International Labour Organization (2020), all workers who lost their jobs at this time were thrown into poverty, which represents an 18-year regression in the level of commitment to the national workforce. Bárcena (2020), ECLAC's executive secretary, when asked about industrial policy and the causes of its poor trajectory in Latin America, stated that:

*Through neoliberalism in its purest form; through the school of Milton Friedman, the Washington consensus had a big impact on countries like Chile, and the result is an unequal and not-at-all diverse economy. In general, the economic model that has been applied in Latin America is exhausted: it is extractivist, it concentrates wealth in a few hands and brings hardly any technological innovation. No one is against the market, but it must be at the service of society and not the other way around. We have to find new ways to grow and for that state policies are required. It is not the market that is going to lead us, for example, to more technological innovation.*

The COVID-19 pandemic has had a significant impact on the country's economy and society, not only in terms of economic upheaval and labor problems, but also through the collapse of the health services and the social consequences of lockdown. According to Economic Commission for Latin America and the Caribbean (2022), the real-terms variation in income from employment, total income and per capita income of households<sup>5</sup> from 2020 when the pandemic began, until the present, has directly affected citizens across Latin America (although Argentina, Brazil, Chile and Colombia have shown signs of recovery). In El Salvador and Mexico, a limited economic recovery of 6.2% in 2021 and a further 2.1% in 2022 has allowed increases in employment income, but in countries such as Ecuador, Paraguay, Peru, and the Dominican Republic, household incomes remain depressed following a greater impact of the pandemic on their economies. In these countries, poverty has clearly deepened among sectors of the population due to the marked difference in income compared to previous years. Ecuador is currently experiencing one of its worst crises in recent times as a result of the impact of the pandemic on the balance of trade (Rosero, Almeida & Herrera, 2020). The economy depends on agricultural production, trade, manufacturing, crude oil and refining and petroleum derivatives, but income from exports of crude oil decreased sharply from 2019 into the first four months of 2020 following the slump in the value of the barrel of exported oil and its derivatives (-39.5%, going from USD 56.4 to USD 34.1) (Central Bank of Ecuador, 2020b). The recently elected government of Guillermo introduced a labor reform bill—the Organic Law on the Creation of Opportunities, Economic Development and Social Sustainability<sup>6</sup>—in an attempt at bringing about a series of transformations based on incentives for foreign investment in the Ecuadorian economy. However, it is not clear how the measures will avoid the growth of social dumping processes that result when employment opportunity is prioritized without guarantees for working conditions. There is a clear need to analyze legislation such as the Organic Law on the Creation of Opportunities<sup>7</sup>, the Constitution of the Republic of Ecuador and the Labor Law in order to understand how these reforms affect the acquired rights of the worker and how these may be compromised by the current economic situation.

## **THEORETICAL FRAMEWORK**

According to Trebilcock (2016), a labor reform defines the terms of the labor relations that are going to be developed within a state. It refers to the system through which companies (public and private), workers and their representatives directly and indirectly interact in order to establish the basic rules of labor relations and associated interrelationships. Employment legislation is a consequence of industrial progress and the parallel demands of the workforce in response to the abuses of enterprises, which give rise to trade unions as a means of representing workers, and the development of labor relations collectively. Labor relations experienced a clear decline with the onset of globalization processes and the rise of transnational power, which led to an overlap of the right to trade with human rights, compounded by accelerating corruption (Luque, Hernández Zubizarreta & de Pablos, 2016). According to Ortiz (2017, p. 283-304), “labor relations” are used to express a type of social relationship of production, reproduction and distribution that emerged in the nineteenth century. On a more descriptive or socio-economic level, the term refers to the sum of formal and informal interactions between three historically prominent collective actors—the “working class” (or workers), the “bourgeoisie” (or entrepreneurs) and the “constitutionally established power” (or the state)—which consists of obligations, rights and powers in return for the provision of a form of work (wage labor). European labor legislation covers two main areas: 1) working conditions, including working hours, part-time work, fixed-term work, transferred workers, etc., and 2) information and consultation of workers in case of collective redundancies, the transfer of companies, etc., (European Commission, 2022). Labor relations are prioritized in the preamble to the Treaty on the Functioning of the EU<sup>8</sup>, in order to place the improvement of the living and working conditions of citizens’ front and center. Labor reforms become even more important in times of crisis. For example, Spain approved Royal Decree-Law 32/2021 of December 28, 2021<sup>9</sup>, which contains modifications related to 1) the modernization and simplification of hiring modalities in order to combat the unjustified fragmentation of the labor market, as well as the proliferation of short-term contracts, 2) the modernization of the contracting and subcontracting of works or services, regulated by article 42 of the Workers’ Statute, 3) the modernization of internal labor flexibility measures and 4) the clarification of collective bargaining powers. Additionally, the legislation facilitates the harmonization of contents such as the right to training and access to the training system for employment, the establishment of fines and updated labor sanctions, the establishment of rules for social security contributions in cases of collective suspension of employment, 4) provisions for the legal situation of unemployment and 5) guidelines for administrative procedures and collaboration between administrations.

### **1. System of Labor Reforms**

An industrial relations system reflects the interaction of the main actors that it comprises: the state and supranational bodies, the enterprise (companies or associations of companies) and trade unions and workers (who may or may not participate in unions and other representational entities). Trade union representation and the collective organization of work are an exercise of the rights and freedoms in the general environment of industrial relations. They are responsible for limiting conflict in relation to the exercise of the workers’ right of assembly, that is, its holders (workers), purposes (socio-labor interests) and means of externalization (assemblies, concentrations and demonstrations) (Pérez, 2018). In Ecuador, due to labor flexibility and the degradation of labor relations between the years 1980-2000, the trade union movement became subordinated to the power of big business and government, endogenously af-

fecting the process of normalization of labor relations. It spent years under the radar, beginning a slight revival following the 2008 National Constituent Assembly (Ibarra, 2007). In fact, based on article 158 of the Criminal Code, the 2008 Constitution largely prohibits the de facto right to strike for public workers. Article 326, paragraph 14 states that workers and their trade unions have the right to strike while Article 326, paragraph 15, prohibits the paralysis of the public services of health, sanitation, education, justice, firefighting, social security, electricity, drinking water and sewerage supply, the production, processing, transport and distribution of hydrocarbon fuels, public transportation, postal services and telecommunications. The law established limits that ensure the operation of such services. In other words, strikes are allowed at the same time as they are prohibited.

Labor reforms in general seek to increase the rate of employment, improve job stability and place a country in a better position to compete with other economies, especially neighboring states. In Ecuador, labor reforms have been carried out with the aim of lowering the historically high unemployment rates, boosting competitiveness in the productive sector, using labor more efficiently and providing the economy with greater dynamism. However, the results have been largely disappointing. Perhaps, the main obstacle has been the conflicting conceptualizations of labor flexibility leading to disagreement between different sectors of the economy. There are numerous economic measures that can affect the labor market (Luzuriaga, Vallejo, and Ayala, 2018). During the COVID-19 pandemic, measures already stipulated in the Labor Code were adopted and additional regulations were introduced by reforms of the legislation published in the Registry, Supplement 229, of June 22, 2020 entitled: Organic Law of Humanitarian Support to Combat the Health Crisis Due to COVID-19. This aimed to “establish humanitarian support measures necessary to face the consequences of the health crisis caused by COVID-19, through measures aimed at mitigating its adverse effects within Ecuadorian territory”. In Chapter III of the Organic Law on Humanitarian Support (2020, Pp. 8-9), the measures to support the sustainability of employment stated that:

*Art.16.- Of the emergency cessation the working day. - For all those work activities that by their nature cannot be carried out by remote working and/or through the reduction or modification of the working day, the private-sector employer will arrange and communicate the emergency cessation of the working day, without this implying the termination of the employment relationship.*

*Article 19.- Special emergency contract. -This is an individual contract of work for a defined time that is drawn up for the sustainability of production and sources of income in emergency situations or for new investments or lines of business, products or services, expansions or extensions of business, modification of the turnover of the business ... The contract will be drawn up for a maximum period of one (1) year and may be renewed only once for the same period. The ordinary working day that is the object of this contract may be partial or complete, with a minimum of twenty (20) and a maximum of forty (40) hours per week, distributed in a maximum of six (6) days a week without exceeding eight (8) hours a day, and the legal remuneration and benefits will be proportionate, in accordance with the agreed working day.*

*Article 20.- Of the emergency reduction of the working day. – In the case of events of force majeure or other proven fortuitous events, the employer may reduce the working day by up to a maximum of 50%. The worker’s salary or wages shall correspond, in proportion, to the hours actually worked, and shall not be less than 55% of that fixed prior to the reduction; the social security contribution is to be paid in line with the reduced working day. The employer must notify the employment authority, indicating*

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*the period of application of the reduced working day and the salaries of the personnel to whom the measure will apply.*

## **2. COVID-19 and its Impact on the Labor Sector in Ecuador**

According to the Ecuadorian Ministry of Public Health (2020), on March 13, 2020, the first death due to COVID-19 was registered. At the same time, the government ratified its commitment to the protection of the population through a series of actions implemented in accordance with the emerging needs. The public was asked to comply with rigorous measures aimed at the prevention of the spread of the disease. On March 17, 2020, Executive Decree 1017 established a state of emergency across the country, which ushered in additional measures such as restricting some constitutional rights (freedom of mobility and the right of assembly) and the cessation of the working day except for activities related to the provision of food, medicines, supply chains, communication services, among others. These measures were originally to be put in place up to March 24, 2020, but were periodically extended by the Emergency Operations Committee and amounted to one of the longest lockdowns and curfews in Ecuador's history. The Central Bank of Ecuador (2020a), reported that the macroeconomic impact of COVID-19 on the Ecuadorian economy during the lockdown was a paralysis of production and severe loss of economic activity.

## **3. The Labor Measures Adopted during the Pandemic**

COVID-19 plunged society into a situation that tested the adaptability of legal systems in areas that are particularly sensitive to economic changes, such as labor legislation. It also tested society's resilience globally. Of course, it is clear that no society was adequately prepared for the challenges of a global crisis of the magnitude COVID-19, but the intensity of the crisis showed that the labor system in Ecuador was built on false assumptions far removed from reality. If the various actors of the economy had only applied the standards of the existing Labor Code or the general standards and recommendations of the International Labour Organization, the impact of the pandemic would most likely have been lessened (despite the limited elasticity of the Ecuadorian labor market). The principal labor measures adopted in Ecuador were:

- a. **Remote working.** This made a great contribution to the labor sector during the pandemic, giving the remote worker access to the relevant databases of the entire company (customers, suppliers, personnel, processes) and access to virtual meetings. The easy transfer of information allowed workers to make quick and proactive decisions although this was not implemented uniformly. According to Ramos, Galarza & Tejera (2020), remote working represents one of the main modalities of flexible working forms, together with mobile working and e-working. In Ecuador, remote working was the first tool implemented by the Ministry of Labor due to the complete lockdown imposed at the beginning of the pandemic, which included the cessation of all in-person work in an attempt to reduce the spread of the infection. According to Iturralde and Duque (2021), the pandemic forced companies to significantly increase remote working practices without there being an opportunity for prior planning, training, the reorganization of processes, technological infrastructures, or even a regulatory framework that specified the new playbook. These led to latent concerns in both employers and employees, with the latter being the more vulnerable group.

- b. **The reduction of the working day.** During the public health emergency, measures were also taken to reduce the working day, so that working hours would not be affected by curfews or other emergency measures. In turn, the Ministry of Labor of Ecuador (2020) issued Ministerial Accord, MDT 220-077, which addressed this complex and ambiguous situation in Article 3:

*Art.3.- Adoption of prevention measures. In order to guarantee the employment stability of workers and protect the country's economy during the health emergency, it will be in the power of the private sector employer to adopt either the reduction, modification or eventual cessation of the working day, applicable by activities, groups, or places of work.*

During this period, the Ministry of Labor also expressly authorized in advance the implementation of a reduction in working hours. According to Cabezas (2020, p. 250), this reduction in working hours should be considered within the context of an emergency period in which a *force majeure* event prevented more than 70% of economic activities from developing as normal. The Ministry of Labor adopted such measures unilaterally, thereby exempting companies and organizations from responsibility for the modification of working conditions.

- c. **Emergency cessation of the working day.** The Ministry of Labor of Ecuador (2020), in article 6 of Ministerial Accord 077 also contemplated the total cessation of working hours. This was basically applicable in companies whose activities could not be carried out remotely or in reduced form. The national newspaper, *El Comercio* (2020), reported on how the emergency cessation of the working day was to be implemented in practice:

*The employer will determine the manner and the schedule for the recuperation of the [lost] days with up to 12 hours a week and on Saturdays 8 hours a day. This is applicable to all work activities that cannot be carried out remotely or with a reduction or modification of the usual working day. The cessation does not imply the termination of the employment relationship, but the employees are obliged to recuperate the time not worked, and whoever does not do this will not be entitled to receive the corresponding remuneration and must return to the employer the money received as wages while not working.*

Later in the pandemic, on November 23 2021, the newly elected government of Guillermo Lasso presented a bill to the National Assembly entitled the “Law of Creation of Opportunities”. This was wide-ranging legislation unified by a common principle: to empower the productive energies of all citizens. President Lasso (2021) claimed that this law would explicitly begin to change labor relations within the country and create an alternative and voluntary regime of job opportunities that would allow access to new forms of employment and, in accordance with the contemporary situation, would make use of technology to allow remote working or flexible working hours. However, this comes with a serious caveat: alternative or paralegal regimes are hazardous and may even be considered illegitimate when they open the door to a de facto “uberization” of labor relations, that is, a commodification of labor that lacks social protection (rights, social security, and pension contributions). For example, one proposed option is to allow fixed-term contracts of up to 4 years and de facto arbitrary dismissal), which implies a clear degradation of rights (Luque & Casado, 2020). Such actions may easily be construed as a travesty of the precarious processes of modernity. On the other hand, Lasso sought to give assurances, making clear that accumulated holidays will not be lost; entrepreneurs and artisans will be considered social

businesses for tax purposes; there will be no limits on employee profit-sharing; and retirement plans will not be touched. In order to encourage entrepreneurs to hire more workers and pay competitive salaries, the government has signaled it is also prepared to lighten some of the burdens on businesses.

## **METHODOLOGY**

Various methods were used in this study in order to broaden and deepen understanding of the research problem. Principally, the historical-logical method was used, which, according to Miranda (2020, p. 6), “studies the real trajectory of phenomena and events in the course of their history. The logical method investigates the general laws of the functioning and development of phenomena.” This method allows the behavior and development of research subjects to be determined over a period of time, which in this case was the COVID-19 emergency in Ecuador. This made it possible to determine the history of workers’ rights, the relationship between their stages of development and the nature of this phenomenon in order to establish the aspects that affect their development and regulatory change. Each historical source stamps its impression so that the period studied reflects legal phenomena within a specific time-frame. Through the development of this method, a comprehensive understanding of the nature of labor variations in Ecuador during the COVID-19 pandemic was achieved. This approach also facilitated the identification and exploration of analogous works indexed in different academic bases, which served as an introduction to the research by compiling a history of how rights have developed in the workplace. The method is also suitable for making a comparison between different regulations. A logical method was also used through the formation of hypotheses related to labor developments in Ecuador, deriving taxonomy of inconsistencies arising from the legislation of successive governments.

## **ANALYSIS AND RESULTS**

At the global level, the COVID-19 pandemic has had serious consequences for the economy and society, with a sharp fall in gross domestic product and persistent unemployment affecting the welfare of the world population. The crisis has brought with it a reconfiguration of the workplace and education through the implementation of remote working and distance education mediated by technologies that have become the norm. However, the mental health and emotional stability of the population were overwhelmed by the cascade of changes brought in by the emergency, including the imposition of limits, lockdowns and curfews, in addition to an evident degradation of labor rights. Table No. 2, Labor Characteristics, is compiled from the analysis of different examples of Ecuadorian employment legislation with implications for labor relations and conditions under the mandates and perspectives of the successive presidents, Correa, Lenin and currently Lasso, with special emphasis given to the Humanitarian Law of 2020. The employment changes brought about are analyzed, as well as the normative and political corollaries arising from each period. The most significant labor changes in modern Ecuadorian history are grouped together with their corresponding taxonomy of inconsistencies in order to understand their idiosyncrasies. The analysis evidences how a lack of employment protections and *flexicurity* are not exclusive to the recent COVID-19 period, but rather political will and eco-social commitments are the determining factors in the degree of labor protection afforded by legislation in all periods.

Table 2. Labor characteristics

	Rafael Correa 2007-2016	Lenin Moreno 2017-2021	Guillermo Lasso 2021-2025
Employment measures	In 2008, outsourcing and labor intermediation, hourly work contracts and any form of precarious employment relationship were eliminated and prohibited. Specialized technical services, complementary activities and part-time work were included.	Elimination of the Productive Development Law <sup>10</sup> , which exempted companies that created sources of employment from paying income tax for up to 12 years.	Elaboration of the Plan for the Creation of Opportunities. <sup>11</sup>
Humanitarian Law	It was described as the “bad humanitarian aid law” passed by Congress. It did not tax the first 20 cents on bank profits, corporate assets in tax havens or large properties. It left workers and legal debtors defenseless and established asymmetric bilateral agreements with transnational companies protected by supranational organizations.	On September 29, 2020, Executive Decree No. 1165 was issued, which controls the General Regulations of the Organic Law of Humanitarian Support to combat the health crisis derived from COVID-19. It contained various measures that were prejudicial to workers, such as 1) reduction of working hours, 2) special contracts of 6 days per week and 3) The establishment of <i>force majeure</i> or fortuitous events as a cause of termination of individual contracts.	Revocation of the draft Organic Law on Humanitarian Support to combat health crises due to the pandemic, with the rationale that the project would create new mechanisms for the protection of rights and not provide protection for those who may be affected by its application.
Severance pay	The Organic Law for Labor Justice and Recognition of Work in the Home. This legislation enabled people with disabilities, once the contractual 90-day trial period was passed, to be incorporated into a company.	The government announced that it would place special emphasis on job creation and the search for new sources of income. It centralized mining as a source of development <sup>12</sup> and proposed tax reform.	The government expressed its intention to introduce sweeping legislation that would compensate the employer and establish 13 grounds for dismissal without due procedure.
Basic salaries	Originally set at \$170, Correa increased it by 17.6% to \$200. In 2016, the unified basic salary was raised to \$366. <sup>13</sup>	Over the 4 years of Lenin’s presidency, the unified basic salary rose to \$ 400.	Lasso announced a rise of 25 dollars in the unified basic salary to \$ 425.
Workers’ legislation	Article 33 of the Constitution of Ecuador establishes that work is a right and a social duty.	The government aimed to enable free and voluntary union to create a stronger and more stable alliance among the working classes of all nations.	Creation of legislation that would establish, 1) the elimination of profit-sharing to family members; 2) an employer retirement scheme that would create a pension fund that can be accessed regardless of where the person works.

Source: Compiled by the Authors From 1) Zibell, 2017, 2) Naranjo Martínez, 2018, 3) Baldeón, Varela, Ruiz, & Oliva, 2022, 4) Aguilar, 2016, 5) Monroy, 2020, 6) Orozco, 2021, 7) Spain, 2019, 8) Bieler, 2021ab, 9) Ministry of Labor of Ecuador, 2020, 10) ECLAC, 2020 and 11) Conaie, 2020.

When Rafael Correa took office, a referendum was held on the proposal for a new constituent assembly; following popular approval the new constitution was issued in 2008 under the title, *Sumak Kawsay*. Article 33 of the Constitution of the Republic of Ecuador (2008), states:

*Work is a social right and duty, and an economic right, a source of personal fulfillment and the basis of the economy. The state shall guarantee workers full respect for their dignity, a decent life, fair remuneration and rewards and the right to carry out healthy work, freely chosen or undertaken*



## ***Analysis of Labor Reform During COVID-19***

During Correa's mandate, significant public investment was made in infrastructure, roads, security and social development (Gobierno del Encuentro, 2022). Important structural and political changes were also made through new legislation, including the new Monetary and Financial Code<sup>15</sup> and by giving greater control and importance to the state in all economic sectors. As for the state of the economy, Correa claimed that the country had overcome a severe recession, that it was stabilizing and that by 2017 the scarcity of funds would be reduced. Areas of investment were opened up in areas such as refineries, metallurgy and shipbuilding with the intention of making a qualitative leap in the development of the country (despite the variable relationship with international organizations such as the International Monetary Fund resulting from what were seen as unfair demands)<sup>16</sup>. Correa's ten years in government led the country through the political, economic and social changes that was styled the Citizen's Revolution, which doubled the size of the economy, reduced poverty levels and increased the country's systematic competitiveness. In addition, unemployment and underemployment remained low (Sandoval, 2019). Following the appearance of new employment categories established by the 2008 constitution, at least 200,000 people entered into direct employment, which, although still far from the levels of job-creation needed, was an unprecedented advance (Cano, 2010). On the other hand, freedom of association was inherently restricted by article 326, paragraphs 8, 13 and 16, of the Constitution so that this endogenous right became subject to a degree of interference by the state. Workers were divided into the public sector and the private sector under two different legal regimes (the Administrative Career for public workers and the Labor Code for the private sector) that also prevented their being regarded as legal entities, while any collective organization was also limited.

The Government of Guillermo Lasso took control of the COVID-19 vaccination scheme following the negligent management of the government of Lenin Moreno, which had been plagued by corruption. Lenin's government had also failed to implement any agreement of the International Labor Organization, evidencing his political intentions (Luque & Casado, 2020). Lasso opted for pragmatism and took advantage of the increasing supply of vaccines, leveraging commercial and geopolitical avenues to prioritize vaccination at any price (Barrera, 2021). The vaccination of the workforce and the view in the media that the worst of the pandemic had already passed allowed the government to open the economy up. Through the new "Law of Opportunities"<sup>17</sup>, recruitment mechanisms were created in order to support the transition from education to the labor market for young people. The focus was on channeling the academic, technical or experiential knowledge of the workforce for the development of the country (Popescu, 2018). The mechanisms included a double deduction of income tax for the hiring of recipients of the Human Development Bond (a welfare payment to the poorest members of society) and a double deduction of income tax for new enterprises that create at least ten places of work. It also incorporates a technique for calculating the annual Unified Basic Salary and improvements in the conditions of seasonal contracts, and contracts for each work place (Lasso, 2020).

Having analyzed the promotion of labor rights by the three successive administrations, it can be seen that their policies were somewhat antagonistic and variable in intensity. In the midst is the significant impact of the crisis caused by COVID-19 in Ecuador. According to ECLAC (2021b), the economic "recovery" in 2021 was not enough to mitigate the profound social and employment impacts of the pandemic in aspects that are intimately linked to income inequality, poverty, informality and vulnerability. Taking the successive (and covert) labor reforms implemented over the last 15 years in Ecuador, there is evidence of a de facto violation of labor rights at the outset of the COVID-19 crisis that coincided with the growing instability of the national economy. A significant number of companies and public institutions began to lay off workers and to ride roughshod over a good part of the hard-won rights of workers.

These circumstances have been aggravated by the introduction of the Law of Creation of Opportunities, which, rather than benefiting the employee, has granted businesses the capacity to carry out unjustified dismissals, with little social protection on the part of the state.

## **SOLUTIONS AND RECOMMENDATIONS**

The impact of the COVID-19 on the global economic environment for the Sustainable Development (SD) is believed to have been earth-shattering in all areas of our society. Moreover, the Post-COVID-19 Era is believed to have been seriously challenged and abruptly affected by everything that the COVID-19 pandemic and the COVID-19 crisis have embodied and have implicated for our society as a whole. Furthermore, the authors of this book chapter are highly worried about the short, medium, and long term consequences of the COVID-19 pandemic and the COVID-19 crisis on our society, since the magnitude of the events that followed was and still is overbearing for all individuals worldwide.

As a result of the COVID-19 pandemic and the COVID-19 crisis, the labor market was irreversibly affected as it has been shown by the authors in this book chapter. Also, as it has been brought to the attention here, the labor reform during the COVID-19 has proven to be a real provocation for leaders, governments, and specialists, at a general level, and in Ecuador, in particular. In this context, it needs to be stated that the magnitude of each event depends from one situation to another, from one case to another, from one region or from country to another. However, in the case of Ecuador, the authors have analyzed several aspects that might raise concern and that clearly have managed to call for concrete action in order to support the future of work and better work standards for all individuals and at a large scale.

There are numerous and far-reaching solutions and recommendations that the authors of this book chapter are having in mind and are willing to draw attention to now and in the near future, as well.

First of all, in order to follow the lines promoted so successfully and so vigorously by the Sustainable Development Goals (SDGs), the authors of this current scientific work have managed to show a great attention to defending the interests of workers, without necessarily being part of the labor unions, and regardless of whether these workers are employed in the formal or in the informal sectors of the economy. In this matter, this current work calls for effective labor laws and seeks to promote individuals' right to better lives for them and for all their family members.

Second of all, in order to be able to cope better and more efficiently with the challenges that effective domestic and international labor laws might have upon individuals and on our society, the authors have suggested the necessity to reform the domestic and the international labor laws, in order to ensure better protection and higher working and living standards for the employed individuals and for their family members. In this matter, the policies should be updated and keen on addressing the human causes, while the labor markets should be more centered on the individuals' state of well-being, mental health, and general level of happiness, and, also, while social dialogue should become a priority on the agenda of all leaders and governments worldwide.

Third of all, in order to be able to foster sustainability in our daily lives, powerful and vital links should be created and should be promoted between the labor reform at a national and at an international level, the Post-COVID-19 Era expectations and desiderates, and the Sustainable Development Goals (SDGs) accomplishment. Hence, sustainability manages to flourishingly combine all areas – being an interdisciplinary concept, with imperative cross-disciplinary ramifications – the authors have come to support and to promote in this scientific work the necessity to become part of ecological, human, and

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Erath-friendly economic practices, including in terms of creating the labor reform with important accents triggered on the importance of human resources – probably the most important intangible asset that our society holds, as well as the ecological, the human, and the economic well-being, health, inter-generational equality, and vitality.

While addressing the vital aspects specific to this current exploration, it can be noticed that the labor market in the developed countries has proven resilient to the most recent shocks generated by the COVID-19 pandemic and the COVID-19 crisis, which could be the result of strong and reliable labor regulations that were designed and which were implemented in a proper and in a correct manner so that the employees and the employers are well protected, while active labor market programs are encouraged, and high incomes that come to reward high employees involvement and dedication are due to be desired and expected (Popescu, 2017). Also, the labor market place in highly developed countries is renowned for its stability, being usually characterized by the lowest rates of unemployment as well as by real wages that register steady increases from one period to another (Popescu, 2019a, 2019b, 2019c, 2019d). According to specialists, the pre-COVID-19 labor marketplace in the developed and overdeveloped countries worldwide was considered relatively healthy, especially in the context in which the emphasis was on sustainability, responsible actions, collaboration, cooperation, concern for the environment and ecological measures (Popescu, 2019e, 2019f, 2019g). Nevertheless, the Post-COVID-19 Era comes with challenges for the labor market all around the world, since the COVID-19 pandemic and the COVID-19 crisis had severe repercussions on all the segments of our society and of our economy, which led to high rates of unemployment, low levels of labor force participation on the marketplace, the lack of homogeneity of workers, less competitive labor market, the suppressing of the workers' wages due to market concentration, and less rapid as well as less sustainably integrated jobs on the labor marketplace (Popescu, 2020a, 2020b).

Hence, in terms of solutions and recommendations due to be seriously taken into consideration, the following ideas are due to be kept in mind for the future of a sustainable and robust labor market for all individuals: (a) the labor market has to adept to the new requirements of the Post-COVID-19 Era, by offering broader opportunities for workers in terms of flexibility regarding the place where the work must be performed (the location of the employees, which have recently become more and more interested to work from the comfort of their homes rather than from the offices) as well as the timeframe for work (the working schedule, which needs to become more flexible in order to support the new desires and the new exportations of the employees); (b) the labor market has to adept to the new requirements of the Post-COVID-19 Era, by offering concrete opportunities to the employees to become more skilled in several areas rather than in targeted areas, since it has lately been proven than it has become more and more difficult for employers to fill vacancies (based on recent statistics, the number of job vacancies has reached a record level on the labor marketplace, there is a sluggish labor recovery, and high-quality and highly trained workers are difficult to be encountered and retained for longer time periods even on well-paid positions).

## **FUTURE RESEARCH DIRECTIONS**

The future research directions in terms of this current analysis of the labor reform during the COVID-19 might address the implications of the case described here, namely the case of Ecuador, for the Post-COVID-19 Era. In this context, it ought to be underlined that the Sustainable Development Goals (SDGs),

which are part of the 2030 Agenda strongly promoted by the United Nations (UN), come to vigorously support the protection of labor rights as well as safe and secure places of work for all individuals.

For instance, a new future direction of analysis could be represented by the presentation of the most relevant Sustainable Development Goals (SDGs) targets which are believed to be related to the labor standards, as seen from the perspectives offered by the International Labor Organization (ILO). In this matter, a particular attention should be given to the situation of the migrant workers and, in particular, to the women migrants, which more than often are implicated in cases of precarious employment.

Another future direction in terms of an up-to-date labor reform analysis from the perspective of the Post-COVID-19 Era could be represented by situations in which Sustainable Development (SD) ought to be promoted and fostered in order to ensure the future of safe and secure work as well as fair and high work standards for all individuals, thus attempting to ensure and to enforce non-discriminatory laws and policies for a bright and successful future as well as better changes for all people at a wide level.

In the same line with the future direction of analysis aforementioned, it needs to be emphasized that a highly sensible and an essential aspect that embodies the labor reform analysis makes reference to finding the necessary solutions to ensure equal access to justice for all individuals, in order to be able to have the rules of law promoted at both the national and the international levels. In this particular situation, an in-depth analysis of the ways in which individuals could have access to justice, in order to be able to protect themselves and maintain secure and safe workplaces, could represent a future research direction. Hence, there are numerous issues that could be included in this type of research work, such as for example, which will the future of work be in the Post-COVID-19 Era and in what manner will the labor standards be affected, on the long run, by the COVID-19 pandemic and the COVID-19 crisis, on the one hand, and how should individuals learn to protect themselves and their families, and become more powerful as a group rather than as single individuals, having the right to the freedom of association and the collective bargain, and be part of the global supply chains having international ramifications, on the other hand.

All in all, it can be easily remarked that the future research directions in terms of this current analysis of the labor reform during the COVID-19 are numerous and may be regarded as decisive to increasing the coherence of such a vital subject that is an integrating part of the United Nations (UN) Sustainable Development Goals (SDGs). Nevertheless, there should be taken into consideration the fact that there exist crucial and extensive Sustainable Development Goals (SDGs) targets which are believed to be related to the labor standards, especially in a society that craves for the creation of active and attractive labor market policies, lusts after those forms of employment capable to support and embody economic growth as well as Sustainable Development (SD), hungers for equality and enterprise development, and cries out for pivotal national employment policies, social dialog and better working conditions. Also, there should be underlined the fact that the success and the coherence the labor reform in the Post-COVID-19 Era has great consequences on the future of our Planet in terms of fostering sustainability, resilience, robustness and inclusiveness in our society and for all individuals worldwide, since it has among its declared aims the ability to maintain and to support individuals well-being, mental health, educational level, working conditions, family satisfaction, continuously over time, preventing environmental degradation and different forms of human abuses.

## CONCLUSION

The economic reality in Ecuador continues to be a topic of debate now, as it was prior to COVID-19. While it is true that many labor reforms were created with the aim of reducing unemployment in the country and creating new job opportunities, it should be noted that many of these “improvements” did not benefit employees. Reforms such as the special emergency contract, brought in during the pandemic, were not applied across all companies, rather many people were made redundant or had their rights violated through reductions in salary or their disaffiliation from the social security system. In the pandemic, a historic opportunity was missed to forge a new social pact with real protections, certainty and confidence along the entire chain of labor supply including all its facilitating elements. A new social contract should promote and strengthen the institutionalization of social protection systems and lead to universal, inclusive, sustainable and resilient systems. Years of weaker economic growth are likely to come, and if efforts to protect livelihoods are not sustained, the region’s stark poverty and inequality will increase further.

The impact of the health crisis was especially severe in vulnerable low-income sectors, which increased inequality in the labor market. This could be observed by examining occupational groups and educational levels. On the other hand, employees with higher level qualifications and who worked in activities that could be carried out remotely were largely able to retain their employment. Going forward, highly skilled workers are likely to enjoy greater job stability despite the sluggish economic recovery in the region. As can be seen in this study, those in vulnerable groups who were badly affected during the health emergency will continue to find it difficult to secure decent employment in the future, especially if the state does not take charge of the existing problems or, worse, if it renounces its duties in favor of capital and the accumulation of transnational wealth. Crises such as the COVID-19 pandemic and its aftermath should be an opportunity for governments to show their solidarity by unequivocally guaranteeing the working conditions of its citizens in the worst times and labor law should be one of the most important constitutional elements of the state since it is promoted by both the executive and legislative powers to strengthen the stability of all its institutions.

The current creation of legislation tailored to the needs of employers constitutes a hypocritical violation of workers’ rights and a travesty of modernity; it is merely economic maximization prevailing over human rights. The authorities seem to hide behind the narrative of creating opportunities in order to limit the powers of the worker in addition to relaxing regulations related to the exploitation of natural resources; they would do better to promote the peaceful coexistence of employee and employer. The worker and the natural environment that is often the source of economic power in Ecuador must be the main focus of protection within the state as a true engine of opportunity and social change.

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## **KEY TERMS AND DEFINITIONS**

**Economic Globalization:** This is a phenomenon in expansion that causes profound changes on the world stage. It revolves around trade, the flow of investment, financial capital, division of labor and specialization. The concept is not limited only to economic variables since its effects extend to individuals, society to the state. Developing countries are experiencing stagnation in the face of their inability to cope with globalization, which is compounded by poor management of their financial markets, leading to an increase in the income inequality gap. Economic globalization brings with it the mobilization of goods and capital, reduces distance between borders and energizes international trade with some alterations to sovereignty.

**International Outsourcing:** Purchases made by an enterprise of goods and services from foreign suppliers with which there are no direct labor relations or through the transfer of tasks to affiliated companies established abroad.

**Labor Union or Trade Union:** Is an organized group of workers who unite to make decisions about conditions affecting their work.

**Legalized Corruption:** Dishonest processes that, both by act and omission, contribute to the demoralization of the individual and of all kinds of public and private organizations by benefitting these through regulatory protection based on the abuse of authority, conventions, legal vacuums, impunity, etc.

**Public Policy:** This refers to decisions and actions that a government takes when addressing public or collective issues.

**Resilience:** Transformations within a complex system related to the capacity for self-organization while maintaining internal structure, together with the ability to create adaptive responses, generate knowledge, experience, and learning. Resilience and sustainability are directly related to changes within societies, economies, and the human system as a whole. The transformation of systems is inevitable since it allows systems to strengthen.

## ENDNOTES

- <sup>1</sup> Ecuadorian Labor Code 2005, available at <https://bit.ly/36zGV3R>
- <sup>2</sup> It is important to determine that the right of workers is inherent, non-transferable and universal; not only national laws have to be taken into account, but also the international treaties that are related to the country, which protect the rights of workers.
- <sup>3</sup> Adler Modemärkte, Auchan, Ascena Retail, Benetton, Bonmarché, Camaïeu, C& A, Cato Fashions, Cropp (LPP), El Corte Inglés, Grabalok, Gueldenpfennig, Inditex (Zara, Bershka, Pull and Bear, Oysho, Stradivarius), Joe Fresh, Kik, Loblaws, Mango, Manufacturing Crown, Mascot, Matalan, NKD, Premier Clothing, Primark, Hijos e Hijas (Kids for Fashion), Texman (Pvt), the Children's Place (TCP), Walmart y Yeszee.
- <sup>4</sup> The price of gasoline (per gallon) stands at \$ 4.66 for high-octane fuel, \$ 2.25 for standard fuel and \$ 1.90 for diesel as of 12/4/2022.
- <sup>5</sup> Per individual: it is usually used to refer to an economic variable that is distributed among the members of a group.
- <sup>6</sup> Lasso, G. [@lassoguillermo]. (2021, March 21). We will support Ecuador's immediate entry into the Pacific Alliance and the signing of trade agreements with the United States, Japan, South Korea and more countries around the world. Economic openness is investment and thousands of jobs. #Encontrémonos To Achieve It [Tweet]. Twitter. <https://twitter.com/lassoguillermo/status/1373823549627064325?lang=es>
- <sup>7</sup> Organic Law on the Creation of Opportunities, Economic Development and Social Sustainability, is legislation implemented by the Presidency of the Republic, in order to make taxation, economic and labor reforms.
- <sup>8</sup> Treaty on European Union and the Treaty on the Functioning of the European Union. Official Journal C 326, 26/10/2012 P. 0001 – 0390. - In the area of labor legislation, the European Union's measures complement the initiatives of each member country by establishing minimum standards. On the basis of the Treaty, namely Article 153 thereof, the EU adopts laws (directives) laying down minimum labor requirements.
- <sup>9</sup> [https://boe.es/diario\\_boe/txt.php?id=BOE-A-2021-21788](https://boe.es/diario_boe/txt.php?id=BOE-A-2021-21788)
- <sup>10</sup> Law for Productive Development, Attraction of Investments and Employment Generation. Available at <https://bit.ly/3uiIriG>
- <sup>11</sup> The "law of opportunity" is the axis of the flexible reforms proposed by Lasso to reactivate markets and encourage employment, which has been falling since 2019 and with the pandemic reaching intolerable levels due to the high level of labor informality that used to exist. The domestic market.
- <sup>12</sup> National Mining Sector Development Plan 2020-2030. Ministry of Energy and Non-Renewable Natural Resources. Available at <https://bit.ly/3wlzhEP>
- <sup>13</sup> "Gobierno del Encuentro", 2022.
- <sup>14</sup> The Organic Monetary and Financial Code aims to regulate the monetary and financial systems, as well as the stock exchange and insurance regimes of Ecuador. Available at <https://bit.ly/3N74UIg>


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- <sup>15</sup> “The agreement with the IMF forces Ecuador to raise VAT to 15% and cut public spending. The government of Lenin Moreno will this year receive 4,000 of the 6,500 million in finance, but the most demanding reforms are expected in 2021.” Information from Elpaís.com by S. Spain 6/10/2020 <https://bit.ly/3sv9h7U>.
- <sup>16</sup> Law of Opportunities, proposed by Guillermo Lasso “to reactivate the market and empower employment”.

## Chapter 2

# Women Victims of Economic Violence: An Analysis of the Associative Sector Through Santa Marta Women's Association, Manabí, Ecuador

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### ABSTRACT

*This chapter analyzes the processes of economic violence as a social problem that is often hidden and accepted by women, families, or society in general. Consequently, it is a type of violence ignored by policy and little known by the public, especially in rural areas, where it has become normalized. There was a clear need to assess the impact of creating rural spaces for association that contribute to the improvement of the condition of women victims of economic violence. To this end, an interpretative and phenomenological approach to a life-story and case study was used to describe and analyze the present situation by means of in-depth interviews with three members of the Santa Marta Women's Association. The analysis shows the importance of providing the women of the association with economic tools that allow them to insulate themselves from any aggression of this type. Therefore, it is necessary to promote the associative sector as both a tool for specific circumstances and as a key element in public policy.*

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## INTRODUCTION

More than four decades ago, various organizations (The L'Occitane Foundation, William and Flora Hewlett, Zonta International, among others) undertook the fight to eradicate violence against women at a global level. Violence is considered an action that, per se, violates the rights of women, affecting their integrity by causing physical, psychological or emotional damage. The phenomenon is present in all societies, globally and without distinction. According to the United Nations (UN, 2021), one in three women worldwide experiences physical or sexual violence from a very young age. This amounts to 736 million women who have suffered some form of abuse at the hands of a partner or other aggressor while one in four young people between 15 and 24 years of age who have had an intimate relationship will have suffered some type of violence by the age of 25. The World Health Organization (WHO, 2005, p. 6), in a study of more than 24,000 women carried out in ten countries, concluded that “the percentages of women who had been victims of violence at the hands of their partner ranged from 4% in Japan, Serbia and Montenegro to 54% in Ethiopia”.

In addition to these commonly reported processes of violence, other types, such as economic violence, are recognized by the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women, 2021). Economic violence is defined as “persistence in achieving or attempting to achieve financial dependence on another person, maintaining total control over their financial resources, preventing them from accessing them and prohibiting them from working or attending school.” In the same vein, it is worth highlighting a study carried out by UN Women and the United Nations Development Program (UNDP), in which an analysis of more than 2500 government provisions were made across 206 countries and territories. The study looked at three areas with a gender focus: the fight against gender violence, supporting unpaid care and strengthening women’s economic security (UN, 2020). It emerged that the Americas has more policies dedicated to strengthening women’s economic security than anywhere else. Forty-seven countries in the region have implemented specific policies of this type and 77% of these include the gender aspect. Of the 634 actions adopted, 281 address gender issues, 190 violence, 65 economic security and 26 focus on unpaid care (UN, 2020). In Latin America, economic violence is conceived as a serious problem that affects all of society and that has caused a deterioration in the economic resources and, therefore, autonomy of women. Aggressions seek to limit or prevent all types of women’s income in order to exercise control over them and instigate a condition of dependence on partners or families. It is worth emphasizing that there is a wide gap between the objective of gender equity and the current economic autonomy of women. Despite the opportunities arising from advances in information technology and the processes of globalization, economic violence continues to affect many women because the time spent in unpaid work is frequently longer than that of men. According to the Economic Commission for Latin America (ECLAC, 2021a), “In the region, on average every day women spend three times as much time on unpaid domestic and care work compared to men’s time.” Table 1, Indicators in Latin America, illustrates this wide difference in unpaid work between men and women. The proportion of women who spend time on unpaid work with no income is greater than those who have some income. Even those in paid employment spend more time on domestic work than men and have to perform domestic tasks while making even more effort to be part of the workplace; in fact, “this overload of women’s working hours ... [should be seen] as a barrier to participation in the labor market on equal terms with men and access to economic resources that allow them greater degrees of autonomy” (ECLAC, 2021bc).

Table 1. Economic indicators in Latin America

Indicators	Time spent on unpaid domestic work		Unpaid working time with income		Unpaid working time with no income		Average time spent on unpaid work		Average time spent on paid work	
	F	M	F	M	F	M	F	M	F	M
<b>Gender</b>										
<b>Country</b>										
Mexico	24.2	8.8	40.1	16.9	58.4	23.6	42.6	16.6	21.1	44.6
Guatemala	19.5	2.6	36.4	10.4	45.2	12.2	36	5.6	13.5	41.9
El Salvador	20.2	7	33.7	18.7	49.8	30.4	37	16.9	21.5	41.4
Honduras	17.3	4.3	30.3	14.2	37.7	19.6	30.2	7.8	14.2	37.4
Costa Rica	22.6	8.7	37.2	16.5	51.4	20.6	39.6	17.1	10.8	25.7
Colombia	18.2	5.3	33.6	16.4	46.1	19.4	32.9	11.4	19.8	43.1
Ecuador	19.8	4.7	41.3	10.9	47.9	13.3	37	9.9	20.7	44
Peru	20.9	7.3	35.9	15.3	55.9	22.3	39.8	15.7	22.6	44.5
Brazil	11.6	5.1	21.1	11.7	27	14.6	21.5	10.8	16.8	28.6
Paraguay	15	4.4	28.7	12.2	39.2	21.2	28.5	11.8	18.1	35.4
Uruguay	19.9	8.4	39.2	19.4	51.5	20.2	35.7	15.4	21.8	36.8
Argentina	23.4	9.3	46.8	24.5	59.6	28.6	42.4	17.3	15.2	33.2
Chile	24.6	10.8	42.2	20.7	55.9	20.6	42.1	19	19.8	34.6

Source: Economic Commission for Latin America and the Caribbean, 2021

In the case of Ecuador, progress has been made on various fronts in mitigating violence against women in all its forms. Leading examples are the Law Against Violence Against Women and the Family (Law 103), 1995; The Constitution of the Republic of Ecuador, 2008; the Comprehensive Organic Criminal Code (COIP) 10<sup>th</sup> reform, 2014; the National Plan for the Eradication of Gender Violence Against Children, Adolescents and Women, 2015; the Comprehensive Organic Law to Prevent and Eradicate Violence Against Women, 2018. In addition, there are national surveys to obtain updated information on the violence suffered by women in the country, the second of which was carried out in 2019; the survey defines economic violence as “any action or omission that is aimed at causing an impairment in the economic resources and property of women” (National Institute of Statistics and Censuses, 2019, p.36). Table 2, National Indicators, shows a summary of the percentages of different categories of violence against women in Ecuador, underlining that there is little difference between the incidence of rural and urban violence.

There is a clear need to raise awareness of the prevalence of violence in all its forms and in all areas, but economic and property violence is perhaps the least visible. Although this form of violence against women has been studied as a social problem and is subject to intervention, little is known about its context and origin due to the control exerted by patriarchal society. In rural areas, the culture and traditions have led to its often going unnoticed even by the victims themselves.

Manabí is one of the 24 provinces of Ecuador and is made up of 22 cantons and 55 rural parishes; the population of women represents 49.4%. (Ferreira, García, Macías, Pérez, & Tomsich, 2021) Within this context, women seek the means to sustain themselves economically and strip away patriarchal control and the state of economic dependence within a framework of equity and empowerment. The National



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Institute of Statistics and Censuses (2019), in the National Survey on Family Relations and Gender Violence against Women, indicate that violence within couples predominates. Nationally, only 19.1% of the cases of violence against women, both physical and economic, were reported while in Manabí the prevalence of economic violence is 33.5%. As a form of mitigation of this type of silenced or naturalized violence, Sánchez & Jiménez (2013) highlight the importance of creating women's associations that form networks of victims that seek to establish common interests. They provide opportunities to influence social change through public participation by establishing strategies for collective action. It should be noted that, although violence against women in general is increasingly recognized as a violation of rights, economic violence remains largely unrecognized and is widely accepted socially.

The relevance of this study should be seen in this context. The main objective is to determine the importance of creating rural associative spaces as a means of improvement of the conditions of women victims of economic violence. It analyzes the importance of providing a place where women can feel safe to express themselves freely, of making the characteristics of economic violence more visible, and of publicizing the experiences of Manabí women in rural areas. To this end, the processes of economic violence against women are here analyzed from a critical, proactive and multidimensional point of view in order to, i) discover the importance of creating associative spaces in rural areas, ii) establish the taxonomy of inconsistencies between the regulations in place and the current reality on the ground and, iii) explore the importance of the distribution of processes of economic independence in areas of vulnerability.

Table 2. National indicators

Percentage of type of violence experienced at some point	National	Urban	Rural
Total violence*	64.9%	65.7%	62.8%
Psychological violence	56.9%	56.7%	57.4%
Physical violence	35.4%	34.4%	38.2%
Sexual violence	32.7%	36.6%	22.9%
Economic and property violence	16.4%	17.0%	14.9%
Gynecological-obstetric violence	47.5%	44.7%	54.8%

Source: National Institute of Statistics and Censuses, 2019  
\*Note: Total violence includes psychological, physical, sexual, economic and property violence

## BACKGROUND

Gender-based violence is a social problem that has been present across all cultures and throughout history. It has affected or indeed destroyed the lives of millions of women (Mayeri, 2001). Although not a new phenomenon, this problem has for long been invisible and accepted by a patriarchal society in which women had no rights. According to Rico (1996, p.8), “the violation of women’s rights and gender violence are not new problems; they involve behaviors that until very recently were socially accepted and that, because they are generally limited to the field of private life, were very little known.” Although much progress has been made in the fight to prevent and eradicate violence against women, it remains one of the most widespread and urgent of human rights issues due to the trauma and damage it causes to women worldwide.

It is necessary clearly to define gender violence. Article 1 of the Declaration on the Elimination of Violence against Women by the UN General Assembly, (1994, p.3) defines it as:

*Any act of violence that results or is likely to result in physical, sexual or psychological harm or suffering to women, as well as threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or private life.*

UN Women (2021) states that gender-based violence consists of any harmful act directed against a person or a group of people because of their gender. It is rooted in gender inequality and the abuse of power over women, whether by a partner, a relative, co-workers or strangers. More generally, gender violence consists of any activity, both by act and omission, that leads to physical, emotional or psychological damage to a person because of their gender (Chávez & Juárez, 2016; Luque, et al., 2022). Generally, there are five types of aggression toward women and girls in the domestic setting: physical, psychological, sexual, economic or emotional, with psychological violence perhaps the most frequent and widespread. Meanwhile, The Assembly of the Republic of Ecuador (2018, p.12-13), in Article 10 of the Comprehensive Organic Law<sup>1</sup> to Prevent and Eradicate Violence against Women, recognizes seven types of violence. Physical violence is any act that causes physical harm, pain or death, including assault and torture. Psychological violence is based on any behavior aimed at causing emotional damage to another person, such as insults, intimidation and control. Sexual violence involves any act that violates the sexual integrity of another person, such as harassment, sexual abuse and exploitation. The sexual division of labor is also included as a type of violence against women that commonly follows the traditional roles assigned to gender carried forward by inertia and the lack of regulation. The division is based on a false dichotomy, with production processes assigned predominantly to men in public space, while the reproduction processes are assigned to women confined to the domestic sphere. This represents a de facto exclusion from the economy, whereby almost all functions that could be carried out by women are transferred to men.

Economic violence focuses on producing a deterioration in the property and economic resources of women, including the retention, confiscation or destruction of goods, the prevention of women seeking paid employment and the control or removal of financial resources. Symbolic violence consists of any action that promotes inequality and the discrimination of women through the creation and distribution of images, messages or icons. Political violence is exercised by an individual or group who seek to prevent or restrict women from accessing public office or the fulfillment of their functions in office; gender-based workplace harassment is an example of this. Finally gynecological-obstetric violence is classed as any action that prevents pregnant women from accessing health services (Heise, et al., 2022). An example of this last category is the inadequate abortion legislation in Ecuador. In 2022, the National Assembly of Ecuador approved abortion for cases of rape within a certain timescale, passing narrowly by 5 votes. Specifically, the law permits women victims of rape who have become pregnant to interrupt the pregnancy up to 12 weeks and, exceptionally, up to 18 weeks in cases of girls, adolescents and indigenous women from rural areas. While the legislation corrected a flagrantly unethical situation for women victims of rape, it did not address the majority of the demands put forward by feminist organizations. These remain in the in-trays of the predominantly male legislators who have control of the National Assembly, consigning this most pressing of women's issues to endless deferral.

## ***Women Victims of Economic Violence***

Although Ecuador has made considerable progress in the question of women's rights in recent years, the last four types of violence listed above are poorly identified and little known by the public, which means that problems related to these abuses remain largely invisible. In particular, economic violence is generally unnoticed by society in comparison with other types of violence and has traditionally been normalized by patriarchal culture. Córdova-López (2017, p.42) points out that "the victim (almost always the woman) believes that certain acts that constitute economic or property violence, such as, for example, when the aggressor does not allow her to work or when he constantly complains about how she spends the week's money, or even when he hides her belongings from her for a while, she considers this as 'normal' or accepts it in the belief that such acts do not constitute violence and that she is not able to report them." Economic violence against women can be exercised by a partner, by a member of the family or by any individual in society or by a private organization. In fact, it can also be exercised by a state when legislating or failing to legislate or by exercising clear institutional abuse. For example, is it moral that the same interest rate and the same conditions be applied on a loan for a person to buy a vehicle or to go on a cruise as for a victim of gender violence who needs financial assistance to escape their situation, or indeed for a single mother struggling with childrearing? In addition, financial institutions and transnational corporations generally receive preferential treatment from states and supranational organizations, yet are left to take their own decisions with regard to corporate social responsibility policies whose only means of regulation is providence or good faith, and which tend to be quite the opposite of what they claim, leading rather to social irresponsibility (Luque and Herrero-García, 2019).

Economic violence often starts insidiously and is unconsciously accepted by the victim, but, over time, control by the aggressor increases gradually until it reaches the point of becoming unbearable. Eventually, the aggressor controls all of the income of the household and prevents the victim from working outside the home, or he removes all kinds of economic resources that the victim previously had access to. Physical assault may be used to enforce the situation, in response to any reproaches or protests, leading to further psychological damage to the victim.

Table 3, Economic Violence, shows some conceptualizations of economic violence as reflected in the legal provisions of various countries of South America. The definitions are taken directly from legislation designed to address, intervene in and raise awareness of economic violence as a type of gender and intra-family violence.

It is worth noting the existing regulatory contributions to the prevention, punishment and eradication of this type of violence against women, in response to circumstances that affect the economic resources of victims by withholding, prohibiting, hiding, damaging or preventing income, resulting in the loss of economic independence. In recent years, many South American states, such as Bolivia, Venezuela, Colombia, Ecuador, Peru and Paraguay have made important advances in policies of care, prevention and punishment as a response to this violation women's rights. Nonetheless, large sections of the public are unaware of certain types of violence that affect the rights of women, especially of those living in rural areas and whose circumstances often prevent them from confronting this kind of abuse due to limited access to information, help services or other resources (Zapata, 2019).

Along the same lines, violence against women combines several cultural and social elements, making it is necessary to address this issue through the development of public and social policies that take into account the particular circumstances of women who live in more remote rural areas, or in communities of indigenous peoples in which the patriarchal state has greater power and continues to be imposed. Kay (2003, p.246) points out that "the state plays a central role in the emergence, development and resolution of rural conflicts and violence and, therefore, those who design public policies have a special responsi-

bility to examine the lessons that may arise” from situations that lead to these events. Consequently, the issue of economic violence is very much centered on the importance and power endogenous to public policies, be they well designed and effective or be they defective and liable to lead to negative effects such as processes of irresponsibility or criminality (Luque & Herrero-García, 2019).

*Table 3. Economic violence*

Country	Name of the Legislation	Definition
<sup>1</sup> Venezuela	Organic Law on the Right of Women to a Life Free of Violence	Art.15. – Subsection 12. Property and economic violence: Property and economic violence is considered any active or omissive conduct that directly or indirectly, in the public and private spheres, is aimed at causing damage to movable or immovable property to the detriment of the economic situation of women victims of violence, or to property held in common, as well as interference in the possession or ownership of property, including theft, destruction, withholding or removal of objects, personal documents, property and securities, economic rights or economic resources that are intended to meet their needs; economic constraints aimed at controlling their income; or the deprivation of the economic means necessary for living.
<sup>2</sup> Colombia	Law 1257, 2008	Art. 2. – Definition of violence against women. Economic violence is understood as any action or omission leading to economic abuse, abusive control of finances, financial rewards or punishments toward women based on their social, economic or political status. This form of violence can develop within couples, families, or working or economic relationships.
<sup>3</sup> Ecuador	Ley to Prevent and Eradicate Violence against Women	Art. 10.- Subsection d) Economic and property violence. - This is any action or omission that is aimed at causing an impairment in the property or economic resources of women, including those within marriages and common-law relationships.
<sup>4</sup> Peru	Law to Prevent, Punish and Eradicate Violence against Women and Members of the Family Group	Art. 8. – Subsection d) Economic or property violence. This is an action or omission that is aimed at causing an impairment in the property or economic resources of any person.
<sup>5</sup> Bolivia	Comprehensive Law to Guarantee Women a Life Free of Violence	Art. 7. – Subsection 10. Property and Economic Violence. This is any action or omission that, by affecting a woman’s personal or shared property, causes damage or impairment to her estate, assets or resources; it controls or limits her economic income and the use thereof, or deprives her of the necessary means to live.
<sup>6</sup> Brazil	Maria da Penha’s Law	Article 7. Subsection IV - Property violence, understood as any conduct that comprises the withholding, theft, partial or total destruction of objects, work instruments, personal documents, goods, assets and rights or economic resources, including those used to satisfy needs;
<sup>7</sup> Paraguay	Law No. 5777 on the Comprehensive Protection of Women against All Forms of Violence	Article 6.- Subsection f) Property and economic violence. Action or omission that leads to the damage or impairment of the personal or shared property, assets, resources or income of a woman by unilateral decision, fraud, removal, concealment, destruction or other means, as well as the denial or prevention of her carrying out work activities outside the home or depriving her of the necessary means to live.

Source: 1) National Assembly of the Bolivarian Republic of Venezuela, 2007, 2) Congress of the Republic of Colombia, 2008, 3) Assembly of the Republic of Ecuador, 2018, 4) Ombudsman of the Government of Peru, 2019, 5) Plurinational Legislative Assembly, 2013, 6) Special Secretariat for Policies for Women, 2006 and 7) Congress of the Paraguayan Nation, 2017.

According to Sedón de León (2003), men traditionally have been categorized hierarchically over women, who are seen as subordinate. The domination of the male gender gives men the opportunity to exert authority and control economic power. Conversely, women are deprived of the power to determine

## **Women Victims of Economic Violence**

their own rights within society. In Latin America, the pervasive culture of machismo drives the naturalization of all types of violence toward women and the social constructions of patriarchy systematically deny them fundamental rights and keep them in a situation of inferiority (Castle, 2020). Faced with this situation, groups organized in defense of women's rights have undertaken a struggle to achieve the promotion of public and social policies and the development of protective regulations to ensure that women have access to justice and that different types of violence are effectively sanctioned (Maldonado, Erazo, Pozo, & Narvaez, 2020). These struggles have achieved considerable penetration into the political, social and economic spheres; according to Daeren, (2001, p.10):

*Development with equity is achieved to the extent that countries manage to increase and take advantage of their capacities and resources (human, technical, natural, among others) to achieve individual and social well-being (...). In order to formulate public policies that promote development with equity, it is essential that a gender approach be applied as an analytical instrument in the processes of analysis and planning; it is a necessary condition to achieve a model of integral development that enhances citizenship, and social and economic integration in societies that are democratic, as well as productive.*

In Ecuador, the data regarding job opportunities for women are not encouraging. There is an especially high rate of informality and job insecurity in Ecuador (Luque, 2021, 2022), but, as of October 2021, men had a higher rate of decent employment compared to women. The adequate employment rate (37.8% for men and 23.8% for women). By contrast, for unpaid employment, the rate for women is approximately 3 times higher than for men (INEC, 2021). This shows that society is configured in a way that limits women's rights to work, which in turn contributes to the practice of economic violence within the family nucleus by depriving women of achieving autonomy, underestimating their capabilities and preventing them from projecting their potential for development. To counter this panorama, opportunities are presented through support networks that provide the means to seek economic independence. Association is regarded as a strategy for achieving improvement and empowerment by the promotion of the activities of small and medium associative economic units and the demand for the goods and services they generate (Verzosi, 2018). Within rural areas, association is a particularly suitable approach; by improving competitiveness, the promotion of such practices allows women better to overcome the weaknesses inherent to small scales of production and the difficulties of access to new and better technologies (Guerra, 2014; Araujo, Gacía, & Cabrera, 2017).

The Provincial Women's Organization of Santa Marta was founded in 1988 with the participation of a group of eight women from Los Laureles, a rural community in the province of Manabí, Ecuador. The women actively sought alternatives to their perception of being excluded, exploited and abused. From these beginnings, the organization engaged in activities that attracted more and more women. In 1996, the Community Development Fund was created as part of a solidarity policy that allowed the members to use their savings to finance the establishment of agricultural production projects, the creation of community stores, the development of community pharmacies and the promotion of various projects that have given rise to micro-enterprises for the transformation of agricultural production throughout the province of Manabí (Jaramillo & Jácome, 2019). In this context, it is important to note that the National Constituent Assembly of Ecuador (2008) states in Article 283 that:

*The economic system is social and solidarity; it recognizes the human being as the subject and end goal; it tends toward a dynamic and balanced relationship between society, state and the market, in harmony with nature; and it aims to guarantee the production and reproduction of the material and immaterial conditions that make good living possible. The economic system shall comprise forms of public, private, mixed, social and solidarity economic organization, and others that may be determined by the constitution (Luque & Casado, 2020). The social and solidarity economy will be regulated in accordance with the law and will include the cooperative, associative and community sectors.*

In 2011, the Santa Marta Women's Organization, hitherto operating at the local and zonal level, began the process of gaining legal recognition at the provincial level by taking advantage of the new Social and Solidarity Economy Law<sup>2</sup>. The legislation was seen as opening the possibility to consolidate an economy oriented to the construction of a more just, inclusive and participatory society, one in which the concept of micro-finance is normalized in popular associations (Coraggio, 2011; Popescu, 2018). It is worth mentioning that the funds of each local organization that operated as part of the Community Development Fund were legalized and placed under the supervision of the Superintendence of Microfinance, becoming subject to the Rights of Use of Public Funds (Presidency of the Republic of Ecuador, 2018). Thanks to the guarantees provided by this legislation and the framework of the social and solidarity economy, new opportunities for participation emerged in coordination with state institutions that give priority to the acquisition of the services of the associations. Consequently, a culture of increasing support for women has developed.

## **ADDRESSING THE PROBLEM**

The study of the Santa Marta Women's Association, Manabí, Ecuador, was carried out from a critical, proactive and multidimensional point of view, reflecting the distribution of processes and casuistry inherent to women's lack of economic independence. The analysis was used to determine the importance of creating rural associative spaces that contribute to the improvement of the condition of women victims of economic violence. According to Bavaresco (2013, p.9), "the forms or ways in which the researcher approaches the methodological process in research are very varied (...) because each scientist, researcher (...) has clear knowledge of what to 'investigate'." Even so, investigative approaches do not usually represent a definitive solution to the problem to be addressed, rather, as in the case of this study, they are often a partial approach that generate new questions, giving rise to the need for further investigation (Dorio, Sabariego, & Massot, 2009).

The methodology used an interpretative phenomenological perspective (Chárriez Cordero, 2012) due to its ability to deepen the knowledge of the social realities that many women in rural areas experience. The method facilitates analysis of the situation in its natural context and allows greater understanding of the object of study through an emphasis on "meanings, perceptions, concepts, thoughts, experiences or feelings" (Loayza, 2020, p. 58). The approach also allows greater contact with the object of study (Melero-Aguilar, 2012). Within this framework, a combination of research techniques and instruments were used as set out below.

## **Women Victims of Economic Violence**

1. An analysis of the existing literature was carried out between 26/12/2021 and 11/04/2022 in databases such as Scopus, Web of Science, Latindex and documents indexed in Open Research Europe. Relative reports in primary sources were also analyzed, such as the Economic Commission for Latin America and the Caribbean (ECLAC), the United Nations Organization (UN), the International Labour Organization (ILO) and various non-profit organizations. The analysis used a search for words and search strings such as “gender violence”, “economic violence”, “violation of rights”, “association”, “machismo”, “femicide” (Luque, 2022).
2. Life story analysis was also used (Bolívar, 2012). The biography of Rosa Obregón, president and founder of the Santa Marta Women’s Association, was described, analyzed and interpreted against the context of society. According to Mallimaci & Giménez (2006, p. 176) the life story “in an individual subject, has, as a core element, the analysis of the narrative that this subject makes about their life experiences”. This method allowed essential information to be gathered about the life of the founder of the association, clarifying the processes of social transformation that it has undergone, as well as its origins.
3. A case study approach was also used (Martínez, 2006, p. 189) in order to study three casuistries of women of the Santa Marta Association in the city of Portoviejo, Manabí. Due to the COVID-19 pandemic, the information was gathered through the zoom platform on December 9, 2021. The founder, Rosa Obregón, the coordinator, Reina Barahona, and one user of the association, given the pseudonym “Erika” for the purposes of the study, were interviewed as a valid sample (Lopez, 2004) in order to obtain a vision of the group as a whole and its own view of the importance of creating associative spaces in rural areas (Table N°5), (Appendix I). Semi-structured interviews were used to determine the processes of transformation and social development experienced within the Santa Marta Association of the city of Portoviejo (see Appendix I), as well as the processes of the violation of rights suffered by the members (Díaz-Bravo, Torruco-García, Martínez-Hernández, & Valera-Ruiz, 2013). A questionnaire was used as the basis of the semi-structured interview (Canales-Cerón, 2006), itself the product of an exhaustive analysis of relevant published research (García-Sanz, 2004; Hernández & Coronado, 2020; Massip, Ortiz, Llantá, Peña, & Infante, 2008), the Comprehensive Organic Law to Prevent and Eradicate Violence against Women (The Assembly of the Republic of Ecuador, 2018) and various reports produced by the Association in Manabí (2019) and the Santa Marta Foundation (2011). The questionnaire consisted of 14 questions divided into two groups (ten questions in group “A” and 4 in group “B”) and another question presented to the two groups, with the division of the questions based on the nature of the study subjects.

The population studied all belonged to the Santa Marta Provincial Women’s Association, which is present in 20 of the 22 cantons of the Province of Manabí, and consists of a network of 120 local women’s organizations. The Association has been developing processes of dignity and social inclusion for 30 years, thereby proving the sustainability of the processes of social transformation such as the eradication of poverty and the promotion and respect of human rights and gender equity.

## **ANALYSIS AND DISCUSSION**

The following is an overview of the life story of Reina Barahona Gonzales, founder of the Santa Marta Women’s Association. Reina is of Guatemalan origin and has lived in Manabí for 38 years with her two

children. She is committed to a society free of violence and with equal opportunities. She has never experienced violence from her husband, but, as a child, suffered violent abuse from her mother, a single mother who worked long hours and routinely dealt out corporal punishment. Reina was often hungry and lived in poverty with her four siblings over whom she assumed the role of caregiver. She started primary school at age 9 while doing everything an adult woman would be expected to do in the home. At the age of 14, she started working in a supermarket, then in a textile factory sewing buttons on shirts, and then she got the opportunity to work in the municipal trade union, an organization of 7,000 workers. There was a great deal of worker repression in her country when she began, but she proved herself an effective leader and soon found herself on the executive committee and then the advisory committee. Following a fierce struggle as a trade unionist, she was fired, but later, she found employment in AMG International as a secretary, working with 2000 children in one of the poorest neighborhoods in Guatemala. After 6 months, she became assistant to the director and 5 months later she was made project director. She created the Department of Social Work, which liaises with families identified by their socioeconomic circumstances. She also worked as an educationalist with refugees, training mothers to teach their children to read and write on the border between Mexico and Guatemala where there were no schools and endemic military repression. She later traveled to the Federal District, Mexico, where she continued her work with refugees, but was unable to stay on in Mexico. She traveled to Spain to study, and met her husband, Alfredo de la Fuente. Two years later, they traveled as secular missionaries to the diocese of Portoviejo, Ecuador. Drawing on her experiences in Guatemala, they saw it necessary to help organize the local women, and to highlight economic violence as a key problem. She began with a group of women in Pueblo Nuevo where she taught them to make crowns of roses to sell for the first of November holiday. They sold all of the products and made money, which motivated the women. In the dioceses, there was a program to give school breakfast to 30,000 children, and the idea arose to include local women who produced cocoa, which they were able to sell at a commercial price. This led to further economic projects for the women and the organization grew. Reina noted that the women of Manabí suffered from a high degree of affective dependence that prevented them from finding a way out of the violent abuse they endured at the hands of men. Through the Santa Marta Association, training and education was given to the women. With motivations from Reina, many completed elementary education, others high school and some university. The Association began to create jobs for women and eventually had 150 women in employment. They sought strategic alliances that would allow them to continue educating women and signed agreements with the Technical University of Manabí, the San Gregorio University and the Southern State University of Manabí. The work that the association was carrying out was largely unpublicized and, despite being one of the largest organizations of its kind in Ecuador, it was not until recently that it became widely recognized for its strength, discipline and methodology of work. Over the last two years, it has begun to work with the Council of the Judiciary of Ecuador and has signed agreements with the Provincial Government of Manabí. Indeed, the work of the organization became difficult to ignore due to the large and growing number of women participating from the most remote and needy rural areas.

The data from the interviews conducted with the founder and coordinator of the Santa Marta Women's Association, and with one of the members (named Erika here in order to protect her identity) are set out in the following tables (see also Appendix I). The interviews provided insights into the process of transformation experienced in Santa Marta Women's Association, from which inferences were made to determine the importance of creating rural associative spaces that contribute to the processes of assisting women victims of economic violence. Table 4 sets out a synthesis of the interviews conducted with



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Reina Barahona and Rosa Obregón. The responses are divided into four parameters, which facilitates the analysis of the data obtained. A synthetic interpretation is also presented, in which the answers presented by the research subjects are interpreted in summary form, in order to provide a better understanding of the table.

Table 4. Interview with Reina Barahona (RB) and Rosa Obregón (RO)

Questions	Responses	Incidence
Do you consider that today women in rural areas still perceive household tasks as their only occupation?	RB: I think there is a fairly significant percentage who still assume that doing the household tasks is normal and is the role that society has placed on them and they do not move from there; women in rural areas age much faster than women in urban areas.	Entrenched patriarchal culture
	RO: Yes, all domestic tasks, despite the fact that many already have a small enterprise, or have a business, or higher education, they still perform household tasks; we women do a double or treble working day.	Patriarchal customs
How many local organizations currently exist in the rural areas of the Province of Manabí?	RB: We are working with 120 communities in rural areas.	Networks created
	RO: There are now some 120 women's organizations.	
What is the objective with which the Santa Marta Women's Association was created?	RB: Organizing women to learn to analyze their own reality, and to decide where they want to be, (...) the sad thing is that not everyone has the opportunity to experience another kind of life.	Women's organization
	RO: Firstly, to organize women; once organized, make them aware of their rights, the opportunities they have, education and training.	Women's organization
What kind of programs has the Association developed to integrate women victims of economic violence?	RB: We mark out a route. First, we look for a safe place, and we follow them up, (...) and we try to get them organized, and get them to learn to do a trade and be enterprising with something, to start a new life. They are given workshops, they improve their self-esteem, we work with their children, and they are supported 24 hours a day. It is not easy, but it is very enriching to talk about their experiences.	Work methodology
	RO: We have comprehensive programs	Modality of work
For the Association, what is the main objective of implementing micro-enterprise projects for users?	RB: For them to have the economic tools to get ahead; without economic tools, it is much more difficult for a woman to say, "I will not return to that cycle of violence", or, "I do not want to be like this"; that is where microenterprises come in.	Economic independence
	RO: For the woman to no longer depend only on the man; because if you depend on other people, it will have to be at the expense of that person. Then, ventures have developed from the association, from their own reality and from the locality itself.	Female independence
What types of violence are experienced most commonly by the members of the Association?	RB: Many experience physical violence and many also psychological, (...) and terrifying economic violence.	Types of violence
	RO: We find all kinds of violence. Property and economic violence has been very strong, because women were not even the owner of the chickens they raised: she had to ask the husband's permission whenever they wanted to eat a chicken. This situation was really terrible.	Types of violence
How would you define the Association?	RB: I think it has a lot of charisma. The charisma of the association is its work with women from the rural area, but also with the poor and excluded women of all areas.	Definition
	RO: The association is, was and will be a great support and training school for women; not only the victims of violence, but for every person, and for every woman.	Training school

continues on following page

Table 4. Continued

Questions	Responses	Incidence
How do you think the Association contributes to the lives of its members?	RB: It has contributed a lot. We started only with women, and one of the rules of the association (although we are now integrating men and although there are mixed associations where there are 50% women and 50% men, and we have worked a lot on equity), a rule that we have not changed—and there is a lot to change—is that the positions of leadership cannot be taken by men. They only have a voice and vote, but they do not have the right to take the management positions. This is not negotiable: we have seen that, if they occupy the managerial positions, they will tell us what we can do and what we cannot do.	Improvement in the quality of life through micro-enterprises
	RO: Comprehensively. Because, as I told you, everything depends on the training; that makes us see that women are worthy; that we do not deserve to be mistreated; that we are the central pillar of the home because a woman does all professions, albeit without a job title; in practice, she carries the household forward.	In training
How important do you think it is to create these groups of associations in rural areas of the province? Why?	RB: It is important that women get organized, because it is a way to make ourselves visible as women, as people. Together, we can see our weaknesses and also our strengths, we can sit down and review our lives, to see what we have made of our lives and what we have not done. Women have hopes, we have dreams. Because we get into a relationship very young, we have children, and that entails other responsibilities and we cancel ourselves as women. But if we organize ourselves, we will see that we have many needs at the affective level, at the level of communication; I think it is important to have to dedicate time to ourselves. Women have great endurance that men do not have, and that can be both a curse and a blessing.	Personal, family and economic development
	RO: It is very important, because often women from the countryside, from the rural areas, are enclosed in their community circle where the institutions do not reach them.	Opportunity in the least accessible places
Do you think that, if women were economically independent, they would separate from their partner/husband?	RB: I think so, but we must also take into account the cultural question. There is never a life-long project together; we always think that men can change, and it is difficult, because no one has been concerned with change in men. In one of the projects, it was contemplated, because they have accepted that women should work. I have had a good response: in Manta, 60 men, in Jama, 90 men, in Revancha, 30; in Pichincha, the male participants were young, helping us to work on machismo. In the end, they realize how easy it is for them to mistreat women, and in the end the question arises: where do I go from here?	Culture and traditions
	RO: It is a bit complicated. There are cases where they would and cases that would not, because we have had to see ourselves, for example, in the cases when we have women victims of violence in the shelter. Not only are they given lodging and food, they are given training so that they can start their small ventures, they can get ahead. Before, because of the macho culture, it did not depend on women: there were no study opportunities, only the husband was attended to. Instead, now women are training, studying, learning their rights, which is the important thing if you want to get ahead.	Culture and traditions

Source: Compiled by the author

The Association is aimed at providing spaces for economic and personal growth for its members through its work methodology, through comprehensive projects, or through micro-enterprises carried out in coordination with other institutions. Creating this type of associative space where women can freely express themselves and feel supported, listened to and understood, allows them to minimize and, in some cases, end this cycle of violence. This is particularly true for women who have grown up in households with clear and persistent patriarchal power (Restrepo & Fracés, 2016). The existence of this “invisible hand”, which determines the family structure in a way that excludes and limits women, highlights the importance of the construction of these spaces that contribute to establishing a culture of peace. The

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work of the Association also focuses on local men. According to Rosa Obregón, those husbands, or men in general, who take the decision to get involved in the Association's processes of improvement have proved to be very receptive. There is a significant group of men who have joined the fight to eradicate aggressions in response to the various types of violence that pervade society, and especially in rural areas. The importance of creating associative spaces in the rural areas of Manabí is expressed by Maldovan & Dzembrowski, (2009, p.2) as "a continuous construction through which the participants interact, generating different threads of meaning that place them in a sphere that is characterized by its horizontality, its commitment and the involvement of its members." The associative spaces are a mechanism of well-being for their members aimed at improving the quality of life of women victims of economic violence.

An interview was also conducted with one of the women, "Erika", with the aim of carrying out an objective study that presents points of view from different scenarios (from the point of view of the leadership and from the perspective of the beneficiaries of the service provided by the Santa Marta Women's Association). "Erika" has experienced this process of transformation, together with many other women of the Association (Table 5). She highlights the positive experience she has had; one of the most significant processes was providing women with the opportunity to be part of a microenterprise since, over time, this leads to the economic independence needed by many women victims of economic violence. Economic dependence often lies at the heart of persistent violence, abuse, and aggressions by partners or relatives. The importance of creating these spaces in rural areas is evident from the lack of knowledge that persists about the enforceability of human rights and the lack of means provided by public policy. Above all, it is evident from the machismo that predominates, creating fear and submission in rural women from a young age and generating a perpetual cycle of violence within the family and society.

Table 5. Interview with "Erika" (identity protected)

Interviewed person	Questions	Responses	Incidence
"Erika" (identity protected)	What has been your experience as part of the Santa Marta Women's Association?	Positive in all aspects. It is like giving back to other women what I felt at some point and could not put into practice. I try to help them to release their fears, and the fears of their daughters, to not be dependent on a man, to do things for themselves and not for others. From the point of view of the Association, the most important thing is to have them organized.	Experience in the transformation process
	What benefits does the Santa Marta Women's Association offer to women like you who decide to be part of a microenterprise?	The opportunity to be heard, to be educated. Through this, we will be able to be enterprising, because it is useless to have an economic advantage without knowing what to do with it. The most important opportunity is education.	Opportunities
	Do you think that, if women were economically independent, they would separate from their partner/husband?	"Yes, whether I were or not, I would separate. I believe that home and parenting is the responsibility of both and I firmly believe that a child does not bind people together, and the purpose of having a child is not to pressure a person to stay by your side or to be an impediment to excelling in life."	Decision making
	How important do you think it is to create these groups of associations in rural areas of the province? Why?	"In rural areas where women do not know their own rights, creating socioeconomic or financial spaces is giving them the opportunity to improve their quality of life. Once, in a conversation, women said they did not have the ability to say "I do not want to have sex", for fear of being beaten. So, acting in that area would reduce not only economic violence, but domestic violence. It is necessary and urgent."	Improvement in quality of life

Source: compiled by the author

## CONCLUSION

Economic violence is not a problem faced merely by women but rather society in general and, without its effective eradication, democracy and the general welfare will be clearly compromised. The results of this study show three situations. 1) The normalization and invisibilization of economic violence by the victims and society in general. 2) The social interest in creating associative spaces in the rural areas of the Province of Manabí despite the disinformation that persists in those rural areas. Without this social support, the existence of cultural and traditional conditions lead to women living in a state of constant vulnerability, one in which they cannot express themselves out of fear and in which they are unable to develop as individuals. 3) The commitment of the women of the Association to bring the processes of improvement to other women who are still living in households that are subject to various types of abuse (physical, psychological, emotional, economic, institutional, verbal, among others). There is a need to establish a physical environment in which women can feel safe to express themselves freely and fend for themselves, thereby offsetting the effects of this violence and preventing the violation of their rights.

There are several pathways toward the eradication of violence. Among these is the establishment of an observatory in each of the provinces of Ecuador and the use of public policy directed at the reduction of violence. Such possibilities should be aspects for analysis and discussion in future studies. All approaches should be based on the clear conviction that the establishment of processes of certainty for women will turn areas such as the Province of Manabí into fairer, more ethical, more supportive places by improving the health of the whole society.

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## **KEY TERMS AND DEFINITIONS**

**Cooperative:** An autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically controlled enterprise.

**Economic Violence:** Any act or behavior which causes economic harm to an individual. Economic violence can take the form of, for example, payment default, inadequate public policies (delays in social assistance payments, execution of sentences), restricting access to financial resources, property damage, education or the labor market, or not complying with economic responsibilities, such as alimony.



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**Gender Violence:** Is violence directed against a person because of that person's gender or violence that affects persons of a particular gender disproportionately. Violence against women is understood as a violation of human rights and a form of discrimination against women and shall mean all acts of gender-based violence that result in, or are likely to result in 1) physical harm, 2) sexual harm, 3) psychological or 4) economic harm and or suffering to women.

**Social Economy:** Encompasses a variety of businesses, organisations and different legal entities. They share the objective of systematically putting people first, producing a positive impact on local communities and pursuing a social cause.

**Welfare State:** A system whereby the state and supranational organizations undertakes to protect the health and well-being of its citizens, especially those in financial or social need, by means of grants, pensions, and other benefits.

## **ENDNOTES**


1- National Assembly of the Republic of Ecuador, 2014

2- [http://www.pichincha.gob.ec/phocadownload/LOTAIP\\_Anexos/Lit\\_A/lit\\_a2/7\\_ley\\_organica\\_de\\_economia\\_popular\\_y\\_solidaria.pdf](http://www.pichincha.gob.ec/phocadownload/LOTAIP_Anexos/Lit_A/lit_a2/7_ley_organica_de_economia_popular_y_solidaria.pdf)

# Chapter 3

## Importance and Implications of Influential, Powerful, and Remarkable Economic Policy Mix: Pre-Pandemic and Post-Pandemic Challenges in Building Inclusive Global Knowledge Societies

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### **ABSTRACT**

*These days, specialists believe there is an overbearing synergistic relationship between the COVID-19 pandemic changes and COVID-19 crisis challenges that have led to an undeniable desideratum to create the optimum economic policy mix meant to support resources allocation, increase international economic cooperation, and achieve sustainable international fiscal and monetary policies. The post-COVID-19 era brings to light several pivotal questions that require immediate actions and answers: How can international wealth can be created as a result of economic policy mix and sustainability? In what manner can the fiscal and monetary discipline can be maintained in order to support sustainable development? Which are the new values that the society should embody in order to support development, economic growth, sustainability, and responsibility? All in all, building inclusive global knowledge societies implicates stronger sustainable development policies, beneficial policies for enterprise development and economic progress, and decisive economic policies oriented towards social needs.*

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## INTRODUCTION

Nowadays, specialists worldwide have come to the important idea that there is an overwhelming as well as a paramount synergistic relationship between the COVID-19 pandemic changes and implications, and the COVID-19 crisis challenges and opportunities, which have determined the specialists to an overpowering necessity to create the optimum economic policy mix capable to function on the medium term and long term, meant to support the allocation of the resources (in particular, of the rare and mostly used resources), to increase international economic cooperation (in particular, the forms of collaboration that are capable to offer benefits to all partners), and achieve sustainable international fiscal and monetary policies (in particular, those policies that are meant to encourage and to support innovation, education, long-life learning programs and trainings, and human resources development). Additionally, the Post-COVID-19 Era brings to light several pivotal questions (Q) that require immediate actions and answers from all the important political figures, from all the representative leaders, and from all the involved specialists, researchers and scholars in the field, namely: (Q1) How can international wealth can be created as a result of economic policy mix and sustainability?; (Q2) In what manner can the fiscal and monetary discipline can be maintained in order to support sustainable development?; and (Q3) Which are the new values that the society should embody in order to support development, economic growth, sustainability, and responsibility? These three vital questions are analyzed in-depth in this book chapter on the “Importance and implications of influential, powerful, and remarkable economic policy mix: pre-pandemic and post-pandemic challenges in building inclusive global knowledge societies”, and represent the very basis of this current scientific work which tries to combine several fields, such as business administration, economics, management, accounting, and audit, while targeting an interdisciplinary approach with implications in other areas of expertise such as behavioral economics, political sciences, psychology, and sociology. All in all, these are times in which the accept ought to be put on building inclusive global knowledge societies with deep and high implications on much stronger sustainable development policies, more beneficial policies for enterprise development and economic progress, and highly decisive economic policies oriented towards the social needs.

**Step 1:** The book chapter centers on finding an answer to the following three powerful key research questions, namely: (Q1) How can international wealth can be created as a result of economic policy mix and sustainability?; (Q2) In what manner can the fiscal and monetary discipline can be maintained in order to support sustainable development?; and (Q3) Which are the new values that the society should embody in order to support development, economic growth, sustainability, and responsibility?.

**Step 2:** The book chapter focuses on defining the economic policy mix and on highlighting the implications that the economic policy mix has on the pre-pandemic and on the post-pandemic challenges in building inclusive global knowledge societies.

**Step 3:** The book chapter tackles the COVID-19 pandemic changes as well as the COVID-19 crisis challenges on today’s society and the strong impact of these phenomenon on the economic policy mix, while struggling to find solutions for the Post-COVID-19 Era sustainable development and positive evolution.

All in all, this book chapter on the “Importance and implications of influential, powerful, and remarkable economic policy mix: pre-pandemic and post-pandemic challenges in building inclusive global knowledge societies”: (a) starts with an extensive introduction in which the authors have intended to justify the importance and the implications of the theme that they have chosen for their analysis, debate, and examples of good and successful practices; (b) continues with a well-organized background in which the authors have centered their attention on the literature review and in which they have addressed timely descriptions and all-important characterizations on the subject of the economic policy mix, in the context generated by the pre-pandemic and post-pandemic situations at an international level; (c) carries on with the main focus of the chapter with indispensable presentations on this novel approach of the economic policy mix as well as with the discussion and the synthesis of results in which the authors have brought to light the vibrant consequences of a well-balanced economic policy mix, the meaningful outcomes derived from the pre-pandemic and post-pandemic situations at an international level in terms of a well-balanced economic policy mix, and the decisive chain reactions that might arise from the correct and the optimum creation and implementation of the economic policy mix; and (d) ends with the solutions and the recommendations, the future research directions, the conclusion, and the references that come to complete this scientific research and to provide the meaning of such a courageous subject.

Hence, sustainable development, economic growth, sustainability, and responsibility are the intended targets for the global economy, even though the COVID-19 pandemic and the COVID-19 crisis have severely and irreversibly disrupted billions of lives and have harshly and sharply endangered the health of the global economy. That the reason why there are several concepts that require immediate attention and that call for imperative focus, namely: business, business administration, business environment, knowledge, human resources, innovation, intangible assets, intellectual capital, sustainable development goals, digitalization, global economic environment, restart the economy, COVID-19, and Post-COVID-19 Era.

## **Background**

These days, specialists believe that the right economic policy mix is essential for the well-being of the society as well as for the health of the economies. In continuation, the policy mix represents the optimum combination between the monetary policy and the fiscal policy, though when referring to sustainable development and sustainable businesses, the aspects related to economic growth and employment tend to become the most valuable assets and the most relevant points of discussion on the global agenda (European Commission (EC), 2021). Hence, the fiscal and the monetary policies have to be extremely strong and highly reliable in order to avoid economic crisis, while a good policy mix is meant to support the sustained and the stable growth, the investments in innovation and good financial and monetary practices, the decrease of the inflation, and the high economic growth which has the power to help individuals in terms of taking more inclusive and more sustainable actions for the future (Luque, et al., 2021).

In this matter, it ought to be noted that the economic reforms are essential for the economic and the financial success of our society, especially when making reference to pivotal aspects, such as: the goods markets, the capital markets, and the labor markets. A very good and successful example can be offered in this matter, namely the Economic and Monetary Union (EMU), since the Economic and Monetary Union (EMU) is characterized by the removal of the barriers that would normally appear between countries and between regions in terms of competition, and the possibility to have access to more flexible markets which are essential for the healthy trades and for the sustainable evolution of consumption and production. Likewise, when addressing the successful case of the Economic and Monetary Union (EMU),

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raising productivity and enhancing employment at the countries' level (such as, for example, in the Euro Area), there are several aspects considered crucial by specialists and scholars: (a) accelerating competitiveness in terms of diminishing and/or even eliminating the trade barriers; (b) raising productivity in terms of offering the goods and services needed by customers, in line with the newest developments in the marketplace, at the right prices, and in the right economic context, capable to offer benefits to both consumers and producers; (c) increasing employment and encouraging solid investments in education, training, and life-long learning programs, since knowledge and human resources have the paramount power to support the society's growth potential in the long term and at an unlimited level; and (d) fostering innovation, in times in which there is a strong and undeniable connection between lowering the prices pressure on individuals and on businesses, enhancing correct and transparent completion, and facilitating access to resources at lower costs in order to be able to cope better with the economic shocks – such as the ones that have occurred as a result of the COVID-19 pandemic and the COVID-19 crisis.

Creating wealth represents indeed a challenge these days, and the right economic policy mix and the power of sustainability are called to support the wealth creating, since wealth is the equivalent of healthy economic practices, structural economic reforms (which are very powerful and very useful especially in a monetary union, such as the Economic and Monetary Union (EMU)), and competitiveness (which is influenced more by the international trends rather than the national fluctuations, but which could help countries adapt faster and better to the facilities offered by the economic, social, and environmental reforms).

Also, the evolution of the Gross Domestic Product (GDP) represents an instrument capable to determine the regions as well as the countries capacities to generate wealth, especially in the context in which the European Commission believes that the Gross Domestic Product (GDP) is an indicator that is “measuring economic success” and could be capable to predict in due time, if necessary, “a period of prosperity in Europe” (European Commission (EC), 2021, p.3).

The European Union (EU) specialists have noted that the advantages of the optimum economic policy mix considered together with the benefits derived from the existence of the Economic and Monetary Union (EMU), and combined together with the opportunities offered by “The Stability and Growth Pact” will result in profound economic activities which “are designed to support sustainable economic growth and high employment through economic and monetary policy” (European Commission (EC), 2022a). In consequence, the Economic and Monetary Union (EMU) represents an example for good practices at an international level, due to the manner in which the operations that have come to define this economic and monetary type of organization, aiming the creation of “an effective monetary policy for the Euro Area with the objective of price stability”, targeting the successful and undisrupted coordination of both the “economic and fiscal policies in EU countries”, focusing on the potential generated by the existence of the single market which possesses the capacity to “run smoothly” in order to facilitate increased benefits for the countries' economies, and addressing the necessary management of the EU countries financial institutions (European Commission (EC), 2022b).

When commenting on the Economic and Monetary Union (EMU) history and evolution, one should take into account the fact that this form of association is a particular one, since it embodies “the result of progressive economic integration in the EU”, since the existence of a common currency – namely the Euro, has given the EU citizens access to “an expansion of the EU single market, with common product regulations and free movement of goods, capital, labor and services” (European Commission (EC), 2022b).

## **MAIN FOCUS OF THE CHAPTER**

The Organization for Economic Co-operation and Development (OECD) has noted in the Report of the Secretary General's Advisory Group on a New Growth Narrative entitled "Beyond Growth: Towards A New Economic Approach" analyzed at an international conference that took place on the 17th and 18th of September 2019 the fact that sustainable development, economic growth, sustainability, and responsibility have to be the results of these days' economic policy mix, which should offer "a wide range of reflection on new ways of thinking about economic policymaking", since the general international economic context has significantly changed in the way in which it now "encompasses a new set of goals and measures of economic progress; new frameworks of economic analysis; and new approaches to policy" (Organization for Economic Co-operation and Development (OECD), 2019, p.2).

The economic policymaking focuses at an extended level these days on the internationally agreed Sustainable Development Goals (SDGs), but the economic policy mix should come to complete these desiderates and these targets and not to compromise the well-being of individuals, their health and their capacity to lead better and more sustainable lives. Hence, the right and the expected economic policy mix represents according to the authors of this current book chapter a means to facilitate access to sustainable prosperity and healthy forms of wealth, in a society that needs to foster responsibility for human lives and for the environment (the ecosystems, the climate, the biodiversity, and, in essence, all the forms of lives that are to be encountered on our Planet Earth) (Luque & Herrero-García, 2019).

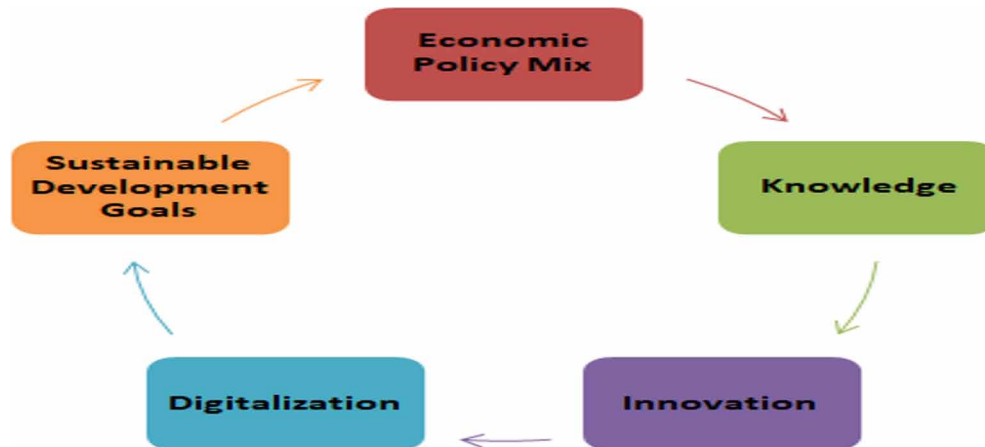
The financial and the monetary policies are strongly and stringently linked between themselves and are an integrated and an important part of today's society, since according to the authors by promoting development the behavior of individuals should be centered on eco-efficient economic growth, while the consumption and the production patterns on which our society relies on ought to be governed by sustainable development in terms of the economic, environmental, and policy cycle (see, in this matter, Figure 1. Specific Links and Connections between the Importance and Implications of Influential, Powerful, and Remarkable Economic Policy Mix, while addressing the Case of the Pre-Pandemic and Post-Pandemic Challenges in Building Inclusive Global Knowledge Societies, while Targeting the Sustainable Development Goals (SDGs)).

In the same line, the specialists from the Department of Economic and Social Affairs Office for the Economic and Social Council (ECOSOC) Support and Coordination, part of the United Nations (UN), noted in 2008, in the document on "Achieving Sustainable Development and Promoting Development Cooperation Dialogues at the Economic and Social Council", the fact that it ought to be "recognized that the world is facing multiple challenges to realize the internationally agreed development goals" as well as the fact that it ought to be "acknowledged that global financial instability, rising food and fuel prices, environmental degradation and climate change require early concerted action" (United Nations (UN), 2008, p.1). Almost fifteen years later (namely, these days, in the year 2022), the world faces more or less the same problems as it did in the past, in the moment in which the United Nations (UN) Member States felt the imperative necessity to reaffirm "their commitments to ensuring the achievement of sustainable development in all countries and to making that goal the central objective of national development strategies and international cooperation" in the aforementioned work on "Achieving Sustainable Development and Promoting Development Cooperation Dialogues at the Economic and Social Council" (United Nations (UN), 2008, p.1).

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Figure 1. Specific links and connections between the importance and implications of influential, powerful, and remarkable economic policy mix, while addressing the case of the pre-pandemic and post-pandemic challenges in building inclusive global knowledge societies, while targeting the sustainable development goals (SDGs)

Source: The authors, based on the references highlighted in this book chapter



The International Labor Organization (ILO) (2022) that in order to obtain and to be able to bring to fruition the results the most advantageous economic policy mix in the Post-COVID-19 Era, there are several goal that ought to be aimed which are part of the Sustainable Development Goals (SDGs), among which the eight goal that tackles promoting the “Inclusive and Sustainable Economic Growth, Employment and Decent Work for All” seems to require a lot of dedication and a lot of hard work from specialists, in the context in which it targets to (a) “achieve higher levels of productivity of economies through diversification, technological upgrading and innovation, including through a focus on high value added and labor-intensive sectors”, it strives to (b) “promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage formalization and growth of micro-, small- and medium-sized enterprises including through access to financial services”, and it intends to (c) “improve progressively through 2030 global resource efficiency in consumption and production, and endeavor to decouple economic growth from environmental degradation in accordance with the 10-year framework of programs on sustainable consumption and production with developed countries taking the lead” (International Labor Organization (ILO), 2022; Luque, 2022).

Stefano Palmieri, the president of the European Economic and Social Committee’s Section for Economic and Monetary Union and Economic and Social Cohesion, emphasized in an article published on the 14<sup>th</sup> of February 2020, suggestively entitled “Time for a Stronger and more Sustainable Economic and Monetary Union”, that sustainable prosperity and the nations’ health have come to rely on the advantages as well as the security that the Economic and Monetary Union (EMU) offers, since there exists the strong belief that this form of organization has managed to support better and at a larger extent stability and sustainable growth in Europe (Palmieri, 2020). The results offered by the analyses of the opportunities that the Economic and Monetary Union (EMU) triggers have shown that the economic crisis that started in 2007 in the United States of America (USA) had a diminished impact on European countries which were part of this association, which led to their capacity to recover faster from the economic, financial, political, and social shock while compared with other countries.

The United Nations Development Programme (UNDP) (2022) has shown a great interest in presenting the Sustainable Development Goals (SDGs) in action and in finding answers to the paramount question “What are the Sustainable Development Goals (SDGs)?”, especially in the current situation that resulted from the COVID-19 pandemic as well as the COVID-19 crisis, in which reaching a common background in terms of the 17 SDGs accomplishment, will be able to support the nations’ prosperity, the international wealth, and the desired economic policy mix, since “the 17 SDGs are integrated – they recognize that action in one area will affect outcomes in others, and that development must balance social, economic and environmental sustainability” (United Nations Development Programme (UNDP), 2022).

According to the European Movement International (EMI) (2022) article on the “Future of Europe – Deepening the Economic and Monetary Union”, there is a stringent requirement for nations to exercise responsibility in finding the right solutions capable to ease the pressure on the financial and the monetary policy in order to obtain higher rates for the economic growth in the Euro Area, and there is a persistent necessity for countries to rethink the way in which “prosperity” is defined and is obtained in order to be able to foster the transition to more sustainable economies (European Movement International (EMI), 2022).

In continuation to the aspects that have been presented in the lines above, Rachel Kyte – who occupied, in 2012, the position of Vice President of the Sustainable Development Network, part of the World Bank (WB), underlined in the volume on the “Inclusive Green Growth: The Pathway to Sustainable Development” that saw the light in 2012, the passionate belief that the “inclusive green growth is the pathway to sustainable development” (World Bank (WB), 2012, p.1, Foreword). However, the same aforementioned document stated in its “Foreword” section the fact that even though “over the past 20 years economic growth has lifted more than 660 million people out of poverty and has raised the income levels of millions more”, the increased levels and rates of economic growth have “too often come at the expense of the environment”, which represents a great concern at a worldwide level, which ultimately led to the worrying conclusion “that the earth’s natural capital tends to be used in ways that are economically inefficient and wasteful, without sufficient reckoning of the true social costs of resource depletion and without adequate reinvestment in other forms of wealth” (World Bank (WB), 2012, p.1, Foreword).

In essence, the 2012 World Bank (WB) report on the “Inclusive Green Growth: The Pathway to Sustainable Development” highlights, on the one hand, the fact “that sustained growth is necessary to achieve the urgent development needs of the world’s poor and that there is substantial scope for growing cleaner without growing slower”, and argues, on the other hand, the fact that “green growth is necessary, efficient, and affordable” (World Bank (WB), 2012, p.1, Foreword).

What is more, the authors’ central belief is that the Post-COVID-19 Era has come, these days, to rely upon the undeniable importance of stability and the increased growth rates expected from the Gross Domestic Product (GDP) of nations, although the world has been shuttered by the effects of the COVID-19 pandemic and the COVID-19 crisis, and, in the same time, even though world peace has become threatened more and more by personal economic and political agendas, greed, and selfishness.

Furthermore, the green economy and the green growth are the elements that are capable to confer regional development and sustainable economic growth which are in the spirit of the circular economy benefits, fostering the desire to ensure a balance between the general economic policies and the general social policies that are intended to influence well-being, healthy lives, and healthy consumption and production behaviors. Besides, the most dependable path to the highest economic, financial, and social performance is the one that resides in sustainable and responsible patterns of behavior as well as in sustainable and responsible actions and activities, based on the certainty that the sustainability initiatives



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need to be supported by well managed investments in sustainable growth for a safer future on Earth (see, in this matter, Table 1. Key Concepts that are embodied in Sustainable Strategies).

*Table 1. Key concepts that are embodied in sustainable strategies*

Key Concepts	Major Links with the Sustainable Strategies
Competitive Pricing Strategy in the Global Knowledge Societies (GKS) for Sustainable Development (SD)	<ul style="list-style-type: none"> <li>• The Competitive Pricing Strategy might be centered at a first glance on raising the economic standards in terms of prices belonging to goods and services available on the marketplace. However, since these days the accent fall on creating Global Knowledge Societies (GKS) for Sustainable Development (SD), any Competitive Pricing Strategy should be aligned with the needs of the individuals and of the society. These days, the COVID-19 pandemic and the COVID-19 crisis have managed to raise awareness to determinant aspects in our society, which are represented by good and strong health, mental health, well-being, prosperity, inner balance, and individual success for a bright and better future for all as well as for the environment. Hence, the economic policy mix should focus on finding a competitive pricing strategy that should be first of all sustainable, and second of all in line with sustainable strategies promoted in our society.</li> </ul>
Green, Resilient, and Inclusive Development (GRID)	<ul style="list-style-type: none"> <li>• Today, fostering green, resilient, and inclusive development (GRID) has become a very serious challenge due to the COVID-19 pandemic and the COVID-19 crisis. The sustainable strategies are deeply relying on the evolution of the business environment, since investments in sustainable innovations represent a must in order to ensure long term benefits for all individuals. In the same line, the circular economy opportunities are offering enormous facilities in terms of reducing waste and of protecting the biodiversity and the ecosystems.</li> </ul>

Source: The authors, based on the references highlighted in this book chapter

Transforming our world implicates “sustainable freedom” (SF), according to Amartya Kumar Sen – the prominent Indian economist, and Nobel Laureate in Economics, which leads to the importance of the security required by human beings in order to be able to flourish, to develop, and to grow. Hence, sustainable human development brings into analysis several important questions, among which specialists could mention the following ones: (1) Does the freedom to choose the standard of living and to act in the spirit of the “sustainable freedom” (SF) offer individuals the opportunity to support sustainable practices in all the areas – namely, economic, financial, managerial, social, and political domains (Popescu *et al.*, 2014; Popescu *et al.*, 2015a, 2015b, 2015c)?; (2) What is development for freedom and how can development for freedom embody best the economic goals of our society without altering the future of us all (Popescu *et al.*, 2015d, 2015e)?; and (c) Will reinventing the paradigm of human development proposed by reputed specialists in the field (such as, Amartya Kumar Sen) enable our societies to recover from recessions, pandemics, and other great losses, thus offering solutions for great economic and social success in the Post-COVID-19 Era (Popescu, 2017; Popescu *et al.*, 2017)?

These are indeed powerful questions, intended to draw attention the vision towards freedom and sustainability that all people should focus on in the process of generating the right economic policy mix that is capable of addressing the following important challenges: (a) the lack of security for the transactions that the financial institutions are facing, in the context in which the Information Technologies (IT) have evolved in an unprecedented manner, the cyber security being threatened from all points of you; (b) the lack of resources, which draw the necessity to finding new alternatives capable to generate energy in a healthier and a more sustainable manner, thus being able to respect the steps included in the de-carbonization roadmap; and (c) the lack of potential at the level of the economies in times of recession and of crisis, which ought to trigger solutions towards more inclusive and more resilient economies, which are capable to focus not only on competitiveness practices and consumers’ desires, but also on the environmental needs (Popescu, 2019a; Popescu & Popescu, 2019b; Popescu, 2020; Popescu, *et al.*, 2016).

Sustainable development makes reference to the power of information, communications and technologies, cybernetics and Artificial Intelligence (AI) since security is a vital element on which individuals and businesses worldwide have come to ultimately depend on (Popescu, *et al.*, 2011; Popescu, *et al.*, 2012a, 2012b; Popescu, *et al.*, 2013). So, the economic policy mix should learn how to find those solutions capable to ensure both individuals and businesses cyber security, so that the business transactions should be done at ease and with no fear of unwanted consequences for the business environment and the economy.

## **DISCUSSION AND SYNTHESIS OF RESULTS**

The discussion and synthesis of results section of this book chapter is believed to contain the most important aspects and the most influential characteristics that today's economic policy mix should embody so that the society in which people live in could be able to cope in terms of the pre-pandemic and post-pandemic challenges that are necessary in building the inclusive global knowledge societies.

Firstly, the most relevant subject derived from the analysis is represented by the correspondence and the bond that might be found between the economic policy mix and sustainability. It is the opinion of the authors of this book chapter that circular economy could be a possible answer as well as a possible solution in terms of defining the relationship that may be encountered between the economic policy mix and sustainability. What is more, there are several essential ingredients that might define the powerful relationship that exists between these days' economic policy mix and sustainability, such as: (a) the technological development for sustainability, in a world that is centered on moving information and knowledge to the next level, in terms of ensuring technological change with the aid of cybernetics and Artificial Intelligence (AI) as an optimum and most desirable combination that ought to enhance a more comprehensive policy mix; (b) the sustainable economic growth, in a society which requires a more balanced policy mix, where the innovation, the intellectual capital, and the human resources combined might offer specialists new opportunities to explore higher economic growth based on more inclusive and more sustainable advantages and benefits for all individuals; and (c) the green economic policy mix for better lives and for more secure future for all individuals, in regions and in countries which are concerned with the people's actions upon the environment, with the creation of monetary and fiscal policies which are based on environmental economics as well as on green finance, and with the ability to steer individuals' actions towards those market-oriented incentives that are capable to encourage both the sustainable growth economics and the sustainable economic systems.

Secondly, another relevant topic that emerged from this analysis is represented by the fact that the economic policy mix centered on more sustainable economies will have the power to create new jobs, namely green jobs – as a result of the green transition to environmental sustainability, socioeconomic development, and well-balanced policy mixes. In this given context, it has become crucial to define and to implement the environment, the economic, and the social sustainability, in order to be able to support constructive competition, sustainable development, and the adequate economic, fiscal, and monetary policy measures – as a determining solution to combine the optimum economic policy mix desiderate with the traits of sustainability.

Thirdly, another relevant theme that has been approached is represented by the harmonization of the national and the international laws and policies that are responsible with the acceleration of the sustainable development in the countries worldwide, in terms of improving and reformulating the existing policies,

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in terms of creating better and more inclusive policies, in terms of developing sustainable economic policies and systems that are keen on: improving the allocation of resources, since resources are limited and the society needs to ensure the well-being of individuals that are currently alive as well as of the next generations; increasing international economic and financial cooperation, since the key for a better, a prosperous, and a more secure future for all people and for all business activities is represented by alliances, assistance, associations, partnerships, teamwork, unity, and mutual support; and coordinating the national economic policies with the international economic policies (such as, for instance, in the case of the countries which are part of the European Union (EU)), since the emphasis is on reaching the interests of all countries by identifying synergies that can lead to close beneficial, effective, productive, and valuable forms of cooperative behavior.

## **SOLUTIONS AND RECOMMENDATIONS**

The solutions and recommendations that have to address the case of the right and the most advantageous economic policy mix in the Post-COVID-19 Era are numerous and are characterized by the insecurity that any type of economy faces these days. Although the world leaders, the governments, and the prominent figures all around the world pride themselves with the desire of building inclusive global knowledge societies, it becomes more and more clear these days that our society faces very serious and very deep problems. In this matter, it ought to be brought to the attention that climate change, corruption, hunger, lack of education, lack of security, malnourishment, pollution, poverty, unemployment, violence, and wars, are just a few predominant issues that our world confronts itself with in these current times, and no matter how many efforts individuals are willing to submit, there will still be regions and countries on our Planet where some of the biggest threats for the humans lives and for the well-being of the Earth will be brought to light and will unfortunately arise (Luque, 2018).

In this particular context, it needs to be underlined that the topic related to the importance and the implications of the influential, the powerful, and the remarkable economic policy mix, in terms of the pre-pandemic and the post-pandemic expected challenges in building inclusive global knowledge societies was not chosen by the authors of this book chapter at random. On the contrary, the authors have chosen this particular subject due to their strong belief that a powerful and a determinant economic policy mix might constitute the key solution in the Post-COVID-19 Era, and might even bring tribute to the manner in which our lives should be and our Planet should look like when seeking solutions for the critical global issues.

**Step 1:** The first solution and recommendation that needs to be addressed is to innovate more and to invest more in research and in science, thus striving to identify the ways in which the global catastrophic risks might be successfully avoided. In this matter, the attention should be drawn, in particular, to the following types of global catastrophic risks, namely: the pandemics (such as, the COVID-19 pandemic, which generated the COVID-19 crisis), the climate change (which generated biodiversity loss, environmental disasters, and human lives loss), the nuclear holocaust (which represented, in the past, and which represents, at present days, a real threat in our society and a real issue for the future of mankind and planet Earth), and the distractive forms of Artificial Intelligence (AI) (since even though digitalization represents the future of humankind, specialists believe that Artificial Intelligence should be a form of helping people in their daily chores and take the burden of the

repetitive activities, but not lead our way of living, by making decisions in the place of individuals or by taking decisive actions in the place of people).

**Step 2:** The second solution and recommendation that ought to be emphasized is to invest more in the environment in order to increase the environment's viability to support life for all individuals and to ensure a healthy and unaltered way of living for all individuals. With the optimum economic policy mix, countries worldwide have the power to build a secure future for the present and for the next generations, relying on the healing power of the environment and of nature, as a whole. According to the data presented in this book chapter, it has prompted that people's actions have resulted in the world's greatest problems, namely: the collapse of the Planet's natural ecosystems, the mass scale extinction of species, the growing levels of pollution and waste, the increasing levels of the social and the economic disparities, and insecurity and fear at all levels. So, the solution and recommendation would be to address these pressing aspects in the right manner, in order to be able to ensure healthier ecosystems, to contribute to the creation of social, financial, and economic equality, as well as better life quality for all people.

## **FUTURE RESEARCH DIRECTIONS**

When analyzing the issues surrounding the topic related to the importance and the implications of the influential, the powerful, and the remarkable economic policy mix, in terms of the pre-pandemic and the post-pandemic expected challenges in building inclusive global knowledge societies, especially when addressing the objectives specific to the SDGs for economic development, social development, and environmental protection, the authors strongly believe that there exist numerous future research directions, as follows in the immediate lines below:

**Step 1:** The first future research direction effectively identified by the authors is represented by presenting some vital suggestions in terms of measures that could be identified and combined by both fiscal and monetary policymakers that ought to make an important contribution in terms of the economic policy mix, while seeking to strengthen, to stabilize, and to promote the success of the national economies. However, it should be also taken into account the fact that the economic policy mix of regions and of countries must make reference to the other types of economic policy mixes that accompany those regions and those countries that have the greatest impact and the highest influence on the analyzed economic policy mix. As a general fact, all nations and all economies are interrelated, thus they might find themselves either in the position of supporting one another, or in the situation of affecting each other's well-being and state of development. In this matter, it would be preferable for the countries to be able to find themselves into the position in which they were to identify their strengths and their opportunities, in order to be able to make the most of them on the medium and on the long term.

**Step 2:** The second future research direction meticulously identified by the authors is represented by underlining which combination of the countries monetary policy and fiscal policy needs to be created and used in order for those countries to be able to achieve economic growth. Nevertheless, the authors would like to point out the fact that the desired economic growth should be the one that channels its influence towards protecting the environment, stimulating the sustainable development, fostering well-being and mental health for individuals, and contributing to ensuring

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open economies, high-income economies, and powerful economies. In this matter, the innovation policy mixes are the ones that put an import accent on entrepreneurship, the ones that have managed triumphantly to respond in time to the interaction that exists between the monetary policy and the fiscal policy, and the ones that are keen to achieve the SDGs for economic development, social development, and environmental protection – as a general rule for a successful way of being, a general solution to overcome any recession, and a general state of addressing unemployment and poverty at an international level.

All in all, it might be concluded that the topic related to the importance and the implications of the influential, the powerful, and the remarkable economic policy mix, in terms of the pre-pandemic and the post-pandemic expected challenges in building inclusive global knowledge societies, is extremely vast and clearly not enough explored these days, which leaves other specialists, scholars, and researchers with the opportunity as well as with the challenge to find new gaps and new horizons that deserve to be exploited and presented in the near future.

## **CONCLUSION**

The conclusion section of the book chapter entitled “Importance and implications of influential, powerful, and remarkable economic policy mix: pre-pandemic and post-pandemic challenges in building inclusive global knowledge societies”, as an integrating part of the “Handbook of Research on SDGs for Economic Development, Social Development, and Environmental Protection”, is centered on the importance and the implications of the influential, the powerful, and the remarkable economic policy mix, in the particular context represented by the pre-pandemic and the post-pandemic challenges in building the inclusive global knowledge societies. In addition, it should be highlighted that this book chapter revolves around the following pivotal concepts, namely: the economic policy mix; the economic stimulus; balancing the economic policy mix for innovation and for sustainable economic growth; the optimal policy mix in the European Union (EU); the challenges in building inclusive global knowledge societies; the opportunities in building inclusive global knowledge societies; the pre-pandemic and the post-pandemic challenges and opportunities.

In terms of the economic policy mix, it ought to be brought to the attention the fact that the COVID-19 pandemic and the COVID-19 crisis have profoundly and irreversibly impacted our society, which led to the need to create a stronger and a more sustainable policy mix, capable to address in a better and in a more coherent manner the fiscal policy and the monetary policy – which are in a powerful combination and which are in a complementary relationship. Hence, in this particular context, it needs to be stressed that the countries due to support the changes, challenges and opportunities due to be derived from the implementation of a novel economic policy mix are expected to manage the economic, financial, social, demographical, and political situation much better, thus responding successfully to the economic, the financial, and the social crisis.

While addressing the importance of the economic stimulus, it needs to be brought to light the fact that this concept is widely used to refer to those cases in which the governments or the governmental agencies are making attempts to kick start economic growth and financial growth during difficult economic periods. Also, there are numerous examples that might be offered when addressing and when referring

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to the case of economic stimulus, since these are very challenging situations for any economy and for any country: (a) cutting the interest rates, and focusing to keep these interests rates at or near zero as long as proved to be necessary, in order to stabilize the marketplace; (b) purchasing debt securities in high amounts, in order to stabilize the marketplace; (c) offering packages with direct assistance to those that have been severely affected by the crisis (for instance, the case of the COVID-19 pandemic and the COVID-19 crisis, and the groups that have been hurt financially by the COVID-19 pandemic and the COVID-19 crisis, namely the parents having school-age children, the people which were unemployed at that time, the small and medium enterprises which were affected by the periodic shutdowns).

While addressing the case of Balancing the economic policy mix for innovation and for sustainable economic growth, it should be emphasized that due to the influence of the COVID-19 pandemic and the COVID-19 crisis on our society, it is believed that balancing the economic policy mix in order to generate innovation and to ensure sustainable economic growth represents a viable and a highly expected response to the economic, the financial, and the social crisis. Nevertheless, the economic policy mix takes into account several pivotal aspects, such as: (a) the combination of certain measures belonging to the fiscal and the monetary policymakers, which are due to strengthen or to stabilize – depending on the case, the countries' economies, in order to promote a balanced economic policy mix for innovation and for sustainable economic growth; (b) the capacity to create a balance and the need to harmonize the monetary policies which are adopted and promoted by the nations' central banks and the fiscal policies which are managed by the federal governments or by different forms of unions (such as, for example, the European Union (EU)); (c) the capacity to ensure the money supply at a regional or at a national level, which falls in the area of the monetary policies, while having in mind the capacity to either raise or spend money, which falls in the area of the fiscal policy; (d) the capacity and the strong need to ensure economic growth, in the context in which economic growth can be cooled and/or stimulated – depending on the case and the status of the economy, based on the decisions, the objectives, the present and the future perspectives, and the economic and the financial interest belonging to the governments and the nations' central banks.

In terms of the optimal policy mix in the European Union (EU), it needs to be highlighted that over the years, there were several crisis situation and pressing cases in which the fiscal and the monetary policymakers had to unite their forces and had to work together, in order to foster an optimal policy mix at a global level or at a less larger scale, such as in the case of the European Union (EU) countries. In this matter, very good examples of such situations are represented by the Great Recession (which was a response to the 2007 economic crisis started in the United States), and the COVID-19 crisis (which was generated by the COVID-19 pandemic, which started in the early 2020 and which threatened the economies of all the nations around the world, affecting at an incalculable level our society and the well-being of individuals). That is the reason why, an optimal policy mix in the European Union (EU) as well as almost anywhere else in the world could focus on certain measures, such as, for example: (a) cutting the interest rates, and focusing to keep these interests rates at or near zero as long as proved to be necessary, in order to stabilize the marketplace; (b) purchasing debt securities in high amounts, in order to stabilize the marketplace; (c) offering packages with direct assistance to those that have been severely affected by the crisis (for instance, the case of the COVID-19 pandemic and the COVID-19 crisis, and the groups that have been hurt financially by the COVID-19 pandemic and the COVID-19 crisis, namely the parents having school-age children, the people which were unemployed at that time, the small and medium enterprises which were affected by the periodic shutdowns).

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While analyzing the challenges in building inclusive global knowledge societies, it should be prompted that, as acknowledged in the United Nations Educational, Scientific and Cultural Organization (UNESCO)'s Information for All Program (IFAP), in the age of COVID-19 there are numerous challenges in building inclusive knowledge societies, especially as a response to the COVID-19 crisis which focuses on new priorities and new strategies in terms of multi-stakeholders digital cooperation, unleashing the “enormous potential” of the information and communication technologies (ICT) use “for positive change”, facilitating access to vital information capable to “save lives, build trust and help develop sustainable policies, strengthen access to health, education and justice, contributing towards reduced inequalities” (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2022). What is more, providing access to information and to knowledge represents the key to avoid disinformation, as an “an effective response to the COVID-19 crisis”, although, in terms of challenges in building inclusive global knowledge societies, international cooperation might be regarded as an unlimited source capable of harnessing “opportunities offered by technology to create equitable knowledge societies” as well as sharing valuable experiences in terms of lessons learned by promoting digital inclusion and a sound “collaborative environment” for all individuals (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2022).

Besides the aforementioned aspects above, it should be stressed that the opportunities in building inclusive global knowledge societies are numerous, so that is the reason why the United Nations Educational, Scientific and Cultural Organization (UNESCO) stated in the document on “Inclusive Knowledge Societies for Sustainable Development” published in March 2012 the fact that there are countless opportunities that may be encountered in the complex process of building inclusive global knowledge societies, since knowledge is regarded by specialist as the vital asset that humanity possesses (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2012). In continuation, human experiences as well as human activities depend on the added value that knowledge managed to provide and that ought to be analyzed together with the unlimited benefits offered by the new communication and information tools (ICTs) that are believed to promote and to accelerate individuals’ “freedom of expression”, good quality education for all, enhancing society’s “respect for cultural and linguistic diversity”, and “universal access to information and knowledge” (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2012).

In the end, this current book chapter on “Importance and implications of influential, powerful, and remarkable economic policy mix: pre-pandemic and post-pandemic challenges in building inclusive global knowledge societies”, as an integrating part of the “Handbook of Research on SDGs for Economic Development, Social Development, and Environmental Protection”, targets the in-depth analysis the pre-pandemic and post-pandemic challenges and opportunities. Thus, there are numerous challenges and opportunities that might be related to the pre-pandemic and the post-pandemic events and situations, especially when targeting the advancement of the society’s development goals in the international context, but the challenges and the opportunities represented by the social inclusion are the ones that need to be mentioned with high priority, since the social inclusion opportunities and challenges have the power to confer success, encourage interdisciplinary, lead to optimum solutions in the process of problem solving analysis cases, target reducing extreme poverty around the world, tackle social cohesion by understanding and by reducing the gaps that exist in the development process of regions and countries at a wide level.

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## KEY TERMS AND DEFINITIONS

**Anthropocene:** Over the last several centuries much of humanity has had such a negative impact on the environment, as well as other unpredictable consequences, that some scientists have described this period of time as a new geological age: the era of human impact on the Earth, or Anthropocene.

**Balancing the Economic Policy Mix for Innovation and for Sustainable Economic Growth:** Due to the influence of the COVID-19 pandemic and the COVID-19 crisis on our society, it is believed that balancing the economic policy mix in order to generate innovation and to ensure sustainable economic growth represents a viable and a highly expected response to the economic, the financial, and the social crisis; the economic policy mix takes into account several pivotal aspects, such as: (a) the combination of certain measures belonging to the fiscal and the monetary policymakers, which are due to strengthen or to stabilize – depending on the case, the countries’ economies, in order to promote a balanced economic policy mix for innovation and for sustainable economic growth; (b) the capacity to create a balance and the need to harmonize the monetary policies which are adopted and promoted by the nations’ central banks and the fiscal policies which are managed by the federal governments or by different forms of unions (such as, for example, the European Union (EU)); (c) the capacity to ensure the money supply at a regional or at a national level, which falls in the area of the monetary policies, while having in mind the capacity to either raise or spend money, which falls in the area of the fiscal policy; (d) the capacity and the strong need to ensure economic growth, in the context in which economic growth can be cooled and/or stimulated – depending on the case and the status of the economy, based on the decisions, the objectives, the present and the future perspectives, and the economic and the financial interest belonging to the governments and the nations’ central banks.

**Challenges in Building Inclusive Global Knowledge Societies:** As acknowledged in the United Nations Educational, Scientific and Cultural Organization (UNESCO)’s Information for All Program (IFAP), in the age of COVID-19 there are numerous challenges in building inclusive knowledge societies, especially as a response to the COVID-19 crisis which focuses on new priorities and new strategies in terms of multi-stakeholders digital cooperation, unleashing the “enormous potential” of the information and communication technologies (ICT) use “for positive change”, facilitating access to vital information capable to “save lives, build trust and help develop sustainable policies, strengthen access to health, education and justice, contributing towards reduced inequalities” (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2022); what is more, providing access to information and to knowledge represents the key to avoid disinformation, as an “an effective response to the COVID-19 crisis”, although, in terms of challenges in building inclusive global knowledge societies, international cooperation might be regarded as an unlimited source capable of harnessing “opportunities offered by technology to create equitable knowledge societies” as well as sharing valuable experiences in terms of lessons learned by promoting digital inclusion and a sound “collaborative environment” for all individuals (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2022).

**Economic Globalization:** This is a phenomenon in expansion that causes profound changes on the world stage. It revolves around trade, the flow of investment, financial capital, division of labor and specialization. The concept is not limited only to economic variables since its effects extend to individuals, society to the state. Developing countries are experiencing stagnation in the face of their inability to cope with globalization, which is compounded by poor management of their financial markets, leading to an increase in the income inequality gap. Economic globalization brings with it the mobilization of

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goods and capital, reduces distance between borders and energizes international trade with some alterations to sovereignty.

**Economic Policy Mix:** The COVID-19 pandemic and the COVID-19 crisis have profoundly and irreversibly impacted our society, which led to the need to create a stronger and a more sustainable policy mix, capable to address in a better and in a more coherent manner the fiscal policy and the monetary policy – which are in a powerful combination and which are in a complementary relationship; the countries due to support the changes, challenges and opportunities due to be derived from the implementation of a novel economic policy mix are expected to manage the economic, financial, social, demographical, and political situation much better, thus responding successfully to the economic, the financial, and the social crisis.

**Economic Stimulus:** This concept is widely used to refer to those cases in which the governments or the governmental agencies are making attempts to kick start economic growth and financial growth during difficult economic periods; there are numerous examples that might be offered when addressing and when referring to the case of economic stimulus, since these are very challenging situations for any economy and for any country: (a) cutting the interest rates, and focusing to keep these interests rates at or near zero as long as proved to be necessary, in order to stabilize the marketplace; (b) purchasing debt securities in high amounts, in order to stabilize the marketplace; (c) offering packages with direct assistance to those that have been severely affected by the crisis (for instance, the case of the COVID-19 pandemic and the COVID-19 crisis, and the groups that have been hurt financially by the COVID-19 pandemic and the COVID-19 crisis, namely the parents having school-age children, the people which were unemployed at that time, the small and medium enterprises which were affected by the periodic shutdowns).

**Opportunities in Building Inclusive Global Knowledge Societies:** The United Nations Educational, Scientific and Cultural Organization (UNESCO) stated in the document on “Inclusive Knowledge Societies for Sustainable Development” published in March 2012 the fact that there are countless opportunities that may be encountered in the complex process of building inclusive global knowledge societies, since knowledge is regarded by specialist as the vital asset that humanity possesses (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2012); in continuation, human experiences as well as human activities depend on the added value that knowledge managed to provide and that ought to be analyzed together with the unlimited benefits offered by the new communication and information tools (ICTs) that are believed to promote and to accelerate individuals’ “freedom of expression”, good quality education for all, enhancing society’s “respect for cultural and linguistic diversity”, and “universal access to information and knowledge” (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2012).

**Optimal Policy Mix in the European Union (EU):** Over the years, there were several crisis situation and pressing cases in which the fiscal and the monetary policymakers had to unite their forces and had to work together, in order to foster an optimal policy mix at a global level or at a less larger scale, such as in the case of the European Union (EU) countries; very good examples of such situations are represented by the Great Recession (which was a response to the 2007 economic crisis started in the United States), and the COVID-19 crisis (which was generated by the COVID-19 pandemic, which started in the early 2020 and which threatened the economies of all the nations around the world, affecting at an incalculable level our society and the well-being of individuals); an optimal policy mix in the European Union (EU) as well as almost anywhere else in the world could focus on certain measures, such as, for example: (a) cutting the interest rates, and focusing to keep these interests rates at or near zero as long as proved to

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be necessary, in order to stabilize the marketplace; (b) purchasing debt securities in high amounts, in order to stabilize the marketplace; (c) offering packages with direct assistance to those that have been severely affected by the crisis (for instance, the case of the COVID-19 pandemic and the COVID-19 crisis, and the groups that have been hurt financially by the COVID-19 pandemic and the COVID-19 crisis, namely the parents having school-age children, the people which were unemployed at that time, the small and medium enterprises which were affected by the periodic shutdowns).

**Pre-Pandemic and Post-Pandemic Challenges and Opportunities:** There are numerous challenges and opportunities that might be related to the pre-pandemic and the post-pandemic events and situations, especially when targeting the advancement of the society's development goals in the international context, but the challenges and the opportunities represented by the social inclusion are the ones that need to be mentioned with high priority, since the social inclusion opportunities and challenges have the power to confer success, encourage interdisciplinary, lead to optimum solutions in the process of problem solving analysis cases, target reducing extreme poverty around the world, tackle social cohesion by understanding and by reducing the gaps that exist in the development process of regions and countries at a wide level.

**Social and Solidarity Economy:** This places human beings as the first and last consideration in economic activities and is an alternative approach to the market economy. It relates to organizations, cooperatives, associations or companies that aim to produce goods, services and knowledge for economic purposes while simultaneously focusing on social implications and fostering solidarity.

## Chapter 4

# Distancing From a Stigmatized Identity: Explaining Hostility by Marginalized Racial Groups Toward New Immigrants

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### ABSTRACT

*Discrimination is perceived as stemming from outgroups. The UN Sustainable Development Goal 10 focused on reducing inequalities calls attention also to intragroup hostilities. In the US, intragroup hostilities between Latinos/as might occur if disassociation from a stigmatized sub-group protects one's status. This chapter tests potential disassociation effects by examining whether US Latinos/as distance themselves from a stigmatized identity by supporting adverse policies regarding Latino/a immigrants. Two studies (n=273 and n=8634) found that citizenship status was linked to support for adverse policies: more US-born Latinos/as considered immigrants a burden than Latinos/as of unknown status or non-citizens. Some Latino/a citizens might cut off reflected failure associated with being an immigrant because distancing might support coping with cultural demands of US residence and distancing from recent immigrants might prevent transference of negative stereotypes. As inequalities increase overall in the post-COVID-19 era, intragroup bias may worsen outcomes for stigmatized sub-groups.*

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## INTRODUCTION

The Sustainable Development Goals (SDGs) adopted by the United Nations in 2015 are a collection of integrated goals created to “end poverty, protect the planet, and ensure that by 2030, all people enjoy peace and prosperity” (United Nations, 2008). In particular, SDG 10 is focused on reducing inequality within and among countries and calls for attention to intragroup inequalities. To expand on the work being conducted towards achieving SDG 10 around inequalities and discrimination toward migrants and refugees, the present chapter examines intragroup hostilities between newly arrived immigrants from Latin American countries (i.e., Central and South American countries) into the United States who identify as Latinos/as compared to domestic US citizens who also identify as Latinos/as, a marginalized racial group in the US. Members of the Latino/a group who identify as US citizens might distance themselves from, or ostracize those identified as new immigrants in order to also distance or disconnect themselves from harmful stigma (McClanahan, et al., 2019; Snyder et al., 1986). These observations are counter to the predominant research and scholarship in the psychological sciences which often presumes that the perpetuation of inequality and discrimination stems from social outgroups. Intragroup hostility encourages unhealthy competition, builds further animosity, and diverts the groups’ attention away from other issues, while less intragroup discrimination could serve to unify Latino/a sub-groups. This could foster collaboration and greater equity for all Latinos/as in the US, as well as the enjoyment of greater “peace and prosperity” as envisioned by SDG 10.

The emergence of intergroup hostilities toward immigrants and refugees is a global phenomenon. By mid-2020, the number of refugees globally reached a record high of 24 million with 307 out of every 100,000 persons being refugees (United Nations, n.d.). For years, this ever-increasing number has exacerbated the rising anti-immigrant and anti-refugee sentiments and conflicts in host countries. The anti-immigrant hostility in Europe has maintained a divide of national identity between the ‘true compatriots’ (e.g., ‘us Swedish/German people’) and the immigrants (e.g., Non-Whites and Muslims), who are not considered within the national ingroup’s definition of the national ‘us’ (Bauer & Hannover, 2020). According to a 2018 Pew Research Center survey, majorities in Hungary, Greece, South Africa, Russia, and Israel view immigrants as a burden to their countries (Gonzalez-Barrera & Connor, 2019). While such hostility is often witnessed from outgroups, ingroup hostility has also been on the rise. In the aftermath of the Rwandan genocide, tensions and violence between the ethnic groups, Hutu and Tutsi, have increased due to intragroup polarization (McDoom, 2012). This polarization in attitudes reportedly stems from the fear and distrust caused by security threats. Anti-immigrant attitudes in Belgium are found among Belgians of Turkish and Moroccan descent (Meeusen et al., 2019). Meeusen and colleagues’ (2019) study investigates the relationship between unfair treatment/identity and interminority attitudes. Hostility and discrimination arises from a perceived threat, and in this case, immigrants are seen as job and social competition. There are instances where immigrant-origin voters will support an anti-immigrant political party (see Spies et al., 2022). Fetzer’s (2000) research indicates that opposition to immigration and support for nativist political movements in France, Germany, and the USA are impacted by race and ethnicity and partially caused by perception of marginality. These and the numerous such anti-immigrant sentiments should be acknowledged and addressed globally. This chapter focuses on one particular case of this phenomenon - the Latino/a intragroup hostility in the United States.

## **BACKGROUND**

Past studies have shown that a majority of Americans dehumanize and derogate Latino/a immigrants (Kteily & Bruneau, 2017), with such actions assumed to be directed towards immigrants by outgroup members. However, intragroup discrimination does occur, particularly among Latino/a Americans (Knoll, 2012). Yet, in mainstream discourse intragroup discrimination may be downplayed in favor of intergroup discrimination as the experience of rejection by ingroup members is experienced as more painful than rejection from outgroup members, particularly in cultures where loyalty is prized (O'Brien et al., 2012).

One explanation for intragroup hostility stems from social identity theory. Hickel and colleagues (2020) propose that achieving social and economic status for immigrants in the US is hard. Thus, immigrants may seek to adopt the identity of the group with higher status. However, adopting a social identity might not be feasible when physical characteristics play a role in that identity. Thus, instead, it is possible that second and third generation immigrants might express stronger affinity with the higher status groups by distancing themselves from new immigrants, particularly when there is negative rhetoric directed towards undocumented immigrants.

Another potential explanation comes from the psychological theory of Cialdini and colleagues' (1976) who proposed the notion of "basking in reflected glory"; that is, when individuals highlight their association with their own ingroup if they perceive it might enhance their status. In contrast, Snyder et al. (1986) suggest that individuals eschew or downplay the relationship if they expect it might damage them, calling this "cutting off reflected failure" (CORF). Thus, animosity between Latinos/as in the US might reflect attempts to disassociate from a devalued social identity, to cut ties with that identity, and negate forms of discrimination associated with it. In this case, stigmatization around the status of the 'illegal immigrant' in the US causes members of the Latino/a community to distance themselves from one another. Additional hypotheses may exist that further account for the social processes underlying stigmatization.

In addressing this under-researched question, the chapter extends the literature in two ways. First, it considers the potentially divisive role of status (both lower and outsider) in understanding ingroup cohesion between documented and undocumented Latinos/as. Second, it examines how experiences of discrimination might trigger ingroup distancing and hostility. The remainder of the chapter is organized as follows. A literature review explores CORF as a theoretical framework and its application across a range of contexts, and considers elements of stigma and overt discrimination as it pertains to members of the Latino/a community in the United States. The methodological approach underpinning the multi-phased empirical investigation is outlined, with results of study 1 and 2 then described. A general discussion of the research findings is offered, followed by the conclusions and limitations.

## **STIGMA AND OVERT DISCRIMINATION**

Stigma occurs when people are viewed as having less worth because of the social group to which they belong (Miller, 2006). Often, stigmatized individuals experience discrimination (Miller & Kaiser, 2001). Media is known to expose audiences to racial stereotypes, which can have an impact on evaluations of minorities (Dixon, 2006; Givens & Monahan, 2005). In the United States, television depicts Latinos/as mainly in crime dramas or as domestic workers with low ranking positions; they have been depicted as lazy, less articulate and intelligent, and more seductive (Mastro & Behm-Marawitz, 2005). Additionally,



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direct discrimination exists towards Latinos/as. Some psychological research is premised on the idea that racist practices have transformed into new forms such as subtle (Gaertner & Dovidio, 1986) or ambivalent (Glick & Fiske, 2001; Katz & Haas, 1998). However, over the last few years, negative rhetoric in the US about immigrants has become more overt and snowballed into direct attacks. In 2008, Phoenix Arizona's Sheriff Joe Arpaio conducted several raids that drove many immigrants out of that state. The 45<sup>th</sup> president of the US declared that Mexico sends its worst to the US: "They're bringing drugs. They're bringing crime. They're rapists" (cited in Ye He Lee, 2015). It is impossible not to observe the stigmas associated with Latino/a immigrants (Crocker et al., 1998); stigmatized social identities might make those who might fall under those categories vulnerable to discrimination (Steele et al., 2002).

Further, common discourse homogenizes and rarely differentiates between Latinos/as. Majority group individuals neither distinguish documented from undocumented Latinos/as, nor Salvadorians from Mexicans, Guatemalans, Nicaraguans, etc. (Guyll et al., 2010). Negative rhetoric, which may pertain to issues such as immigration, employment, education, crime, terrorism, and border security, arises and is discussed in conjunction with the threat that demonize Latinos/as (Guyll, et al., 2010; Immigration Policy Center, 2008).

## **THEORETICAL FRAMEWORK: CUTTING OFF REFLECTED FAILURE (CORF)**

The current research is framed by Snyder and colleagues' (1986) theory of *cutting off reflected failure* (CORF). The cognitive aspects of CORF are based on Heider's (1958) balance theory, which suggests that people's social and demographic connections with others affect their sentimental bonds as well as their (positive or negative) evaluations of them. CORF holds that when individuals perceive that their group is failing (e.g., in a competition), they may disassociate themselves from the group's identity. They may also experience more anxiety, depression, and hostility (Snyder et al., 1986; Spinda, 2011). To study this phenomenon, Snyder et al. (1986) had respondents complete a matrix task. After the task, respondents were placed in three conditions: one in which they received positive feedback, another in which they received negative feedback, and a control group, which involved no feedback. Only those who received negative feedback were less likely to partake in a presentation about their group and wear badges identifying the group (see also Wann et al., 1995).

The reverse has also been observed. Cialdini and colleagues (1976) showed that students were more likely to highlight connections with their school's athletic teams when the teams had won – a phenomenon they termed the theory of basking in reflected glory. Boen and colleagues (2002) noted that after elections, people displayed yard signs of the winning candidates longer than those of losing candidates. Miller (2009) revealed that students who voted for McCain versus Obama in 2008 rated McCain lower after Obama was elected President (see also Alabastro et al., 2013).

That individuals distance themselves from members of their ingroups has received empirical confirmation in other contexts. van Veelen and colleagues (2020) discuss many examples of individuals distancing from their ingroup to avoid discrimination. One example they discuss is a Muslim woman not wearing the headscarf at a job interview, a 50 year old actress using botox and fillers to get roles, and a gay man saying they are different from other gay men. The Queen Bee syndrome is another example (Derks et al., 2011), wherein a woman holding a position traditionally held by a man might act emotionless or tougher to appear more masculine. Applying these findings to the current research, it is

reasonable that Latinos/as might try to disassociate from a stigmatized social identity (e.g., 'illegal immigrant') to prevent transference of stigma to them and might also apply stereotypes to other Latinos/as as a way of distancing.

In the current research, the term Latino/a is viewed as a social identity that characterizes a group. Considering Latinos/as as a group in psychological terms is important. CORF-ing applies to groups that recognize and can identify with their group because they must be able to rebut or take pride in their group's failure or success (Wann et al., 1995). Latinos/as fit an overall group composed of those coming from multiple countries in Latin America (e.g., Mexico, El Salvador, Guatemala, Cuba; Garcia-Navarro, 2015). The Latino/a identity would be formed from a self-categorization process that occurs when individuals recognize that their ingroup is distinct from other outgroups (Brewer, 1999). Once people perceive themselves as part of a group, their perception of those who are ingroup or outgroup changes (Tajfel, 1974). Being Latino/a should derive value and meaning (Tajfel, 1979). Latinos/as should be biased to admire people who are part of that category and value their association to that (in)group. They should rate their ingroup better (Mullen et al., 1992). Behavior or attitudes that are inconsistent with these expectations might imply that distancing is in process.

Alternative explanations to CORF might explain hostilities (if these exist) among Latino/a immigrants in the US. One might be that Latinos/as from different countries adopt alternative social identities (i.e., the individual's awareness to which social group they belong; Tajfel, 1979). For example, Salvadorians may identify principally as Salvadorians, not as Latinos/as. In one study, by the Pew Research Center (2013), 54% of sampled individuals used terms such as Mexican, Cuban, or Dominican to describe themselves, and 23% preferred the term American. In addition, individuals with multiple identities may associate with the identity that is most available (Hogg, 2006). For example, a lesbian Latina immigrant may identify more as a queer Latina than as a Latina immigrant because her career involves addressing and overcoming discrimination on the basis of LGBTQ status, rather than Latina status. Thus, immigrant Latinas might not be part of her most immediate ingroup.

Not identifying as Latino/a (i.e., hostility to a perceived outgroup) might fit with the multiple identities explanation. However, this explanation relies on the supposition that the Latino/a identity may not be as present in the mind of Latinos/as. However, research suggests that 67% of Hispanics identify it as part of their racial background (Gonzalez-Barrera & Lopez, 2015). Some confusion exists in distinguishing between the terms Hispanic and Latino/a and whether this heritage implies a race (Garcia-Navarro, 2015). In Texas, Hispanics prefer Hispanic to Latino/a 46% to 8% (Pew Research Center, 2013), but among all Hispanics in the same study, the majority (50%) voiced no preference for either Hispanic or Latino/a, and 33% preferred Hispanic while 15% preferred Latino/a.

In sum, the current research considers the possible consequences of having a devalued identity. The authors postulate that US Latinos/as might be reacting to the devaluation of the immigrant status by directly cutting associations with it, or identifying more as 'American.' For example, research shows that Latinos/as identify more with Whites than African Americans, even though Whites may not reciprocate that identification (McClain et al., 2006). In addition, theories of stigma and prejudice predict that the victims of prejudice desire association with the dominant group as a way to cope with the related challenges of being a victim of prejudice (Allport, 1954). They want to appear more like prototypical members of the US American identity. As such, US Latinos/as may disassociate from immigrants and desire to appear more American to reduce the stigma associated with the 'illegal immigrant' status.

## OVERVIEW OF RESEARCH STUDIES

### Research Strategy

The research was conducted in two phases, with quantitative analysis performed on two different secondary datasets and samples. First, the hypothesized relationship between citizenship status and support or lack thereof of immigrant-related policies and the desire to appear more American were investigated. The goal was to understand whether more established Latinos/as would support two types of policies with adverse consequences towards other Latinos/as, and whether citizens desired to appear more American. The goals of the second study were to replicate the results of the first, verify the role of stigma, examine differences among various Latinos/as from different countries, and reinvestigate respondents' desires to associate more with the host country.

### Study 1 Hypotheses

- H1:** Immigrants who had become US Citizens (i.e., naturalized immigrants) and US-born (Latino/a) citizens (i.e., later generations) will desire fewer immigrants coming into the country compared to non-citizen immigrants.
- H2:** Naturalized citizens and US-born Latinos/as will have more negative attitudes towards policies that support undocumented immigrants than those with a less established status in the US.
- H3:** Documented immigrants will be more likely than undocumented immigrants to desire to be perceived as being true Americans.

### Method

#### Materials

Data from the nationally representative telephone survey conducted in 2004 by Schildkraut and Grosse were used to test the current hypotheses. The sample was stratified to target certain areas with a higher density of minorities and was randomly generated using a computer. The survey was conducted in both English and Spanish (Schildkraut & Grosse, 2010). Its purpose was to investigate 1) the multiple dimensions of identity, 2) resentment of whites towards immigrants, and, 3) how perceptions of discrimination in ethnic minorities affect the Americanization process. In sum, 2800 complete responses were obtained, including 436 by Hispanic or Latino/a individuals, 396 Asian, 324 Black, with the remainder from White individuals. For the present research, only responses from Latinos/as were used.

#### Respondents

Data from 436 respondents who identified or indicated an ancestry related to being Hispanic or Latino/a (e.g., Mexicans, Salvadorians, Guatemalans, Cubans) were extracted; however, only 273 individuals "self-identified" as Latinos/as. Thus, 163 respondents were excluded because they reported some ancestral Latino/a ties but did not specify their identity as Latino/a. The dataset itself did not contain information on whether some individuals had an unlawful status. To deal with this, two variables were cross-tabulated: citizenship status and whether they were born in the US or not (see predictor variables).

## Predictor Variables

### *Status in the US*

This was a nominal variable including one of three respondent statuses including US born, naturalized, and non-citizens. The variable was created using two demographic variables: *US citizenship* (*Yes = 1, No = 2*) and *US born* (*Yes = 1, Non = 2*). This permitted creation of three different comparison groups: (*Non-citizen immigrants = 0, Naturalized immigrants = 1, and US born citizens = 2*). The non-citizen group could be comprised of residents, visa holders, or undocumented immigrants. There was no way to further distinguish this status in the dataset.

## Outcome Variables

### *Support for Policy Towards Immigrants*

This construct was assessed with a single categorical item, “Do you think the number of immigrants from foreign countries who are permitted to come to the [US] to live should be increased, decreased or left the same as it is now?” (*1 = Increased, 2 = Decreased, 3 = Left the same, Don’t know = 88 and No Answer = 99*). This variable was re-coded into three levels (*Increase = 1, Leave the same = 0, and Decrease = -1, Don’t know and No Answer were coded as missing*). Since the previous version was an omnibus test, a dichotomized version of this policy was also used in other analyses: Dichotomous Decrease: (*Decrease = -1, Leave the same and Increase = 1*).

### *Support for Policy towards ‘Illegal’ Immigrant’s Use of Social Services*

This single item variable asked respondents, “Do you think [people who immigrated illegally] should be allowed to benefit from government assistance programs like Medicaid and food stamps?” (*Yes, allow = 1, No, do not allow = 2, Depends = 3, Don’t know = 88, and No Answer = 99*). This variable was re-coded similarly as the previous one. Since the previous version was an omnibus test, a dichotomized version of this policy was also used in different analyses: Decrease (*Do not allow = 0, Depends and Allow = 1*).

### *American Pride*

A single item constituted the “pride” variable. It read, “I would feel good if I were described as a typical American.” This single-Likert-type item was scored from 1 (*Not at all*) to 4 (*Very strongly*). “Don’t know” and “No Answer” options were coded as missing.

## Analysis Plan

A chi-square test of independence was conducted to test the association between the citizenship status variable and respondents’ support for a policy regarding more immigrants entering the country (hypothesis 1), as well as for the relationship between citizenship status and support for a policy that would enable ‘illegal immigrants’ to benefit from government assistance programs like Medicaid and food stamps (hypothesis 2). The third hypothesis was that immigrants with permanent status would be more likely than undocumented immigrants to want to be perceived as being true Americans. The prospective analysis of this hypothesis was to investigate whether or not US citizens differed from non-US citizens

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in feeling good if they were described as a typical American. An exact analysis could not be conducted because the survey implementers did not pose the question to non-citizen respondents. However, the dataset contained information about whether the US-born and naturalized Latino/a citizens felt good if described as a typical American, so this comparison was statistically analyzed with a t-test.

## Results

### Hypothesis 1

A chi-square test of independence between status and the respondent's desirability of maintaining the current influx of immigrants revealed a significant association [ $\chi^2(242, 4) = 20.68, p < .001$ , gamma = - .37 (see Table 1)]. Non-citizen immigrants chose to increase the number of immigrants entering the country in greater proportions than to leave the same, and they preferred leaving the numbers the same in higher proportions than decreasing them (see Table 1). Citizens choose to decrease the number of immigrants entering the country in greater proportions than naturalized and non-citizens. A gamma test measures the strength of the association between two rank-ordered variables on a scale from -1 to 1, similar to correlations. In this case, the gamma value is negative, indicating that individuals with more established citizenship were less likely to choose to increase the number of incoming immigrants. Thus, Hypothesis 1 is supported.

*Table 1. Chi-squared analysis: two US statuses by policy 1*

Citizenship	Policy Towards Influx of Immigrants		
	Decrease	Leave Same	Increase
Unknown	8 (9.2%)	39 (44.8%)	40 (46.0%)
Naturalized	9 (20.5%)	15 (34.1%)	20 (45.5%)
US Born Citizens	28 (25.2%)	60 (54.1%)	23 (20.7%)

Note.  $\chi^2 = 26.56^{***}$   $\gamma$  (Gamma Value) =  $-.37^{***}$   
Group percentages appear in parentheses;  $*** p < .001$ .

### Hypothesis 2

A chi-square test of independence between status and whether 'illegal' immigrants should be allowed to benefit from government assistance programs showed similar trends [ $\chi^2(256, 4) = 58.67, p < .001$  (see Table 2)]. The analysis reveals that citizens tend to choose not to allow illegal immigrants to benefit from government assisted programs in higher proportions than choosing to allow (gamma = - .59,  $p < .001$ ). There is support for hypothesis 2.

Table 2. Chi-squared analysis: two US statuses by policy 2

Citizenship	Policy Towards Use of Social Services		
	Don't Allow	Depends	Allow
Unknown	12 (12.9%)	20 (21.5%)	61 (65.6%)
Naturalized	15 (32.6%)	12 (26.1%)	19 (41.3%)
US Born Citizens	74 (63.2%)	12 (10.3%)	31 (26.5%)

Note.  $\chi^2 = 56.67^{***}$ ;  $\gamma$  (Gamma Value) =  $-.59^{***}$   
 Group percentages appear in parentheses;  $*** p < .001$ .

A follow-up analysis was conducted comparing non-citizen immigrants to citizens (US-born and naturalized) in their choice of *Allow* versus *Do not Allow* (coupled with *Depends*). This 2 x 2 chi-square test of independence returned statistically significant results ( $\phi = -.34$ ),  $X^2(256, 1) = 29.40, p < .001$ . Among non-citizen immigrants, 32 of 93 (34.4%) opted for *Do not allow* compared to the 113 of 163 (69.3%) US-born/naturalized. In other words, Latino/a citizens were more than twice as likely as non-citizen immigrants to choose *Do not allow*.

### Hypothesis 3

Analysis showed that naturalized immigrants ( $M = 2.92, SD = 1.13$ ) were no less likely than US born ( $M = 3.20, SD = .94$ ) to feel good if they were identified as Americans,  $t = -1.67, p > .05$  (there were no data to compare non-citizens). Hypothesis 3 is therefore unsupported.

### Discussion and Hypothesis Development for Study 2

The results of study 1 provide some evidence of distancing behaviors among Latinos/as in the US. Established immigrants appear to discount their association with less established immigrants. For instance, compared to non-citizen immigrants, citizens and naturalized immigrants were less in favor of allowing new immigrants to enter the country and not in favor of allowing ‘illegal immigrants’ to use government-assisted programs (e.g., Medicare and food stamps). It is impossible to link these results to stigma or discrimination, as no direct measure of stigma was available in the dataset. Additionally, although having a more established immigration status was associated with more support for adverse policies towards ‘illegal’ immigrants, the alternative argument that there were no hostility differences among Latinos/as in the US could not be tested. Another shortcoming was that the test of whether individuals would wish to associate more with the host country was limited to a comparison between citizens and naturalized individuals (as opposed to citizens vs. non-citizens). That test did not yield significant results. These limitations were investigated in the following study.

## Study 2

### Hypotheses

The hypotheses were as follows:

- H1a:** US born Latino/a citizens will hold more hostile immigration views (operationalized as the claim that immigrants are a burden to the US) compared to non-citizens of unknown status.
- H1b:** Having a more established status in the US will have an effect on whether Latinos/as are hostile to other Latinos/as beyond the effect of the country to which they belong.
- H2:** Experiencing discrimination will be associated with hostility towards other immigrants entering the country.
- H3:** Experiencing discrimination will trigger distancing effects resulting in respondents feeling more American.

### Method

#### Participants

Data were drawn from the Latino National Survey (LNS) (Fraga et al., 2006) which consists of responses gathered through 8,634 computer-assisted telephone interviews (CATI) with a stratified, random sample of Latinos/as in the 15 US states that contain 87.5% of the Hispanic population. Every sample per state was representative of the Latino/a population within it. All respondents were living in the US and had the option of responding in English or Spanish. Ages ranged from 18 to 79 years ( $M = 40$ ,  $SD = 15.47$ ). The sample contained marginally more females (55%) than males (45%). About 2380 (28.4%) of the respondents were born in the mainland US, 449 (5.4%) in Puerto Rico, and 5547 (66.2%) in other countries. In terms of education level, 2.6% had none, 20% had an eighth grade education or less, 14.5% had some high school, 3.3% had their general education (GED) degree, 24.4% were high school graduates, 19% had some college education, and 9.5% had a four-year college degree, and 6.7% had a graduate or professional degree.

#### Outcome Variables

##### *American Self-Perception*

The American self-perception item read: “How strongly or not do you think of yourself as an American?” This single-item Likert-type measure was scored from 1 (*Not at all*) to 4 (*Very strongly*).

##### *Immigration Views*

This variable assessed respondents’ views of immigrants. It is a binary variable that read: “Which comes closer to your own views?” 1 = “Immigrants today strengthen our country because of their hard work and talents” and 2 = “Immigrants today are a burden on our country because they take our jobs, housing, and health care.” Responses were coded so that “0” denoted the view that immigrants were a strength and “1” represented burden.

## Predictor Variables

### *Mistreatment*

This was a composite variable aimed at measuring mistreatment based on race including whether respondents perceived discrimination at work, by police, when finding housing, or in restaurants. These read: “Have you ever been unfairly... (a) fired or denied a job promotion?” (b) “treated by the police?” (c) “prevented from moving into a neighborhood (*vecindario* or *barrio*) because the landlord or realtor refused to sell or rent you a house or apartment?” and (d) “treated unfairly or badly at restaurants or stores?” These are binary items; respondents could either answer 0, (*No*) or 1 (*Yes*). Scores on the four items were summed to a single measure of discrimination. The Kuder Richardson 20-test for the four items was low (4 items; KR20 = .58).

### *Citizenship Status*

Respondents’ US citizenship status of respondents is a nominal variable comprised of three levels: *US born citizens*, which included Latinos/as who were born in the US to immigrant parents and those born in Puerto Rico (who are US citizens); *Naturalized citizens*, those who emigrated from Latin America and became US citizens; and *Non-citizen/Unknown status*, respondents who could be residents, visa holders, or undocumented. Their status was unknown because they were answering if they were citizens or not. The status variable was created using two categorical variables that asked respondents if they were *Born in the US* (two levels: in the US, Outside) and if they were *Naturalized* (two levels: Yes, No).

### *Place of Birth*

This is a nominal variable indicating the country in which the respondents were born. Respondents originally came from about 20 different countries in Latin America including Mexico, Colombia, Argentina, Chile, El Salvador, etc. These responses were recorded into four regions: 1 (*South America*), 2 (*Central America*), 3 (*Caribbean*), and 4 (*Mexico*).

## Analysis Plan

To test hypothesis 1a, immigration views (two levels: burden, strength) and status (three levels: non-citizen/unknown, naturalized citizen, born citizen) among Latinos/as in the US were cross-tabulated. A chi-square ( $\chi^2$ ) goodness-of-fit test was used to assess the strength of association between the variables. In a follow-up analysis, citizenship status was dichotomized. Naturalized citizens were joined with US born citizens such that both variables (immigration views and status) contained two levels only. A chi-square test in which a variable contains three levels results in an omnibus test. To identify which status differs from the other, the authors ran a 2x2 chi-square analysis that allows for a clearer interpretation. Also, US born and naturalized citizens may fit better as a category, help balance sample size disparities between citizens and non-citizens, and assist in understanding differences between the main targeted groups (Crano et al., 2015).

The second analysis tested the same relationship (i.e., between immigration views and immigration status), but it included a third variable—birthplace. Hypothesis 1b was tested using a three-layer  $\chi^2$  test examining differences in immigration views between non-citizens and US born/Naturalized citizens by birthplace (reorganized by region).



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Hypothesis 2 involved testing the relationships between status, immigration views, and country of birth, with the addition of a fourth variable: mistreatment based on race. The test involved hierarchical binary logistic regression.

Finally, to test hypothesis 4, the relationship between mistreatment and respondents' self-perceptions of being American was analyzed through an independent samples t-test. Mistreatment was the grouping variable; American self-perception was a continuous outcome variable. This test compared whether those who had experienced mistreatment reported higher mean levels of American self-perceptions than those who had not experienced mistreatment.

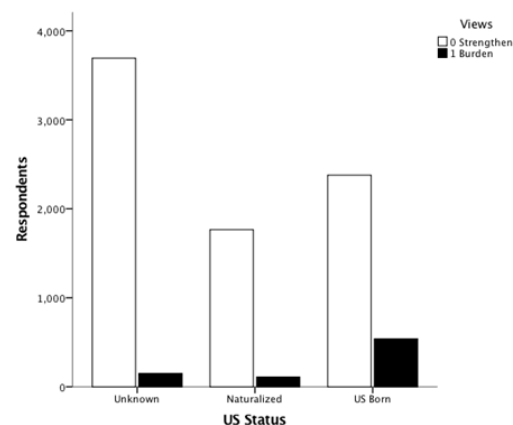
## Results

### Testing Hypothesis 1a and Replication

The first analysis was a 3 (status: Non-citizen/Unknown status, Naturalized citizens, US born citizens) by 2 (views of immigrants: "Strengthen Country," "Burden Country")  $\chi^2$  goodness of fit test. In this analysis, the majority of respondents 90.8% (n = 7836) indicated that immigrants strengthened the country, compared to the small group 9.2% (n = 798) of those who said that immigrants were a burden. These are impressive results. However, the central issue was not a general question of whether a greater number of Latinos/as saw immigrants as a burden than as strength to the country. The key issue was whether, within the 9.2% who viewed immigrants as a burden to the US, more citizens than non-citizens saw immigrants as a burden, and indeed, that was the result that emerged, supporting hypothesis 1a.

The analyses revealed associations between status and immigration views,  $\chi^2(8634, 2) = 453.87$ ,  $p < .001$ ; Cramer's  $V = .23$  (nominal by nominal); Gamma = .58 (ordinal by ordinal), both  $p < .001$ . Significantly more of those in the citizen group viewed immigrants as a burden than those in the naturalized or the group of non-citizens of unknown status. About 96% of respondents with unknown status believed that *immigrants strengthen the US* compared to 4% that chose *immigrants burden the US*. Compared to the previous results, fewer naturalized respondents chose *strengthen* (94%) and slightly more of them chose *burden* (6%). This trend continued with US born respondents. Fewer of them chose *strengthen* (81.5%), and more chose *burden* (18.5%; See Figure 1).

Figure 1. Respondents' citizenship status and views toward immigrants



After dichotomizing the status variable (i.e., combining US born and naturalized citizens), the association remained [ $\chi^2(8634, 1) = 237.47, p < .001$ ; nominal by nominal Phi = .17,  $p < .001$ ] (Table 3). Again, comparing strengthen versus burden options, about 96% of those with unknown status indicated their view that *immigrants strengthen the US* compared to about 4% that chose *immigrants burden the US*. Fewer citizens chose *strengthen* (86.5%) and more chose *burden* (13.5%), compared to unknown status. Comparing status differences, more US born Latinos/as considered immigrants a burden (81.3%) than Latinos/as of unknown status (18.7%).

Table 3. Chi-squared analysis: two US statuses by immigration views

Citizenship	Immigration Views	
	Strengthen the Country	Burden the Country
Legal Status	12 (12.9%)	20 (21.5%)
Unknown	15 (32.6%)	12 (26.1%)
Naturalized/US Born	74 (63.2%)	12 (10.3%)

*Note.*  $\chi^2 = 237.47, df = 1$ ; Phi = .17; numbers in parentheses indicate column percentages;  $p < .001^{***}$

### Testing Hypothesis 1b

A three-layered  $\chi^2$  analysis 2 (status: Non-citizen, US born/Naturalized) by 2 (immigration views: strength, burden) by 4 (region of birth: South America, Central America, Caribbean Islands, and Mexico) examined differences in immigration views between non-citizens and US born/Naturalized citizens by country of birth. The results showed a consistent pattern by region such that naturalized/US born citizens were more likely compared to non-citizens to say that immigrants were a burden. For South America, 8.2% of naturalized/US born citizens said that immigrants were a burden compared to 4.8% of non-citizens  $\chi^2(410, 1) = 1.99, p > .05$ , 7.9% of naturalized/US born Central Americans said immigrants were a burden compared to 4.1% of non-citizens  $\chi^2(708, 1) = 4.56, p > .05$ , 7.0% of US born/naturalized Caribbean Islanders said immigrants were a burden compared to 3.6% of non-citizens  $\chi^2(639, 1) = 3.40, p > .05$ , and finally, 4.5% of US born/naturalized Mexicans said immigrants were a burden compared to 3.8% of non-citizens  $\chi^2(3879, 1) = 1.13, p > .05$ ; all of these were two-tailed tests. No differences were found across regions. These patterns show the region of origin may not be driving the harsher immigration views (saying that immigrants are a burden) as much as being a US born Latino/a citizen.

### Testing Hypotheses 1b and 2

A hierarchical logistic regression analysis was used to examine a model in which status and discrimination, but not place of birth, predicted views of immigrants. First, status was entered as a sole predictor of immigration views ( $B = .43, SE = .13, p < .001$ ). In this two-variable model, the odds that citizens would say that immigrants were a burden were about 1.54 times greater than that of non-citizen/unknown status respondents. In a second model, discrimination was added as a predictor variable. It did not predict

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viewing immigrants as a burden ( $B = -0.02$ ,  $SE = .34$ ,  $p > .05$ ). Only citizen status predicted deeming illegal immigrants a burden. Finally, as theorized, birthplace (i.e., the third predictor variable) did not significantly predict immigration views, nor did any of the regions, and there were no significant differences among the regions (see Table 4).

Table 4. Binary logistic regression US Status, discrimination, and birthplace by immigration views

B (SE)	95% CI for Odds Ratio	Lower	Odds Ratio	Upper
<b>Included</b>				
Constant	-3.21 (.09)			
US Status	.43 (.13)	1.19	1.54***	1.99
Experienced Discrimination	-0.02 (.34)	.51	.96	1.90
<b>Birthplace</b>				
1 South America	.43 (.22)	.99	1.53	2.36
2 Central America	.27 (.19)	.91	1.31	1.90
3 Caribbean	.23 (.20)	.86	1.26	1.86
Note: $R^2 = .003$ (Cox & Snell), $.009$ (Nagelkerke) Model $X^2(5636, 3) = 5.26$ ; $p < .001$ ***				

### Testing Hypothesis 3

An independent samples t-test was used to test the third hypothesis. Two groups (respondents who experienced mistreatment based on race and those who did not) were compared on the extent to which they rated themselves as American. The results showed that those who answered that they had experienced mistreatment had significantly higher mean scores in American self-perception ( $M = 3.88$ ,  $SD = 1.49$ ) than those who had not experienced mistreatment ( $M = 3.47$ ,  $SD = 1.54$ ),  $t(5779) = -2.97$ ,  $p < .01$ . Respondents who had experienced mistreatment reported feeling more “American” than those who had not. This result supports the third hypothesis. The Pearson correlation between mistreatment and American self-perception is  $r = .108$ ,  $p < .01$ , one tailed ( $n = 853$ ), which also supports the hypothesis.

## DISCUSSION

Media discourses tend to homogenize minorities who have shared geographical roots. According to such discourse, discrimination towards minorities comes from outside of the minority group, which downplays intragroup discrimination. Drawing on the theory of cutting off reflected failure, the authors hypothesized that contrary to the dominant discourse, Latino/a US citizens distance themselves from other (i.e., non-citizen) Latinos/as due to the stigma associated with an ‘illegal immigrant’ status. The analyses provided strong, but not unqualified support for this proposition. The association between citizenship status and perceptions towards immigrants suggests that Latino/a citizens view immigrants as a burden on the US. This study replicated findings of Study 1. Compared to non-citizens, Latino/a citizens favored decreasing the number of immigrants coming to the US and did not want them to have

access to government aid. Some observers might attribute these dynamics between Latinos/as to hatred or jealousy, but the authors believe that a distancing effect (i.e., CORF) might better explain these dynamics. However, the role of stigma is yet to be known.

It was also important to learn if there were differences in immigration views held by respondents from different Latin American countries. Differences could mean that the postulated distancing might not be due to CORF but belonging to differing national identities. In the first attempt to address this issue, the authors considered differences in immigration views between Latinos/as with unknown status and those who were citizens of South America, Central America, the Caribbean Islands, and Mexico. In this analysis, every region followed the same pattern: citizens were more likely than non-citizens to rate immigrants as a burden.

The next question considered the reasons why distancing may have occurred. The authors believe that discrimination played a role in distancing. The results are consistent with the possibility that those possessing a more established citizenship status (US citizens) attempted to offset discrimination directed to undocumented immigrants from being transferred to them by acting against other immigrants (i.e., reducing their available resources). A binary logistic regression was used to test the variables of interest simultaneously. To support the authors' position, the test results needed to show: a) a relationship between immigration views (i.e., claiming immigrants as a burden) and citizenship status, b) a lack of relationship between immigration views and region of birth, and c) a model in which status and experienced discrimination both significantly predicted views of immigrants. Two of the prescribed tests were passed. Status predicted immigration views, but region of birth did not, nor were there significant differences among the contrasted regions. However, those who reported higher levels of discrimination were not more likely to deem immigrants as a burden. Thus, there was limited support for the second hypothesis. Nonetheless, those who claimed they had experienced higher levels of discrimination thought of themselves as more American than those who claimed to have experienced lower levels of discrimination. Experiencing discrimination was associated with a stronger desire to be perceived as American.

## **IMPLICATIONS**

One implication of the present research is that Latinos/as might be coping by CORF-ing from their immigrant identities. Wanting to appear American might be part of stigma avoidance as much as a desire to cut off self-reflected failure. However, lack of support for the second hypothesis is conflicting because it tested the direct effects of discrimination. Therefore, future results showing the role of discrimination more clearly on this distancing effect are needed. For example, citizens may have assimilated to US culture and might not associate as much with their Latino/a or immigrant identity as recent arrivals. This issue was only somewhat addressed in the first study, in which only the number of respondents who self-identified as Latino/a were chosen. More research examining assimilation and discrimination will result in better understanding of this research premise.

These findings could shed some light on the consequences of stigmatized identities. In this case, a stigmatized immigrant identity might result in internal conflicts among Latinos/as related to cutting off an association with an identity that might be damaging, and which could lead to difficulty for the integration of American Latinos/as. Specifically, more established immigrants might unknowingly stigmatize incoming immigrants to signify that they themselves are neither 'illegal,' criminals, nor take advantage of the system because they feel devalued as well. If a devalued immigrant identity exists, it

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could be difficult to achieve policies that benefit every Latino/a living in the US. Minority influence research indicates that for a minority (immigrants) to influence a majority (US non-immigrants), they could benefit from strategies such as building a united front, being consistent with their message and goals, and working from the inside (see Crano, 2012). Distancing from an aspect of one's identity might result in people choosing policies that are self-detrimental. For example, in the 2016 election, nearly 30% of Latino/a citizens voted for a man who called Mexican immigrants rapists, criminals, and drug dealers, and promised to build a wall between the US and Mexican border (Krongstad & Lopez, 2016).

The present chapter also has consequences for research in social psychology. Crocker and Major (1989) showed that contrary to expectations, stigmatized groups did not have low self-esteem (also see Twenge & Crocker, 2000). They explained this paradox by pointing out the coping mechanisms used by stigmatized individuals. Stigmatized people actively seek to protect themselves from the harms that stigma might cause. Other research has shown specific coping mechanisms to deal with stigma such as engaging or disengaging from stressful events (Compas et al., 2001) wherein, engaging refers to finding ways to deal with the stressor and disengagement refers to avoiding the stressor. The latter is the process that may plausibly occur among immigrants who disassociate from other immigrants to relieve the stress and stigma of being misidentified as an 'illegal' immigrant.

In harsh contexts such as the post-COVID-19 era, special attention should be paid to how intragroup bias may worsen outcomes for stigmatized sub-groups. The widespread fear and changes in everyday life caused by the pandemic have greatly affected psychological and socio-economic health. There has been a sharp increase in inequalities overall, especially for minority and low-income populations. Lockdowns and distancing measures have adversely impacted populations who were already subject to social and economic marginalization (Warren & Bordoloi, 2020). As the COVID-19 pandemic continues to surge, there has been exacerbated financial instability, mass unemployment, higher levels of discrimination, restricted access to health and welfare services, and all-time-high number of refugee and asylum seekers (United Nations, n.d.). These inequalities have intensified intragroup biases by creating unprecedented issues that cause new forms of conflicts in addition to the existing ones. The exacerbating inequities may continue to rise unless specific and intentional efforts are dedicated to combating them.

## **LIMITATIONS AND FUTURE DIRECTIONS**

As with many secondary analyses, the analysis that could be performed was restricted by the way in which the original data were collected and the variables operationalized. Most of the relevant variables contained in both datasets were categorical, without clear value differences among their levels, and many of them were dichotomous. Even the ordinal variables, constructed using Likert-type items, were relatively restricted in range. With these kinds of variables, applicable analytic options are limited (e.g., chi-square, binary logistic regression). These analyses, particularly the chi-square, are dependent on sample size.

An additional challenge was the measure used to evaluate experience of discrimination implemented. It was a composite variable that included four indicators: "Have you ever been unfairly fired or denied a job or promotion?" The reported percentages of experienced discrimination across the regions of South America (14.6%), Central America (18.2%), Caribbean (12.0%), and Mexico (14.3%) were small. The pattern was similar for the three remaining items. The second item asked: "Have you been unfairly treated by the police?" Only 10% of South Americans, 9.6% of Central Americans, 8.6% of Caribbean, and

10.6% of Mexicans said they had experienced this type of discrimination. The third item asked: “Have you been unfairly prevented from moving into a neighborhood because the landlord or realtor refused to sell or rent them a house or apartment?” Only 4.4% of South Americans, 4.9% of Central Americans, 4.2% of Caribbean, and 5.0% of Mexicans had experienced this type of discrimination. The same patterns appeared when respondents were asked: “Have you been treated unfairly or badly at restaurants or stores?” In this case, the percentages across the regions were closer to 10%. Furthermore, the alpha coefficient was low, which might not have captured the kinds of discrimination experienced by immigrants that may prompt distancing.

Future work on these topics may be directed at understanding the psychological purpose of distancing. The issues associated with a secondary dataset should also be viewed in the light of fact that undocumented, documented and naturalized US Latinos/as are hard-to-reach populations. Future research may need to use innovative techniques to recruit from this population. Future work may also develop appropriate measures with scales designed to understand the causes and effects of distancing through experimental methods. Finally, such studies also should control for effects of acculturation. Primary research can help refine precise understanding of the phenomenon of distancing and its role in the assimilation of new immigrants into host countries.

## **CONCLUSION AND PRACTICAL IMPLICATIONS**

We conclude this chapter by offering some concrete suggestions on how to improve intragroup relations, increase prosperity, and reduce inequality:

- **Changing Negative Rhetoric:** The UN International Organization for Migration (IOM) calls for various sustainable development goals around migration (International Organization for Migration, n.d.). One of them is acknowledging the divisive and harmful impact that negative rhetoric has on immigrants. Another is addressing the contributions that immigrants make to culture and economy. Since much public opinion is influenced by the rhetoric of political leaders, change in negative rhetoric to positive and affirming rhetoric has to be driven by political leaders. Research studies indicate that negative attitudes can be changed via narrative transportation, i.e., a story-telling intervention in which an individual becomes so involved with a story that they experience feelings and visualize images related to the story, which can align the beliefs of the listener with those of the story teller (see Green & Brock, 2000; Mendoza-Lepe, 2020). Narrative transportation work can be conducted with political leaders to invite them to take the perspective of immigrants and deeply understand and connect with their lived experiences. As a result, they may shift negative political rhetoric about undocumented immigrants. Positive rhetoric by political leaders might reduce intragroup discrimination among the masses by reducing a sense of threat felt by established immigrants who might in turn reduce distancing from newcomers.
- **Fair Migration Laws:** Countries should have policies that allow all immigrants to have a fair path, similar waiting time and process. Currently in the US, some Latinos/as such as Cubans become citizens upon arrival to the US, while others like Mexicans have to wait 21 years in processing family petitions. These differences should not exist since there are already asylum procedures for immigrants in immediate danger.

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- **Compassionate Migration Laws:** The UN IOM also calls for immigration laws that are sensitive to context. In the US, crossing the border without appropriate documents is considered a felonious crime, especially for those who cross multiple times. First, most immigrants might not speak English and might thereby not be familiar with the immigration policies. Without English skills, it would be difficult to find legitimate lawyers (cf. fraudulent immigration consultants; Unger, 2011) and pay expensive fees to orient them with immigration options and application processes. Thus, a transgression arising from lack of information and resources should not be punished so severely. There is a need for legislators to advocate for a change in status for this type of crime, in the absence of which make it extremely challenging to attain legal status and thus achieve equality and prosperity.
- **Mental Health and Educational Interventions:** Interventions for established Latino/a citizens need to be implemented that help them understand the distinct immigration processes of newcomers, as well as coping mechanisms for managing discrimination against themselves. Thus, they would be equipped to recognize how they might negatively and positively impact fellow new immigrants. They will learn that some processes are lengthy and costly and might become more welcoming towards fellow immigrants; they might also learn different ways of coping to avoid the distancing effect and thus strive to create a more unified and collaborative Latino/a identity. Finally, interventions may draw upon common values, identities, and goals such as religion to establish collaborations and collectively combat inequity (e.g., Pasha-Zaidi et al., 2021; Wamue-Ngare et al., 2021).
- **Opportunities for Education, Mobility, and Data:** Legislators must allocate funding for a wide variety of educational programs including language learning, parenting, and vocational skills, and make higher education accessible for those interested, with the goal of improving job prospects and economic opportunities. These programs should also be evaluated for their effectiveness in various emergent conditions (e.g., Warren et al., 2021). For example, it would be useful to understand how public health emergencies, like COVID-19, affect individuals participating in these programs compared to those who are not.
- **Happiness, Peace, and Prosperity:** The World Happiness Report of 2018 considered happiness, peace and prosperity in the context of migration. The authors suggest that the migration rhetoric of the host country can be an important influence in intergroup and intragroup dynamics (World Happiness Report, 2018). Latinos/as value spending quality time with family, relatives and guests (what they call “convivencia”). Providing opportunities for cultural exchanges and opportunities for convivencia with other Latinos/as in the US might lead to more contact and more positive attitudes about the immigrants as a group (e.g., Potochnick et al., 2012). At the same time, it might allow for immigrants to practice their values and feel more welcomed.

These suggestions, albeit grounded in the specific case of Latinos/as in the US, might offer insights for legislators globally to move forward with implementing sustainable intragroup relations. Strengthening intragroup relationships between established and new immigrants can help countries better support the UN Sustainable Development Goals of reduced inequality, greater peace, and prosperity.

**Conflict of Interest Statement:** On behalf of all authors, the corresponding author states that there is no conflict of interest.

**Data Availability Statement:** The datasets analyzed during the current study are available from The 21st Century Americanism: Nationally Representative Survey of the United States Population,

2004 (<https://www.icpsr.umich.edu/web/RCMD/studies/27601>) and Latino National Survey (LNS) published by the Inter-University Consortium for Political and Social Research (ICPSR; <https://www.icpsr.umich.edu/web/RCMD/studies/20862>).

**Compliance with Ethical Standards:** The studies in the chapter did not collect original data from human subjects, and only analyzed deidentified data from publicly available archives. Informed consent was collected by the original data collectors. The first author gained ethical approval from the ethical board of their university (name masked) for analysis of secondary data.

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## **KEY TERMS AND DEFINITIONS**

**Cutting Off Reflected Failure:** This theory states that when a group is perceived by its focal members to be failing, those members will disassociate themselves from the group's identity by distancing themselves from the lower-status individuals.

**Illegal Immigrant:** A person who violates the immigration laws of a foreign country by unlawfully entering, residing, or seeking to reside in said foreign country.

**Intragroup Discrimination:** The bias-based outlooks and conflicts developed between sub-groups stemming from competition and prejudice.

**Latino/a:** A term for a person of Latin American ancestry; those who claim a Latin American cultural or ethnic identity in the US.

**Social Identity:** A person's sense of self based on their social group membership(s).

**Stigma:** An aspect of one's character, physical, or group identity or association that prevents them from gaining social acceptance.

**Sustainable Development Goals:** Seventeen integrated global goals designed to achieve peace and prosperity for the planet and its people; reduced inequalities, no poverty, zero hunger, quality education, climate action, and good health and well-being are a few of the goals.

## Chapter 5

# COVID–19 and Wine Tourism: A Story of Heartbreak

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### ABSTRACT

*Several studies have addressed the role played by the Spanish wine routes in boosting the competitiveness of a territory, increasing wine production, improving the quality of life of citizens, and respecting the environment. However, to the authors' knowledge, the impact of COVID-19 on these wine routes has not been addressed in the academic literature. To overcome this research gap, this chapter aims to analyze the impact of the pathogen on the supply and demand of tourism activities through, on the one hand, the analysis of the evolution of the institutions adhered to the Spanish wine routes and, on the other hand, the study of the economic impact of the 32 routes that make up this tourism product.*

### INTRODUCTION

Changes in society have contributed to the transformation of patterns in tourism demand. Nowadays, travelers are attracted, beyond the classic sun and beach offer, by little-known and overcrowded destinations. This favors the generation of new tourist offers, in which culture and the elements that surround

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it play an increasingly important role. In this framework, at the end of the 90s of the last century, the so-called wine tourism arose, a new type of tourism whose purpose is to learn about the wine culture and the customs of the region where the wine is produced (Hall, 1996; Getz, 2000).

Wine and tourism offer a unique experience to tourists, promoting, in turn, the environmental, economic, and social development of the wine regions where this activity takes place (López-Guzmán et al., 2011; Marco-Lajara et al., 2022). Any tourist, regardless of their previous knowledge of oenology, can appreciate the smell of the different wines, visit the winery facilities, and learn how to toast with the right glass. Therefore, wine has gone from being a complementary activity to the trip to become the main reason for the visit (Stewart et al., 2008).

Wine tourism has had a great level of development and expansion in the last two decades in Spain. Thus, since the beginning of the new millennium, a process of creation and certification of wine routes has been developed through which it has been intended to revitalize the territories with a long wine tradition. These routes have succeeded in structuring the Spanish wine tourism activity, generating significant flows of tourists around the world of vines and wine (Vázquez-Vicente et al., 2021). As a consequence, wine tourism activity has been consolidated in the Spanish wine regions par excellence, i.e., La Rioja, Ribera del Duero, Penedés and Marco de Jerez. However, the COVID-19 has altered the proper functioning of tourism activities since its appearance, causing a sharp decrease in the flow of foreign tourists and, as a result, a negative impact on the tourism sector (Marco-Lajara et al., 2021a; Marco-Lajara et al., 2021b). In this context, the Spanish wine industry has not remained unaffected by the impact of the pathogen, as wineries have had to face an unprecedented hostile environment. Following the declaration of the state of alarm by the Spanish government on 14 March 2020, establishments in the hotel and catering sector (Horeca channel) were closed and leisure activities were cancelled as a result of mobility restrictions, thus directly affecting two key channels for the marketing of wine in Spain. Likewise, during the 99 days of the Spanish state of emergency, which ended on 21 June 2020, there was no wine consumption linked to the tourist flow, as no travel between autonomous communities was allowed, nor the arrival of foreign tourists, negatively affecting wine tourism activities. In 2021 the power to apply restrictive mobility measures has been decentralized to the autonomous communities, which have implemented different measures to avoid the agglomeration of people and control tourist flows. As a result, wineries and wine shops have started to develop and implement online services and home deliveries, considerably increasing sales through the online channel (Marco-Lajara et al., 2021a).

Several research address the role played by Spanish Wine Routes to boost the competitiveness of a territory, increase wine production, improve the quality of life of citizens and respect the environment (Jiménez & Sevilla, 2008; Guerrero & Albert, 2012; Romero, 2017; Portela & Domínguez, 2020). However, to our knowledge, the impact of COVI-19 on the Wine Routes of Spain has not been addressed in the academic literature. To overcome this research gap, the paper aims to analyse the impact of the pathogen on the supply and demand of tourism activities through, on the one hand, the analysis of the evolution of the institutions adhered to the Spanish Wine Routes and, on the other hand, the study of the economic impact of these routes. Therefore, the study aims to answer the following two research questions: What has been the impact of COVID-19 on the institutions adhered to the Spanish wine routes and what has been the impact of COVID-19 on the economic value generated in each of these routes?

The research is structured as follows. In section 2, after this brief introduction, the relationship between wine and tourism is analyzed, as well as the role of wine routes as the backbone of wine tourism activity, with special emphasis on the case of Spain. Section 3 deals with the methodology followed in

this research. Section 4 presents the results and, finally, Section 5 presents the conclusions, limitations, and future lines of research.

## WINE TOURISM

Wine tourism brings together two economic activities that have traditionally been studied separately: tourism and wine production. This typology of tourism is nourished by the typical gastronomy of wine regions, given that food and its adjacent factors are the main actors (Pratt & Carlini, 2019).

The conceptualization of wine tourism is a fertile field for proposals since it can be analyzed from different points of view. On the one hand, Hall et al. (2000) consider wine tourism as the experience associated with visiting vineyards, wineries and wine demonstrations in which wine tasting is the main element. Getz & Brown (2006), on the other hand, conceive wine tourism as a strategy to develop a certain geographical area and an opportunity for wineries to promote and sell their products directly to consumers. On the other hand, Elias (2006) defines the activity as the set of trips and stays aimed at the knowledge of the landscapes, the work, the spaces of winemaking, as well as the activities that improve the knowledge of the tourist around the theme of wine. According to Getz et al. (2008) wine tourism activity involves a trip motivated by the desire to visit wine-producing regions in general and wineries in particular. Therefore, wine tourism is not a simple wine tasting, but a set of socio-cultural and environmental factors that allow responding to the search for a differentiating and themed experience around the world of wine.

This type of tourism has a long tradition in the so-called New World countries, in particular: the United States, Australia, South Africa and Chile. The first works on the field of wine tourism were developed by authors from New World countries in the 1990s (Hall, 1996). Among the seminal works, the books *Wine Tourism Around the World* (Hall et al., 2000) and *Explore Wine Tourism* (Getz, 2000) stand out for their disruptive character in the field, as well as the pioneering research carried out by Charters and Ali-Knigh (2002), Carlsen (2004), Getz & Brown (2006) and Mitchell & Hall (2006). Currently, its study has acquired a high level of maturity in the academic literature, with research in several countries, such as: Australia (Sigala, 2019), Canada (Hashimoto and Telfer, 2003; Getz and Brown, 2006), Chile (Torres et al., 2021), Hungary (Medina, 2015), Italy (Colombini, 2015), New Zealand (Baird et al., 2018), Portugal (Lavandoski et al., 2018), South Africa (Ferreira & Hunter, 2017) and Spain (Gómez et al., 2015). For the case of Spain, the first research carried out was addressed by foreign researchers, focusing mainly on La Rioja (Gilbert, 1992) and Marco de Jerez (Hall & Mitchell, 2000). However, these early studies were later complemented by Spanish researchers (Carrasco et al., 2019).

There are currently different lines of research active in the field of wine tourism. In this sense, in order to show the state of the art, Gómez et al. (2019) identify six main research fronts in the study of wine tourism:

1. Territorial development. This line of research analyses the link between wine tourism and economic and regional development. In particular, studies examine issues related to the challenges and potential of wine tourism to achieve regional development and sustainability (Stavrinoudis et al., 2012; Contò et al., 2014), the comparison of wine tourism destinations (Getz & Brown, 2006), as well as the importance of wine tourism to enhance regional and national branding (Simpson & Bretherton, 2004; Gómez & Molina, 2012).



2. The wine routes. The second block of research focuses on the creation and proliferation of wine routes in different countries, among which we can highlight: Chile (Sharples, 2002), Greece (Tzimitra-Kalogianni et al., 1999), Italy (Brunori & Rossi, 2000), Portugal (Correia et al., 2004); South Africa Africa Africa (Bruwer, 2003) and Spain (López-Guzmán & Sánchez-Cañizares, 2008). In fact, this line of research has now been extended to the study of sophisticated and innovative networks, clusters and alliances within wine regions (Taylor et al., 2007; Rebelo & Caldas, 2013).
3. Behavior of wine tourists. The studies included in this block try to understand the profile of this type of tourists through their segmentation. These studies include the profile of demographic characteristics (Alonso et al., 2007; Grybovych et al., 2013) or the combination of demographic characteristics with psychographic characteristics (Tassiopoulou et al., 2004; Nella & Christou, 2014). In addition, this typology of studies also focuses its interest on post-visit/purchase behaviour in order to build brand loyalty (Kolyesnikova & Dodd, 2008).
4. Tasting and winery experience. The fourth block includes research on the winery experience and tastings. The experience and well-being of the wine tourist is key, as the sales that can be made after the visit to the winery represent an important distribution channel for the winery (Charters & O'Neill, 2001; Wilson & Goddard, 2004). Research includes the needs and expectations of wine tourists in the winery (Alonso et al., 2008; Fountain et al., 2008), as well as the quality of the service provided.
5. Wine events and festivals. This line of research focuses on the study of wine events and festivals. In particular, they evaluate the impact of such events in wine regions (Veres et al., 2008), the motivations of visitors to attend events (Park et al., 2008) and the analysis of festival routes (Mason & Paggiaro, 2012).
6. Wine marketing and promotion. Research on marketing and promotion in the field of wine tourism consists of studies of regional positioning in the consumer's mind (Frochot, 2003), analysis of information provided on wineries' websites (Murphy et al., 2005) and research on winery sales (Olsen & Thach, 2008).

Within these lines of research defined by Gómez et al. (2019), in the following research we focus on the tourism routes front, specifically on the analysis of the effect of COVID-19 on the evolution of the institutions adhered to the wine routes in Spain (supply) and the economic impact generated by each route (demand). In the following two sections we will explain how wine tourism is structured in Europe, in general, and in Spain, in particular. In addition, the academic literature that has addressed the effect of COVID-19 on wine tourism activity is analyzed.

## **Wine Tourism in Europe: The European Network of Wine Cities**

Wine tourism activities have been developed in all the wine regions of the world in order to promote the social, economic, and environmental development of their respective areas of influence. Among the most important pioneering areas in the development of this activity are the Californian valleys of Sonoma and Napa, and the French regions of Bordeaux and Alsace. These wine-producing areas represent the mirror in which the rest of the wine-producing regions that wanted to implement a model of tourism linked to wine began to look at themselves (Escolar & Morueco, 2011).

In Europe, aware of the potential of this activity, the European Network of Wine Cities (RECEVIN) was created in 2000 as a non-profit association with headquarters in Strasbourg, with the aim of pro-

moting and boosting wine tourism in the old continent. This network can be formed by European cities belonging to countries of the European Union, as well as by European cities belonging to third countries that have a close link with the wine industry, since the wine production area must be protected by a Protected Designation of Origin (PDO). At present, cities in France, Italy, Spain, Portugal, Germany, Austria, Slovenia, Greece and Hungary are part of this European network. The adhesion of these cities to RECEVIN implies the fulfilment of a series of commitments structured in four blocks:

1. Promote wine culture through European PDOs, since wine has been part of the heritage of the old continent for millennia, being a fundamental element for the territorial development of its wine regions.
2. To act as a pressure group to defend the interests of the European wine cities, both in matters related to the wine sector and those linked to the social, economic and environmental development of the cities that make up the network.
3. To promote wine tourism through the standardization of the regulations governing the activity. The following initiatives have been developed for this purpose:
  - a. The creation of the *European Wine Routes* label, constituting the European brand of the wine tourism sector. The accreditation as a European Wine Route implies the adhesion of the cities to the *European Charter of Enotourism*, through which the cities commit themselves to develop a strategy of sustainable wine tourism in the territory, given that during the wine tourism activity the natural and patrimonial resources of the adhered territories must be preserved. This document also sets out the concept of wine tourism at European level, due to the heterogeneity of existing definitions of the concept.
  - b. The creation of the European Wine Tourism Manual, which establishes the quality management system for the development of European wine tourism, as well as the definition of the criteria for the recognition of the *European Wine Routes*.
  - c. The celebration since 2009 of the *European Day of Wine Tourism* on the second Sunday of November in the cities attached to RECEVIN.
  - d. The creation of the *European City of Wine* competition in 2012 to promote and disseminate wine tourism in Europe.
4. To provide training for young oenologists and winegrowers, between 18 and 35 years old, enriching their learning with guided visits and tastings to companies in the wine sector.

RECEVIN represents, therefore, an opportunity for European wine cities to present their richness, diversity and their own wine culture, improving the understanding of the landscape, gastronomy and local heritage of these cities. In this way, an integral development strategy for European wine regions is sought.

According to the *European Charter of Enotourism*, wine tourism can be defined as the development of tourist and recreational activities aimed at enjoying the vineyard, the wine and a specific territory. The pillars of this activity (see Figure 1), according to the *Vademecum of European Enotourism*, are:

- The culture of wine. It is worth highlighting the cultural importance of the European wine industry. Without this value, wine tourism would have no reason to exist. Culture is the axis on which the wine tourism activity is based, so the wineries must ensure that the tourist perceives this value during the development of the activity. Elements such as the characteristics of the wineries, the way of working the vine, the folklore or the festivals around the world of wine are, therefore, cul-

## COVID-19 and Wine Tourism

tural manifestations that must be taken into account by the agents that make up the wine tourism activity.

- **Tourism.** Both tourism and the tourist represent two key elements in the wine tourism activity. The tourist (demander) is the factor that determines the success of the wine tourism companies (suppliers), therefore, they must guarantee the quality of the tourist facilities, as well as the offer of complementary services.
- **The territory.** This plays a crucial role in the development of the business strategy of the wine tourism offer, given that the European wine regions are made up of areas with a series of characteristics that identify and characterize each region.
- **Sustainability.** European wine tourism must be developed under the pillars of sustainable tourism, which, according to the World Tourism Organization (WTO) are based on: the conservation of the natural and cultural resources of a given territory, the preservation of the environment, the satisfaction of visitors and the distribution of benefits among society.
- **Authenticity.** The authenticity of this tourist product is an attribute valued by the tourist, given that, unlike mass tourism, this type of tourism is aimed at a differentiated public with high levels of demand.
- **Competitiveness.** The competitiveness of a given wine tourism activity refers to the capacity to adapt the tourist offer to the changes produced in the market in a sustainable way. In this way, it is possible to point out that there is a direct relationship between the concepts of sustainability and competitiveness.

Figure 1. European pillars of wine tourism.

Source: García-López (2008)



## Wine Tourism in Spain: The Wine Routes of Spain

The *Wine Routes of Spain* is the tourist product through which the Spanish wine tourism activity is structured. These routes refer to itineraries of quality wine-growing areas that offer tourists the opportunity to discover the historical, cultural and heritage wealth of the territories in which the vine is located, representing a mechanism of territorial structuring widely developed by the countries of the Old World, unlike the wine-producing countries of the New World (López-Guzmán et al., 2013).

The wine routes are made up of signposted routes and advertised on panels through which the social, cultural, and environmental values of the vineyards and wineries are transmitted, being the instrument with which the wine-growing territories can publicize and market their wines in the form of a tourist offer (Millán Vázquez de la Torre, 2012). Therefore, wine routes are not only a mere signposting of the oenological offer of a particular wine region, as wineries must be able to guide and show their facilities, welcome, and welcome the tourists they receive and, on many occasions, but the development of the activity also involves the modification of the facilities.

This product is based on three pillars: (1) the cooperation between public and private agents, (2) the territorial economic development strategy, and (3) the valorization of the heritage and culture of the wine destination, which integrates both tourist companies (hotels, hostels, etc.) and wine companies (wineries, wine cellars, etc.). The routes additionally incorporate the local administrations of the territories where the activity is carried out and a management entity in charge of planning, managing, controlling, and marketing this tourist product.

The economic weight of the wine industry in Spain and its diversity in the tourist offer, make the Iberian country an appropriate territory for the development of wine tourism activities. In 1994 the Spanish Association of Small and Medium Wine Cities (ACEVIN) was created with the aim of disseminating the economic and cultural wealth of the wine regions, being also a key organization in the promotion and development of Spanish wine tourism. All those municipalities that belong to a certain PDO and whose wine activity has a higher relative weight than the rest of the activities can join this entity. Likewise, all those legal entities linked to the world of wine that, as a consequence, contribute to the purposes of this entity, can be part of ACEVIN.

In particular, the Spanish wine routes originated in 2001, the year in which ACEVIN obtained the support of the General Secretariat of Tourism to start collaborating in the creation of a regulation for this tourist product. The cooperation between the two institutions began in the context of the *Tourism Product Quality Programme*, which was part of the *Integral Quality Plan for Spanish Tourism* (PICTE 200-2006), whose aim was to develop new tourism proposals that would support the diversification and depersonalization of Spain's tourism offer. Under these premises, the Wine Routes of Spain were created with the aim of:

- Diversify and depersonalize economic activity in a given wine region.
- Improve the infrastructures close to the tourist product.
- Generate economic wealth through complementary activities to the traditional one (wine production).
- Increase the flow of tourists in the wine-growing areas where the product is established.

The pioneering routes that participated in this initial project in 2001 were six: Jumilla, La Mancha, Montilla-Moriles, Penedés, Rías Baixas and Utiel-Requena. From then until nowadays, the public-private work developed by all the organizations of the wine tourism sector has turned the *Wine Routes of Spain* into a quality tourist product of reference both at national and international level. Currently, the Wine Routes of Spain product has 32 certified routes (See Figure 2), which must be periodically accredited under the quality criteria imposed by ACEVIN and the Ministry of Industry, Commerce and Tourism.

Specifically, in the *Manual of the Tourist Product Wine Routes of Spain*, formulated by the two aforementioned institutions, the methodology to be followed during the process of implementation and subsequent certification of the wine routes appears. This process consists of three phases:

Figure 2. Wine routes in Spain

Source: Wine Routes of Spain (2021)



1. **Launching.** In this phase, both public and private entities that are part of the tourism product must make sure that the required demands are met, since a managing body of the route must be founded, a manager of this body must be appointed, and the facilities of the future members must be adapted to the quality requirements demanded by the institutions.
2. **Development.** This phase lasts two years, starting once the *Wine Route of Spain* certification has been obtained. During this temporary period, the members of the route must commit themselves to develop the actions included in the *Manual of the Tourist Product Wine Routes of Spain*. If, once the period is over, the process ends with a positive evaluation, the tourist product will keep the certification and will pass to the next phase. In the opposite case, the destination would lose its certification and would not be able to apply for it again in the period of one year as a penalty. This system guarantees the continuous effort of the wine routes to maintain and even improve the required quality standards.
3. **Consolidation.** In order to maintain the level of demand of the wine routes, every two years, the standards set out in the aforementioned manual are checked. If after the evaluation a negative result is obtained, the destination will lose the distinction of *Wine Route of Spain*, having to reapply for the distinction when it meets the minimum requirements.

## Wine Tourism and COVID-19: An Astringent Flavor

The global pandemic context is not a new scenario for humanity, as past pandemics have disrupted the proper functioning of human activities and global economic growth. Currently, humanity is facing COVID-19, an infectious disease caused by Severe Acute Respiratory Syndrome Severe Coronavirus

2 (SARS-CoV-2) that was first detected in the capital of China's Hubei province, Wuhan, in late 2019. Subsequently, in March 2020, COVID-19 was declared by the World Health Organization (WHO) as a global pandemic, being labeled by the International Labor Organization (ILO) as "the most serious crisis since World War II" (ILO, 2020).

The pandemic has severely affected the global wine industry, decreasing its worldwide revenue by 14% in 2020 (Lu, 2020). Along with the demand shock caused by the coronavirus crisis, other factors destabilized the proper functioning of the global wine industry in 2020, such as damage caused by climate change or forest fires in some of the world's most important wine regions. Thus, while Burgundy had the earliest harvest season on record, California suffered four of the most virulent wildfires in the last twenty years and Australia suffered the fifth deadliest bushfire season in the country (Canavati et al., 2020).

In this context, the Spanish wine industry has not remained unaffected by the impact of the pathogen. Marco-Lajara et al. (2021) address the effect of COVID-19 on the Spanish wine industry through the evolution of consumption in the different wine distribution channels in Spain. The results of their research reveal that, on the one hand, wine marketing through the Horeca channel decreased from 295 million liters of wine in 2019 to 151 million liters in 2020, a decrease of 48.80%. On the other hand, wine consumption in the home experienced a significant increase, from 354 million liters of wine consumed in 2019 to 422 million liters in 2020, an increase of 19.2%. This increase is explained by the shift of food and beverage consumption from restaurants to households, as people were able to go to bars and restaurants as a result of mobility restrictions. In addition, it is important to note that the outbreak of the pandemic increased public concern about a potential supply crisis, causing people to stockpile more food and beverages than necessary. During 2020, wineries increased their online sales by 161% in 2020, representing one of the best ways to sell wine while complying with health restrictions. However, the reduction in consumption in the Horeca channel (-48.80%) was not offset by the increase in consumption in Spanish households (19.2%) and in other channels (10.52%), including online<sup>1</sup>.

As far as we know, the impact of the coronavirus on wine tourism activity has not been addressed in the academic literature for the Spanish case, a fact that shows the research gap to be covered. Table 1 shows the set of research indexed in the main collection of the Web of Science that aims to address this research objective. As can be seen, there is parity between research focused on New World (Anon, 2021; Curtis & Slocum, 2021; Davis & Gómez, 2021; Squire, 2020) and Old-World countries (Barcaccia, 2020; Karagiannis & Metaxas, 2020; Loose, 2020; Stastna et al., 2020). Moreover, most of the scientific production studied conceives wine tourism as a tool to mitigate the negative effects of the pandemic (Anon, 2021; Curtis & Slocum, 2021; Davis & Gómez, 2021; Karagiannis & Metaxas, 2020; Loose, 2020; Squire, 2020; Stastna et al., 2020), since it allows increasing direct sales in the winery and favors the diversification of distribution channels. The present research aims to overcome the existing research gap in the literature through the analysis of the pathogen on the Spanish wine tourism industry. Likewise, the approach under which the research is analyzed differs from previous literature, since the study analyzes in depth the effect of the coronavirus on the influx of tourists to the Wine Routes of Spain (demand), as well as on the number of institutions adhered to these routes (supply).

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Table 1. Research indexed in the Web of Science addressing the effect of the coronavirus on wine tourism.

Authors	Journal	Country	Objectives/Results
Anon (2021)	Australian & New Zealand Grapegrower & Winemaker	Australia	This research aims to analyze the evolution of Australian wine sales during the COVID-19 pandemic. In particular, it addresses how wine tourism, direct marketing and the use of social media have allowed wineries to mitigate the negative effects of the pandemic.
Barcaccia (2020)	Sustainability	Italy	The article addresses the effect of the pathogen on the Italian agri-food industry, analyzing why and how the economic crisis resulting from the pandemic may represent a turning point to introduce the pillars of sustainability in Italian food and agricultural systems. The analysis includes the effect of COVID-19 on wine tourism, given the ancient and deep-rooted nature of this activity in the culture and history of the transalpine country.
Curtis and Slocum (2021)	Sustainability	United States	This study examines the resilience of wineries in California wine regions, including the challenges they faced during the pandemic and the strategies used to sustain their business, including wine tourism.
Davis and Gomez (2021)	International Journal of Wine Business Research	United States	Research identifies drivers of customer satisfaction and sales performance at wineries in the Finger Lakes region of New York State in the context of pandemic. Among the factors analyzed, wine tourism was shown to have a positive influence on total amount spent and customer satisfaction.
Karagiannis and Metaxas (2020)	Sustainability	Greece	The paper studies the relationship between tourism and sustainability in Greek wine companies during COVID-19. It examines the successful business practices of Greek wineries in the main wine producing region of the Peloponnese and the impact of sustainability on their operational practices. Furthermore, the research highlights the role played by wine tourism for the maintenance and survival of Greek wineries.
Loose (2020)	Deutsche Weinmagazin	Germany	The study addresses the impact of the COVID-19 pandemic on German wineries, highlighting the need to diversify their distribution channels, as well as to promote sustainable wine tourism activities.
Squire (2020)	Australian & New Zealand Grapegrower & Winemaker	Australia	This paper analyses the impact of the COVID-19 pandemic on the Australian wine industry. The research highlights the importance of regional wine tourism in increasing revenues for Australian wineries, as well as consumer interest in ordering wines online during the pandemic.
Vaishar, and Stastná (2020)	Current Issues in Tourism	Czech Republic	The study addresses the potential of the Czech Republic to develop wine tourism in rural areas in order to promote inland tourism and thus avoid the concentration of tourists in urban areas. The research identifies wine tourism as an opportunity to reduce contagion during COVID-19 by avoiding crowds and, at the same time, as a territorial development strategy.

Source: Own elaboration

## METHODOLOGY

In order to answer the two research questions posed, research with a quantitative approach and an exploratory scope has been carried out, given that the study deals with a topic on which there is no previous academic literature.

The sources of information used for this research are secondary, since in an era in which a large amount of information is generated and archived, the ability to analyze, summarize and interpret the data is of increasing value (Andrews et al., 2012). In order to study the evolution of the different members of the routes (supply), the number of tourists on each route (demand), the average price of the visit and the average expenditure on each route, we have used the data provided by the National Institute of Statistics (INE) and the Spanish Wine Tourism Observatory (OTVE). The data provided in the reports of the latter organization have allowed us to calculate the economic impact generated by visits to wineries and wine museums in each of the Wine Routes of Spain between the period 2018-2020, since they contain the necessary information to be able to make the appropriate calculations. The formulas used to calculate the economic impact of the wine routes are as follows:

- Economic Impact of Winery Visits (EIWV) = Number of visitors to the wineries on the route\*average price of the visit + Number of visitors to the wineries on the route\*average spend in store per visitor to the winery
- Economic Impact of Wine Museum Visits (EIMV) = Number of visitors in the wine museums of the route\*average price of the visit + Number of visitors in the wine museums of the route\*average shop expenditure per visitor in the museum
- Total Economic Impact = EIWV + EIMV

## **RESULTS**

The following section presents the main results of the research divided into two blocks: (1) the effect of the coronavirus on the demand of the Wine Routes of Spain and (2) the effect of the coronavirus on the supply of the Wine Routes of Spain.

### **The Effect of COVID-19 on the Demand in the Spanish Wine Routes**

The outbreak of the health crisis and the measures taken to control it since March 2020 have slowed the trend of steady growth in recent years in the number of foreign tourists, in general, and the number of wine tourists, in particular, causing a fall of 77.3% and 73.5% respectively compared to 2019. Thus, while the flow of foreign visitors in the Iberian country during 2020 was 18,957,856, the total number of visits to wineries and museums attached to the Wine Routes of Spain amounted to 814,323, producing a decrease in absolute terms of more than 60 and 2 million respectively (see Figure 3.).

With regard to the distribution of wine tourists based on their origin, there was a drop in international tourism: 88% of the visitors received in 2020 were national (716,981), while the remaining 12% were international (97,343). As can be seen in Graph 2, during 2020, local and proximity tourism was boosted, given that, although the number of national wine tourists had remained at around 74% since 2016, in 2020 their weight was increased to represent 88%.



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Figure 3.. Evolution of the number of foreign tourists and wine tourists in Spain.

Source: Prepared by the authors based on INE and OTVE.

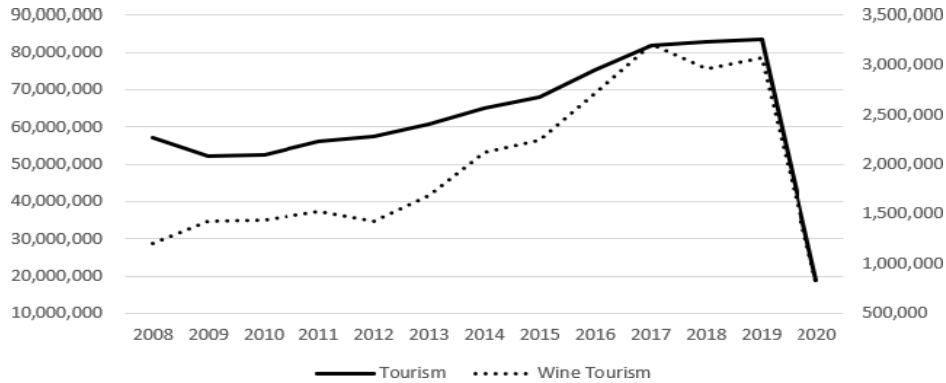
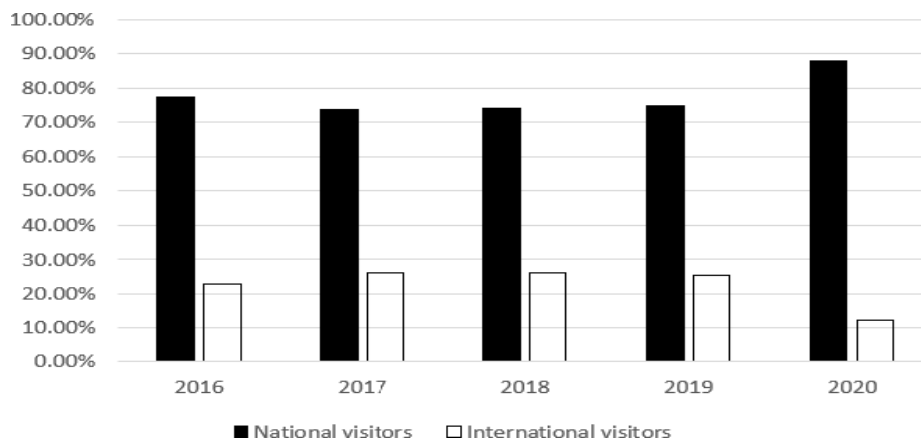


Figure 4. Distribution of visitors to the Wine Routes by origin (2016-2020).

Source: own elaboration based on OTVE



Regarding the touristic ones for each of the wine routes in Spain, it is important to highlight that the most visited routes during the period 2018-2020 were the Penedès Wine Route, the Marco de Jerez Wine Route and the Ribera del Duero Wine Route (see Table 2). In fact, these three routes represent more than 40% of the total number of visitors to wineries and wine museums in the three years studied, denoting their high specialization in wine tourism activity. Since 2018, the total number of visitors to wineries and wine museums associated with the Wine Routes of Spain had stabilized at around 3,000,000 visitors. However, in 2020 there was a drastic fall in demand, with a drop of 73.53% compared to the previous year.

It is worth highlighting the important increases achieved by the Campo de Cariñena (41.59%), Montilla-Moriles (38.64%) and Yecla (27.56%) wine routes in 2018, as well as Navarra (76.24%), Sierra de Francia (36.58%) and Montilla-Moriles (26.98%) in 2019. In 2020, on the other hand, all routes experience negative variation rates. Likewise, based on the number of visitors to wineries and wine museums, the average price of the visit and the expenditure made in the shop for each Wine Route in Table 2, an approximation of the economic impact of wine tourism in the wineries and museums of the Wine Routes of Spain can be observed. The economic impact of wine tourism in wineries and museums has been

increasing from 83,073,584.71 € in 2018 to 91,799,104.12 € in 2019, an increase of 10.50%. In 2020, on the other hand, there was a sharp reduction of -74.70% compared to the previous year. Thus, the three routes that generate a greater economic impact are those that receive a greater number of tourists: the Penedès Wine Route, the Marco de Jerez Wine Route and the Ribera del Duero Wine Route. However, this relationship is not always the case, since there are routes with a higher number of visitors, but with a lower relative economic impact. As an example, we can give the case of the Rías Baixas wine route and the Somontano wine route in 2019, given that, although the former received a greater number of visitors, the Somontano wine route generated a greater economic impact.

Table 2. Number of visitors to wineries and wine museums adhered to the Wine Routes of Spain (tourist impact) and their economic impact.

Wine Route	Tourist impact			Economic impact		
	2018	2019	2020	2018	2019	2020
Alicante	47,507	55,068	21,334	1,407,202	1,632,203	689,075
Arlanza	37,725	36,177	18,976	480,150	456,781	267,169
Arribes	-	1,390	822	-	52,222	23,180
Bierzo	22,712	24,858	3,253	429,538	433,514	68,382
Bullas	22,423	22,966	8,109	276,345	292,797	117,266
Calatayud	296,325	299,740	73,763	3,490,856	3,630,114	919,877
Campo de Cariñena	22,055	23,911	5,535	312,220	330,583	126,591
Cigales	14,431	18,259	2,197	410,610	439,489	32,583
DO Empordà				-	-	-
Enoturisme Penedès	441,467	370,556	132,416	14,099,442	12,256,858	3,689,358
Garnacha - Campo de Borja	56,821	54,755	23,591	709,050	697,199	279,941
Jumilla	42,722	47,105	13,567	1,512,439	1,721,432	380,817
Lleida	-	23,989	13,796	2,799,983	1,475,654	459,407
La Mancha	-	22,308	10,555	-	473,954	197,939
La Manchuela	50,596	45,573	3,783	-	813,350	147,537
Madrid	-	-	23,744	-	-	403,273
Marco de Jerez	582,351	568,997	99,006	16,183,501	20,986,822	2,909,626
Montilla-Moriles	24,513	31,796	4,638	349,721	481,425	71,810
Nvarra	25,605	39,456	10,382	580,502	703,199	232,223
Rías Baixas	116,557	124,104	32,089	2,625,707	2,686,072	868,575
Ribera del Duero	383,150	389,377	94,909	13,451,407	11,820,742	3,330,709
Ribera del Guadiana	49,445	52,716	7,583	802,272	844,831	123,787
Rioja Alavesa	192,213	204,515	50,981	6,842,669	6,898,516	2,397,556
Rioja Alta	297,268	313,497	69,378	10,218,654	11,718,972	2,483,723
Rioja Oriental	5,896	8,295	1,684	121,291	156,762	44,983
Ronda	26,818	24,723	3,881	543,165	994,615	124,378

continues on following page

*Table 2. Continued*

Wine Route	Tourist impact			Economic impact		
	2018	2019	2020	2018	2019	2020
Rueda	38,009	41,382	7,554	1,333,797	1,388,020	233,649
Sierra de Francia	1,479	2,020	573	29,269	46,440	17,786
Somontano	79,601	93,119	28,453	2,333,105	4,923,202	1,344,171
Txakolí	-	35,885	18,758	-	-	-
Toro				-	1,287,059	456,207
Utiel-Requena	76,627	78,904	24,628	1,730,689	1,845,966	687,591
Valdepeñas	-	13,969	3,118	-	174,740	56,175
Yecla	7,063	6,924	1,267	159,341	135,572	44,294
Total	2,961,379.00	3,076,334.00	814,323.00	83,073,584.71	91,799,104.12	23,229,636.57

Source: own elaboration based on OTVE.

## The Effect of the COVID-19 on the Offer in the Wine Routes of Spain

The companies associated to the Wine Routes of Spain have increased since 2018, from 1,865 in 2018 to 2,295 in 2020, which represents a variation of 23.05% in the period analyzed (see Table 3). The data provided show that the main driver of wine tourism activity is the wineries, with more than 600 associates in the four years analyzed. They are followed by the accommodation and catering sectors, with 476 and 357 in 2020. Thus, while the number of accommodations has been increasing since 2018, restaurants experienced a slight decrease in 2020, with a year-on-year variation rate of -1.38%. Both accommodation and restaurants represent the basic offer of any tourist destination. However, in the case of the Wine Routes of Spain they are especially important since their offer is themed and specialized around the world of wine. Themed leisure activities, on the other hand, include all kinds of experiences related to wine culture and follow an irregular evolution during the period, proof of this are the variation rates: -7.55% in 2017-2018, 13.27% in 2018-2019 and -8.11% in 2019-2020. On the contrary, the number of museums and interpretation centers have experienced an increase from 2018 to 2020.

As for the entities that make up the wine route, it is worth highlighting the predominant role of the town councils, as their integration reinforces the role of the wine routes as a regional economic engine. The number of adhering town councils increased from 2018 to 2019, from 642 to 775 respectively, subsequently experiencing a considerable decrease of -24.00% in 2020. The number of regulatory councils, meanwhile, follows an upward trend since 2018. As for the type of accommodation, the three- and four-star hotel offer stands out, with a positive evolution in both types of establishments since 2018 and with more than 100 establishments since 2019. As for the extra-hotel offer, rural houses stand out, with more than 200 establishments since 2019.

Table 3. Offer of wine tourism services in the Wine Routes of Spain.

	2018	2019	2020	Change 2018-2019	Change 2019-2020
Wineries	595	688	718	15.63%	4.36%
Accommodation	373	462	476	23.86%	3.03%
Restaurants	306	362	357	18.30%	-1.38%
Themed leisure	98	111	102	13.27%	-8.11%
Museums and interpretation centres	82	95	132	15.85%	38.95%
Tourist offices	96	113	114	17.71%	0.88%
Wine bars	71	75	81	5.63%	8.00%
Shops	62	70	75	12.90%	7.14%
Wine Merchants	50	60	57	20.00%	-5.00%
Incoming agencies	33	42	44	27.27%	4.76%
Transport companies	19	20	18	5.26%	-10.00%
Wine therapy services	11	11	12	0.00%	9.09%
Agri-Food Industries	19	28	35	47.37%	25.00%
Other services	13	21	26	61.54%	23.81%
Digital-based companies	11	7	7	-36.36%	0.00%
Tourist guides	6	15	12	150.00%	-20.00%
Visitor centres in the vineyard	9	16	9	77.78%	-43.75%
Serv. Tasting and tasting	11	31	20	181.82%	-35.48%
Partners of the Routes	1,865	2,227	2,295	19.41%	3.05%
City Councils	642	775	589	20.72%	-24.00%
Regulatory Boards	27	30	33	11.11%	10.00%
Other member entities	71	67	76	-5.63%	13.43%
Member entities of the routes	740	872	698	17.84%	-19.95%
Hotels 5	7	8	9	14.29%	12.50%
Hotels 4	46	54	59	17.39%	9.26%
Hotels 3	44	59	63	34.09%	6.78%
Hotels 2	33	39	36	18.18%	-7.69%
Hotels 1	13	14	14	7.69%	0.00%
Hostels and guesthouses	11	23	30	109.09%	30.43%
Apartments	34	34	36	0.00%	5.88%
Rural houses	163	202	201	23.93%	-0.50%
Hostels	5	7	7	40.00%	0.00%
Campsites	6	10	9	66.67%	-10.00%
Other accommodations	11	12	12	9.09%	0.00%
Number of accommodations	373	462	476	23.86%	3.03%
Total	2,978	3,561	3,469	19.58%	-2.58%

Source: own elaboration based on OTVE.

## CONCLUSION

The results of the present research are of special interest for the academic community, as well as for the companies and professionals of the wine sector since they improve the knowledge about the Spanish wine tourism industry. In particular, the research contributes to improve the understanding of the effect of COVID-19 on the supply and demand of the Spanish Wine Routes, allowing to know the impact of the pathogen on the evolution of the adhered institutions and the economic value derived from the visits to wineries and museums of the Spanish Wine Routes. In this way, the research aims to fill a gap in the literature, since the impact of COVID-19 on the Spanish wine tourism activity has not been addressed in the academic literature.

The wine tourism developed through the Wine Routes of Spain has suffered a hard blow during 2020 as a consequence of the COVID-19 pandemic. The Wine Routes of Spain as a whole have received a total of 814,323 visitors in their wineries and museums during 2020, representing a decrease of 73.5% compared to the previous year. In absolute terms, in 2020 there were 2,262,011 visitors less than the previous year. Likewise, the economic impact of wine tourism activity in wineries and museums has registered a fall of nearly 72.5%, representing losses of more than 68 million euros compared to 2019. Faced with this situation, the companies of the Wine Routes of Spain have redefined their competitive strategies, renewed their tourism products, promotional activities and, above all, the markets on which to focus their efforts, which have become closer. This has strengthened the resilience of Spanish wineries, which have been able to adapt to a much more complex environment. In fact, during 2020 an important internal consumption was generated through the attraction of the local and proximity public. In this way, tourists have discovered attractions close to their location, acting as ambassadors of the wine routes close to their territory. The research shows, on the other hand, a drop in international tourism in 2020 compared to the previous year. Logical considering the mobility restrictions imposed worldwide to try to curb the spread of the coronavirus. Despite the adverse circumstances, the offer of wine tourism companies and services linked to the Wine Routes of Spain has experienced a slight growth during 2020, mainly due to the incorporation of the Madrid Wine Route and the positive evolution of many of the already existing routes.

There are different types of factors that explain the asymmetric impact of the coronavirus on the 32 Wine Routes of Spain. Among these factors we can highlight some of them such as the wine tourism offer of their wineries, the geographical location and their proximity to large tourist centres, the tourist development of the destinations, the positioning of the destinations and their wines or the communications to access these wine routes. These factors have led to significant differences in the number of visitors received on each route. Thus, the Penedès was the most visited Route in 2020 with 132,416 visitors, followed by the Wine and Brandy Route of the Marco de Jerez with 99,006 visitors and the Wine Route of Ribera del Duero with 94,909 visitors. Among the Routes most affected in terms of the decrease in the number of visits during 2020 are: Cigales (-88.0%), Bierzo Enoturismo (-86.9%), Ribera del Guadiana (-85.6%), Montilla-Moriles (-85.4%) and Ronda-Málaga (-84.3%). With regard to the routes that experienced a greater decline in the economic impact generated we find: Cigales (-92.59%), Ronda (-87.49%), Marco de Jerez (-86.14%), Ribera del Guadiana (-85.35%) and Montilla-Moriles (-85.08%). These data illustrate that there is no direct relationship between the number of visitors and economic impact, given that there are routes with a lower number of visitors, but with a higher relative economic impact. This is due to the differences in the price of the visit and the average expenditure during the visit.

Thus, those routes that are able to charge a higher price and encourage greater consumption during the visit can generate a higher relative economic impact.

## FUTURE RESEARCH DIRECTIONS

Despite the contributions made, it is also possible to highlight certain limitations of the work. In this regard, it should be noted that the research only addresses the impact of COVID-19 on visits to wineries and museums attached to the Wine Routes of Spain, so the impact of the coronavirus on wine tourism activity would be greater if other concepts such as accommodation, restaurants or activity companies were considered. To overcome this limitation, as a future line of research the authors would like to extend the analysis of the impact of COVID-19 on all the agents involved in the wine routes. Likewise, we would like to ask wineries directly about the effects of the pandemic on their wine tourism activity, as well as their opinion about the different measures that the Spanish government has implemented to improve the situation of wine companies.

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## KEY TERMS AND DEFINITIONS

**COVID-19:** Highly contagious respiratory disease caused by the SARS-CoV-2 virus.

**Horeca:** Horeca is an acronym for hotels, restaurants, and catering.

**Protected Designation of Origin (PDO):** Protected Designations of Origin (PDO) recognize and certify a product's differentiated quality as a result of its own distinctive characteristics.

**Sustainability:** The concept refers to trying to meet the needs of present generations without compromising the needs of future generations.

**Wine Route:** The Wine Routes are routes marked and advertised with special panels that emphasize natural, cultural and environmental values, vineyards and wineries, individual farms or cooperatives that are open to the public.

**Wine Tourism:** Wine tourism is the type of tourism dedicated to promoting and managing the wine wealth of a given area.

**Wine Tourist:** Person who practices wine tourism.


## **ENDNOTE**

- <sup>1</sup> Although the online channel experienced a 161% increase in 2020 compared to the previous year, it represents a very small percentage of the sales made by wineries, around 1% on average.

## Chapter 6

# COVID–19 Pandemic: Impacts on Supply Chain Sustainability

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### ABSTRACT

*The present work aims to analyze the impacts of the COVID-19 pandemic with sustainability commitments in the supply chain, providing practices and tendencies. Through literature review and application of research questionnaire to 53 respondents, it was understood that robust and reliable relationships are essential to increase the resilience and safety of the supply chain. It was concluded that the COVID-19 pandemic re-signifies the supply chain, catalyzing existing visibility, resilience, digitalization, and risk management problems. Quality management has also been impacted, requiring adaptation to ensure the quality of services and supplies and support the companies' strategic decisions. In this sense, this chapter updates the COVID-19 pandemic impacts that occurred on the supply chain management sustainability, with lessons learned for mitigation of future crises and shows the limitations like applied questionnaires regarding different industries in different countries to analyze the challenges and impressions of different sectors and cultures.*

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## INTRODUCTION

According to Brandenburg et al. (2019) to overcome the lack of holistic research in this field, sophisticated techniques, and integrated systems to support decision making are needed to deal with the complexity of issues related to the sustainable supply chain.

Evaluating the research by Seuring and Müller (2008), the role of government and legal authorities, as well as customers and other stakeholders, can stimulate sustainable supply chain management through pressures and incentives. Regulatory strategies, related to external provider performance and risk management or sustainability related to the product, help to propagate sustainability in the supply chain, while higher costs and complexity, and lack of communication represent the main barriers to its implementation.

Regardless of the sector they operate, organizations have missions, visions, legal and socio-cultural structures established on historical bases, both their own and arising from their operating context (regulation, relationships, and customs). Changes in these elements always encounter resistance, both internal and external, which oppose the emergence and celerity of innovations (Philippi, Fernandes and Pacheco, 2017).

Guidance, continuity, collaboration, risk management, and proactivity are, according to Beske and Seuring (2014), five key categories of sustainable supply chain management (SSCM). Some related practices allow organizations to follow the path of sustainability, but with the COVID-19 pandemic, such was put to the test, suggesting questions of how to achieve sustainability performance in the supply chain in a crisis and post-crisis scenario.

Robust and reliable supply chain relationships are central to enhancing supply chain resilience. In addition, collaborative relationships build trust among supply chain partners and flexibility in responding to unexpected changes in demand or unanticipated supply disruptions (Hobbs, 2020).

Harapko (2021) shows that the COVID-19 pandemic has accelerated preexisting supply chain issues and brought priorities such as visibility, resilience, and digitization to the fore. Although some sectors were hit hard by disruption, there were some winners, notably life sciences.

The COVID-19 pandemic pushed risk management to the top of virtually every corporate agenda. The proactive monitoring of external provider risks was the primary focus of these efforts, yet significant blind spots remain in most companies' supply chain risk management setups. (Alicke, Barribal and Trautwein, 2021).

COVID-19 pandemic events and responses are unprecedented to modern operations supply chains. Scholars and practitioners seek to make sense of how this event will make us revisit basic scholarly notions and ontology. Sustainability implications exist. Short-term environmental sustainability gains occur, while long-term effects are still uncertain and require research. Sustainability and resilience are complements and jointly require investigation (Sarkis, 2020).

This chapter aims to analyze the impacts of the COVID-19 pandemic on commitments to supply chain sustainability

## LITERATURE REVIEW

This section presents the supply chain management and its importance, its migration from environmental commitments to sustainability, based on strategic decisions and customer demand. Then came COVID-19

## **COVID-19 Pandemic**

the pandemic, so how this new scenario impacts sustainability commitments in the supply chain. Essential relationships to increase the resilience and safety of the supply chain and quality management were presented, as well the requiring quality management adaptation of existing problems assumed in this new scenario for supporting the companies' strategic decisions.

## **Sustainability in the Supply Chain Management**

The continuous improvement of the relationships between the links in the supply chain and the strategic adjustment of its structure are decisive elements for organizations to remain in the market (BORGES, 2015). Ruptures and interruptions in supply chains can cause large financial losses and damage the reputation of organizations (Oliveira et. al, 2017).

For a long time, profit dictated how companies should act. Rather than just looking at results, sustainable procurement makes companies consider issues such as the environmental impact of their external providers, human and labor rights records, and business ethics.

In general, protecting, retraining, and reskilling the workforce is a major priority, along with investing to make the autonomous supply chain a reality (Harapko, 2021). This statement is in line with Hobbs (2020), who argues that, at an individual enterprise level, risk management plans should include contingency planning to deal with labor shortages or disruptions to transportation and supply networks. Thought restrictions on travel imposed by lock-downs and the high number of infected people, for health reasons due to the COVID-19 pandemic, the need for actions to maintain essential services to the population was accentuated.

According to Vieira, Bem and Ferreira (2021), it was found that purchasing activities have effectively contributed to the incorporation of sustainability in supply management, through the optimization of resources and the contracting of less degrading services and materials. Inventory control and flow activities, which constantly deal with perishable materials and emergency consumption, contribute positively to management by incorporating sustainability into processes, as it develops a leaner system and eliminates material losses. Among the challenges to disseminating sustainability in supply management is the change in the corporate culture's values.

Social responsibility and sustainability issues have been increasingly recurrent and represent challenges to be addressed in different researches and different businesses (Brito and Berardi, 2010). The approaches range from the normative aspect to the pursuit of superior performance and competitive advantage.

The supply chain management in the face of the adjustment of this strategic structure favors the promotion of a conditioning environment for companies to achieve certifications by quality and sustainability standards (Green et al., 1998).

Regarding quality standards, they are part of an important link in sustainable supply chain management, the qualification of external providers, a process presented in the next subsection.

## **Quality Management and the Qualification of External Providers**

Quality management comprises the approach adopted and the set of practices used to efficiently and effectively achieve the intended quality of the product. According to Toledo (1997), the quality management of a company involves its processes and extends to external providers and customers. During the 20th century, quality management evolved from the era of pure inspection and statistical quality control to achieving quality assurance and moving towards strategic quality management.

The relevance of certifications by international standards and their application to the qualification process of external providers is undoubtedly a competitive advantage for organizations that choose for this decision, being a differentiated business strategy in terms of recognition of their quality management system and a facilitator of supply chain management.

The certifications are awarded based on internationally accepted quality standards and attest to the permanent application of quality standards in companies. Quality standards are references for evaluating the ability to satisfy consumer demands (Carpinetti, Miguel and Gerolamo, 2009).

How to select, evaluate and approve the external providers are the first steps towards good supply chain management. The external provider selection process is not simple. Complexity increases depending on the characteristics of the item or service to be purchased. The act of acquisition is no longer simply making a price quote (FNQ, 2017).

Certifications demonstrate respect for the consumer through high-quality standards. Thus, the difference lies in the ability to develop production processes that are aligned with the certification scope. This reality that recommends the association between strategic aspects, such as cost reduction actions, innovation, cooperation, training, and aspects committed to sustainability has brought a challenging universe to all those organizations that seek to meet their demands from the quality management requirements (BORGES, 2015).

Ikram, Shen, Ferasso and D'Adamo (2021) indicate that ISO 9001 (Quality Management System) and ISO 14001 (Environmental Management System) certifications in Asian countries (India, Iran, Indonesia, Philippines, Bangladesh, and Pakistan) were highly affected during the COVID-19 pandemic, due to restrictions on audits and site surveys. Due to cross-border travel restrictions, social distances measures, thousands of companies have lost their certification of ISO 9001 and ISO 14001 during COVID-19 spread out, tending to lose the opportunity to target the international markets. To date, there is no action plan or agenda to cover this issue and provide some extension by certification bodies. To solve this issue, ISO and the International Accreditation Forum issued a guide for remote audits in April 2020, allowing the external provider qualification process to be maintained, avoiding even more difficulties in the process of acquiring items and services in the supply chain.

Another perspective, addressed by Alicke, Barribal, and Trautwein (2021), is the need to understand the location of your first-tier external providers and the key risks those external providers face. In this survey, only 2% can make the same claim about external providers in the third tier and beyond. That matters because many of the most urgent supply shortages in 2021, such as semiconductors, happen in these deeper supply chain tiers, bringing difficulties for managing their supply chains during the crisis (Alicke, Barribal and Trautwein; 2021).

Regional supply chains, unlike global ones, are more stable and reliable (less risk of disruption) during low and high levels of uncertainty (Alvarado-Vargas & Kelley, 2020). Companies must make strategic decisions that will secure their supply chain functionality and assess the likelihood of such events.

While there are numerous lessons learned from the COVID-19 pandemic, Nandi et al. (2021) limited their observations to three characteristics: localization, agility, and digitization, for making supply chains more resilient, transparent, and sustainable. These insights emerged early and remained as pervasive concerns during the crisis. They also provide significant insights for future supply chain sustainability and relate closely to circular economy achievement.



## **RESEARCH METHODOLOGY**

Based on the postulates of Gil (2019), Fleury (2018), Cauchik-Miguel (2017), Gray (2012), and Yin (2015), this research was classified as applied research, which aims to produce knowledge that has practical application in order the need to solve concrete problems.

### **Conceptual Framework**

The conceptual framework of this research was structured into parts. First, it was initiated with an overview of supply chain management sustainability, as part of a review study performed to align theory and practical issues, problems, and trends regarding supply chain sustainability. By exploratory bibliographic research presented on the literature review, it was raised the main fundamentals and structural factors identified as a weakness and missed opportunities of supply chain sustainability during the COVID-19 pandemic. Second, it was developed a research questionnaire, based on the literature review findings, which was submitted to the target audience, represented by different actors of the supply chain. Third, followed by data collection, it was performed a triangulation of results. As a result, the analysis of the COVID-19 pandemic impacts on the supply chain sustainability was presented in section practical findings. Finally, it was prepared the conclusion of this study.

The following paragraphs describe in more detail the research methodology.

### **Exploratory Bibliographic**

According to the theme and objective, this research procedure was classified as exploratory bibliographic research, which is carried out from published materials, based on periodical articles, technical publications, books, magazines, and management models. (Gray, 2012).

Conducting a literature review “can be understood as a kind of bibliographic research, consequently involving the stages of planning, data collection, analysis and interpretation and writing of the report” (Gil, 2019, p. 78).

According to Gray (2012, p. 87), it is necessary to focus on a high-quality base to carry out high-quality research. It is understood that defining the bases to be researched is essential.

Academic bases Capes, Web of Science, Scopus, Science Direct and SciELO, and BDTD were selected and the page of the management model (<https://www.iso.org/home.html>).

It is understood that it is essential to define the group of keywords for a better understanding of the amount of work and to start the search with the following words in isolation: “COVID-19 AND PANDEMIC”, “SUPPLY AND CHAIN”; “SUSTAINABILITY”; “QUALITY MANAGEMENT”; “QUALITY MANAGEMENT SYSTEM” and “QMS”. Later carrying out the searches combining these exact words, as described below “COVID-19 AND PANDEMIC” and “SUPPLY AND CHAIN” and “SUSTAINABILITY”, and so too, “COVID-19 AND PANDEMIC” and “SUPPLY AND CHAIN” and “QUALITY MANAGEMENT”. Thus, we found a total of 17 articles cited in this work.

### **Data Collection Instruments**

To identify how the COVID-19 pandemic impacted the supply chain, an empirical study was performed through the application of a questionnaire using the online survey type research instrument, supported

by the Google Forms platform, with open and closed questions to be carried out with external providers, consultants and quality auditors, specialists within the supply chain and quality area, where investigation and prioritization sustainability issues, relevant criteria for risk mitigation and support to strategic decisions. The questions were prepared in a Likert Scale applying that the respondents should indicate how strongly they agree or disagree (Gray, 2012).

The following criteria were used: 1 - I totally disagree; 2 - I disagree; 3 - I neither disagree nor agree; 4 - I agree; 5 - I totally agree.

The questions were elaborated based on a literature review to verify the acknowledgment of the target audience.

Robust and reliable relationships questionnaire questions are related to Hobbs (2020). The COVID-19 pandemic re-signification of the supply chain by Harapko (2021). The stimulus and barriers to supply chain management sustainability question was based on Seuring and Müller (2008). Ikram, Shen, Ferasso and D'Adamo (2021) research about the affected certifications in Asian countries inspires the question regarding certification difficulties.

The questions are presented below.

#### *Robust and Reliable Relationships*

1. It is understood that robust and reliable relationships are essential to increase the resilience and safety of the supply chain and quality management to guarantee the high standards demanded by consumers. (Hobbs, 2020)

#### *The COVID-19 Pandemic Re-Signifies the Supply Chain*

2. The COVID-19 pandemic re-signifies the supply chain, catalyzing existing problems such as visibility, resilience, digitalization, and risk management. (Harapko, 2021)
3. Based on the previous statement, make your choice from the lowest to the highest impact.

#### *The COVID-19 Pandemic has Impacted Quality Management*

4. Quality management has been impacted by COVID-19 pandemia requiring adaptation to activities ensuring the quality of services and supplies and supporting the companies' strategic decisions.

#### *Stimulus to Supply Chain Management Sustainability*

5. Supplier performance and risk management or sustainability related to the product, help to propagate sustainability in the supply chain. (Seuring and Müller, 2008)
6. Based on the previous statement, make your choice from the lowest to the highest impact.

#### *Barriers to Supply Chain Management Sustainability*

7. Higher costs and complexity and lack of communication represent the main barriers to Supply chain management sustainability implementation. (Seuring and Müller, 2008)
8. Based on the previous statement, make your choice from the lowest to the highest impact.

#### *Qualification of External Providers*

9. How to select, evaluate and approve the external providers are the first steps towards good supply chain management. (FNQ, 2017)

#### *Certification of External Providers*

10. Certifications of external providers were highly affected during the COVID-19 pandemic, due to restrictions on audits and site surveys. (Ikram, Shen, Ferasso and D'Adamo, 2021)

#### *Regional Supply Chain*

11. Regional supply chains, unlike global ones, are more stable and reliable (less risk of disruption) during low and high levels of uncertainty. (Alvarado-Vargas & Kelley, 2020)

## Triangulation of the Results

In this step, the triangulation strategy was used to seek convergence to increase the validity of the constructs (GRAY, 2012) to increase the reliability of the collected data and conclusions. (Zappellini; Feuerschütte, 2015).

The triangulation of the results was carried out as a procedure that combines different data collection methods to consolidate the results and analyze and present the research conclusions.

This method is applied because triangulation consists of comparing the information obtained from the Exploratory Bibliographic and Data Collection Instruments to corroborate the research results, minimizing the observation of the investigators’.

“Once all the data has been collected, and considering the triangulation of these data (various sources of evidence, considered within the perspectives of the theory, the researcher and the object of study).” (Mello et al., 2011, p. 9) and (Cauchik-Miguel et al., 2017, p. 160), the research result discussed in the following section is elaborated.

## PRACTICAL FINDINGS

To verify the main barriers and difficulties on the supply chain management sustainability during the COVID-19 pandemic, as described earlier, it was performed an online survey during February 07-11, 2022. There were 52 (fifty-two) responses to the research questionnaire regarding supply chain management, sustainability, and quality management. The questions were prepared in a Likert Scale applying the following criteria: 1 - I totally disagree; 2 - I disagree; 3 - I neither disagree nor agree; 4 - I agree; 5 - I totally agree. The results are presented and discussed below.

It was understood that robust and reliable relationships are essential to increase the resilience and safety of the supply chain and quality management to guarantee the high standards demanded by consumers, as illustrated by Figure 1.

Figure 1. Robust and reliable relationships

Source: Prepared by the authors (2022)

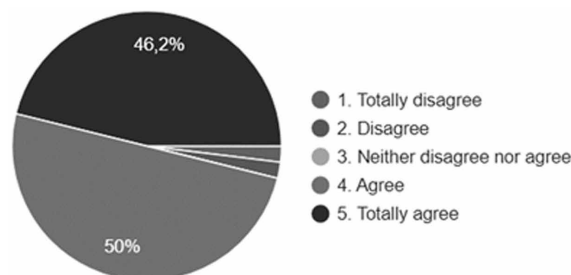
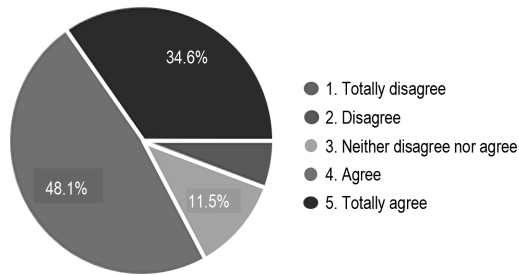


Figure 2 shows that 82,7% of respondents agree with Harapok (2021) about the COVID-19 pandemic re-signification of the supply chain, catalyzing existing problems such as visibility, resilience, digitalization, and risk management.

Figure 2. The COVID-19 pandemic re-signifies the supply chain  
Source: Prepared by the authors (2022)



Based on the results presented in Figure 3, risk management was the most significant issue in supply chain management confirming Alicke, Barribal and Trautwein, 2021.

Figure 3. Risk management, digitalization, resilience, and visibility re-signified by the COVID-19 pandemic  
Source: Prepared by the authors (2022)

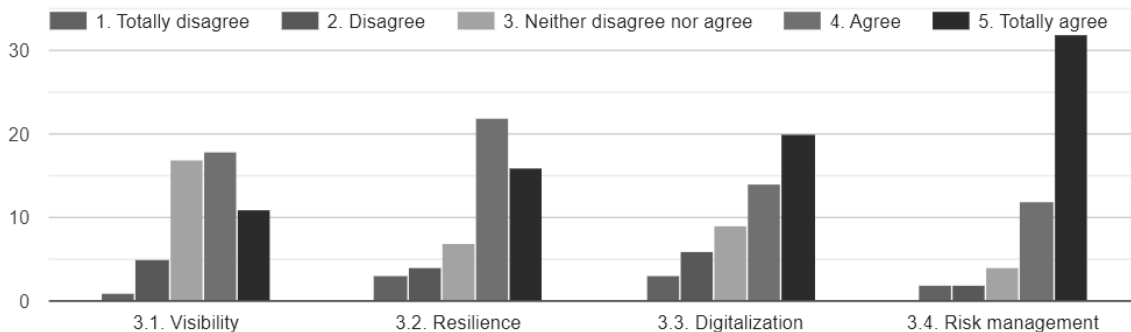
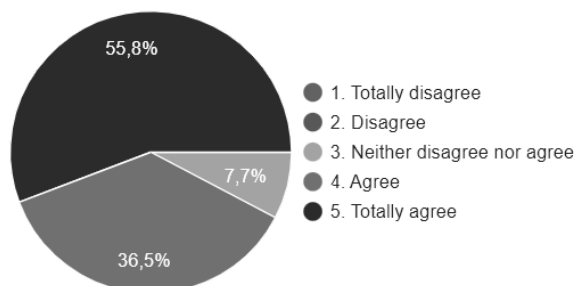


Figure 4. Quality management has been impacted by the COVID-19 pandemic  
Source: Prepared by the authors (2022)



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Quality management has been impacted by the COVID-19 pandemic for 92,3% of respondents, as shown in Figure 4, requiring adaptation to activities ensuring the quality of services and supplies and supporting the companies' strategic decisions.

Figure 5. Stimulus to supply chain management sustainability

Source: Prepared by the authors (2022)

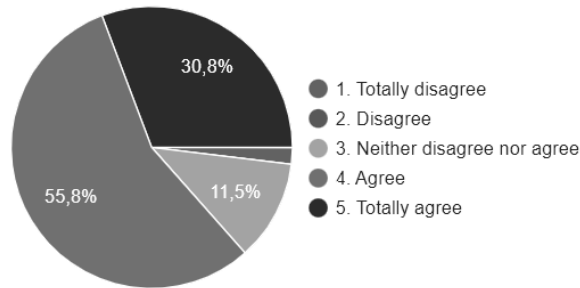
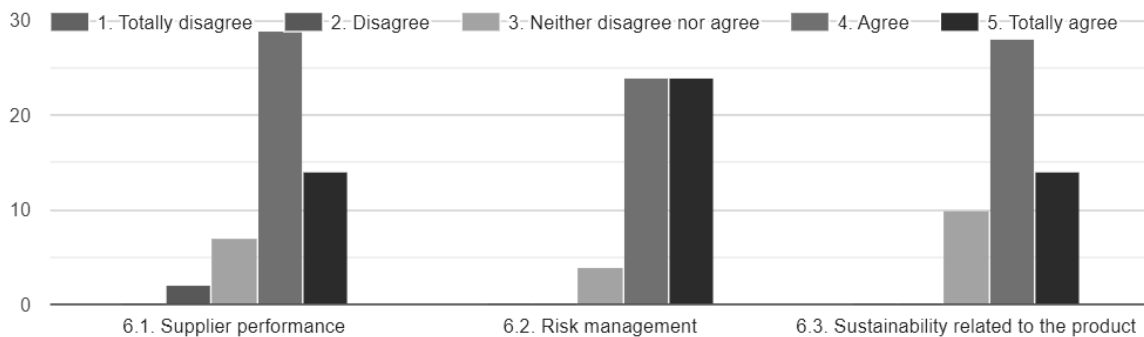


Figure 5 illustrates that, for 86,6% of respondents, external provider performance and risk management or sustainability related to the product, help to propagate sustainability in the supply chain.

Figure 6. Barriers to supply chain management sustainability

Source: Prepared by the authors (2022)



Based on the results presented in Figure 6, most of the respondents agree with the impact of the Supplier performance, Risk management, and Sustainability related to the product.

Based on the results presented in Figure 7 and Figure 8, risk management was the most significant stimulus to supply chain sustainability, while complexity was the most barrier.

Figure 7. Stimulus to supply chain management sustainability by external provider performance, risk management, or sustainability-related to the product  
 Source: Prepared by the authors (2022)

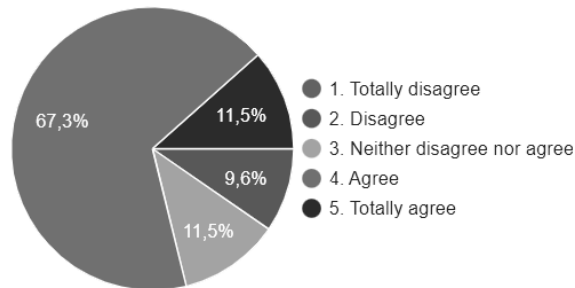
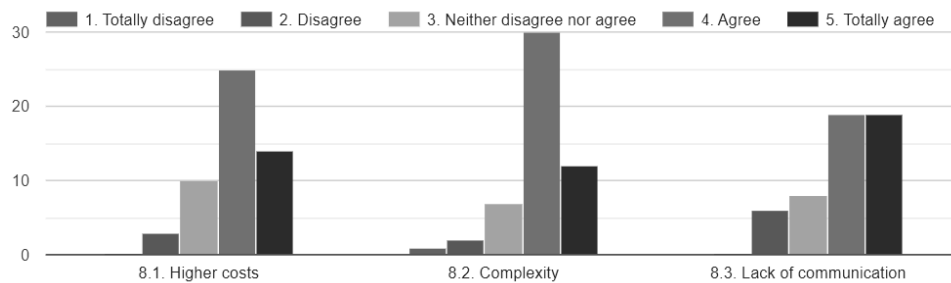
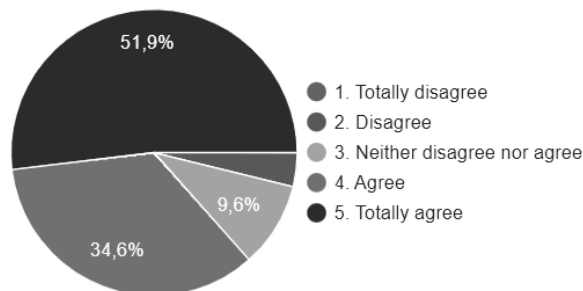


Figure 8. Barriers to supply chain management sustainability by higher costs, complexity, and lack of communication  
 Source: Prepared by the authors (2022)



For 86,5% of respondents, as presented in Figure 9, how to select, evaluate and approve the external providers as the first steps towards good supply chain management.

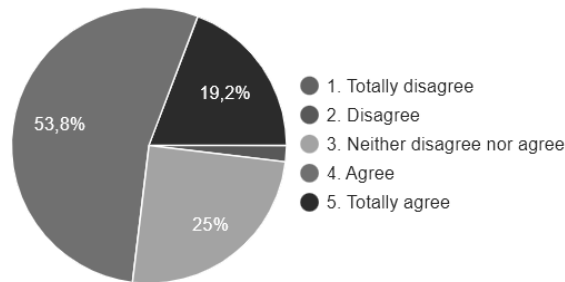
Figure 9. Qualification of external providers as the first step towards good supply chain management  
 Source: Prepared by the authors (2022)



## COVID-19 Pandemic

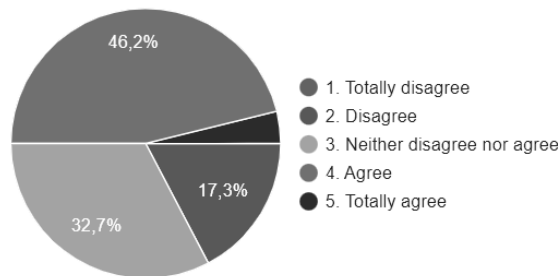
Certifications of external providers were highly affected during the COVID-19 pandemic, due to restrictions on audits and on-site surveys as illustrated in Figure 10 by 78,8% of respondents.

*Figure 10. Certification of external providers affected during the COVID-19 pandemic*  
Source: Prepared by the authors (2022)



17,3% of respondents disagree that regional supply chains, unlike global ones, are more stable and reliable (less risk of disruption) during low and high levels of uncertainty, while 50% of respondents have the same opinion as Alvarado-Vargas & Kelley, 2020.

*Figure 11. Regional supply chains*  
Source: Prepared by the authors (2022)



## THEORETICAL FRAMEWORK SOLUTIONS AND RECOMMENDATIONS

This research collaborates towards the realignment of commitments to sustainability in the supply chain, impacted by the advent of COVID-19. The study points out the main impacts identified, thus contributing to decision-making and re-establishment of sustainable commitments.

In addition, the notion of sustainable development incorporates a set of different conceptual elements, some from the scientific field, others from past experiences in the field of development, and still others from social and political clashes that develop on various national and international scales, as presented by Phillipe Jr, Fernandes, and Pacheco (2017).

Using as support the evaluation form of the interdisciplinary area presented by Capes (2020), the following impacts can infer that should be highlighted from this research, where it is understood that

there is a contribution to society, industry, and all actors involved in the supply chain management sustainability. Social, educational, economic, professional, and environmental impacts were highlighted and described below.

**Social Impact:** contribution to sustainable supply chain management activities. Research activities will ensure the supply under adequate conditions of quality and balance safety and price in a sustainable way.

**Educational Impact:** contribution to professional qualification improvement due to the generation of knowledge about quality requirements. There is the possibility of new educational actions regarding the qualification training of professionals to improve the supply chain quality.

**Economic Impact:** contribution to greater efficiency in public or private companies, enabling cost reduction, since logistics costs tend to reduce with the adoption of quality management with continuous improvement of their processes.

**Professional Impact:** contribution to the qualification of professionals in their industries, where professionals are qualified to work in Quality Management System standards with possibilities for remote training or on-the-job practices.

**Environmental Impact:** contribution to less logistical resources with the emission of fewer greenhouse gases. Possibly maintaining more acceptable production practices, with the adoption of continuous improvement, optimizing the production processes, reducing inventories, minimizing waste and errors, thus improving products or services.

It is understood that this work has great potential to contribute to what has been briefly described in this section.

## FUTURE RESEARCH DIRECTIONS

The present research discussed the impacts on supply chain sustainability. These points were not part of the current research. For future research, questionnaires should be applied regarding different industries in different countries to identify and analyze the challenges and impressions of different sectors and cultures.

The sustainability of the supply chain is part of the Sustainable Development Goals (SDGs), so, it should be developed a correlation in the depth of the direct impacts on the economic development, social development, and environmental protection, which would prove to be valuable for specialists, governmental institutions, and policymakers worldwide.

## CONCLUSION

Although scholar and corporate interest in sustainable supply chain management have increased considerably in recent years, which can be verified by the number of published articles and, in particular, by the special issues of journals, the COVID-19 pandemic has tested the sustainability of the supply chain, identifying that risk management was not always being analyzed in depth.

Globalization in the industry structure has several impacts, such as reduced profitability, technological innovation leading to optimization of resources and processes, quality leverage, savings in some markets,



## COVID-19 Pandemic

consumer demands, among others. Anticipating changes, monitoring the competitive environment, and having information for decision-making generate competitive advantages, being necessary to be prepared for different scenarios. This serves as lessons learned for the post-COVID 19 pandemic or other crises.

Regarding the impacts of the COVID-19 pandemic, as discussed in this chapter, we learned that risk management and quality management remain important links in the sustainable supply chain, where such relationships shall always be evaluated and revisited to prevent and mitigate further crises.

Recognition of the need for a strategic change to adopt activities in virtual environments for business continuity was fundamental to guarantee the supply of products and services, where demand was imposed by a complex problem - the COVID-19 pandemic, which made organizations quickly adapt to a new scenario, as exemplified through the practice of remote audits for external provider qualification.

## ACKNOWLEDGMENT

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## **KEY TERMS AND DEFINITIONS**

**Activity:** A task that contributes to the realization of the products or services.

**External Providers:** An organization that provides processes, products, or services.

**Item:** An all-inclusive term used in place of any of the following: assembly, component, equipment, material, module, part, software, structure, sub-assembly, sub-system, system, or unit.

**Quality Management:** It is the act of overseeing activities and tasks needed to maintain a desired level of excellence.

**Questionnaires:** Asking the target audience to provide information about their experience and knowledge aspects and/or activities.

**Risk Management:** It is the process of identifying, assessing, and controlling threats to an organization's capital and earnings, from a variety of sources including strategic management errors, accidents, and natural disasters.

**Supplier Certification:** Buyers require suppliers to have a management system that is certified as fully compliant with one of the recognized international standards, such as ISO 14001 from the International Organization for Standardization (ISO).

**Supplier Compliance Auditing:** Buyers audit suppliers to determine their level of compliance with environmental requirements.


**Supply Chain Management (SCM):** Management of the flow of goods, data, and finances related to a product or service, from the manufacturer or service provider to the final destination.

**Sustainable Supply Chain Management (SSCM):** Sustainable supply chain management involves integrating environmentally and financially viable practices into the complete supply chain lifecycle, from product design and development to material selection.

# Chapter 7

## Explicating Sustainable Development Growth and Triumph: An Islamic–Based Sustainability Model

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### ABSTRACT

*The chapter provides valuable insight into the Islamic teachings in environmental conservation. Yet, the gaps exist in the study and understanding of environmental sustainability from the Islamic approach. This chapter identifies sustainable practices from Islamic views based on 12 articles derived from a systematic review. Results reveal the documents emphasizing the principle of Tawhid, Khalifa (vicegerent), Fitra, Mizan (balance), and Islamic jurisprudence. The findings contribute to the conceptualization of sustainability and identifying sustainable practices from Islamic views. The study further constructs an Islamic-based sustainability model for enhancing sustainable development growth and triumph. Islam is concerned about the significance of the human-environment link on environmental protection and conservation. The human-environment connection is essential for future sustainable growth.*

### INTRODUCTION

Islam acknowledges sustainable development by stressing the human-environment connection's significant nature because much environmental degradation is due to people's ignorance of what their Creator requires. God has said, "And do good as Allah has done well to you. And do not seek to cause corruption in the earth. Allâh does not love the corrupters" (Al-Quran 28:77). Hence, people should be aware that God demands environmental conservation, and it is people's duty and liability. Also grateful to what God has given, your added value assigned to the environment is preserving and protecting it.

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## ***Explicating Sustainable Development Growth and Triumph***

There is evidence in many of the verses in the Al-Quran, and several sayings of the Prophet Muhammad (PBUH) stress the importance of environmental concerns and man's responsibility to the environment. Religion can teach humankind to value the environment and prudently use natural resources. Man's rights over the environment are to consume within moderation, balance, and conservation. It is against nature or transgression of rights if used with greed, selfishness, extravagance, and waste reflecting our ego/desire to environmental misused. The Al-Quran reveals that "Corruption has appeared throughout the land and sea by [reason of] what the hands of people have earned so He may let them taste part of [the consequence of] what they have done that perhaps they will return [to righteousness]" (Al-Quran 30:41). Therefore, humankind's attributes to nature can be an inducer or inhibitor of the disaster in the world.

Allah the Almighty creates the universe for the sustenance of life (Al-Quran, 7:10) in due proportion and measurement that are ample for human use since the world exists provided managed wisely. The primary source of Islam, the Al Quran, tells us that humankind is a trustee (Khalifa) of the earth and liable in the Day of Resurrection (Al-Quran, 6:165). Humankind bestowed with mentalities must execute trust as commanded by Allah the Almighty since they are part of nature but excellent than other creations (Al-Quran, 6: 38). However, Islam tells us that the best among them is the most pious to his Creator-Allah the Almighty (Al-Quran, 49:13).

Consequently, the sustainable concept is not new in Islam. The Al Quran and Hadith vindicate the construction for humanity's spiritual and physical welfare and justice and equity and how to deal with the environment. Yet has a little discussion in research and literature predominant by western industries and researchers. Indeed, comprehensive waste and environmental management regulations were as early as 1539 during the Ottoman reign (1299-1923). Later, Islamic scholars highlighted sustainability studies from an Islamic perspective since the 1970s but significantly emerged post-2000. Based on the Brundtland Report's sustainability definition (Brundtland, 1987), organization integrates environmental sustainability practices in their strategic planning to manage their environmental, economic, and social performance improvement.

Many contemporary studies induce and seek new sustainable practices to construct a valued physical environment quality due to climate change, global warming, and other disasters that caused environmental damage. Today's environmental practices built to preserve and sustain the natural environment for the future lead to benefits to many aspects. The concept of sustainable practices is the creation of ecological intentions, activities, initiatives, or culture and its sustainability that positively impacts the universe and its ecosystem: people, social factors such as quality of life, benefits of social safety for all stakeholders. Despite this, there is a lack of study and understanding of the environment, sustainable practices, sustainability, and sustainable development from the Islamic approach.

Due to the absence of a comprehensive collective systematic review, this chapter provides the review process and findings of sustainable or environmental studies related to Islamic approaches. It is also essential to determine the significance of each related work relative to the rest pool of influences. This chapter shows how Islam perceives the environment through Ukurawi and Duniawi, encouraging humans to use natural resources prudently (Suratkon, Chan, & Tuan Ab Rahman, 2014). These reviews help better understand some Islamic principles that positively impact sustainable practices. This chapter focuses specifically on the Islamic principles towards sustainable practices. The chapter presents (i) the current status of sustainability studies from Islamic views, (ii) the Islamic principles related to sustainable practices, and (ii) a conceptual framework of Islamic principles for environmental sustainability.

The following section describes the materials and methods used throughout the study with details on the study selection criteria, outcome measures, search strategy, screening and selection of articles, and quality assessment. Subsequently, the descriptive analysis section presents a summary overview of the selected papers. Then, the content analysis is discussed before closing with a conclusion.

## **METHOD**

The chapter makes use of PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) method to cater for the ten (10) databases (Web of Science, Scopus, Science Direct, Taylor Francis, SpringerLink, SAGE, Emerald Insight, JStor, Oxford Journals and Wiley Online Library): to retrieve the previous literature, review process steps (identification, screening, eligibility), data abstraction and analysis of the vast literature on sustainable practices from Islamic principles/views or perspectives. The PRISMA Statement used “sustainability” as guidance throughout the systematic review (Ahmad, Mustafa, Yusoff, & Didams, 2020). PRISMA is valuable due to its ability to (i) define straightforward research questions, (ii) identify inclusion and exclusion criteria, and (iii) examine large databases over some time. Hence, it allows for a rigorous search of literature related to sustainable practices from Islamic principles/views or perspectives.

## **Resource**

The review depends on two (2) central databases, i.e. Web of Science (WoS) and Scopus, which offer comprehensive searching tools. The WoS established by Clarivate Analytics includes more than 33,000 journals containing over 100 years of the most influential and relevant multidisciplinary research findings (Web of Science, 2019). This robust database offers comprehensive data collection and backup files by a rating based on citations, papers and citations per paper (Shaffril, Krauss, & Samsuddin, 2018). Scopus comprises over 75 million records and 24,600 peer-reviewed journals from 5,000 publishers. Besides WoS and Scopus, the study also utilises supplementary databases such as Science Direct, Taylor Francis, SpringerLink, SAGE, Emerald Insight, JStor, Oxford Journals and Wiley Online Library to cater for all possible relevant literature for a comprehensive review.

## **Eligibility and Exclusion Criteria**

This study applies viable eligibility criteria, i.e. (i) retrieve only journal articles as they have gone through a rigorous research process to establish findings and conclusions (Ahmad et al., 2020) and case studies as they reflect a contemporary phenomenon within the real-life context (Yin, 1994), (ii) only consider English publication to avoid confusion, ease search and analysis of literature and (iii) only articles that focus on sustainable or sustainable practices or sustainability from Islamic principle/ views and perspectives were retrieved. Table 1 presents these criteria.

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Table 1. Inclusion and exclusion criteria

Criterion	Eligibility	Exclusion
Literature type	Journal articles including case studies	Review articles, chapter in book, conference proceeding
Language	English	Non-English
Focus of study	Sustainable/sustainable practices or sustainability from Islamic perspectives/ principles/ views.	Non-sustainable/ sustainable practices/ sustainability from Non-Islamic perspectives/ principles/ views

## Systematic Review Process

The systematic review based on ten databases was performed in July 2020 and involved four (4) stages. An integrative systematic review that caters to articles using quantitative, qualitative, and mixed methods allows a rich overview of papers with multiple research approaches (Jackson, Davison, Adams, Edordu, & Picton, 2019). The first stage deals with keyword identification for the searching process. Several keywords related to social capital and poverty were identified based on suggested keywords of databases like Scopus, thesaurus and previous studies. Compared to WoS and Scopus, others databases required researchers to prioritise and customise certain words for specific searches such as title, abstract or keyword sections. The search strings for different databases are as in Table 2.

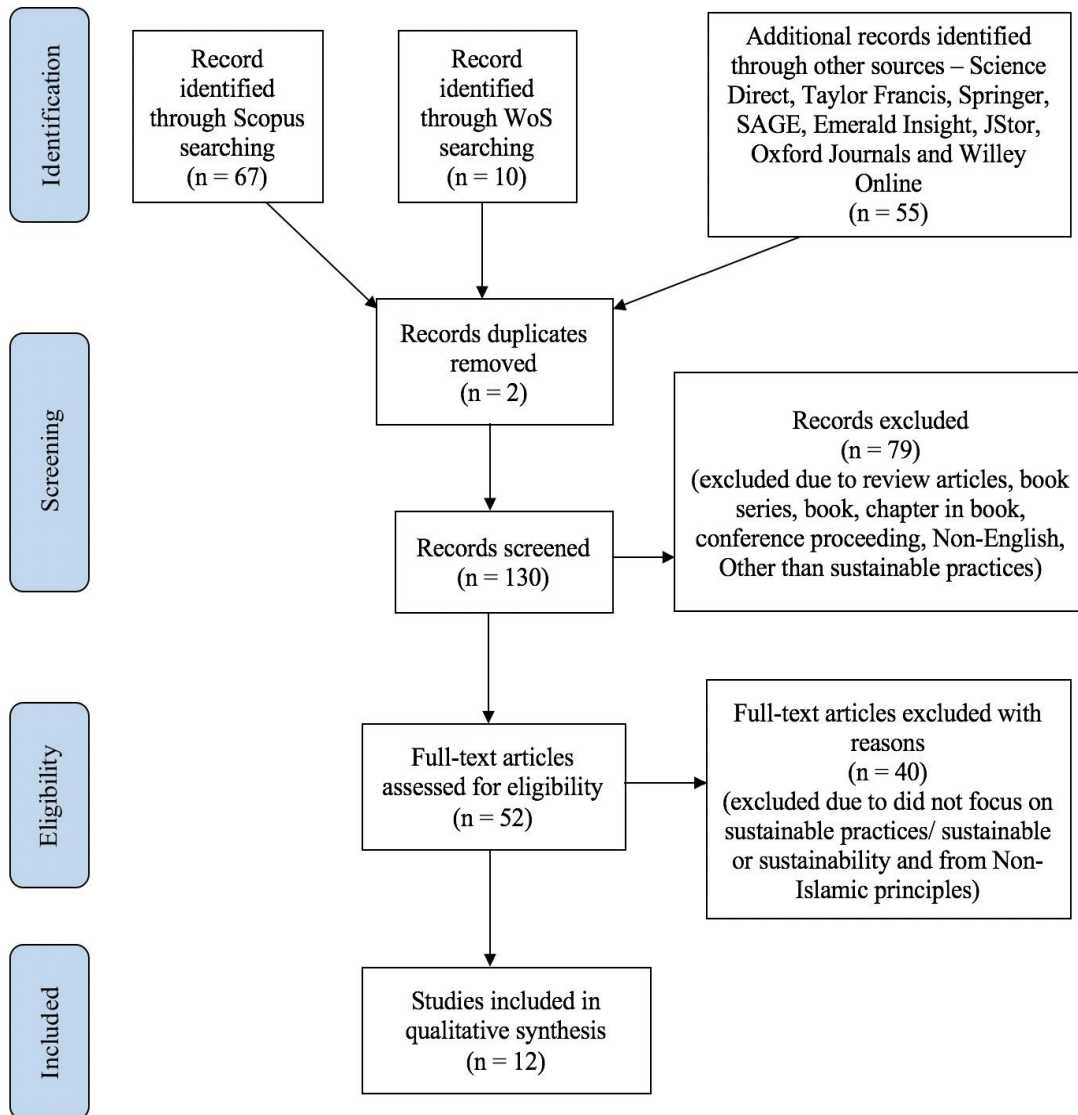
Table 2. The search strings used for systematic literature reviewing

Journal database	Search string	Frequency of hits
WoS	TOPIC:(sustainability OR sustainable OR "sustainable-practice*") AND ("Islamic-perspectives" OR "Islamic-views" OR "Islamic-principles")	10
Scopus	TITLE-ABS-KEY (sustainable OR sustainability OR "sustainable practice*") AND ("Islamic perspectives" OR "Islamic views" OR "Islamic principles")	67
Science Direct	("sustainable practice" OR sustainable OR sustainability) AND ("Islamic perspective" OR "Islamic perspectives" OR "Islamic view" OR "Islamic views" OR "Islamic principle" OR "Islamic principles")	7
Taylor Francis	[[Keywords: "sustainable practices*"] OR [Keywords: sustainable] OR [Keywords: sustainability] AND [[Keywords: "Islamic principles"] OR [Keywords: "Islamic views"] OR [Keywords: "Islamic perspectives"]]]	0
SpringerLink	title = sustainability and Islamic view	1
SAGE	for [Abstract sustainable] AND [Abstract "Islamic view"]	9
Emerald Insight	Abstract: sustainable AND [Abstract: "Islamic perspective"]	4
JStor	(ab:(sustainable OR "sustainable practice" OR sustainability) AND ab:(("Islamic perspective" OR "Islamic view" OR "Islamic principle"))	0
Oxford Journals	abstract = sustainable and Islamic	0
Wiley Online Library	"sustainability OR sustainability" in Abstract and "Islamic perspective*" in Abstract	34

One hundred thirty-two articles suit the search strings throughout ten databases. During the identification stage, two (2) duplicated articles were removed. The screening stage views a rejection of 52 papers, while 40 more articles were excluded upon the eligibility stage. Finally, after this rigorous systematic

review which requires a highly demanding process and is time-consuming (Mallett, Hagen-Zanker, Slater, & Duvendack, 2012), only twelve (12) articles, i.e. primary studies, were retained as they focused on the realm topic. Figure 1. illustrates this PRISMA flow diagram.

Figure 1. The flow diagram of the study  
 Source: Adapted from Moher, Liberati, Tetzlaff, & Altman (2009)



## FINDINGS

This section presents key findings pertaining to the three research questions. PRISMA has analyzed the twelve (12) articles through Preferred Reporting Items. The analysis began by looking at the abstract,



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followed by the contents. The identified articles had led to vital outcomes (sustainable practices) and different appraisals related to Islamic principles. This section highlights an overview of the papers dealing with the issue of sustainable practices and Islamic principles. Next section provides identified sustainable practices among Islamic scholars and later presents

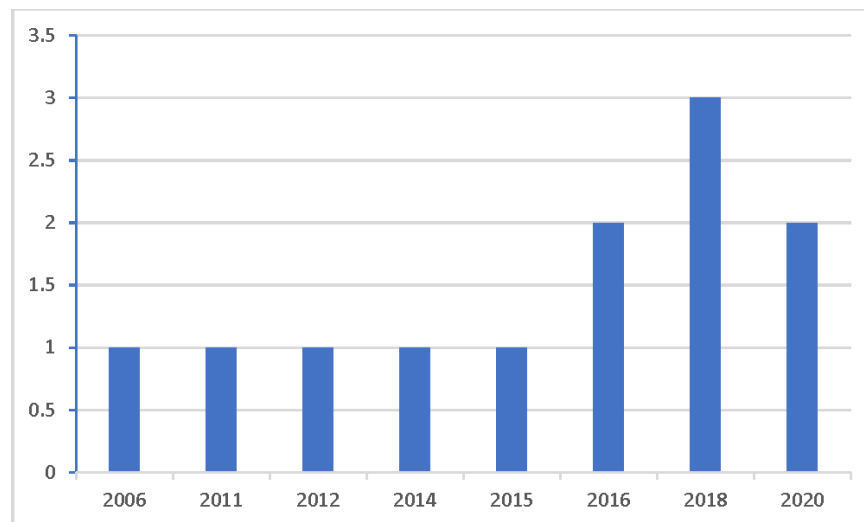
Two viewpoints were considered to accomplish this purpose:

1. Papers distribution over time.
2. Papers distribution across journals.

### **Papers Over Time**

The first viewpoint (Figure 2) shows that only one paper was published in the year 2006, one article during the year 2012, in the year 2014 illustrated that only one paper was published and one paper published in the year 2015. However, compared to the other year, published articles are increased by one to become two publications in 2016. Similarly, the publication also raises in 2018 to become three papers. Contrary to the increasing trend in the previous year, the number of published articles in the year 2020 a little bit decreases one article, resulting in only two papers published. Therefore, the trend on this topic related to sustainable practices from Islamic principles has increased until the year 2018 and somehow started decreasing in the year 2020. The most prolific authors belong to Malaysia, Indonesia and the USA.

*Figure 2. Distribution of papers over time*



### **Papers Across Journals**

The distribution of papers across journals highlights that there are various of journal (12) on the topic of sustainable practices from Islamic principle. All of the journal only published one paper which contributing to 12 papers.

*Table 3. Distribution of papers across journals*

<b>Journal</b>	<b>Number of papers</b>
Research Journal of Fisheries and Hydrobiology	1
Advances in Environmental Biology	1
International Journal of Advanced Science and Technology	1
International Journal of Civil Engineering and Technology (IJCIET)	1
International Journal of Business, Economics and Law	1
International Journal of Academic Research in Business and Social Sciences	1
Alam Cipta	1
Middle-East Journal of Scientific Research	1
Journal of Environmental Management and Tourism	1
Advances in Natural and Applied Sciences	1
European Journal of Social Sciences	1
Journal of King Abdulaziz University-Islamic Economics	1

## **SUSTAINABLE PRACTICES FROM ISLAMIC PRINCIPLES**

This section shows how sustainable practices are associated with Islamic principles or views based on twelve (12) papers. An essential feature of the Islamic doctrine or thoughts is the close relationship between religious and worldly matters. That environment is seen in a broader context encompassing the economic activities of human beings and their social well-being. Moreover, Islamic principles in sustainable practices mean some principles or opinions contained in Islamic literature and thoughts play a part in establishing a healthy, sustainable, and enduring environmental condition. Viable principles or ideas that reveal and are significant to sustainable practices are as in Table 4. However, the available data show that the frequency of Islamic principles concerning sustainable practices is more on the principle of Khalifa followed by Mizan, Islamic Jurisprudence, Tauhid, and Creation.

### **The Principle of Tawhid (Unity)**

Tawhid is the concept that acknowledges and believes in Allah’s Oneness. As the foremost principle of Islam, this principle involves of two-part, which is “there is no God except Allah (Lailahaillallah)” and “Muhammad is the Messenger of Allah (Muhammaddur Rasulullah)”. It is related to what has been mentioned in the Qur’an (Qur’an, 112:1-1), which is “He is Allah, Absolute Oneness, Allah the Everlasting Sustainer of all” (Latiff et al., 2016). Moreover, God is affirmed as the Creator and Lord of all creation. The Qur’an says: “Allah is the Creator of all things and He is the guardian over all things” (Az-Zumar, 39:62). Therefore, humankind’s integrity is not to forget their Creator and accept Allah and all metaphysical principles.

There are three papers that discuss the concept of sustainable practices based on the principle of Tawhid (Latiff et al., 2016; Laxman et al., 2014; Yusuf & Wekke, 2020). Laxman et al. (2014) did the qualitative method study by using content analysis of the translations of the Qur’an and also other studies related to environmental nature. Their study discussed the impact of biodiversity on crucial areas such

*Table 4. Papers of Islamic principles towards sustainability*

Authors and year	Islamic principles				
	The principle of Tawhid	The principle of Khalifa	The principle of Creation	The principle of Mizan	The principle of Islamic jurisprudence
Latiff et al. (2016)	/	/	/	/	
Laxman, Ansari, & Zawawi (2014)	/	/	/	/	/
Yusuf & Wekke (2020)	/				
Ab Rahman et al. (2018)		/		/	
Sarkawi, Abdullah, & Dali (2016)		/			
Abdullah & Harun (2018)		/			
Salam & Nik Ibrahim (2018)		/			
Sarkawi & Abdullah (2015)		/			/
Irfan, Febria, Nofianti, & Rijulvita (2020)		/			
Ansari et al. (2012)				/	
Ibrahim, Rahman, & Basir (2011)					/
Hasan (2006)					/

as fair trade, sustainable development, sustainable utilization, and other biosafety issues. The result from the study affirms that the unity of Tawhid was one of the principles that successfully brought the implementation of the biodiversity concept. The authors stated that it is the perfect time to re-investigate and harness the possibility of religious value as an element that shapes the thinking of people and how they are behaving, and how they relate Islamic principles to the natural environment and world. Another author, Latiff et al. (2016), did the content analysis to analyze the Islamic doctrine that lures and attract humans to conserving biodiversity for global sustainability. Their result highlighted that the Islamic principle, especially the principle of Tawhid, can be one of the elements that explicitly affect global sustainability in conserving biodiversity. Similarly, Yusuf & Wekke (2020) also affirmed that the principle of Tawhid is a pillar of developing environmental awareness.

### **The Principle of Khalifa (Vicegerant)**

In addition to tawhid, the concept of humankind as Khalifah was also another Islamic principle or view regarding sustainable practices. Most scholars have addressed the sustainability concept as Khalifa's principle on earth. The Khalifa's term is often associated with vicegerent, trusteeship and stewardship, which refer to the act of shouldering the custodian of nature's responsibility (Latiff et al., 2016). As the Khalifa on the earth, humans or humankind become essential factors to encourage sustainable practices (Ab Rahman et al., 2018; Sarkawi et al., 2016). The history of humankind began with the creation of the first man, Prophet Adam. Humankind's role as Khalifa or vicegerency was essential to continue the work and tasks successfully implemented during prophethood periods (Ab Rahman et al., 2018). Hence,

it proves that humankind's engagement as Khalifa is crucial to maintain their and others' continuity and survival in this challenging life. Therefore, it is evident that humankind is Khalifa on the earth.

However, although bringing responsibility and duty to the environment, humankind can also contribute to the world's destruction. It is related to what Allah noted in the Qur'an. Allah may give them some feeling of what they have done to make them turn back from Evil (Ab Rahman et al., 2018). For instance, there are various corruption and destruction have done by humans, including environmental deterioration such as ecological damage, mismanagement of natural resources, industrial pollution and reckless exploitation. All of that habit is a bad attitude and disliked by Allah (Subhanahu Wa Ta'ala).

Seven (7) papers discuss sustainable practices from Islamic principles or views, especially the principle of humankind as Khalifa. Related authors that illustrated the principle of Khalifa or vicegerency such as Ab Rahman et al. (2018); Abdullah and Harun (2018); Latiff et al. (2016); Salam & Nik Ibrahim (2018); Sarkawi & Abdullah (2015) and Sarkawi et al. (2016). The implementation of the role of Khalifa generally benefits human society and communities (Ab Rahman et al., 2018). As important as that, successfully performing their role as Khalifa can induce humankind to maintain fairness and the protection of society in the most balanced way (Abdullah and Harun, 2018). Moreover, as mentioned in Surah Al-Baqarah, 2:30, humankind's role as Khalifa is significant, especially in supporting development on this planet (Ab Rahman et al., 2018). Accordingly, as vicegerency or Khalifa, humankind needs to take a suitable process to ensure that delegated property to them can safely be passed to the next generation in the purest form possible. Moreover, humankind is supposed to use the power given to him, which aligns with the creator's wish and not the other way around (Laxman et al., 2014). It is the obligation of Khalifa to conserve and preserve nature (Salam & Nik Ibrahim, 2018). Humankind must live in harmony and a peaceful environment with the other creatures where it is in line with the concept of humankind as custodian of nature in Islam (Abdullah and Harun, 2018). Sometimes, nature is only seen for its use without thinking about the consequences. This happens when the human is less than or none spiritually (Salam & Nik Ibrahim, 2018). Thus, the earth is a testing ground for humankind as the vicegerent (Khalifa) and submitting ourselves to Allah the Almighty by complying with his teachings environmentally, socially and economically (Sarkawi and Abdullah, 2015).

Concerning the seven (7) papers dealing with the principle of humankind as Khalifa in the earth, Ab Rahman et al. (2018) elucidate some analysis based on the Islamic perspective involving the Qur'anic or Hadith. The authors use secondary data primarily on the Islamic worldview and environmental issues to analyse the data using content analysis. They revealed that religion plays a crucial role in teaching human awareness on the sustainability and environment. Abdullah & Harun (2018) conceptualise the general principles of Islam, which is the role of the Qur'anic Model of holistic. The result from the study affirmed that to perform their responsibilities and duties, the human being must be well balanced. Hence, understanding the concept of Khalifa will lure humans to do sustainable practices. As mentioned by Latiff et al. (2016) in their study related to the Islamic perspective towards sustainability, they found that the principle of Khalifa was one of the principles that will guide humans to do their best in the sustainability concept. If humans understand and imbue their responsibility as Khalifa, they know that they need to be concerned about the universe and make it the best place to live.

Similarly, Salam & Nik Ibrahim (2018) also revealed that the principle of Khalifa plays a vital role for humans successfully implementing sustainable practices. As Allah's vicegerent (Khalifa) on earth, humankind has to successfully do their part by giving happiness to others' creations and protecting nature, not controlling it. Moreover, as similar to other studies, Sarkawi & Abdullah (2015) also affirmed that the sustainability concept is the principle of Khalifa on earth. The author deduced that submitting ourselves

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to Allah the almighty can make us stick with Allah's teachings. Another study by Sarkawi et al. (2016) discusses the concept of sustainability from the Islamic perspective. They deduced that sustainability is the concept of following the principle of Khalifa include of Amanah approach.

Moreover, Irfan, Febria, Nofianti, & Rijulvita (2020) analyse one of the Khalifa elements, the Ihsan. The study provides the conceptual framework for sustainability, especially water accounting. They found that the concept of Ihsan is crucial to implement the principle of Khalifa in the earth successfully.

### **The Principle of Creation (Fitra)**

The principle of creation is referred to the concept that all humans in the world were born in Islamic nature (Latiff et al., 2016). It is related to what has been said by our beloved Prophet Muhammad, "All human beings are born with nature of Islam. It depends on their parents' responsibility to make them become Jew, Christian or Zoroastrian". Therefore, all creation in the world has been created in the natural state and subject to its creator. As aforementioned, the human species was part of that Allah creation and cannot be separated from other creatures.

Concerning the two papers dealing with the principle of creation (fitra), Latiff et al. (2016) analyse the concept of sustainability based on Islamic views. Content analysis was used as the methodology to extract the principles and theories of the Islamic ideas based on the work of Said Nursi and Ibn Taymiyyah. They also established the principles that define a sustainable environment. The result revealed that the principle of creation (fitra) could be one of the Islamic principles towards sustainability. Moreover, similar to other studies, Laxman et al. (2014) also affirmed that the principle of creation significantly Sunnatullah will also affect biodiversity for the global sustainability approach. Allah has a plan and set the nature or fitrah of every creation. Therefore, they will be necessary when the Sunnatullah has been disrupted.

### **The Principle of Balance (Mizan)**

The review analyses show that Islamic scholars view sustainability as the concept of balance or Mizan. As the fourth principle of Islam regarding sustainable practices, the concept of Mizan can be described as cycles of living and non-living things. Moreover, it refers to the law of creation that encompasses the elements of balance, order and accuracy (Ab Rahman et al., 2018). Hence, we are encouraged to be concerned and not disturb the creation's natural order. For instance, as stated in Qur'an: "He raised the heavens and set up the balance (of justice). So you do not violate the balance" (Ar-Rahman, 55: 7-8). This ayat reveals that it is imperative to care for the natural order. The balance principle is paramount, and its importance is emphasized in viable situations in the Qur'an and the prophet hadith

Concerning the significant balance's concept to sustainable living, Ab Rahman et al. (2018) discussed the primary elements of balance: the balance between Ukhrawi and Duniawi, including spiritual and physical dimensions. The study reveals the discussion of sustainable development from Islamic perspectives. They conclude that the conservation of sustainable development is the process of maintaining the allure of Allah's creation and managing it according to Islamic teachings. Everything created by Allah, especially on this earth bringing specific objectives and purpose. Therefore, humankind has to be aware of and appreciate those things.

Moreover, as similar to other studies, Laxman et al. (2014) also affirmed that the concept of balance (justice and moderation) is paramount to conserving biodiversity for environmental sustainability. They illustrated the concept of global sustainability based on the Islamic approach by using content analysis. Hence, it is explicitly deduced that Islam claims equality and equilibrium in utilizing the other creatures, which are natural resources. Therefore, undue and excessive exploitation of natural resources can be prevented. Abdullah & Harun (2018) analyze the principles of Islamic Muamalat to the concept of sustainability. Their results highlighted that they are the crucial responsibility to balance the nature of the earth to ensure that all creation on the earth can successfully be doing their duty and function effectively according to Allah's law. Ab Rahman et al. (2018) identify the role of the Islamic principle in sustainable development. Concerning content analysis as their method to analyze the concept of Islamic view and environmental issues, they insist that religion, especially Islam plays a crucial role in teaching humankind's awareness of the environment and its sustainability. Latiff et al. (2016) discuss the Islamic perspective towards sustainability theory. Their study revealed that the principle of balance (Mizan) was identified as one of the elements of sustainability theory. An understanding of the concept of sustainable development based on Islamic principles or views, Ansari et al. (2012) conducted some analysis towards that issue. They stressed that spiritual development, intellectual and social experiences were the pillars of sustainable development.

### **The Principle of Islamic Jurisprudence (Shariah)**

Islamic jurisprudence or Fiqh is another fundamental Islamic principle of sustainability highlighted by Islamic scholars that refers to human understanding of the shariah and practices it. They are four (4) papers discussing the concept of Islamic jurisprudence to sustainable practices. Ibrahim, Rahman, & Basir (2011) analyze sustainable development based on Islamic perspectives. They found that understanding and practicing the Islamic jurisprudence concept, which protects humans from harm, can be sustainable practices indicators. Another study by Sarkawi & Abdullah (2015) also revealed that Islamic jurisprudence is a sustainability factor based on Islamic fundamentals. They have surveyed concepts of sustainability, quality of life, and liveability in the built environment.

Moreover, similar to other studies, Laxman et al. (2014) surveyed to identify the Islamic approach towards global sustainability. The result highlighted jurisprudence shariah (the ethics of action and belief in the day of judgment) as one of the Islamic approaches towards global sustainability. There are two elements of shariah. Besides that, Hasan (2006) conducted a study to identify the Islamic perspective towards sustainable development. The author also suggested that complying with the Maqasid shariah will help humans move to sustainable development.

### **Islamic-Based Sustainability Model**

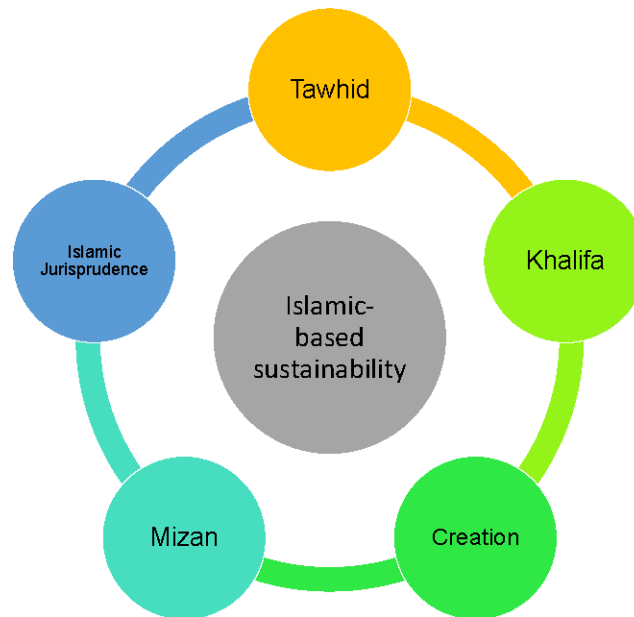
Content analysis reveals five essential principles for environmental conservation, explicitly Tawhid (the Oneness of Allah), Khalifa, Mizan, Fitrah (nature), and Jurisprudence. The first principle which leads to Islamic teaching on sustainable practices or environmental sustainability is the concept of Tawhid. Tawhid is a belief in God; to fully practice what God has said "And do good as Allah has done well to you. And do not seek to cause corruption in the earth. Allâh does not love the corrupters" (Al-Quran 28:77). The second is the principle of Khalifa. Humankind's role as Khalifa is the custodian/guardian/trustee of nature. They must live in harmony with other creatures and ensure the entrusted property is a

## Explicating Sustainable Development Growth and Triumph

heritage to the next generation. The third principle is Fitrah, the natural state or the notion of harmony in the systems of the universe or to respect nature and all forms of life. All humans are born with the spirit of Islam, and they must respect, nurture and care for the environment. Allah has a plan and sets the heart or the Fitrah of every creation towards lovely, calm, and safe environments.

In addition, the fourth principle, Mizan, refers to man's rights over the environment are to consume within moderation, balance, and conservation. The Prophet (Sallallahu Alaihi Wasallam) recognized that natural resources should not be overexploited or abused. It is against nature or transgression of rights if used with greed, selfishness, extravagance, and waste reflecting our ego/desire to environmental misused. Finally, the Islamic Jurisprudence principle. According to Islamic law, the essential elements of nature – land, water, fire, forest, and light – belong to all living things, not just human beings. Jurisprudence shariah (the ethics of action and belief in the day of judgment) is the Islamic jurisprudence concept of protecting all living things from harm, one of the Islamic approaches towards global sustainability. Figure 3 displays a model of Islamic principles for environmental sustainability.

Figure 3. Islamic-based sustainability model



## DISCUSSION AND IMPLICATIONS

Islam is concerned about the importance of the human-environment link on environmental protection and conservation. The human-environment connection is essential for future sustainable development, particularly in the 5.0 industry revolution because much system ecological degradation is due to people's ignorance of what their Creator requires. Therefore, humankind's attributes to nature might be an inducer or inhibitor of the disaster in the world. The United Nations Agenda 2030 under Sustainable Development Goals (SDGs), humans and the environment are integrated with responsibility and accountability (United Nations, 2016) aligns with this conventional perspective.

Any action on the earth must follow what the Creator needs. Al-Quran has conveyed some Islamic principles of relevance to sustainability. Whatever, Tawhid becomes the ultimate principle embedded naturally or practiced by people. Islam's inner dimension is the best way to achieve Tawhid. Muslims believe in absolute Divine Unity: There is no deity but Allah. All of their actions and words emit a spiritual fragrance and beauty. The Tawhid-based measures and decisions positively influence responsible consumption and protect nature. The main principle of Tawhid (a belief in God) refers to enhancing particular attribution to fully command to God by how fulfilling instruction and prohibition can be one of the elements that explicitly affect global sustainability in conserving biodiversity and a pillar of developing environmental awareness. The unity of Tawhid is one of the principles that successfully brought the implementation of the biodiversity concept.

The principle of Khalifa (vicegerents) regards that humankind has been assigned as the trustees and Khalifa of God' on earth to ensure the rights and interests of its inhabitants for today and future generations. The roles as servants and vicegerents of Allah play a vital role for humans successfully implementing sustainable practices, and Khalifa principles guide humans to do their best in sustainability. If humans understand and imbue their responsibility as Khalifa, they know they need to be concerned about the universe and make it the best place to live. The principle of creation (fitra) could be one of the Islamic principles towards sustainability which refers to the concept that all humans were born in an Islamic nature. Allah has a plan and sets the heart or the Fitrah of every creation towards lovely, calm, and safe environments. Meanwhile, the principle of balance (Mizan) is one of the elements of sustainability theory acknowledging Islam plays a crucial role in teaching humankind's awareness of the environment and sustainability. The essential responsibility is to balance the nature of the earth to ensure that all creation can successfully be doing their duty and function effectively according to Allah's law. Islamic jurisprudence is a sustainability factor based on Islamic fundamentals or an Islamic approach towards global sustainability that complies with the Maqasid shariah to help humans move to sustainable development. Islamic jurisprudence allows human understanding of the shariah and practices it.

## **Implications**

The study presents novel contributions to theoretical implications. First, it verifies the Islamic teachings on the importance of human-environment connection to enhancing environmental protection and conservation, to which scholars have little attention. Second, it addresses the absence of a comprehensive review of sustainable or environmental studies from the Islamic perspective with little discussion but traditionally research and literature predominant by western scholars. Third, it provides an Islamic-based sustainability model to ascertain robust environmental performance and sustainable growth. Islamic-based sustainability model embraces the principle of Tawhid, Khalifa (vicegerent), Fitrah, Mizan (balance), and Islamic jurisprudence that measures and constructs sustainable practices from Islamic thoughts. These conventional paradigms will always visualize reality and the future accountable and sustainable. Finally, it extends the literature and research concerning environmental or sustainability issues.

The findings also suggest managerial implications. Managers and organizations may find an Islamic-based sustainability model helpful in achieving sustainable growth and enhancing environmental-economic-social performance. Organizations should be aware that these Islamic principles: Tawhid-Khalifa-Creation-Mizan-Jurisprudence, could enhance superior sustainability development. A good manager or person who possesses the principle of Tawhid tends to value the environment, plays the role of Khalifa, love/value environments, balanced and moderate consumptions, and follows Islamic juris-



## ***Explicating Sustainable Development Growth and Triumph***

prudence. These attributes positively impact the longevity of sustainable practices and environmental conservation. Focusing on these principles as the conventional approach is the most reliable and robust for cultivating, preserving, and protecting the environment. In addition, organizations need to understand that (1) Islamic beliefs and values provide an effective and comprehensive solution to environmental degradation and challenges, (2) the human-environment connection is significant in the dynamic and rapidly changing environment, and (3) the positive effects of such Islamic principles on environmental, economic, social, operations, and financial performance. Further, sustainable performance becomes the objective of every business decision-maker and public policymaker. Therefore Islamic-based sustainability model helps achieve environmental conservation and sustainable development goals to balance environment-economic-social ends.

## **CONCLUSION**

Man's rights over the environment are to consume within moderation, balance, and conservation. However, humankind's attributes to nature can be an inducer or inhibitor of the disaster in the world. The Al-Quran reveals that "Corruption has appeared throughout the land and sea by [reason of] what the hands of people have earned so." Therefore, many verses of Al-Quran and several sayings of the Prophet Muhammad (PBUH) stress the importance of environmental concerns and man's responsibility to the environment. Islam teaches humankind to value the environment and prudently use natural resources. Hence, the human-environment connection is essential to enhancing environmental protection and conservation.

Islamic beliefs and values provide an effective and comprehensive solution to environmental degradation and challenges. The Islamic-based sustainability model explains sustainable development triumph and growth through five Islamic principles. Empirically, the study provides evidence to justify the five Islamic principles towards sustainability and sustainable practices. It draws theoretical foundations from Islamic views and relevant Islamic literature to construct the Islamic-based sustainability model, which comprises Tawhid, Khalifa, Creation, balance, and Islamic jurisprudence principles.

The systematic literature review on sustainable practices from the Islamic principle offers a panorama of literature. It summarizes the selected articles and interprets them in the descriptive analysis. In particular, there have been unstable trends over recent years. The content analysis makes it possible to identify that there are five Islamic principles related to sustainable practices: the principle of Tawhid, Khalifa, Creation, Mizan, and also Islamic jurisprudence. Even though there are viable Islamic principles, the Khalifa principle has become a paramount principle regarding sustainable practices since most papers discuss that type. The model is limited to five principles and is yet to be tested. Future research should consider applying the proposed model by testing the relationship between five principles and sustainable development. Undeniably, the other Islamic principles are still important and need more investigation, and for the sake of that, future research needs more research.

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## **KEY TERMS AND DEFINITIONS**

**Fitrah (Creation):** The natural state or the notion of harmony in the systems of the universe or to respect nature and all forms of life.

**Human-Environment Connection:** Man's rights and responsibility to the environment, duty, and liability toward nature. Man's rights over the environment are to consume within moderation, balance, and conservation.

**Islamic Jurisprudence:** Jurisprudence sharia (the ethics of action and belief in the day of judgment).

**Islamic-Based Sustainability:** A model comprises Tawhid, Khalifa, Creation, balance, and Islamic jurisprudence principles for sustainable development growth and triumph; a practical and comprehensive solution to environmental degradation and challenges.

**Khalifa:** Allah's vicegerent (Khalifa) on earth, the custodian/guardian/trustee of nature, do its part to the universe by giving happiness to other creations, protecting nature, not controlling it.

**Mizan:** Balance the nature of the earth to ensure that all creation can successfully be doing their duty and function effectively according to Allah's law.

**Tawhid:** Is a belief in God, beliefs in Allah's Oneness, and practicing what God has said fully.

## Chapter 8

# Globalization and the Global Economy: A Literature Study of India Being Part of the Global Economy

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### **ABSTRACT**

*With the advancement of automobile technology for last mile communication and other mediums of travel, railways and aeroplanes have made travelling a long distance easier and faster. Also, with more stable governments in most countries, the security of goods and returns increased. This created a global scenario of world trade, which we now call globalisation. India has embraced globalisation in a positive manner with an increase in growth rate and lower unemployment and shows opportunity for future growth, but proper central power and coordination between states can affect the growth of the nation. Thus, this study will investigate various factors and aspects of global economy and globalisation and also relate with the Indian economy. The study will also make a comparative literature study of global economy for different countries. As an outcome, the study will suggest some recommendations/strategies for the issues growing with the Indian economy.*

### **INTRODUCTION**

Globalization is usually used to refer to economic globalization, which is defined as the integration of national economies into the global economy through trade, foreign direct investment, capital flows, migration, and technological advancements. The economic improvements that were implemented had a significant impact on the economy's expansion. It also signaled the integration of the Indian economy with the global economy. The Indian economy was in serious trouble in 1991, when foreign currency reserves plummeted to just \$1 billion. The economic process had an impact on a variety of industries, including agriculture, industry, finance, healthcare, and many more. The primary aim is to examine glo-

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balization and how it affects India's economic growth and exports. The point of this study is to examine the growth of the Indian economy prior to and after globalization.

### **History of Globalization**

During the medieval periods, each country was looking for opportunities to expand and conquer not only for political and strategic reasons but also to expand its market. India was a far well nation with a booming international textile trade, this created a lot of influx of money in its economy and also increased the number of skilled people with sufficient jobs which created a stable atmosphere in the nation so further expansion towards to the north was not recommended. While in Europe, the Feudal governing system made trade between the nations low, and a desperate need of a market for European goods started, which gave rise to more expedition towards the east and far west for opportunities to trading which then lead to trading ports and finally into becoming their colonies which served as their market in the course of industrialization phase which marked the sitting up factories like mushrooms in every part of Europe and selling the pieces of stuff to their colonies which was a form of forced trade and an earlier more tainted form of Globalization.

The requirement of countries to become a part of Globalization came after the rise of the Nazis and German forces invading Poland and other nations. This created a scenario where each country involved had something to lose, even countries that were not involved suffered like the Bengal famine of 1943. After the war governments, various nations found out that in modern times every country is interlinked and for the progress of any nation, opening its market was useful and big guns like the USA supported this and included many nations in this ideology. While other major power USSR had other plans to not engage in global trade, other countries with socialism had free trade with the nation but not at an international level. All the things changed after the fall of the USSR and the rise of capitalist mentality, which opened the gate to explore and extract goods ideas internationally, which was also helped by the dotcom movement which allowed any person of any nation to connect at a global scale. This has resulted in a system in which every country is linked in every way, and policymakers must evaluate every decision since it may result in a global phenomenon affecting the country.

### **GLOBAL ECONOMY**

Globalization brought with it the term "global economy," which refers to "worldwide economic activity between various countries that are considered intertwined and thus can affect other countries negatively or positively," as well as the economies of all nations that are considered as a single large economy.

The economy does not only deal with the exchange of goods but also the effect on the value of currencies, dealing with neighboring nations and its geopolitical effects, the race to become a developed nation for many and building international organization to fulfill a certain goal, all these and many other situations affect a nation as an individual and also the world economy at large as with the increase in technology data has become easy to manage and analyze which makes every act committed by a nation more transparent than ever, which in the long run can affect a nation be it develop or developing nation positively or negatively (Ghose, 2017).

Countries can have dominance in the world economy and exert their power in making international decisions or global laws, these soft powers aid in the proper regulation of the global economy, making it easier for any nation irrespective of its size or military might sustain itself. Countries like Monaco are very small in size and military might but have money in their economy and also per capita wise they are more prosperous making their policymakers focus on their taxation aspects and international tourism to make plans, while countries like China which has a high GDP but with a huge population the per capita wise it gets defeated, while its government focuses on its cheap labor market and producing low-end products in bulk, these things drive its financial structure, as the USA does when pumping a great share of its GDP in defense making a global dominance in military might, while countries like Djibouti survive by allowing major nations to set up military camps in their nations.

The global economy is a huge market that is hungry for products, labor, and services, while each country is playing its card to stay in the global race and sustain its economy. This creates a scenario of balance where one country is benefiting the other which is then providing to another nation by taking its product. This helps in maintaining world peace as every nation becomes important and stability provides for a good market to grow.

The following are some of the variables that contribute to the feasibility of a global economy:

### **Multinational Co-Operation Have Global Reach and Increase in Power**

Shreni, a class of persons who could independently engage in a contract or possess property, were the forerunners to firms in ancient India. These guilds powered the earliest phase of India's economy. During the Song dynasty in China, the economy was transformed by technological innovations such as movable print, improved seeds for rice and other commercial crops, gunpowder, water-powered mechanical clocks, the use of coal as a source of fuel for a variety of industries, improved techniques for iron and steel production, pound locks, and many others. Merchants engaged in international trade by investing in trading vessels and conducting business with ports as far away as East Africa. During this time, the world's first banknote, or printed paper money, known as Jiaozi, was created and distributed on a large scale. Then, with the support of the government, European businesses began claiming colonies in the East. The Dutch East India Company (VOC) was the first to list themselves as a public company, allowing anyone to buy stock in their company to fund their expedition, resulting in the world's first formal "Stock Market." The English East India Company (EIC) was granted a formal charter to break the Dutch spice trade monopoly in Indonesia, but this expedition turned into colonization as EIC gained political power in India, and EIC became the most wealthy and powerful company in India. The banana republic marked the era of Free Market capitalism at its best, which was also a type of Co-operate colonization. After Second World War saw the rise of multinational giants especially in the consumer goods sector where global companies set up warehouses and even manufacturing plants in other nations, many became powerful entities in many nations as they also entered the heavy industries. Technology became the booming sector as global tech giants emerged and created the next wave of globalization through MNCs, who were setting up Business process management and IT tech parks in many developing nations, out-sourcing work where cheap skilled employees can complete it efficiently (India Brand Equity Foundation, 2021). The rise of the out-sourcing sector has resulted in the development and an increase in the standard of living in many developing countries, making it a reliant element in the national economy. The grip and power of MNCs grew in numerous countries around the world as a result of this.

## **Travel and Shipping are Cheap and Safe**

In the nineteenth century, modern manufacturing progress resulted in a dramatic decrease in freight expenses. This contradicts Douglas North's well-known claim that organizational improvement was the primary source of cost savings. Although the North American freight rate sequence declined as a result of the introduction of the metal steamship, the British rate degraded only gradually until 1850, then rapidly after metal steamships were in service. Cotton freights were in charge of the North index, and as cotton got more tightly packaged for shipping, they fell. Nonetheless, from 1850, metal ships and steam engines caused a widespread fall in freight expenses.

## **Tariffs and Regulations on International Trade Have Been Restricted by the Government**

The General Agreement on Tariffs and Trade (GATT), which has regulated world trade, is a legal agreement between many countries whose overall aim was to promote international trade by reducing or eliminating barriers to trade, such as tariffs or quotas. Its prologue stated that its purpose was to "significantly reduce tariffs and other trade obstacles, as well as the removal of prejudices on a reciprocal and mutually beneficial basis" (Howell & Ballantine, 2020). It was the first trade liberalization method, encouraging a global environment for free trade by providing members with a minimal set of norms and standards. They worked to reduce the rate of tariffs imposed by rich countries on commodities imported from developing countries. GATT was an advisory council, not a ruling one, so things didn't move quickly, but it did represent the start of a global economy. The Uruguay Round of the GATT established the World Trade Organisation, a body tasked with negotiating trade obstacles, developing policies, and resolving disputes under full and permanent rules. This set-up allowed global trade to flourish, as goods grew cheaper and more readily available, and businesses discovered new markets, reducing unemployment.

## **Bretton Woods Agreement**

The agreement laid the foundation of a common currency for international trade, along with settling the problem of gold convertibility. The agreements also resulted in the creation of the International Monetary Fund (IMF) and the World Bank, the former of which oversees financial crises and keeps tabs on the global economy while maintaining economic policies in member countries, and the latter of which focuses on reducing poverty by providing loans for infrastructure projects. The two organizations have been a stronghold in maintaining the balance of the global economy, by providing the necessary cash flow a struggling nation needs to stabilize its economy. The IMF encourages countries to participate in global trade by imposing loan conditions that promote market opening and trade barriers. One example is India in 1991, when the country was introduced to LPG (Liberalization, Privatisation, and Globalization), as a result of a trade deficit and economic instability, financial aid from the IMF was required to normalize the situation, and the IMF had imposed the condition of opening India's market (Economic Times, 2019).

## **Geo-Politics**

The intra-governmental activities in the yesteryears of global politics were mostly limited to border issues and trade deals, this limited the impacts of the rise and fall of empires too far away nations. A new “core definition” of globalization is also being utilized to replace geopolitics. If globalization is about a world without borders, geopolitics is about the major powers and empires that divide the world and exert colonial rule over it. That is, to make such a clear comparison between current society and a previous society. Globalization, as we know it today, does not just rise out of historically thin air, but its strong global origins and prejudices.

This can be analyzed in the case of a country that has been an example of the Zenith of free-market capitalism, which then was replaced with a workers’ paradise. These shifts were taken place due to the effects of a global economy of every nation after the end of World War I and Cuba being at the receiving end of the shift. Cuba is a nation with well-educated work, a huge reserve of oil, and a climate conducive to tourism, but after all these plus points the average citizen of Cuba is poor earning an average of \$25 US Dollars per month and the falling trend can be seen especially at the rural part of the nation (Shangquan, 2000). Cuba had declared independence from Spain and began investing in industrialized agriculture with the help of the United States, focusing more on sugar production, which became a huge export back to the United States; it also became a popular tourist destination, primarily due to the country’s liberal stance on gambling, which attracted a large number of tourists to Havana, which was a hotspot for gamblers at the time. This economic activity did not reach the lower end of the income group and most of the industries, farmland, hotels, and casinos were owned by Americans, who also heavily invested in the infrastructure of the nation, which gave rise to a new form of colonialism called “cooperates colonialism”. The scene changed when the Cuban Communist party raised to power, which nationalized the telecom industry, farmland, and oil refineries, by the 60’s almost all industries came under the authority. This created tension between Cuba and USA, and the latter blocked all trade activities with the nation, and sugar being a top export of Cuba, it suffered greatly. Cuba was a nation that embraced Communism though being near the US, this strategic advantage of Cuba encouraged the Soviets to help them and buy all the sugar to help them in the crisis. After the fall of the USSR in 1991, this led to a fall of GDP by 35% for Cuba (Rossi, 2011). The country then focused on attracting foreign investment, opening tourism, allowing people to open businesses, and legalizing US currency. As tourism grew, foreign investment poured in, gradually stabilizing the Cuban economy. Today, the country is a unique blend of a socialist government and a free-market capitalist tourism industry.

## **Modern Colonisation**

The great Chinese initiative, also known as “One Belt, One Road” (OBOR) or “Belt and Road,” connects China to Europe via land and sea routes across South East and Central Asia, has the potential to have significant economic consequences for South Asian countries. Sri Lanka is a prime example of a significant debt incurred as a result of hosting and accepting Chinese-funded projects. Sri Lankan government is operating massive financial losses due to high-interest rates paid by Chinese borrowers for major development ventures that will now be part of OBORAs a result, host countries are trapped in a “Debt-Trap,” making them vulnerable to Chinese influence (Brautigam, 2019). Sri Lanka has borrowed billions of dollars from China for domestic infrastructure development. For the Hambantota port project, the country borrowed 301 million dollars from China at a 6.3 percent interest rate, compared to 0.25-3



percent for soft loans from the World Bank and the Asian Development Bank (ADB). The estimated national debt of Sri Lanka is 64.9 billion dollars, with 8 billion dollars owed to China due to their high-interest rates, effectively creating a Defacto Enclave outside of China (Brautigam, 2019).

By mid-2013, Chinese businesses had completed 12 percent of Africa's 322 large-scale infrastructure development projects, while the remaining 37 percent were held by European or American companies. By 2014, Chinese investments in Africa had grown to 75 billion dollars, with a turnover of 53 billion dollars, a 40-fold increase since 2000 (The 'New Great Game': China's Debt-Trap Diplomacy, 2019). The coastal railway project contract in Nigeria, which China's Railway Construction Corporation Ltd acquired, was worth a total of 11.97 billion dollars. This was the most expensive single-contract project in China's overseas engineering history, followed by Stage 1 of the Addis Ababa–Adama Expressway, which was finished in May 2014 and stretches for 78 kilometers (48.7 miles). Many Africans perceive Africa as becoming a puppet of Chinese interests since African countries and administrations are known to be plagued by chronic corruption. China is a prominent role in the African continent's political, economic, and business decision-making processes (Brautigam, 2019).

China's "Checkbook Diplomacy" has raised many eyebrows, as many are against the growing influence of a single nation in Asia. History has always spoken of powerful nations growing large enough to cause tensions with smaller nations, either through economic dominance or invasion, such as Germany in the 1930s (Brautigam, 2019). This causes unrest to the world at large, as the world is more connected than ever, and the global economy is the new concern for most developed nations, new forms of control or authorization have become evident, by making a nation dependent on a larger one, not only disrupts the economy of the dependent nation, but it also disrupts the economy of the larger nation.

## **Dumping of Imports**

Dumping is the export of products with a lower 'normal value,' which is commonly defined as the price at which they are sold on the domestic market. The General Agreement on Tariffs and Trade (GATT) has permitted signatories to levy anti-dumping duties where they cause or threaten to cause material damage to any sector within a GATT nation's authority since its inception.

Strategic dumping means subsidizing exports by higher home prices supported through collusive consumer activity and a secured domestic sector. In industries with large competitive economies of scale, high fixed costs — for example, organized R&D spending — would help to discourage entry. The key aspects of strategic dumping are thus the foreign policy and competitiveness policies of the exporting nation.

Damage to the importing country's businesses entails both a restraint on production and a lack of competitive productivity benefits (learning by doing) that can be incremental and distributed over a wide variety of goods. The easiest approach to cope with strategic dumping will be to tackle the root causes of the problem: trade and market policies in the exporting region. To eliminate obstacles to entry to the exporter sector, the first phase will be to settle on a list of the characteristics of the industry; for example, the degree of competition as calculated by the share of the exporting firms in the home market, the share of the exporting firms in the global economy. The goal of targeting particular businesses will be to concentrate discussions on removing security for sectors where strategic action is feasible. These are high-technology markets, for example, businesses with oligopolistic systems, large penetration barriers, major stagnant and competitive efficiencies, and multinational market supremacy. The elimination of trade barriers does not, on its own, eliminate the problem of competitive dumping, but still includes

intervention on competition policy in the export sector. Since convergence, or consensus on new foreign law, would be a lengthy process, a good argument may be made that, in the absence of a supranational body, bilateral arrangements should be envisaged to guarantee equal treatment of compliance conflicts when there is a spill overcharge on the trade front.

## **GLOBAL MARKET**

With the rise of the Global economy with various countries coming together and becoming interlinked through trade, new markets are emerging that were never thought of earlier. This drastic change that is brought globalization has brought opportunities to nations with the least natural resources or political dominance to raise their citizens' income levels.

### **Djibouti**

Since 2001, the frequency and size of foreign military deployments in the Horn of Africa region have increased significantly, particularly in the recent decade (SIPRI, 2019). A wide range of international security actors is now working in the region, including those from Europe, the United States, the Middle East, the Gulf, and Asia. As a result, foreign military bases have grown across the Horn of Africa, and naval forces have been deployed.

### **India**

India became a big market for foreign companies. The land has no natural resource to speak of and the climate is hot and arid, with land being too dry. With a population of less than a million people, the little country is prized for its strategic location, which is bordered on the west by Ethiopia, on the east by Somalia, and on the north by Eritrea. Its port overlooks the busiest shipping lanes, with nearly 25% of the world's exports passing through its water, including 4.5 million barrels of crude oil and refined petroleum products daily. Its eastern coastline meets the Red Sea, thus connecting the markets of the Mediterranean Sea with the Arabian sea and the Indian ocean.

The Babb El Mandeb Strait is surrounded by nations who have failed in maintaining their stability and caused the Strait to become a choke point which gave to the rise of piracy activity on the Somali coast. To avoid any catastrophic situation unfolding many nations have to act in setting up a basis in the small nation, to secure their maritime trade in that region. The government of Djibouti came forward to rent its strategic real estate to the foreign military to set up a basis, without any other form of income the territory of the nation was used to generate income.

### **Interested Nations**

China has had long-standing trading relations with African countries, but its first substantial security intervention in the region occurred in 2008. Iran has been attempting to establish a permanent naval station in the Red Sea and the Gulf of Aden to strengthen its regional dominance. Since 2001, Germany has been involved in the Horn of Africa as part of Operation Lasting Freedom. Israel has maintained

## Globalization and the Global Economy

a naval presence in the Horn of Africa since 2012. The participation of Israel is aimed to gather intelligence and tracking Iran's Red Sea operations (SIPRI, 2019).

Russia conducted an autonomous anti-piracy campaign off the region in 2008 by deploying a frigate. Egypt has not developed military bases in the region but is a leading force of the Red Sea via its Suez Canal.

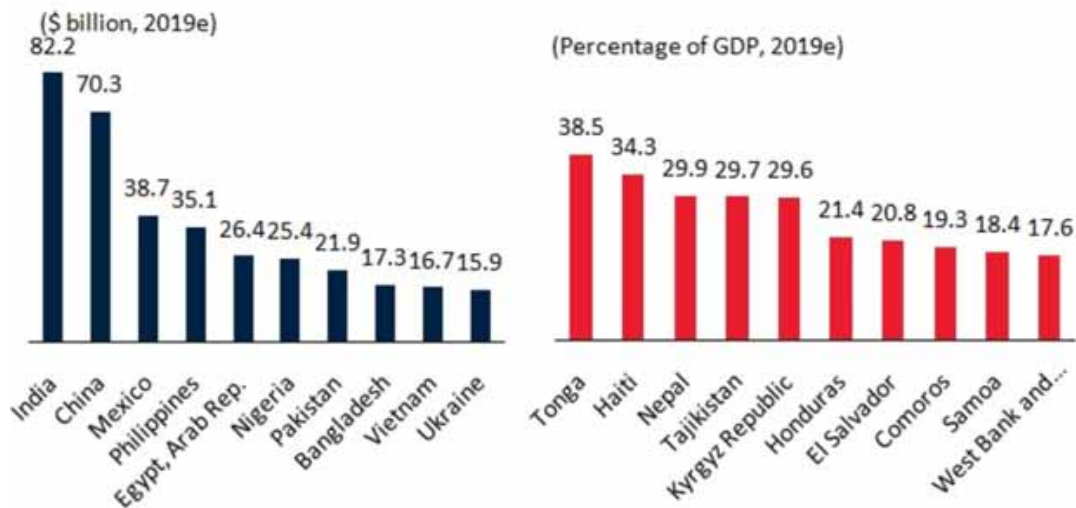
The US has stepped up its efforts to combat violent extremism, particularly Islamist extremism, in the Horn of Africa following the attacks of September 2001. In October 2002, Operation Enduring Freedom-Horn of Africa (OEF-HOA) began as a military campaign to combat radical Islamism and piracy (SIPRI, 2019).

## Remittances

According to the World Bank's latest Migration and Development Brief, remittances to low- and middle-income countries hit a new high in 2018. Remittances to low- and middle-income countries are expected to hit \$551 billion in 2019, and \$597 billion in 2021 (Larson, Loayza, & Woolcock, 2016). India received \$79 billion in remittances from other countries, headed by China (\$67 billion), Mexico (\$36 billion), the Philippines (\$34 billion), and Egypt (\$29 billion) (RATHA & DE, 2019).

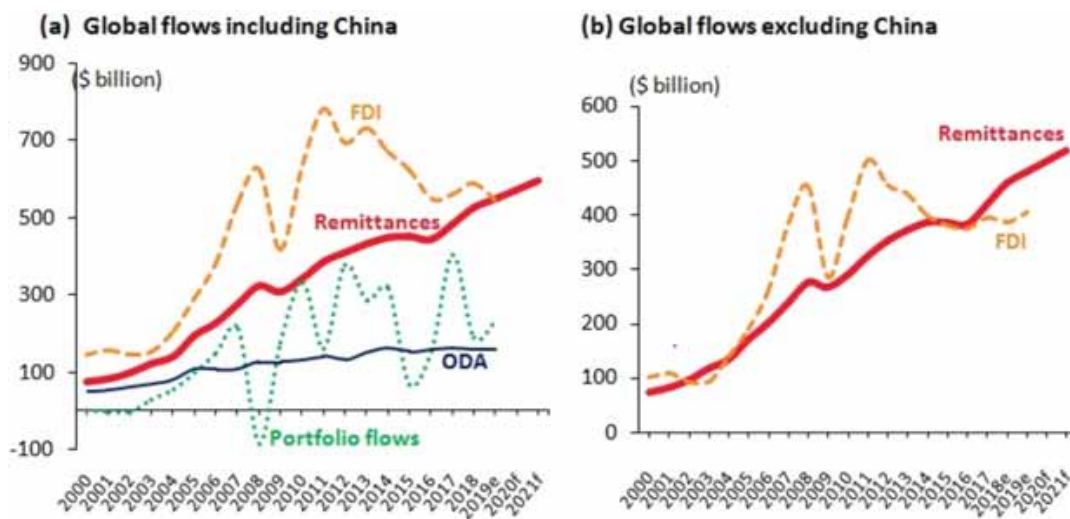
If the currency of the source nation depreciates against the US dollar, the amount of the external remittances fall in US dollar terms. Approximately half of the remittance flows to LMICs are expected to occur in countries where the US dollar is the major currency or where the local currency is highly correlated with the US dollar (for example, the Gulf Cooperation Council (GCC) countries). Because the balance is denominated in certain currencies, it is susceptible to currency fluctuations. For example, 12 percent of these remittances came from eurozone economies, 4 percent from the United Kingdom, 3 percent from the Russian Federation, 3 percent from Canada, and 2 percent from Australia as mentioned in Figure 1 (RATHA & DE, 2019).

Figure 1. GDP share comparison.



Seen as above data, global remittances have become a major part of their gross domestic product in the northern triangle countries of Central America. El Salvador comprises of 20.38%, Honduras has 18.8%, and Guatemala has an 11.2% portion of their GDP as mentioned in Figure 2. Money circulated in this method is not re-circulated back to the parent nation, costing the taxpayers and jobs, many see this form of cash flow as a direct loss to the parent nation, many nations have started taxing their remittance (RATHA & DE, 2019). The US state of Oklahoma taxes remittance from the state is the only state to do so in their country (The World Bank, 2019).

Figure 2. Global flow comparisons including and excluding China.



## RECESSION

The negative disruption to the balance between supply and demand causes the mild decline of economic activity in a single country that lasts for a certain period, a long-lasting downturn of global ramification that lasts for years or anything in between. Staring from the Tulip Mania in the seventeenth century in Dutch, the Dot.com Mania in the nineties, the Housing and Real estate bubble in the late two thousand, saw the extreme rise of certain assets which generally was priced way more than it valued, this created a market which even surged the value of the assets, but as time passed the bubble burst which cause the fall of the market which was oriented towards it. But as nations become too much interlinked and dependent the effects of market fall can be devastating for the entire Global Economy. Some recession can also occur due to global crisis which directly affects the market, such as World War, the Gulf War, or certain health crisis like pandemics.

One such crisis occurred due to the rise of a certain type of novel coronavirus named Covid-19 has been a pandemic that has grown further and more exponentially than was commonly predicted a few weeks earlier. Early proof of the adverse economic effect on China is now visible and much beyond the original estimates. An extreme worldwide recession appeared in the first half of 2020, with aggregate demand in China falling by roughly 32% in the first quarter and by 24% and 13% in the euro area and

## ***Globalization and the Global Economy***

the United States in the second quarter, respectively. The quarterly decrease in GDP growth is estimated to greatly surpass anything previously reported that dates back at least to the Second World War.

Markets are volatile, and accumulated effects result in a market decline. This discussion focuses on volatility rather than ambiguity. The word “Era of Uncertainty” has returned to trend, possibly because of the comparisons that can be made between the turbulent 1970s and current circumstances. However, it is inaccurate to equate confusion with enhanced turbulence. Indeed, it is not plausible to claim that ambiguity is greater now than it has traditionally been. There is no justification, in particular, to term this period the Period of Instability, but there are very clear explanations to predict the Age of Turbulence. Citizens become more conscious and afraid of global disruptions and threats. Virtually unrestricted exposure to global media has significantly improved knowledge flows and the possible pace of each person on the planet’s answer. Analysis and views are freely visible. We learn more than ever, definitely not fewer. Economic transparency exposes countries to threats outside their grasp, sometimes stoking anti-globalization feelings. It may be upsetting because it creates uncertainty, but it will not symbolize the modern Era of Uncertainty.

Commodity markets, particularly food and oil, are struggling against supply constraints. As a result, demand rises on a sporadic basis but inflationary pressures remain constant. Domestic demand growth in emerging nations frequently causes bottlenecks in infrastructure and utilities, such as transportation, power, and water supply, and contributes to inflationary pressure. The March 2011 earthquake/tsunami disaster in Japan, as well as the 2010 Icelandic volcano eruption and winter weather disturbance in Europe, have highlighted the challenges posed by the widespread adoption of the lean “just in time” (JIT) development paradigm, dynamic global supply chains, and reliance on foreign transportation networks. Access to financing can still be limited by a growing North Atlantic crisis if sovereign debt threats are not managed rapidly and effectively. At the end of October, the eurozone signed a big compromise on the allocation of funding to alleviate the possibility of a Lehman-style financial crisis, but strains persist.

The global economy has proven its durability, its capacity to rebound from cycle decreases and adverse shocks, but we remain highly apprehensive of more volatility and future risks. In a particular danger level, that could be acceptable to short-lived human beings for which a cyclical contraction could constitute a substantial proportion of their working life or might be at a crucial juncture of their professions. However, we need to be more optimistic regarding the favorable prospects for global economic developments and the growth of the world economy in the mid to long term.

## **IMPACT OF GLOBALIZATION IN INDIA**

India has become the world’s fastest-growing major economy, and it is predicted to become one of the world’s top three economic powers in the next 10-15 years, thanks to its strong democracy and alliances. According to a survey by NASSCOM, India has maintained its status as the world’s third-largest start-up base, with about 8,900-9,300 start-ups and roughly 1,300 new start-ups being created in 2019. Up until August of this year, India saw the addition of seven unicorns, bringing the total number of unicorns in the country to 24.

According to a report by ASSOCHAM and Thought Arbitrage Research Institute, India’s labor force would reach 160-170 million by 2020, owing to population growth, increasing labor force participation, and higher education enrolment, among other reasons. According to RBI data, India’s foreign exchange

reserves were US\$ 448.59 billion in the week ending November 22, 2019. In April-November 2019, India's exports climbed 1.60 percent year on year to US\$ 356.96 billion (Reserve Bank of India, 2020).

Based on digitization, globalization, favorable demographics, and reforms, India's gross domestic product (GDP) is predicted to surpass US\$ 5 trillion by FY25 and achieve upper-middle income status (Larson, Loayza, & Woolcock, 2016).

Gross Value Added (GVA) Composition by Sector (2017-18 2nd Advance Estimate)

- **Services:** 54.30 percent
- **Industry:** 29.6 percent
- **Agriculture:** 16.14 percent

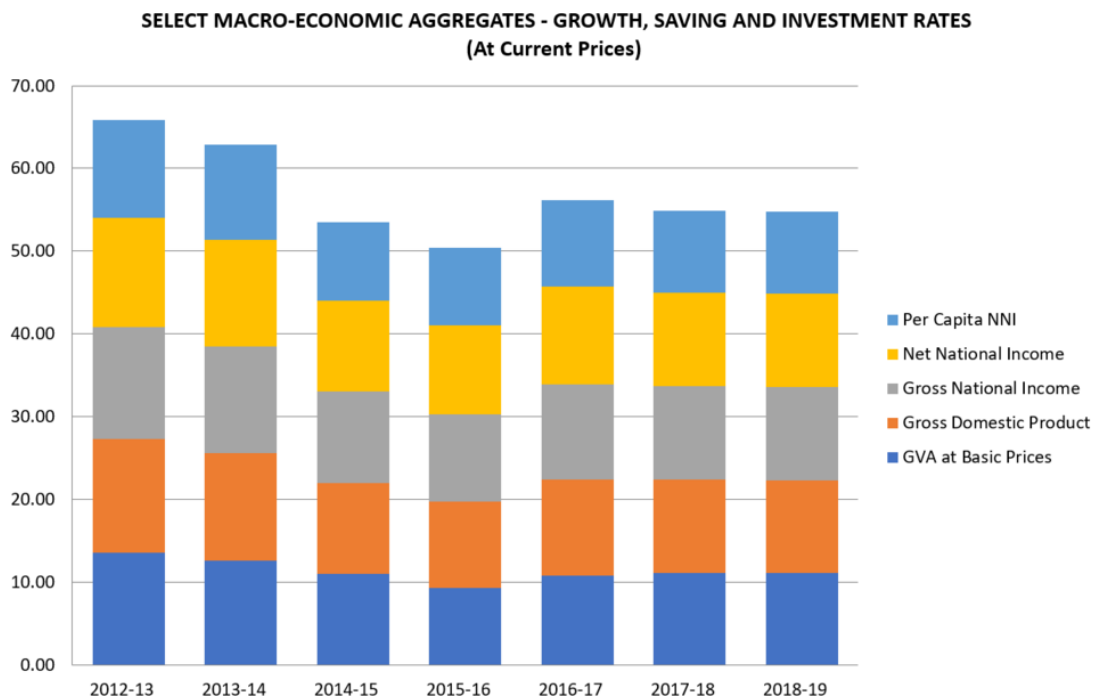
**Forex Reserves:** US\$ 448.59 billion in the week up to November 22, 2019

- **Export Value:** From April to November 2019, India's exports were US\$ 356.96 billion.
- **Export partners** include the United States, Germany, the United Arab Emirates, China, Japan, Thailand, Indonesia, and the European Union. India is also expanding its presence in Africa and Latin America.

Cumulative FDI Equity Inflows: US\$ 436.35 billion (April 2000 to June 2019)

Major Sectors Attracting Highest FDI Equity Inflows: Services Sector (18 percent), Telecommunications (8 percent), Computer Software and Hardware (9 percent), Construction Development (6 percent), Automobile (5 percent), Trading (6 percent), Drugs and Pharmaceuticals (4 percent), Chemicals (4 percent), Power (3 percent), Construction Activities (4 percent) (as in April 2000 – June 2019) as mentioned in Figure 3.

Figure 3. Select macro-economic aggregates - growth, saving, and investment rates (at current prices).



## **POLICY CHANGE**

Major economies of the world had been divided between being Capitalist or Socialist, the former being market-oriented allowing the flow of trade across nations, the latter were more inward and did not participate in world trade. These differences diminished after the 1990s majorly due to the fall of the USSR, a former socialist stronghold. Capital flows soared sixfold in developing countries that adopted capitalism, causing immense joy. Given the domestic policy constraints of many developing countries, the World Bank and the IMF, together with wealthy countries, have been the most ardent champions of globalization. The theme of trade liberalization was also promoted by the World Trade Organization. Lowering tariffs and trade barriers as a solution for prosperity in an increasingly globalized world. Globalization and expansion were the buzzwords for all of these companies in the early 1990s.

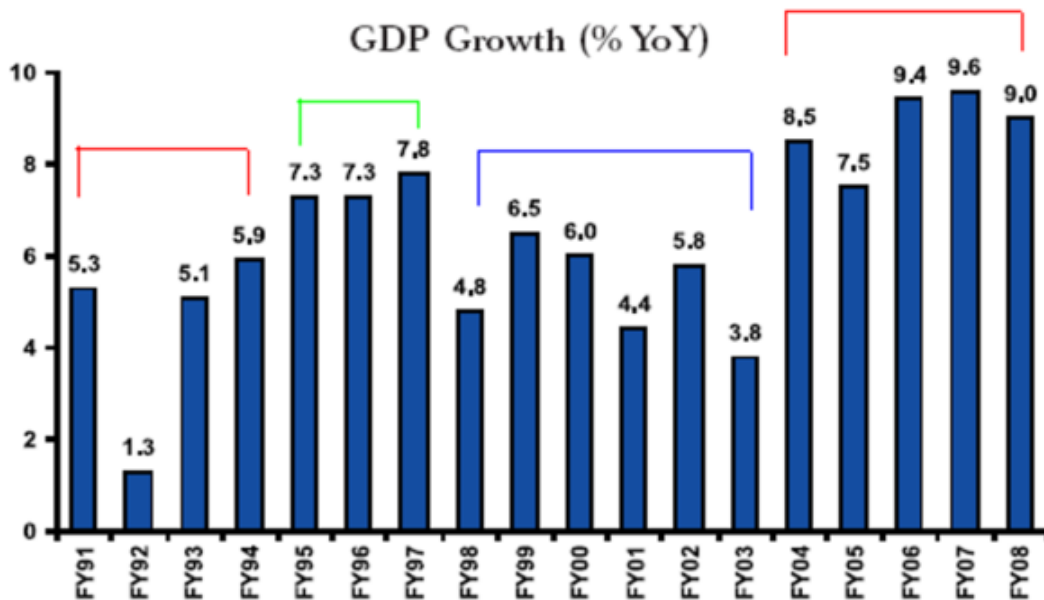
India started its path of growth with democratic values and self-. It has resorted to policies that have focused on the development of the domestic industry and the industrialization of import substitution. Import substitution industrialization is an economic theory that is commonly used by developing or emerging-market countries to minimize their reliance on industrialized countries. The goal of the theory is to protect and incubate newly developed domestic enterprises to completely expand sectors such that products generated are competitive with imported goods. When the public sector was at its high, all the banks were nationalized, the license raj was at its apex, and Garibi Hatao populism was strong, the political acts of the early 1970s often saw the quintessence of the government's revolutionary objectives. Global trading accounted for just around 5 percent of national GDP, with a share of less than one percent in international trade. After the 1970s, a growing number of public sector companies (PSUs) have also incurred losses. Contributions by public agencies have demonstrated significant shortfalls owing to organizational inefficiencies. The licensing raj, which refers to legislation and accompanying red tape that was required to set up and operate Indian businesses in India between 1951 and 1991, was one of the causes contributing to dismal performance (GOI, 1971). Following the Industries Development and Regulation Act of 1951, the government has resorted to the licensing system to keep control over the industries. Nationalized banks have built large non-loans. Regulatory approvals or licenses required by the private sector benefited the rich and the corrupt, as they could be bought at a price (Kotwal, Ramaswami, & Wadhwa, 2011).

During the Gulf Wars of the 1990s, oil prices skyrocketed overnight, causing global upheaval. The situation in India was even worse, as the country was heavily reliant on Middle Eastern oil imports, resulting in a Balance of Payments deficit. Forex reserves were limited to only three weeks of imports, external debts accumulated to 23%, and internal debt is 55% of the nation's GDP. The next move was to get a loan for IMF, which advised to devalue the currency, curb the fiscal policy and allow FDI (Foreign Direct Investment). Major steps were taken to liberalize the economy, like the dilution of the MRTP (Monopoly Restrictive Trade Practice) act, the government agreed to abolish the active influence of the government over financial markets and to substitute it with a clear regulatory system. Significant manufacturing and export strategies were revised, reduction of import duties financial and banking sector reform which gave RBI (Reserve Bank of India) more power than government (Reserve Bank of India, 2020).

In 1992-98, GDP expanded by more than 6.95 percent, compared to 5.5 percent in the 1980s. This has slowed down for the following three years and then started up again over the past three years. Manufacturing was the key driver of this development. In the past three years, the growth rate has risen from 8.7% to 9.1% and 11.3% respectively. The services sector has likewise maintained a phenomenal rate of expansion. The saving rate for the same year was calculated at 32.4% and the investment rate was

calculated at 33.8%. Over the last few years, both savings and investment rates have gradually increased. Many economists think that the globalization era has experienced extraordinary development success. Poverty, for example, has been cut in half since 1989, from 40% to 20%. As the share of families using electricity (34 percent to 54 percent), cooking gas (2 percent to 11, 71 percent), and utilizing the refrigerator increased in the post-globalization period, growth did not entirely overtake the rural sector. The poorest of the poor, i.e., those who are hungry in some or all months of the year, have dropped from 5.5 percent to 2.6 percent as mentioned in Figure 4 (World Economic Forum, 2019). In terms of foreign direct investment and international portfolio investment, the country enjoys a very steady foreign exchange position. What caused the 1991 economic crisis was the volatile foreign-exchange condition (World Economic Forum, 2019).

Figure 4. GDP growth.



India improved its position in trade facilitation from 143 in 2016 to 68 in 2019, according to the World Bank’s Trading Across Borders statistic, which was used to judge the overall ranking of nearly 190 countries in its Ease of Doing Business Report. The UN Global Survey on Modern and Efficient Trade Facilitation 2019 was recently released. India not only improved its overall trade facilitation ranking from 69 to 80 percent, but it also beat other Asian countries in the South and South-West Asia regions as mentioned in Figure 5.

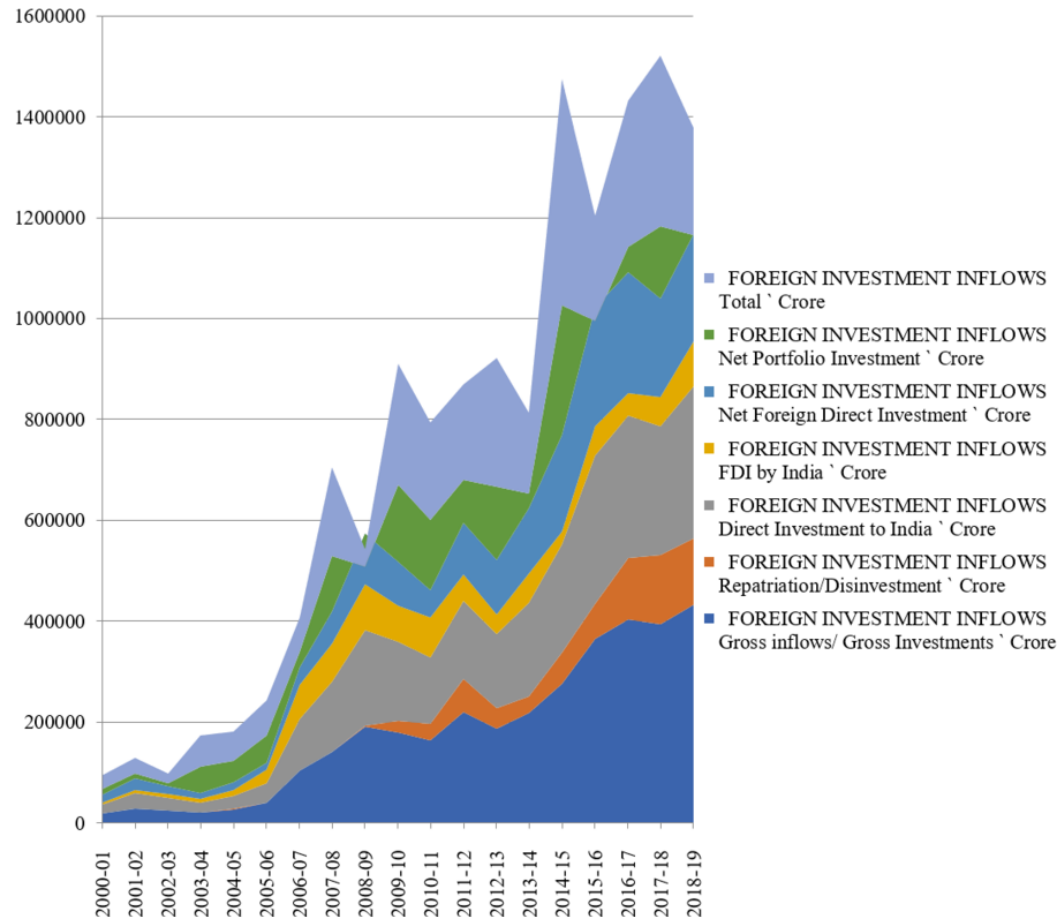
Globalization has generated prospects for jobs in the finance industry, in particular IT and ITES, financial services, and also the retail market. However, there is a disparity, with BPOs producing the majority of jobs at a lower level. Before the opening of the market, India was a nation with a large population of lower-income individuals who observed stalled growth in generational income levels, limiting the standard of living and spending to a single level. After the liberalization, there was a shift in generational income as a sudden rise in income levels saw a drastic shift in consumer spending, pav-



## Globalization and the Global Economy

ing the way for new services and goods to enter the market. India became a nation with a high domestic consumption economy, which was a big advantage for many foreign companies as more international companies popped into the market. India has tried to compete with competitive Asian economies to obtain a greater share of the market. Since then, over \$67 billion in foreign investment has been approved.

Figure 5. Foreign investment inflows comparison.



## TRENDS IN BALANCE OF PAYMENT

All loans and commitments to foreign citizens, as well as all contributions and duties obtained from foreign nationals, are represented in the Balance of Payments (BoP), a ledger of monetary dealings with the rest of the world across time.

India's balance of payments, which is made up of a big trade gap maintained by huge optimistic intangible inflows, is a wonder in a modern service-oriented world economy. The liberalized climate has made Indian services appealing to the modern IT-dependent market of the developing countries. Between the three elements, such as services, transactions, and exports, the largest surplus is created by services followed by transactions, while the income flow from India is raised by introducing a net

deficit to the BoP account. The total sum unknown to the current account was a loss of \$242 million in 1990-91. However, the post-reform era saw rapid growth in this group, which added a significant surplus to India's BoP account. This surplus, while not enough to eradicate the trade gap, may make a major contribution to neutralizing the extent of the effects of the massive deficit.

The devaluation of the rupee was one of the measures implemented by the government to improve the balance of payments situation. Economic devaluation contributes to a rise in production and thus an improvement in foreign currency inflows. Initially, the rupee was devalued by around 20%. There was a need to close the difference between actual and nominal exchange rates that arose as a consequence of high inflation. This devaluation has reversed the changed exchange rate.

Yet another threat for BoP is arising today in the shape of rupee depreciation. The Indian Rupee has lost its value to the US Dollar, posing a fresh challenge to the Indian economy (Mathew, 2013). Grim's global economic forecast, coupled with high inflation, increasing current account deficits, and FII outflows, led to this downturn. Although RBI reacted to timely interventions by selling dollars intermittently, in times of global volatility, investors prefer USD to be a haven. Deterioration of India's current account, and thus of the overall BoP, has contributed to several policy debates on stabilization, the significance of exchange rates in affecting the trade balance, and the position of high and increasing inflation.

The Economic Survey 2019-20 expressed the pleasure that India's external sector had improved in the first half of 2019-20, with an increase in the Balance of Payments (BoP) role, owing to capital flows via FDI, FPI, and ECBS. By September 2019, the balance of payments situation had improved to USD 433.7 billion, up from USD 412.9 billion in March 2019 (Howell & Ballantine, 2020). This is based on the current account deficit (CAD), which is expected to shrink further from 2.1 percent of GDP in 2018-19 to 1.5 percent in the first half of 2019-2020. As of 10 January 2020, India's foreign reserves are anticipated to be USD 461.2 billion. Furthermore, towards the end of September 2019, the level of external debt remained low, at 20.1 percent of GDP (Howell & Ballantine, 2020). At the end of June 2019, India's foreign debt liabilities to GDP, both debt and equity components, increased, owing to an increase in FDI, fund flows, and external commercial borrowing as mentioned in Table 1.

## **Look East and Act East Policy**

Look East Strategy is one of the most influential foreign policy measures initiated by the Government of India since the Cold War. This strategy was followed in the early 1990s toward the gradual deterioration of the Indian economy and the abrupt end of the Cold War (Nag, 2015). This approach was the result of a determined effort to develop security relations with Southeast Asian countries. The strategy was structured to improve geographical, economic, and political relations with individual countries as well as with the Union of Southeast Asian Nations (ASEAN). The Prime Minister recently relaunched the "Look East" strategy as "Act East," signaling a substantial shift toward a more proactive and action-oriented approach to the area to create linkages in all spheres.

The main objectives of the Look East policy were to re-engage India from a commercial point of view with its neighbors and emerging Southeast Asian countries. Its goal was to bolster India's position in the region by cultivating socioeconomic, political, cultural, and strategic ties with Southeast Asian countries to prevent China from becoming the region's dominating power.

North East India has international borders with Nepal, Bhutan, China, Myanmar, and Bangladesh, with a total length of 4500 kilometers. With a 1643-kilometer border with the states of Arunachal Pradesh, Manipur, Mizoram, and Nagaland, Myanmar is regarded as the key gateway between North East and

## **Globalization and the Global Economy**

South East Asia. The North East Region (NER) serves as a gateway to the Southeast Asian region, giving New Delhi a unique opportunity to strengthen ties with South and Southeast Asian neighbors. This region has all the potential to develop into a powerhouse in India as it has abundant rich sources of energy, natural gas, coal, oil, limestone, and other mineral resources.

Progress in the North-Eastern region would lead the population of the region to prosperity. Geographical proximity and ancient links between the North-East region and the South-East region are the real driving force behind the policy of the Act of the East. Several critics argue that there are numerous roadblocks in the way of the 'Serve East' strategy. These problems include lack of coordination at the ministerial level, bureaucratic inertia, lack of investors-friendly laws, insurgency in the region, etc.

*Table 1. India's BOP during 1990-91 to 2011-21 (values in US \$ million).*

<b>Year</b>	<b>Current account balance</b>	<b>Capital account balance</b>	<b>Overall Balance</b>
1990-91	-9680	7188	-2492
1991-92	-1178	3777	2599
1992-93	-3526	2936	-590
1993-94	-1159	9694	8535
1994-95	-3369	9156	5787
1995-96	-5912	4690	-1222
1996-97	-4619	11412	6793
1997-98	-5499	10010	4511
1998-99	-4038	8260	4222
1999-00	-4698	11100	6402
2000-01	-2666	8535	5868
2001-02	3400	8357	11757
2002-03	6345	10640	16985
2003-04	14083	17338	31421
2004-05	-2470	28629	26159
2005-06	-9902	24954	15052
2006-07	-9565	46171	36606
2007-08	-15737	107901	92164
2008-09	-27915	7835	-20079
2009-10	-38180	51622	13441
2010-11	-45945	58996	13050
2011-12	-78155	65324	-12832

Source: Reserve Bank of India, 2014

## **KEY LANDMARKS**

### **IT Sector Boom**

In comparison to the IT-BPM business, India's global supply market continues to grow at a faster rate. In 2017-18, India was the world's biggest service provider, accounting for around 55 percent of the US\$ 185-190 billion global services sourcing industry. More than 1,000 global delivery centers have been established by Indian IT and ITES companies in more than 80 countries around the world. India's IT industry generated about 7.7% of the country's GDP in 2015, and it is predicted to contribute 10% by 2025 (India Brand Equity Foundation, 2021). The IT industry employs 4.1 million workers as of FY19 (India Brand Equity Foundation, 2021). The IT industry is fuelling the growth of start-ups in India, with the presence of around 5,300 tech start-ups in India. India is the world's biggest sourcing destination, with a market share of around 55% of the US\$ 185-190 billion global services sourcing industry in 2017-18, and a market share of around 38% of the entire Business Process Management (BPM) sourcing market (India Brand Equity Foundation, 2021).

### **Surge in FMCG Sector**

The fourth-largest industry in the Indian economy is fast-moving consumer goods (FMCG). There are three major divisions of the industry – food and drink accounting for 19 percent of the market, health care accounting for 31 percent, and household and personal care accounting for the remaining 50 percent (Ferreira, Lustig, & Teles, 2015).

The fourth-largest sector of the Indian economy is fast-moving consumer goods (FMCGs). There are three major divisions of the industry – food and drink accounting for 19percent of the business, health care accounting for 31percent, and household and personal care accounting for the remaining 50percent.

Increasing awareness, easy exposure, and growing habits are the main drivers of success for the customer sector. The Union budget 2019-20's emphasis on agriculture, small and medium-sized enterprises, education, health care, infrastructure, and tax rebates is expected to have a substantial impact on the FMCG economy (Mitra & Kadam, 2017). These interventions are expected to increase disposable income in the hands of the common people, especially in rural areas.

### **Infrastructure**

According to the Department of Economic Affairs, certain sectors are introduced to the infrastructure list, these are Transport, energy, Water and Sanitation, Communication, Social and Commercial Infrastructure. The inclusion of "Logistics Sector" in the Harmonized Master List of Infrastructure Sub-sectors was considered in the 14th Institutional Mechanism (IM) Meeting held on 10th November 2017

After globalization was introduced to India, the Logistics of goods became more important for the economic activities to flow properly. This sector got the heavy load of the economy of the nation as more FDI increased more job creation occurred, traffic in this sector increased as goods needed to reach fast and in cheap rate, though India has shown steady development of this sector still lack of road infrastructure throughout the nation has hindered in its progress.

## ***Globalization and the Global Economy***

**Industrial Production Index** The logistics business in India is a bright spot, with a market value of over US\$ 160 billion and a predicted value of US\$ 215 billion shortly. India is now ranked 44th in the world in the World Bank Logistics Quality Ranking, up from 54th in 2014. According to the Economic Survey, reducing Logistics Costs from their current levels of 13-14 percent of GDP to 10 percent in line with global standards would be a significant step forward, with programmes like Fast-Tag, Bharatmala, Sagarmala, and Dedicated Freight Corridors playing a key role (Harley, 1988).

## **LIABILITIES**

### **Middle-Income Trap**

Indermit Gill and Homi Kharas coined the term “middle-income trap” to describe the overall phenomena witnessed in Latin America and the Middle East, as well as the prospect of slowdowns in East Asia’s growing economies. Their account explains how rapid growth from low- to middle-income countries — fueled by cheap labor, basic technology catch-up, and reallocation of labor and capital from low-productivity sectors like traditional agriculture to export-driven, high-productivity manufacturing — is frequently followed by slower growth. The accumulation component that historically drove strong development gradually loses power as rural labor decreases and salaries rise. A country’s ability to compete may be jeopardized if fresh sources of economic growth are not developed. Some studies support the existence of a middle-income trap by demonstrating that development slowdowns are more probable at middle-income levels. For example, a study of all economic slowdowns between 1960 and 2005 found that middle-income countries are more likely to experience them than low- and high-income countries. There’s also evidence that fast-growing economies slow considerably once they reach middle-income levels, which are rough \$10,000-11,000 and \$15,000-16,000 in 2005 PPP-adjusted dollars (Larson, Loayza, & Woolcock, 2016).

The effects of the middle-income trap can be noticed as the consumption of the huge chunk of the middle-income category of people in the nation has stagnated or in some cases declined. Data released by the industry body Society of Indian Automobile Manufacturers (SIAM) showed passenger vehicle sales decreased for the tenth straight month in August by 31.57% to 196,524 units. This is the steepest drop since SIAM began collecting statistics in 1997-98 (Larson, Loayza, & Woolcock, 2016). The surging FMCG sector has experienced a decline in consumer spending with lower growth of the sector due to many speculative government policy measures (Mitra & Kadam, 2017). This slowdown will further lead to more unemployment which in turn contributes to a cycle of downward flow.

### **Damping Economic Condition**

The global economy had a difficult year in 2019, with world production forecast to expand at its worst rate of 2.9 percent since the global financial crisis of 2009, down from 3.6 percent in 2018 and 3.8 percent in 2017 (Rossi, 2011). Uncertainties, while diminishing, are still on the increase due to the protectionist policies of China and the US and growing geopolitical tensions between the US and Iran. The Indian economy slowed in the first half of 2019-20, with GDP growth falling to 4.8 percent from 6.2 percent in the second half of 2018-19, owing to sluggish global manufacturing, trade, and demand environment

(Nag, 2015). According to the World Economic Outlook for October 2019, India's economy will be the fifth-largest in the world, based on GDP at current US\$ levels, surpassing the United Kingdom and France. In 2019, the economy is anticipated to be worth US\$ 2.9 trillion (Nag, 2015).

In the case of food and non-food products, consumer spending in real terms indicates a growing difference between the upper and lower classes. In the case of clothing and boots, the inequalities in original entitlements between the upper and lower classes were large, but the lower classes' upward demand rise was greater than the upper classes. In the case of consumer products, schooling, and medical treatment, not only were the initial differences between the upper and lower classes large, but the slopes were also higher for the upper classes relative to their lower equivalents. The decrease in cereals and pulses, as well as the increase in other foods, suggests a significant shift in diet, which could have a direct impact on the welfare of the lower classes. This also means that disadvantaged Indians are more able to buy food of higher quality.

The liberalization cycle that has been ongoing since 1991 has moved India towards a healthy pace of growth, contributing to millions of Indians coming out of poverty. A huge range of new job prospects has emerged. However, there is a stumbling block to increased growth: widening economic disparities. With a solid GDP and per capita income increase, India's Gini Index has risen over time, showing a rise in disparity. The National Sample Survey Organization's statistics on monthly per capita expenditure (MPCE) are a good measure of living standards. From 2004–2005 to 2011–2012, this graph shows the MPCE ratio for the upper deciles (top 10% of the population) to the lower deciles (bottom 10% of the population) in both rural and urban India (Ferreira, Lustig, & Teles, 2015).

## **Domestic Driven Consumption Economy**

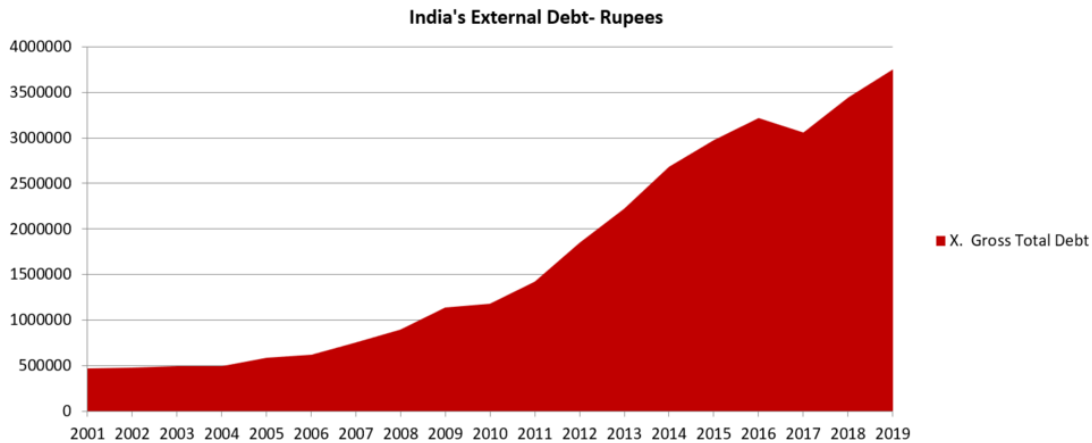
As stated earlier, India's relatively huge (and growing) domestic market is expected to be the key draw for international companies. For example, foreign suppliers of soft drinks and fast-food outlets, who were invisible ten years ago, have become noticeable in metropolitan cities, while their quantitative importance might still be marginal. The big foreign automotive firms have set up production and processing plants of various degrees. The same may be said for washing machines, refrigerators, and other consumer electronics. Such large-scale business penetration also culminated in the enhanced market and non-competitive rivalry, contributing to better variety and improved quality—a positive outcomes for customers India has the second largest population in the world, this creates lots of opportunities and job creation possibilities for private companies to invest in its market as mentioned in Figure 6.

## **Import-Export Imbalance**

Trade imbalance arises when the purchase of products by a nation exceeds the production of goods. This is generally the case when the country is unable to generate the necessary exports. In the near term, the trade imbalance offers the impression of a diversified domestic market. It represents a steady inflow of international products into the domestic sector, a higher quality of life, and equal rivalry on the domestic market. However, in the long run, this is not the best option. A nation facing excessive trade gaps means being heavily dependent on imports for its existence which is extremely disastrous. To cover the debt, the government would have to obtain foreign loans, which will establish a “poor balance of payment” scenario and render the crisis worse as mentioned in Figure 7.

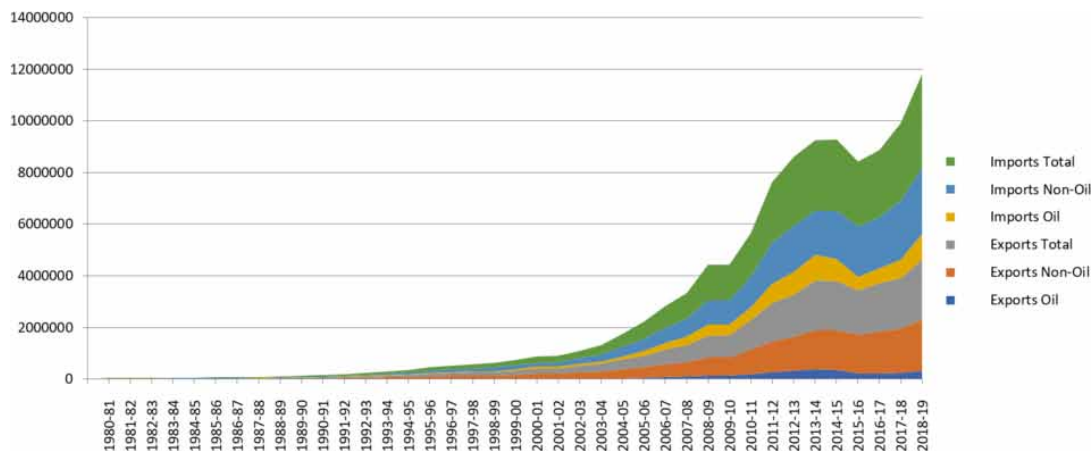
## Globalization and the Global Economy

Figure 6. India's external debt - rupees.



India should tap into new global markets where the demand for Indian foods may arise. Central Asia is a promising trading partner but neighboring tensions with Pakistan have made it hard to provide goods there, India's deal with Iran for building and maintaining a trade relationship at the Chabahar Port may ease the problem. Africa has been the new trading partner with India with mostly grains and pulses can look for more trading opportunities to find a new market in Africa. Trade deals with Latin America can be a huge boost for India and will look promising for the countries to become partners.

Figure 7. Import and export comparisons.



## Rural Dependency

The rural population of India has been estimated to be 833 million as of 2011 which is almost 68% of the nation's population. As of 2016, the agriculture sector employed 49.9% of the Indian workforce, but the output contributed is only 16.9–17.9% to the country's GDP. Agriculture and related industries such

as animal husbandry, forestry, and fisheries accounted for 15.4% of GDP in 2016 and employed around 31% of the workforce in 2014.

India's agricultural exports were \$38 billion in 2013, making it the world's seventh-largest agricultural exporter and the sixth largest net exporter. The majority of its agricultural exports are destined for developing and least developed countries. Indian agricultural/horticultural and processed goods are exported to over 120 countries, with Japan, Southeast Asia, SAARC countries, the European Union, and the United States is the most popular destinations.

The bleak image that emerges is political parties' reliance on the rural population, which is lavished with subsidies and loan forgiveness, affecting the country's Balance of Payment in the long run. The money generated for these freebies is snatched from the secondary sector, through taxation the sector is already are struggling in managing and competing with international influence in the domestic market, lack of energy supplies, and irregular transport infrastructure has made goods costlier for them to produce. The Service sector has been prosperous and the bulk of revenue from this sector is provided to the failing other two sectors. The imbalance is on a brink of instability to rise as a crisis can lead to high prices and surging unemployment (World Bank, 2010).

## **CONCLUSION**

India is a land of diverse cultures and traditions, making it a daunting task to bring all the members into a common consensus, historically the region was highly fragmented into distinct ethnic groups formed political boundaries which shifted dramatically. Divided landscape allowed foreign powers to divide and rule the region by forming a balance between these ethnicities by making a coalition with native powers to project their sphere of influence, as internal ethnic resentment were higher than foreign influence, this strategy was followed successfully by many empires and dynasties, even the modern government structure governance in the following manner. This also creates a fundamental problem that creates tension between authorities of the center to the autonomy of the states. The nation works like a federation with the state's cooperation hindering development activities in the nation. The nation has shifted from a Shreni culture to land trade dominance, the rich resource and diverse landforms make it suitable for a trading partner. The economic activities changed after independence the socialist ideology was poorly implemented which forced its gates to open for an abrupt change towards capitalism, in a scenario when lifestyle and income inequalities change overnight, making coverage of development and benefits of economic boost is somewhat restricted to a particular region or income category. The dual mindset of a rigid socialist mindset with a highly westernized capitalist one in the bureaucratic and governance system makes the decision-making sluggish.

Though India has positively embraced globalization with an increase in growth rate and lower unemployment population shows opportunity for future growth but with proper central power and coordination between states can affect the growth of the nation. The Indian economy has become more globalized, allowing international corporations to enter the Indian market. Indian enterprises have also been given the option to operate on a global basis. Only after 2000 did employment conditions begin to improve significantly. The organized sector grew rapidly and created a lot of jobs between 2000 and 2010. As a result, the organized sector drew labor from the unorganized sector. The result was a quick improvement in employment circumstances in the unorganized sector, thanks to a decrease in labor force growth mixed with accelerated output growth.



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# Chapter 9

## How Can Business Enterprises Use Sustainability–Oriented Innovations as a Strategic Tool?

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### ABSTRACT

*Today, companies' incremental innovations and reactive approaches remain insufficient to cope with shocks like the COVID-19 pandemic and the climate crisis. Thus, they need to start with a radical shift in their thinking to be responsible and sustainable at the minimum level. Furthermore, companies must build, transform, and adapt an innovation ecosystem with stakeholders who interact to create and diffuse innovation. The author suggests that 'organizational transformation', which emphasizes creating more shared value within society, and 'system building', which highlights the company that goes beyond the institutional borders and redefines the purpose of the company's mission in society, are essential innovation strategies in overcoming the shocks generated by the COVID-19 pandemic and climate crisis. This chapter aims to clarify the meaning of the innovation terms related to sustainability and provide responsible and sustainable business practices from traditional resources and gray literature based on organizational transformation and system building approaches.*

### INTRODUCTION

The profound impacts of the COVID-19 pandemic, such as curfews and lockdowns that resulted in economic activity almost entirely stopping all around the world, caused irreversible effects on the lives of millions of people. As a current example of a COVID-19 pandemic shock, the 'chip crisis' has generated drastic disruption in the production of different industries, from wearable health technologies to electronic systems in automobiles and smartphones (Baraniuk, 2021). Civil aviation, which the COVID-19 pandemic has severely impacted, has suffered significant financial losses on a global level. The number

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of seats offered by airlines decreased 50% in 2020, yet 3 million people chose not to fly with any airline company throughout the pandemic. Thus, the total loss for the civil aviation industry was about 371 billion USD in 2020 (ICAO, 2021). The most recent COVID-19 pandemic shock case is from the United Kingdom. While the business owners who carry goods in trucks offer higher wages at the beginning of employment with other financial incentives like bonuses, there has not been enough recruitment in the sector during the post-pandemic era (Milliken, 2021). Thus, people have sometimes found empty shelves in malls or other places, like pharmacies, that didn't have any pills.

However, despite the powerful COVID-19 pandemic shocks, the threat of even greater shocks looms for the global economy and many industries because of climate change. As a result of the global scale of greenhouse gas emissions, it has turned out to be a common situation to hear about extreme weather events such as flash floods and wildfires from different parts of the world. One last instance is the unprecedented rainfall that caused rivers to burst their banks, with catastrophic impacts on a broad area of Europe, including Germany, Belgium, the Netherlands, Luxembourg, and Switzerland (BBC, 2021). Moreover, most business models that adopt traditional innovation approaches still continue to use limited resources in an unsustainable way to make profits and cause climate change with harmful effects to the environment and society, such as carbon emissions and child labor (Kelleci, 2021).

The following part gives a brief explanation of traditional innovation approaches. After World War II, two fundamental streams dominated innovation without including sustainability motivations. The first one, the commercialized innovation, aims to make discoveries or inventions through incentivized scientific activities and research and development (R&D) to recruit new industries for national economic growth. This linear stream moves from R&D to commercialization and attributes much more attention to scientific activities than implementation and consequences because novelty rewards can be quickly obtained in a well-functioning market (Schot & Steinmueller, 2016). The second one, the national systems of innovation, has goals such as better employing knowledge creation, assisting commodification of novelties, and thus closing the gap between scientific discoveries or inventions and practice. In addition to entrepreneurship, different types of learning are crucial for this second approach, such as employing, manufacturing, interacting, and building bridges among different actors, drawing on the national assimilation capacity of knowledge to make corporations competitive (Schot & Steinmueller, 2016). But this stream led to a definition of countries as developed or underdeveloped. As a result, businesses that emerged from and evolved with the dominant social paradigm attempted to sell more and more products in order to make more profit through the aforementioned traditional innovation approaches that wasted limited resources inefficiently in previous years (Kemper & Ballentine, 2019; Kelleci & Yıldız, 2021). Smartphones are an excellent example of this understanding. Smartphone giants release new models rapidly, stimulating recent user trends. This business strategy causes the waste of finite supplies and has destructive societal consequences, such as creating overconsumption tendencies and dangerous labor conditions in mines. But the shocks triggered by the COVID-19 pandemic have proven that business models with short-term goals are no longer sustainable. Today, governments, consumers, particularly conscious consumers, new generations, suppliers, non-governmental organizations (NGOs), and universities request that businesses consider their wants, needs, and thoughts in a sustainable approach. Furthermore, shareholders expect corporations to do more than maximize the market value of their dividends; they also expect them to safeguard the environment and engage in activities that benefit society. This transition refers to a shift in mindset from traditional innovation to sustainable innovation and a shift from a shareholder to a stakeholder approach.

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Adams et al. (2015, p. 181) defined sustainability-oriented innovation (SOI) as “making intentional changes to an organization’s philosophy and values, as well as to its products, processes, or practices, to serve the specific purpose of creating and realizing social and environmental value in addition to economic returns.” They also contributed to the literature by developing a three-category framework for classifying transitions of business enterprises’ SOI activities (Adams et al., 2015). All types involve different strategic approaches for business enterprises. The first one is ‘operational optimization,’ which refers to reducing harm through reactive improvements and incremental innovations that deal with regulatory requirements and efficiency problems. ‘Organizational transformation’ encapsulates the adoption of innovation by formulating shared values throughout the institution and distributing broader advantages to the community through a limited stakeholder focus. The last one, ‘system building,’ refers to a radical shift by redefining the business enterprise’s goal in the community, and it is primarily focused on creating and delivering value with internal and external stakeholders such as NGOs, industry actors, and international initiatives.

In addition to the COVID-19 pandemic shocks, the broad range of hurdles varies from the mitigation of climate change to waste disposal to child labor to creating responsible production and consumption patterns. Thus, it does not appear possible for businesses that adopt operational optimization and employ traditional innovation approaches to cope with these problems in question, each of which has different characteristics. The former implies only preventing businesses’ harmful effects on the environment by considering regulatory schemes and bureaucratic procedures. The latter has left millions of people in the developing world behind, resulting in growing global inequalities. Therefore, firms must start with a radical shift in their thinking to develop a responsible and sustainable business model. Furthermore, companies must build, transform, and adapt to an innovation ecosystem with stakeholders who interact to create and diffuse innovation. Thus, the author seeks to address how sustainability-oriented innovations can be used as a strategic tool to deal with shocks like the COVID-19 pandemic and climate change. Accordingly, the author suggests that organizational transformation, which emphasizes creating more shared value within society, and system-building, which highlights the corporation that goes beyond the institutional borders and redefines the purpose of the company’s mission in society, are essential strategies in overcoming the shocks generated by the COVID-19 pandemic and climate change. This chapter also aims to clarify the meaning of the innovation terms related to sustainability and provide responsible and sustainable business practices from traditional resources and gray literature, which offer access to current practices in different fields. The following sections start with the evolution of innovation, continue with what sustainability-oriented innovation is and is not, and then provide constructive practices based on SOI categorization. Last but not least, it delivers conclusions about how SOI can be used as a strategic tool based on organizational transformation and system building approaches.

## **BACKGROUND**

Traditional innovation can be divided into two eras: (i) commercialized innovation and (ii) national systems of innovation. Following WWII and the start of the Cold War, the public had a powerful belief that scientific research should serve society by generating new industries and goods rather than developing nuclear weapons. Also, there was widespread concurrence that states should encourage financially private entrepreneurs to undertake scientific activities through R&D. Thus, the first innovation era started through R&D activities that governments supported. Furthermore, it is considered that scientific activities that

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offer advantages to society also provide states with opportunities for economic growth. Novelties such as automobiles, televisions, and aircraft make this connection strong. In keeping with the explanation above, Freeman (1974) defined innovation as a ‘commercialized invention.’ Commercialization requires that many people buy an invention. The underlying point of the commercialized innovation era is that every scientific innovation step needs to realize economic returns from invention and discovery in the potential markets (Schot & Steinmueller, 2016). This approach also compels corporations to be competitive in the mass-production industries. As mentioned above, the ultimate aim is to achieve long-term significant economic growth and build new sectors through R&D activities in the commercialized innovation era.

The understanding of innovations for economic growth continued until the 1980s, when a ferocious contest started between countries that contemplated taking a leading role, and the national and industrial capacity of innovations became comparable. In the second era, there was a consensus that the different innovation levels might stem from the absorptive knowledge capacity of communities and the concentration of countries on cognition methodology and interaction forms of institutions. Thus, Freeman (1988) and Lundvall (1992) used the term ‘national systems of innovation.’ Furthermore, wealthy countries that allocated much more resources to innovations chose the way of impeding other countries’ ability to take advantage of the knowledge and to become equal. While the close connection between government and industry has been kept similar to the commercialized innovation era, the term Triple Helix Model (THM), a more interactive model that describes the further interconnected structure of government, industry, and university research initiatives, has been offered in the national systems of the innovation era (Etzkowitz, 2003; Compagnucci et al., 2021). Thus, knowledge is created by synergy among the miscellaneous actors in nationwide, industrial, and regional information systems rather than through a linear approach that involves a movement from R&D to commercialized innovation.

So far today, people have considered innovations to provide beneficial outputs for society, and governmental regulations can cope with any leftover externalities. Furthermore, while technological improvements might entail short-term adverse outcomes, like losing jobs, they will also provide new, higher-ranked professions for labor. Thus, Schumpeter (1949) defined technological innovation as a process of creative destruction. On the other hand, Soete (2013) noted that innovation might cause more problems than benefits and described it ironically as a destructive creation. For example, most industries employ fossil fuels for production, which triggers the climate crisis. Considering the smartphone industry again, the accumulation, warehousing, and disposal of waste such as old batteries and parts loom as a significant externality caused by technological innovations. Moreover, the damaging effects caused by automobiles on the environment have increased since the day they were produced, even though regulations have reduced the harmful gases emitted by cars. It is possible to explain this situation in terms of the rebound effect. Continuing with the automobile example, cars with fuel efficiency give consumers a tendency to use their cars more than usual.

Accordingly, traditional innovation approaches provided affluence in a few countries and corporations during the commercialized and national systems of innovation eras. However, they have also left many people in the developing world behind and have entailed rising inequalities around the globe. Considering today’s innovation practices, it can also be inferred that most of the strategies are still based on last century’s premises that put market share and profit orientation at the forefront (Ehrenfeld, 2009). Moreover, business enterprises’ efforts are mainly about enhancing available production processes and technologies by employing energy and resources efficiently, rather than creating value with and for consumers and supporting sustainable consumption patterns (Keskin et al., 2013; Daae & Boks, 2015; Kelleci & Yıldız, 2021). But achieving the sustainability goals of international initiatives, such as the

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EU and UN, requires a transition from R&D activities towards an integrated collaboration that includes different units inside and between companies. Thus, contemporary innovation compels organizations to depend on their ability to match their customer expectations with limited resources, evaluate the lead users' domination, and try to be proactive to adapt to future developments (Pettersen et al., 2013). While THM can be considered the first step, including collaboration among government, industry, and universities, it is insufficient to meet the community's underlying expectations (Gray et al., 2014). Therefore, the Quadruple Helix Model (QHM) adds users as a fourth critical element that plays a crucial role in an innovation ecosystem (Carayannis et al., 2012; Leydesdorff, 2012). The user is essential because the knowledge generated by R&D activities impacts how it creates value for society, covers different community segments, and supports sustainability (Arnkil et al., 2010). As stated in THM and QHM, sustainable innovations typically originate outside of the organizational borders and are primarily generated by the combined efforts of the various corporate departments. This inference is also parallel with the concept of open innovation, which was coined by Chesbrough (2003).

It is evident that addressing the three pillars of sustainable development, economic, environmental, and social concerns, will require a significant shift in the interaction between infrastructures and human behavior. Because optimizing existing systems will not be sufficient, an innovation approach that encompasses revolutionary transformation must focus considerably less on goods, methods, companies, and R&D activities and more on realizing system-wide transformations (OECD, 2015). This required transformation is called a Second Deep Transition (Schot and Kanger, 2016), which is explained by the Adams et al. (2016) in the introduction section as 'system building' that involves reframing the mission of a company in the community and a collaboration strategy that goes beyond the company's boundaries. Besides, this new era of innovation involves new collaborations between government, industry, users, non-governmental actors, suppliers, and competitors that must build a symbiotic relationship web where one uses another's waste as an input.

## **MAIN FOCUS OF THE CHAPTER**

This section depicts the progress from sustainability to sustainability-oriented innovation. The concept of sustainable development entered the literature with the United Nations Conference on the Human Environment in 1972 (Hall et al., 2010). Also, the World Commission on Environment and Development report, known as the Brundtland report (1987), is a foundation of the concept. The Brundtland Report defined the concept as "sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). The report also stated clearly that the planetary resources and current advancements do not have enough (living) space for present and future generations at the accelerating rate of human populations (McLellan, 2013). This concept was introduced and incorporated into prevailing government and industry understanding at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, 1992. Thus, it can be inferred that sustainability has joined the world agenda, got traction, and given appropriate space for innovations that progress along with the social, environmental, and economic aspects (Kelleci, 2022).

As an achievement of UNCED at the Rio Summit, United Nations Framework Convention on Climate Change (UNFCCC) aims to prevent dangerous human intervention on the climate system, has triggered an array of arrangements for steady progress against greenhouse gas emissions at the global scale. The goals of the primary regulations such as the Kyoto Protocol in 1997, the Doha Amendment in 2008,

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and the Paris Agreement in 2015 are to limit and reduce greenhouse gas emissions of states that take part. The latter refers to an intensive effort to constrain global warming to well below 2 degrees Celsius and reach a climate-neutral world by mid-century (UN Climate Change, n.d.). The UN Sustainable Development Summit also established the 2030 Agenda for Sustainable Development, which includes 17 Sustainable Development Goals (SDGs) in September 2015. This agenda involves an action plan for the planet, humanity, and well-being. The European Union (EU) is another leading actor that makes satisfying efforts against climate change and environmental problems. The European Green Deal aims to get over these problems by neutralizing carbon emissions and transforming the EU into a resource-efficient, sensitive, and competitive economy (European Commission, 2021). Parallel with the European Green Deal, European Commission introduced the new Circular Economy Action Plan (CEAP) that involves schemes on more sustainable product design, reducing waste, and empowering consumers in 2020. CEAP includes a wide-ranging portfolio of electronics, batteries, textiles, buildings, plastics, and food (European Parliament, 2021). Furthermore, after the COVID-19 pandemic, the aforementioned international initiatives augmented their plans, such as being fair and equitable in allocating vaccines to underdeveloped countries (i.e., COVAX) and supporting electric mobile vehicle innovations (i.e., e-scooter, electric motorcycle). For example, the German government made a bailout offer to subsidize the losses of Lufthansa Airways on the condition that it would ensure a more climate-friendly future for the airline (Wettengel, 2020).

As mentioned before, most business enterprise innovation processes still focus on their internal resources and supply-driven innovations that involve competition between opponents and great effort for economic growth through R&D activities. International initiatives have triggered a transformative change in innovation, focusing on environmental and social dimensions and externalities such as inequalities, climate change, and waste disposal. Then, sustainability-oriented innovation has burgeoned throughout the world. But many innovation terms, such as environmental innovation, green innovation, business model innovation, and eco-innovation, address innovation transitions toward sustainability (De Jesus et al., 2018). Environmental innovation is defined as “innovations that consist of new or modified processes, practices, systems, and products which benefit the environment and so contribute to environmental sustainability” (Oltra & Saint Jean, 2009, p. 567). For example, the 7-meter-tall Smog Free Towers that were created by Daan Roosegaarde and his team of specialists clean 30 thousand cubic meters per hour by employing a small quantity of green energy and offer people to breathe clean air for free in different cities of the world (Studio Roosegaarde, n.d.). Then the gathered carbon is converted to diamonds as jewelry, which provides funds to build new towers.

Another concept is green innovation, described by Chen et al. (2006, p. 534) as “hardware or software innovation that is related to green products or processes, including the innovation in technologies that are involved in energy-saving, pollution-prevention, waste recycling, green product designs, or corporate environmental management.” Developed by Newlight Technologies, AirCarbon is a biodegradable polyester created from microorganisms and trees to the human body. Thus, it can be re-consumed by nature. Another advantage of AirCarbon is being meltable, making it possible to change its form, thus replacing synthetic plastic and animal leather (NewLight, 2021).

Originally focusing end of pipe solutions, eco-innovation is a well-accepted concept in the literature (Pichlak & Szromek, 2021) and is defined as “resulting in or aiming at significant and demonstrable progress towards the goal of sustainable development, through reducing impacts on the environment, enhancing resilience to environmental pressures, or achieving a more efficient and responsible use of natural resources” (European Commission, 2011, p. 2). For example, the Prius model introduced an in-



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novation called the Hybrid Drive system, patented by Toyota in 1997. The Prius employs electric energy through its hybrid motor in metropolitan areas where traffic jams remain high. However, it uses the power of gasoline for driving on the highway and charging its batteries (Carrillo-Hermosilla et al., 2010).

Sustainable business innovation, defined by Bocken et al. (2014, p. 44) as a “process where sustainable considerations (environmental, social, and financial) are integrated into company systems, from idea generation through research, development, and commercialization,” is a current topic on which researchers have recently focused. For example, Vitsoe defines its mission as designing products with well-defined quality standards and offering creations with flexibility, adjustability, durability, and longevity (Vitsoe, n.d.). Vitsoe furniture has sustainable features such as comprising recyclable aluminum, steel, and compostable wood and a production system that makes end-of-life furniture possible to construct, repair, and dismantle. Thus, the Vitsoe business model curbs the overconsumption tendency of consumers, contrasting to the fast-fashion phenomenon.

SOI refers to an intrinsic motivation to transform its existential goal and vision in keeping with a particular aim of making and fulfilling underlying societal and environmental needs and to internalize making products and manufacturing processes sustainably. SOI also implies that all forms of innovation, such as the evolution of products and services, technological and organizational developments, must provide environmental and societal value besides economic one, both from a positive and normative perspective to an inclusive lens gathering all stakeholders (Bos-Brouwers, 2010).

Considering the definitions mentioned above, the first three have substantially emphasized the environment and the economy by reducing harmful effects and maximizing resource efficiency. However, although sustainable innovation and eco-innovation are sometimes employed interchangeably, eco-innovation solely tackles environmental and economic concerns. In contrast, sustainable innovation includes ethical and social considerations (Kneipp et al., 2019) and has a holistic perspective with a long-term sustainable development approach (Boons et al., 2013). Furthermore, rather than other types of innovation, sustainability-oriented innovation has been linked to a balanced approach to economic, social, and environmental challenges, as well as a focus on collaborations beyond firm borders. Siqueira and Pitassi (2016) state that sustainability-oriented innovation is a broader concept than eco-innovation since it encompasses the social dimension. It is a multilevel phenomenon that requires three major forces for its promotion: at the macro level, government policies and actions that overcome the immense risks involved in radical innovations; at the company level, the development of new business models; and, at the individual level, changes in cognitive mechanisms, attitudes, and behaviors.

## **SOLUTIONS AND RECOMMENDATIONS**

As a relatively new term, “sustainability-oriented innovation” that includes a step-by-step transition of organizational alignment with sustainability, has been studied by some scholars in various contexts that include how SOI leads to better economic performance for the firm and how SOI acts as a key driver for competitiveness (Kneipp et al., 2019; Hermundsdottir & Aspelund, 2021; Weidner et al., 2021). Adams et al. (2016) described the adoption of sustainability-oriented innovations as reactive, embedding, and system building (Pellegrini et al., 2019). The reactive type concentrates on concerns like increasing efficiency and reducing harm from a limited internal integration perspective. The embedded form refers to the structured transformation of the company that involves an intrinsic motivation for sustainable innovations with an intense integration encompassing various divisions of the corporation and limited

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collaboration with stakeholders. Finally, system building primarily positions internal and external collaboration at the heart of organizational innovation approaches and establishes corporate missions based on societal expectations. As suggested in the introduction, the author notes that business enterprises must shift from reactive approaches that refer to short-termism to organizational transformation and system building strategies that show the intrinsic motivation for sustainable corporate innovations. The following practices include the adoption of sustainability-oriented innovations based on organizational transformation and system building approaches.

One of the leading companies in financial services, BBVA has exhibited good performance in organizational transformation during the COVID-19 pandemic. BBVA, a Spanish-based multinational in the top fifty, aims to build awareness about externalities on a global scale. The company uses educational activities as a leveraging tool that creates privileges even for suffering people, and thus, it supports educational programs for about 2.5 million people worldwide (Montinel et al., 2021). The Campus BBVA, a digital training interface, contributed significantly to its employees and co-workers at the beginning of the COVID-19 pandemic by cultivating intellectual capabilities for remote working, which increased the corporate competitiveness. This digital training system also allowed employees to consult to prevent pandemics and learn about governmental restrictions (Baeza, 2021). Most digital training programs are organized with leading worldwide partners like Google, LinkedIn Learning, Harvard, and Cambridge. Furthermore, the Hope Fund initiative in Chile is one of BBVA's investments in promoting microenterprise ecosystems. As a result, thousands of potential business people have been trained and supported financially in various ventures.

As an encouraging example, the D-Grade case refers to the category of organizational transformation that Desch Plantpak, the owner of D-Grade, creates fully biodegradable and compostable thermoform pots, containers, and trays for professionals who grow flowers, fruit, and vegetables. Desch Plantpak has been manufacturing sustainable products that include consuming less energy and materials, and improving workforce conditions since 2009 (Oskam et al., 2018).

Consumers have doubled their online grocery shopping since the COVID-19 pandemic shock caused lockdowns in the United Kingdom (The Guardian, 2020). Supermarkets executives believe the pandemic triggered a permanent change in consumers' shopping behaviors. Furthermore, online grocery sales reached \$96 billion amid the pandemic, with a 54% increase in the United States (eMarketer, 2021). Thus, online grocery shopping is an excellent example of organizational transformation. As a significant e-commerce retailer in Turkey, Alibaba acquired Trendyol in 2018. Considering the change in consumer habits similar to the UK and US, Trendyolgo, entered the online grocery market after the COVID-19 pandemic started in Turkey. Trendyolgo mostly manages its grocery operations with motorcycle couriers as a novelty. Thus, this innovation allowed many people to shop online while reducing contact with people during lockdown periods. Because of the need for a workforce specializing in fast delivery, Trendyolgo calls on its potential workforce to have opportunities to work with their vehicles, such as vans and motorcycles. The motorcycle couriers can work flexible hours, such as 24, 45, or 60 hours each week. The responsible business model provides a chance for suffering people from different parts of the community, such as university students and unemployed people, to stand on their own feet, which is essential during the COVID-19 pandemic (TrendyolGo, n.d.).

As an instance of 'system building,' Careem, the United Arab Emirates-oriented ride-hailing service, establishes its mission as "to simplify and improve the lives of people and build a lasting organization that inspires" (Careem, n.d.). Careem was founded in 2012 and had a technology platform for the Middle East region, operating in over 100 cities in 14 countries and employing over one million drivers. Careem

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provides gender equality in the workplace with flexible hours, extended maternity and paternity leave, and training on diversity and inclusion. Extended paternity and maternity leave in underdeveloped and developing countries, where preschool education services are relatively expensive, remains a very pivotal privilege for parents during the COVID-19 pandemic. Careem also collaborates with organizations beyond its boundaries, such as the UN Refugee Agency, to shield asylum seekers and give them sufficient opportunities to build their lives honorably. Careem's last constructive practice provides a platform that gathers donations for refugees by choosing car types. The grants meet vital needs, such as nutrient-rich foods, healthcare, and education, through the UN Refugee Agency. Reducing inequalities by supporting diversity and satisfying the essential requirements of refugees under the conditions of the COVID-19 pandemic refers to the responsible and sustainable business model of Careem. Moreover, the Careem business model leads to a meaningful structural transformation for communities and other business enterprises.

The case of Mosaic is an instructive example of system building. While the traditional implementation of solar energy investments differs from one country to another, the process starts with the foundation of legal infrastructure. Then, people buy solar panel equipment, which is generally expensive because of the importation of novelty from outside of the country. However, people have houses with roofs suitable for positioning solar panels. Unfortunately, they do not have enough financial resources to invest in photovoltaic technologies independently. Because of this situation, most people have to choose unsustainable solutions such as energy sourced from fossil fuels. Contrasting to the traditionally structured sector, Mosaic employs a transformative and destructive business model that puts together individual investors with homeowners who want to get solar panels built into their houses and pay them back over time (Inigo & Albareda, 2016). Mosaic has an online platform that matches users with financial supporters to install new solar panels by experienced labor. Mosaic reframed its purpose by providing people with clean and renewable energy, creating a win-win strategy. The purpose is a win-win situation because when homeowners get renewable energy resources, investors can get their investment back and more through the system's revenue. Finally, houses with solar panels make it possible to reduce carbon emissions.

ThredUp Inc. is an online thrift store that estimated the second-hand clothing shopping market will double within five years, reaching approximately 77 billion USD in the US by 2026 (Reuters, 2021b). It is a much greater rate than other retail markets. Considering vital elements of sustainable entrepreneurship, an increasing number of young influencers, usually Generation Z and Millennials, are making disruptive innovation attractive by giving outdated fashion clothes new life. Depop, a fashion marketplace app, is taking the sustainable shopping world by storm, boasting 30 million users across 150 countries worldwide (Depop, n.d.). It is an online hub where people buy and sell used clothing, vintage shoes, and accessories. In mid-2021, e-commerce giant Etsy acquired the ten-year-old Depop app for 1.6 billion USD, seeking to attract young shoppers. According to marketing experts, the app could pose a genuine threat to traditional retailing. In contrast to traditional retail, Depop allows vintage clothing for younger generations who are more concerned with their needs than their wants. The app also does not require an inventory cost for sellers and has excellent online mobile channels that efficiently match demand and supply sides. The Depop app builds a new sustainable business system in the retail market that makes it possible to collaborate with young people worldwide and curb overconsumption tendencies.

As mentioned earlier in the introduction section, COVID-19 has harmed millions of people worldwide. People had to meet essentials at home because of lockdowns and curfews while balancing their work from home. As a result, these habits have caused low demand for transportation modes such as flying and commuting. On the other hand, they have examined hygiene options for mobility. As a descriptive

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indicator, people have increasingly preferred digital channels that range from online grocery shopping to subscription-based digital services during the COVID-19 pandemic, and now they want mobility companies to increase their online offerings to meet these expectations (McKinsey & Company, 2021). Thus, mobility traders react to these tendencies by adapting their tactics to the appearance of ACES (autonomous driving, connected cars, electrified vehicles, and shared mobility). Because of that, they have steadily examined pandemic effects on consumption patterns and governmental and local policies straightforwardly. Today's pandemic era urges people to choose transportation modes such as EVs, e-scooters, and mopeds that come with a lower risk of infection and sustainable options, in contrast to traditional transportation preferences such as affordability, suitability, and speed. Lime has a mobile app for its mobility services and provides alternative transportation modes for urban living through vehicles such as electric bikes, electric mopeds, and electric scooters. As a system building approach, the main idea behind Lime is to transform mobility from being car-centric to being people-centric. It is a hyperlocal company because the city's restrictions depend on policymakers and local authorities. The company also hires the local workforce based on the diversity principle and collaborates with external partners to generate societal growth and improve urban living. Consequently, it is possible to create job opportunities in every market they serve during the COVID-19 pandemic. On the other hand, Lime feeds into the sustainability perceptions of people in cities with the following implementations (Lime, 2021): (1) Lime's e-scooters are charged with 100% renewable energy; (2) broken Lime e-scooters are repaired, and they reuse the remaining parts; (3) they recycle all available parts at the end of their useful life; (4) Lime riders have avoided over 1.2 million car trips in the past year; and, (5) by 2030, Lime e-scooters could prevent over 10,000 tons of carbon emissions and 300 kg of local pollution, annually.

## **FUTURE RESEARCH DIRECTIONS**

It is possible to see different sustainable innovation terms that are used interchangeably in the literature. Thus, an elaborate definition and a profound classification of sustainability-oriented innovations based on Oslo Manual (OM4) 2018 (i.e., product, process, marketing, and organizational) will provide business enterprises with a roadmap to help them choose the best level for their sustainability journey and compare the various levels.

Although organizational transformation involves fully integrated internal cooperation and limited external collaboration, system building refers to sophisticated collaborations with different stakeholders beyond organizational boundaries. Thus, distinguishing and explaining more existing practices based on organizational transformation and system building will guide business enterprises that intend to implement sustainability-oriented innovation.

## **DISCUSSION AND CONCLUSION**

It is possible to see different terms for sustainable innovation in the literature, such as green innovation, environmental innovation, social innovation, and eco-innovation. As noted earlier, sustainability-oriented innovation provides a holistic lens with a long-term perspective that goes further than the internal resources of a company to collaborations with stakeholders that can be even competitors, as well as covers

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the social, environmental, and economic dimensions of sustainability. Accordingly, this chapter provides a clear definition of sustainability-oriented innovation.

Traditional innovation methods have boosted commercialized inventions and national knowledge capacity to obtain a competitive edge and market share while squandering the planet's limited resources. Consequently, people have faced poverty caused by inequalities and disasters such as hurricanes, flash floods, and wildfires because of climate change in different parts of the world. Operational optimization is also omitted because innovations of that kind have only attempted to keep businesses from having harmful effects on the environment by following authorities' regulations and seeking to acquire efficiency gains. For example, Maersk makes new ships from old ones, thus reducing new steel consumption (Inigo & Albareda, 2016). Nonetheless, this process needs a large amount of energy to melt the old material. Another instance is Ecocement, developed by a Japanese company, a kind of cement manufactured from the city's garbage-burning clinkers (Carrillo-Hermosilla et al., 2010). However, this implementation emits carbon dioxide into the atmosphere. Accordingly, it can be inferred that while traditional innovations have harmful impacts on the environment and society, activities applying operational optimization do not seem like a good way to contribute to sustainable development. Therefore, shocks like the COVID-19 pandemic and the climate crisis require an intrinsic motivation from corporations to protect the environment and create value for society rather than incremental innovations or hypocritical innovations like greenwashing.

Considering organizational transformation, for instance, Trendyolgo has provided people with novel ways to meet their fundamental needs in online grocery shopping during the pandemic and collaborates with unemployed motorcycle and van owners to give them the means to earn money. By providing job opportunities to unemployed people and consumers to meet their basic needs within hygienic conditions during the COVID-19 pandemic, the company turns a great threat into a business opportunity via innovation. It increases its competitiveness with its responsible and sustainable business model.

Although the innovations made by business enterprises' organizational transformation strategy appear to be sufficient in terms of problem-solving in the given practices, as stated at the end of the second section, system-based innovations that replace the existing structures with radical ones appear to be the most appropriate solution to deal with the pandemic and climate crisis. Considering the case of Lime, rather than solving the transportation problem with vehicles that cover large spaces, it appears to be a more reasonable solution to have flexible, safe, and hygienic transportation options by making them human-centered, using sustainable energy, and collaborating with stakeholders in the city. Lime's innovative mobility alternatives provide consumers living in congested cities with sustainable and hygienic transportation options, giving them a significant competitive edge over other means of transportation. Therefore, the solution proposed by the company seems to be the only reasonable solution for metropolitan areas.

Last but not least, the COVID-19 pandemic is linked indirectly to the climate crisis. Many firms relocate plants and factories to China because of low-paid employees and low-cost raw materials, while exploiting finite resources to compete in global marketplaces. As a result, the wealth disparity between rich and poor people has widened. Thus, poverty-stricken people had to choose between different food sources in Wuhan, China, and then the COVID-19 pandemic erupted, affecting millions of people throughout the globe. As a result, the author proposes organizational transformation and system-building as the right paths to adopt sustainability-oriented innovations, which are critical strategies for overcoming the shocks caused by the COVID-19 pandemic and climate change.

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## KEY TERMS AND DEFINITIONS

**Circular Economy Action Plan (CEAP):** A radical transition triggered by the European Green Deal is based on co-creation with miscellaneous actors such as universities, non-governmental organizations, consumers, and communities in a circular manner.

**Eco-Innovation:** The concept refers to making substantial and measurable progress toward the objective of sustainable development by minimizing environmental effects and increasing environmental resilience.

**European Green Deal:** It is a scheme for turning climate crises and environmental threats into opportunities by covering all stakeholders in order to make the EU's economy truly sustainable.

**Green Innovation:** The notion refers to the development of goods, services, or processes that limit environmental damage, impact, and degradation while also minimizing the use of natural resources.

**Open Innovation:** It entails integrating problem-solving capabilities and information as well as seeking solutions and recommendations from individuals outside the company.

**Quadruple Helix Model:** The model expands on the triple helix model by incorporating a fourth component, citizens, which includes community and the media, into the context of interactions between the other three components.

**Responsible Research and Innovation:** RRI is a continuous method of connecting innovation and research to ethical and social issues.

**Triple Helix Model of Innovation:** It describes a series of connections between academics, business, and government that drive economic and social progress.

# Chapter 10

## Mitigation of Antibiotics in Nature: A Case Study of a Purification Device

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### ABSTRACT

*Antimicrobial medicines are taken orally or parenterally. These molecules are primarily eliminated by kidneys. However, several studies indicate that the methods of wastewater treatment are not sufficient to effectively remove these drugs from the environment, such as excreted antibiotics and antifungals in urine. Thus, antimicrobials can pollute the food chain. Mutations of bacteria and/or fungi may be responsible for the emergence of new drug resistances, with irreparable global consequences. The chapter's aim is to present a new and inventive purification device of human urine during treatment with antimicrobials. The regular use of this device by citizens during treatment with antimicrobials may lead to a reduction of more than 30% to 50% of these molecules in urine, with the reduction of antibiotic or antifungal pollution.*

### INTRODUCTION

Medicines, such as antibiotics and antifungals for human or veterinary use are usually primarily eliminated by kidneys, excreted in urine, and disseminated to the environment as residual chemical substances in wastewaters (Eyler et al., 2019; Regitano et al. 2010). Around 30%–90% of antibiotics are excreted through urine and feces within 8–24 h after being taken (Frade et al., 2014). Antibiotics are disseminated into environment (partially degraded and/or undegraded) through wastewaters leading to antibiotic pollution and resistances, while its bioremediation is a demanding task (Kumar et al., 2019). Pharmaceuticals are emerging as pollutants of water sources, with an increased risk of antimicrobial resistances. Antibiotic resistances pose a risk for both humans and animals (Center for Disease Dynamics, Economics & Policy, Inc., 2021). According to a report from the Organization for Economic Co-operation and

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Development (OECD): “antimicrobial resistance is a large and growing problem with the potential for enormous health and economic consequences globally” (Organization for Economic Co-operation and Development, 2019; Padget, 2018). Antimicrobial resistances may occur with bacteria, viruses, fungi, or parasites, as a consequence of their changes over time. These changes may generate drug resistances, which may lead to difficulties in treating infections, increase the risk of spreading infectious diseases, severe illness, and death (World Health Organization, 2022).

The use of antimicrobials is globally increasing, with the highest consumption in Low-to-Middle-Income Country (LMIC). The predominant use of antibiotics in LMIC may be explained by the fact that these medicines become more accessible and affordable. However, the access to newer and more effective antibiotics in LMIC is more limited than in developed countries. The use antibiotics increased 90% worldwide, with an impressive growth of 165% in Low-to-Middle-Income Countries between 2000 and 2015 (Center for Disease Dynamics, Economics & Policy, Inc., 2021). In the European Union (EU), health complications related to antimicrobial resistance increased between 2007 and 2015: nearly one in five infections is due to antibiotic-resistant bacteria, with 33 000 deaths out of more than 670 000 infections from antimicrobial resistant bacteria. For instance, the number of deaths associated with *K. pneumoniae* resistant to carbapenems increased six-fold. Narrow prevention and control measures are highly recommended in health care settings to mitigate the spread of this bacteria. According to the projections of Organization for Economic Co-operation and Development (OECD) antimicrobial resistance will keep growing from around 17% of infections with antibiotic resistance in 2015 to 19% in 2030 in the European Union (Cassini et al., 2019; Organization for Economic Co-operation and Development, 2019).

The consumption of antibiotics in agriculture, and veterinary medicine is also increasing. According to the data of our world in data (2015), the antibiotic use in livestock in Europe was as follows 434.2 mg (Cyprus), 402 (Spain), 322 (Italy), 97.9 mg (Germany), 70.2 mg (France), 56.7 mg (United Kingdom), 20.4 mg (Finland), 11.8 mg (Sweden), and 2.9 mg Norway. Overall, the majority of countries performed above the recommended global cap of antibiotic use in livestock (i.e., a suggested global cap of antibiotic use in livestock of 50mg/PCU (Population-Corrected Unit), which raise some concerns regarding the rational use of antibiotics in animals (Our World in Data, 2022).

Antibiotics remain as pollutants in water wastes and soils, which support the lack of effective water waste management in many countries (Nair et al., 2021; Robles-Jimenez et al., 2021). The Drug Resistance Index (DRI) measures “the average effectiveness of the set of antibiotics used to treat a given bacterial infection”, with the lowest scores for Sweden, Canada, and Norway, and the highest scores for Ecuador, Thailand, and India, respectively (Center for Disease Dynamics, Economics & Policy, Inc., 2021; Klein et al., 2019). However, DRI may not be a not a good measure of antibiotic effectiveness in relation to drug resistance since a low DRI may be the consequence of unnecessary or excessive use of broad-spectrum antibiotics (Vandenbroucke-Grauls et al., 2019). Positively, regulations and recommendations on the rational use of antibiotics have increased in the last years, despite the misuse of antibiotics in humans and/or food animal production is still a reality (Nair et al., 2021; Robles-Jimenez et al., 2021). The misuse and overuse of antimicrobials in the area of human health, low vaccination coverage, and, finally, poor water, sanitation, and hygiene infrastructure contribute to enhance the risk of infection and to a higher use of antimicrobials. These factors were identified as the main drivers of antibiotic resistance in a recent report of the Center for Disease Dynamics, Economics & Policy, Inc. (CDDEP, 2021).

Activated carbon is as an adsorption method approved by the Word Health Organization to remove pharmaceutical compounds from water, reduce the potential high toxicological risk to aquatic fauna and diminish the risk of spreading drugs into the environment (Bernal et al., 2020; Serrano et al., 2021). Many

innovative water-management technologies were developed in the last decades, such as early warning systems, remote sensing and geographical information systems, satellites, unmanned aerial vehicles (or drones), blockchain technologies, and water, loss, and sensor-based management systems (World Intellectual Property Organization, 2020). However, the current methods of treatment of effluents may not be sufficiently effective to completely remove all contaminants from the wastewater, such as antimicrobial drugs. Thus, wastewater may remain irreparably contaminated, with these molecules being disseminated to food chain. Inadequate propagation of antimicrobials to environment may contribute to the occurrence of new mutations in bacteria or fungus and, consequently, leading to the appearance of dangerous and potentially fatal drug resistances (Bila et al., 2003; Regitano et al. 2010). For instance, over 2.8 million antibiotic-resistant infections happen in the U.S. per year, which are related to 35000 deaths (Centers for Disease Control and Prevention, 2021). Some contaminants may not be biodegradable, which compromise their bioelimination after reaching nature (Barran et al., 2011; Serrano et al., 2021). When using, prescribing, dispensing, or disposing antibiotics, both individual immediate risks and long-term risks should be taken into consideration to minimize the collective global hazard of developing new antibiotic resistances (Call et al., 2013; Krockow et al., 2019). According to a report from World Health Organization (2019): “drug-resistant diseases could cause 10 million deaths each year by 2050 and damage to the economy as catastrophic as the 2008-2009 global financial crisis. By 2030, antimicrobial resistance could force up to 24 million people into extreme poverty” (World Health Organization, 2019).

Among the antibiotics, which are mainly excreted in urine are daptomycin (78% unchanged) or vancomycin (90% unchanged). Penicillin antibiotics are rapidly and actively secreted by the renal tubules, and, in general, are also eliminated unchanged in urine (Barza et al., 1976; Eyler et al., 2019). Like antibiotics, some antifungals are eliminated, with a significant renal excretion in many cases. For example, flucytosine and fluconazole have low protein binding and are mainly eliminated by the kidneys (90% flucytosine and 60 to 80% fluconazole). Additionally, some antifungals are metabolized in the liver and may be eliminated by the kidneys or feces, as follows: amphotericin B is eliminated unchanged in the urine (20%) and feces (40%). Itraconazole (54% stool and 35% urine), voriconazole (20% stool and 80% renal) or posaconazole (77% stool and 14% urine) (Bellmann & Smuszkewicz, 2017).

The threat of antimicrobial resistances is enhanced by the lack of new antibiotics. The use of antibiotics is the most explanatory factor of antibiotic resistance, while high rates of inappropriate drug use are positively related to more antibiotic resistances (Organization for Economic Co-operation and Development, 2019; Padget, 2018). The 17 sustainable development goals (SDG) were adopted at the United Nations (UN) Sustainable Development Summit in New York in September 2015. These 17 SDG were defined, as follows SDG 1 (no poverty); SDG 2 (zero hunger); SDG 3 (good health and well-being); SDG 4 (quality education); SDG 5 (gender equality); SDG 6 (clean water and sanitation); SDG 7 (affordable and clean energy); SDG 8 (decent work and economic growth); SDG 9 (industry, innovation, and infrastructure); SDG 10 (reduced inequalities); SDG 11 (sustainable cities and communities); 12 SDG (responsible consumption and production); 13 SDG (climate action); 14 SDG (life below water); 15 SDG (life on land); 16 SDG (peace, justice and strong institutions); and 17 SDG (partnership for the goals) (United Nations, 2022). Overall, the rising of antimicrobial resistances threatens the achievement of diverse Sustainable Development Goals (SDGs) related to health and poverty reduction”. A new research agenda for sustainable development needs to be defined, as a consequence of COVID-2019 pandemic. Thus, some authors recommend the adaptation and optimization of the 17 SDG because of COVID-2019 pandemic. An eventual adaptation of SDG will support a stronger response to the present societal and

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health needs, such as pollutions of water and soil by antibiotics and appearance of new antimicrobial resistances (Organization for Economic Co-operation and Development, 2019; Padget, 2018).

Among others, it is recommended to promote innovative and sustainable production patterns in societies, such as supporting the development of more innovative and sustainable inventions. Ideally, new inventions should be sustainable and contribute to human health and wellbeing (Ranjbari et al., 2021; Wang et al., 2021). In this sense, study aim was to present a new and inventive device for the treatment and purification of urine during treatment with antimicrobials essentially excreted in human urine.

## **Background**

A device for collecting and purifying human urine during the treatment with drugs essentially renally excreted, such as, antimicrobials molecules (e.g., unchanged molecules or its metabolites in urine) is purposed in the present work. This invention is not suitable for drugs mainly excreted in feces or other body fluids. The purposed purification device was developed in the scope of SDG of the UN since its use will contribute to a better public health and a more sustainable environment (Jasovský, 2016; United Nations, 2022; World Health Organization, 2017).

A limited spread of antibiotics in the environment is potentially relevant to reduce pollution and the risk of developing new antimicrobials resistances, which were estimated to lead to “4.95 million (3.62–6.57) deaths associated with bacterial antimicrobial resistance in 2019” (Antimicrobial Resistance Collaborators, 2022). It is important to highlight that the patterns of antimicrobial resistance are changing, with increasing rates of antimicrobial resistance in common infections (especially in low- and middle-income countries), and in certain infectious diseases, such as HIV, malaria, and typhoid fever. These changes may compromise the global elimination of these diseases (Center for Disease Dynamics, Economics & Policy, Inc., 2021).

## **Antibiotic Resistance: Mechanisms**

Antibiotic-resistance appeared with the discover of the first antibiotics, such as penicillin or tetracyclines. Antibiotic-resistance cumulatively and progressively increased in the last decades. Cumulative resistances lead to complex and dangerous multi-drug resistant bacteria, which are difficult to treat (Padget, 2018). Four main mechanisms of resistance were identified: 1) limiting uptake of a drug, 2) modification of a drug target, 3) inactivation of a drug, and 4) active efflux of a drug (Reygaert, 2018). The molecular basis of these mechanisms are presented, as follows: 1) efflux pumps, which are responsible for pumping antibiotic out of cell before it reaches target (effective against: Fluoroquinolones; Aminoglycosides; Tetracyclines; Beta-lactams; and Macrolides); 2) immunity and bypass, with antibiotics or antibiotic targets bound by proteins preventing antibiotic binding (effective against: Tetracyclines; Trimethoprim; Sulfonamides; and Vancomycin); 3) target modification, with antibiotic targets are modified to prevent antibiotic binding; and 4) inactivating enzymes, which destroys antibiotic through catalysation (effective against: Beta-lactams; Aminoglycosides; Macrolides; and Rifamycins) (Padget, 2018). Knowledge on the mechanisms of bacteria resistance is fundamental to develop new treatments. For instance, the co-administration of efflux pump inhibitors with antimicrobial agents may improve the efficacy of antibiotics against resistant microorganisms (Willers et al., 2017).

Resistance mechanisms may be native/intrinsic or acquired (Reygaert, 2018). Among the native/intrinsic mechanisms are *Bacteroides* (anaerobes) (intrinsic resistance: aminoglycosides, many  $\beta$ -lactams, quinolones); all *gram positives* (intrinsic resistance: aztreonam); *enterococci* (intrinsic resistance: aminoglycosides, cephalosporins, lincosamides); *Listeria monocytogenes* (intrinsic resistance: cephalosporins); all *gram negatives* (intrinsic resistance: glycopeptides, lipopeptides); *Escherichia coli* (intrinsic resistance: macrolides); *Klebsiella spp.* (intrinsic resistance: ampicillin); *Serratia marcescens* (intrinsic resistance: macrolides); *Pseudomonas aeruginosa* (intrinsic resistance: sulfonamides, ampicillin, 1st and 2nd generation cephalosporins, chloramphenicol, tetracycline); *Stenotrophomonas maltophilia* (intrinsic resistance: aminoglycosides,  $\beta$ -lactams, carbapenems, quinolones); and *Acinetobacter spp.* (intrinsic resistance: ampicillin, glycopeptides) (Reygaert, 2018).

Considering the global data from antibiotic resistance, a list of bacteria for which new antibiotics are urgently needed was published by WHO based on three priorities (critical, high, medium, and urgent), as follows (World Health Organization, 2017):

Priority 1: CRITICAL

- *Acinetobacter baumannii*, carbapenem-resistant;
- *Pseudomonas aeruginosa*, carbapenem-resistant;
- *Enterobacteriaceae*, carbapenem-resistant, extended spectrum beta-lactamase (ESBL)-producing.

Priority 2: HIGH

- *Enterococcus faecium*, vancomycin-resistant;
- *Staphylococcus aureus*, methicillin-resistant, vancomycin-intermediate and resistant;
- *Helicobacter pylori*, clarithromycin-resistant;
- *Campylobacter spp.*, fluoroquinolone-resistant;
- *Salmonellae*, fluoroquinolone-resistant;
- *Neisseria gonorrhoeae*, cephalosporin-resistant, fluoroquinolone-resistant.

Priority 3: MEDIUM

- *Streptococcus pneumoniae*, penicillin-non-susceptible;
- *Haemophilus influenzae*, ampicillin-resistant;
- *Shigella spp.*, fluoroquinolone-resistant.

Additionally, diverse bacteria and fungi were listed in the antimicrobial resistance threats report of the Centers for Disease Control and Prevention based on four categories (urgent threats, serious threats, concerning threats, and watch list) (2019):

Urgent Threats

- Carbapenem-resistant *Acinetobacter*
- *Candida auris*
- *Clostridioides difficile*
- Carbapenem-resistant *Enterobacterales*
- Drug-resistant *Neisseria gonorrhoeae*

Serious Threats

- Drug-resistant *Campylobacter*
- Drug-resistant *Candida*



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- ESBL-producing *Enterobacteriales*
- Vancomycin-resistant *Enterococci* (VRE)
- Multidrug-resistant *Pseudomonas aeruginosa*
- Drug-resistant nontyphoidal *Salmonella*
- Drug-resistant *Salmonella* serotype Typhi
- Drug-resistant *Shigella*
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Drug-resistant *Streptococcus pneumoniae*
- Drug-resistant Tuberculosis

#### Concerning Threats

- Erythromycin-Resistant *Group A Streptococcus*
- Clindamycin-resistant *Group B Streptococcus*

#### Watch List

- Azole-resistant *Aspergillus fumigatus*
- Drug-resistant *Mycoplasma genitalium*
- Drug-resistant *Bordetella pertussis*

Positively, there are 252 agents under development to treat the priority pathogens of WHO list (2017), although only 2 to 5 products will become available over the following 10 years (or more). This research is mainly carried out by medium-sized enterprises since the pharmaceutical companies continues to not show interest in the development of new antibiotics (United Nations, 2017).

### **Renal Excretion: Urine**

A healthy adult, who practice a normal diet produces between 1000 and 2000 ml of urine per day (Lab-Center, 2019). Usually, urine is a white to yellowish liquid, excreted through the urethra. It is possible to distinguish between freshly collected urine and stored urine since urea decomposes in the last one generating a characteristic smell. The pH of urine may vary between 4.5 and 8, while the normal pH is slightly acidic: 5.5 to 6.5 (Hospital Fernando Fonseca, 2012). The stored urine presents the following characteristics: pH of 8.9, with eight main ionic species ( $> 0.1 \text{ meq L}^{-1}$ ), the cations Na, K,  $\text{NH}_4$ , Ca and the anions Cl,  $\text{SO}_4$ ,  $\text{PO}_4$  and  $\text{HCO}_3$ . Nitrogen is in the form of ammoniacal N ( $>90\%$ ), with ammonium bicarbonate as the dominant compound (Kirchmann et al., 1994). Most of the molecules of antibiotics are excreted in urine, usually after hepatic metabolism. The hepatic metabolization ensures that antibiotics become hydrophilic molecules and, consequently turn out to be, soluble in urine (Aldred et al., 2009).

Among the antibiotic molecules that are excreted in urine are fluoroquinolones (ciprofloxacin 40-50%; levofloxacin 87%; moxifloxacin 40% including metabolites; ofloxacin 65-80% and gemifloxacin 60-70%); carbapenems (70% imipenem; 70% meropenem or 97.2% doripenem) or penicillins (cloxacillin  $> 90\%$ ; dicloxacillin  $> 90\%$  or ampicillin 65%) (Baietto et al., 2014). Importantly, antibiotic-resistant bacteria and genes are maintained during collection and storage of human urine (e.g., sulfonamides, tetracyclines, and fluoroquinolones). Some molecules of antifungals are also renally eliminated, such as: fluconazole (60 to 80%); flucytosine (90%) or itraconazole (35% as metabolites) (Bellmann, 2007; Zhou et al., 2021). Fungal resistance to antimicrobials was also reported. For instance, resistance to flucon-

azole was observed with *C. tropicalis*, *C. albicans*, *C. glabrata*, and *Trichosporon species*, respectively in human urine (Singla et al., 2012).

## Water Treatment

Wastewater treatment *per se* is not capable of fully eliminating the micropollutants, such as antibiotics, which are continually discharged into the environment in low doses (Kim and Carlson, 2006; Kumar et al., 2019; He et al., 2018). Importantly, some antibiotics present a low molecular weight (<1000 D), which support its likely persistence and recalcitrance in the environment (e.g., beta-lactams, aminoglycosides, lincosamides, macrolides, nitrofurans, amphenicols, phosphonates, quinolones, and fluoroquinolones, rifamycins, sulfonamides, and tetracyclines) and their isomers (Krzeminski et al., 2018; Kumar et al., 2019).

Narrow and broad-spectrum antibiotics were globally detected in different environmental samples, such as water and soils (Kumar et al., 2019; Liu et al., 2021). These contaminants may be easily transmitted to humans via food chains (Kumar et al., 2019; Manyi-Loh et al., 2018). The presence of antibiotic residues in food or water may lead to severe consequences in human and/or animals (Manyi-Loh et al., 2018). For instance, the presence of enrofloxacin as a residue in chicken tissues may lead to “allergic hypersensitivity reactions or toxic effects, phototoxic skin reactions, chondrotoxic, and tendon rupture” (Tavakoli et al., 2015); the presence of quinolones as a residue in chicken or beef may lead to “allergic hypersensitivity reactions or toxic effects (phototoxic skin reactions, chondrotoxic) and tendon rupture” (Er et al., 2013); the presence of amoxicillin in milk or eggs may lead to “carcinogenic, teratogenic, and mutagenic effects” (Chowdhury et al., 2013); the presence of Penicillin G in fresh milk, cheese (wara), or fermented milk (nono) may lead to “allergy (hypersensitivity reaction) ranging from mild skin rash to life-threatening anaphylaxis” (Olatoye et al., 2016); or the presence of sulfadimidine or sulfamethoxazole in raw milk may lead to “carcinogenicity and allergic reactions” (Nirala et al., 2017).

Antibiotics may enter into the environment through diverse routes, such as urban, industrial, or agricultural wastewaters. The most significant route of spread of antimicrobials into the environment is the wastewater treatment plants (WWTP) since the molecules of antibiotics are only partially metabolized after consumption by humans or animals. For instance, for  $\beta$ -lactams, quinolones, tetracyclines, phenicols and trimethoprim (more than 50% of these antibiotics are excreted) or ciprofloxacin (sulfociprofloxacin, oxociprofloxacin, desethyle ciprofloxacin and formylciprofloxacin), with an excretion of only 19% as active metabolites (Sanseverino et al., 2018). Excreted antibiotics (or their metabolites) are eliminated by the sewage system to the WWTP, and, consequently, reaching the natural aquatic systems, such as surface waters and soils and the sewage sludge. The persistence of antibiotics in the environment is variable, with some of them presenting the ability of reaching drinking water (Kraemer et al., 2019; Sanseverino et al., 2018). For instance, some plants are capable of reducing the content of pollutants in the aqueous environment. Plants may take up antibiotics from water and/or sediments through roots, stems, and leaves, with the consequent transport of these molecules through transpiration or degradation by microorganisms enriched by the roots (Li et al., 2021; Susarla et al., 2002). However, this biodegradation is not fully effective. Among the most detected antibiotics in the environment are quinolones, sulphonamides and trimethoprim (Kraemer et al., 2019; Sanseverino et al., 2018).

An efficient access to clean water and sanitation infrastructures remains a global problem, especially in LMICs, with nearly 500,000 deaths each year from waterborne diarrheal diseases (Center for Disease Dynamics, Economics & Policy, Inc., 2021; World Health Organization, 2022). Only, 71% of the global

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population have access to a safety water service (free from contaminations) in 2017. Least developed countries face diverse problems in water supply: no water service (22% of health care facilities), no sanitation service (21%), and no waste management service (22%) (World Health Organization, 2022).

In developed countries, such as the European Union, the contamination of antibiotics in drinking water is low (ng/L). According to WHO, low levels of pharmaceuticals in drinking water are unlikely to constitute a risk to human health, although the monitorization of antibiotics in drinking water is recommended. For instance, low quantities of antibiotics in drinking water are likely to potentiate the likelihood of appearance of new bacterial mutants. Research reporting of the dosage of antibiotics in drinking water is limited, and the health consequences related to a long period of exposition to antibiotics through the ingestion of drinking water is not known (Kraemer et al., 2019; Sanseverino et al., 2018).

Besides the potential development of antibiotic resistances due to the presence of antimicrobials in the environment, antibiotics pollution may directly and indirectly affect human and ecosystem health. The presence of antibiotics in aquatic or land environments may inhibit the functions of all living organisms in these ecosystems, and reach humans through the ingestion of contaminated food. In human, the long-term effect of this exposure is unknown, although some epidemiologic studies suggest the appearance of chronic conditions including obesity, diabetes, and asthma due to chronic exposure to low doses of antimicrobials. Thus, the impact of antibiotic pollution on humans and on the environment, plus its contribution to antibiotic resistance must be considered in future studies. In this sense, efficient policies must be developed and implemented to face both problems (i.e., antimicrobial resistances and environmental pollution) since, currently, environmental policies are mainly focus on surveilling the presence of antibiotics in the environment (Kraemer et al., 2019).

Therefore, OECD provided some policy recommendations on how to address pharmaceutical residues in freshwater, as follows: targeted monitoring and assessment strategies should be applied to identify potential existing and new active pharmaceutical ingredients, which should be compared with other pollutants (e.g., heavy metals, persistent organic pollutants and other contaminants of emerging concern); suitable monitoring modelling methods as well as decision-support tools should be applied to better understand and predict the risks; data and information should be disseminated; institutional coordination is required to implement and monitor all adopted strategies; decisions should be taken based on scientific evidence; public awareness and understanding on the present topic should be perceived and raised; and all decisions should preferably be cost-effective. Finally, the approval of new medicines should require the development, definition, and implementation of strategies for collecting and disposing medicines as well as strategies of wastewater treatment and reuse. Diverse interventive measures were purposed, such as assessment of environmental risk of medicines, facilitate the access to data, evaluation of the environmental risks in the risk-benefit analysis, implementation of mitigation measure, or improvement of the risk management options. The purposed policies should ensure a cost-effectively management of pharmaceuticals and the protection of water quality and freshwater ecosystems through the application of five strategies (Table 1) (Organization for Economic Co-operation and Development, 2019).

## **ACTIVATED CARBON: CHARACTERISTICS AND POSSIBLE APPLICATIONS**

There are diverse antibiotic treatment techniques for the degradation/elimination of antibiotics, such as physical adsorption, chemical oxidation, photodegradation, and biodegradation. Particularly, the physical adsorption is based on “the adsorption of antibiotic molecules on the adsorbent through intermolecular

Table 1. Five purposed strategies from OECD to ensure a cost-effectively management of pharmaceuticals and the protection of water quality and freshwater ecosystems (Organization for Economic Co-operation and Development, 2019)

Number	OECD strategies
1.	<i>Reporting on the occurrence, fate, and risks of pharmaceutical residues in water bodies, consideration of environmental risks in the risk-benefit analysis pre-authorization of new pharmaceuticals, and continued monitoring of high-risk pharmaceuticals post-authorization (including of those already approved on the market).</i>
2.	<i>Source-directed approaches to impose, incentivize or encourage measures in order to prevent the release of pharmaceuticals into water bodies.</i>
3.	<i>Use-orientated approaches to impose, incentivize or encourage reductions in the inappropriate and excessive consumption of pharmaceuticals.</i>
4.	<i>End-of-pipe measures – as a compliment to strategies 1-3 - that impose, incentivize or encourage improved waste and wastewater treatment to remove pharmaceutical residues after their use or release into the aquatic environment.</i>
5.	<i>A collaborative life cycle approach, combining the four strategies above and involving several policy sectors.</i>

forces”, which may be carried out with activated carbon, modified activated carbon, and other molecular sieve pore structure substances (Liu et al., 2021). Activated carbon or activated charcoal is a highly porous form of carbon, with a surface area from 950 to 2000m<sup>2</sup>/g. Activated carbon is capable of adsorbing molecules with a molecular weight of 100 to 1000 daltons (Lu & Xue, 2019). Among other applications, it may be used as an adsorbent substance, for example in the treatment of wastewater or in the case of drug overdose intoxications (e.g., 50 g orally) (Guss, 1989; Müller et al., 2009).

Activated carbon is widely applied as adsorbent of antibiotics and other chemical substances, regarding its large specific surface area. Furthermore, activated carbon is very effective in adsorbing molecules of antibiotics (Ahmed, 2017). The removal of some drugs, such as atenolol, paracetamol, and ampicillin from human urine with activated charcoal by adsorption was already reported and demonstrated. The best results in the adsorption tests were found, with a pH 4 to 8 and adsorbent solid concentration of 10 gL<sup>-1</sup> for the three drugs. For instance, ampicillin adsorption was tested, within the following range ampicillin 0 – 880 mg L<sup>-1</sup> (Haro, 2017). In another study, the remotion of sulfamethoxazole in an aqueous solution was possible with activated charcoal. An efficiency of 96 to 98% was achieved at a room temperature of 25°C and 39.67 mg.g<sup>-1</sup> (Fonseca, 2017).

## MAIN FOCUS OF THE CHAPTER

The main focus of the chapter is the presentation of a device for collecting and purifying urine while taking drugs that are essentially excreted in human urine, such as antibiotics or antifungals. This device (Figure 1) can be used to purify the urine of a patient taking any drug or molecule that is significantly excreted in urine, such as antimicrobials or antifungals. The present invention is also related to the method of collecting and purifying urine through the use of this purification device. Overall, the concentration of antimicrobials or its metabolites may be reduced in at least 30% to 50% in human urine. Metabolism data/information of commercialized medicines is freely available in the summary of drug characteristics, for instance information on “absorption, distribution, metabolism, and excretion” (ADME) of medicines,

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such as antibiotics or antifungals (Pires et al., 2015). This information is relevant to identify the drugs essentially excreted in urine.

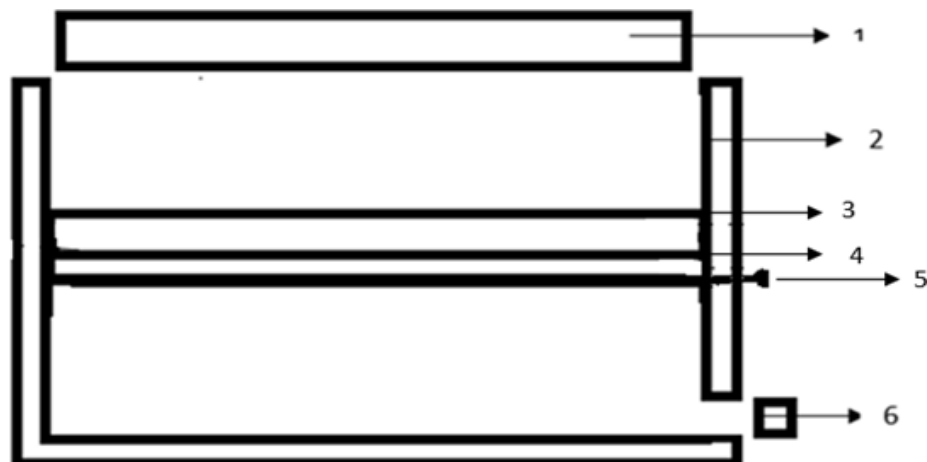
The purification device is composed of the following elements: (1) a container top cover, (2) a container; (3) a first horizontal division e.g., a wire mesh; (4) a second horizontal division e.g., a wire mesh; (5) a third removable horizontal division with a handle e.g., in polyethylene, plastic, biodegradable materials, metal or a light metal alloy, and a (6) bottom cover (Figure 1). Additional, horizontal divisions may be considered in this device (Figure 1).

## SOLUTIONS AND RECOMMENDATIONS

### Purification Device

The solution was the conceptual design of a purification device, which is presented in Figure 1. The device is composed of a container top cover (1) on the upper part of the container; a container (2); at least a first horizontal division within the container, which is fixed (3) (e.g. a wire mesh); at least one second horizontal division inside the container, which is fixed (4) (e.g. a wire mesh) and at least one third horizontal division inside the container with a handle at the end (5) (e.g. in polyethylene, plastic, biodegradable materials, metal or a light metal alloy), which can be moved horizontally to the outside of the container, and a cover (6) at the bottom of the container. The three horizontal divisions (3) (4) (5) are adjacent to each other and separate the upper and lower part of the container (2). The device may comprise additional horizontal divisions (if necessary). The purification device may be used for 1 to 10 consecutive days; after this period, it must be replaced by another device.

Figure 1. Purification device of urine



## Materials of the Purification Device

Preferably, ecological, and sustainable materials should be used to construct the purification device. Some materials are suggested, as follows:

- The container (2), the container top cover (1) and the container bottom cover (6) can be made of polyethylene, plastic, biodegradable materials, metal, or a light metal alloy;
- The first and second horizontal divisions (3) and (4) (fixed divisions) are composed of a metal mesh, polyethylene, plastic, biodegradable materials, metal, or a perforated light metal alloy;
- The activated carbon is deposited between the first and second division (3) (4) (which are fixed) (20-500 g of activated charcoal);
- The third horizontal division inside the container comprise a handle at the end (5), which can be moved horizontally to the outside of the container. This third horizontal division is composed of polyethylene, plastic, biodegradable materials, metal or a light metal alloy (not perforated materials), and;
- The purification device may comprise more than third horizontal divisions (fixed and/or movable divisions).

## Recommendations on the Use of the Purification Device

The process of purification of human urine is composed of steps 1 to 10, as follows:

1. Collection of urine: the user may urinate directly into the container (2) when he/she is taking certain drugs essentially excreted in the urine, such as antibiotics or antifungals; alternatively, the urine may be collected in other device and, after introduced into the purification device of urine;
2. The urine must remain in the container at least until all the urine in the upper division of the container (2) drains into the bottom division of this device; for this purpose, the user can remove the top cap (1) and visually observe the presence/absence of urine in the container (2);
3. The time of contact of urine with activated charcoal may be until all the urine flows from the top to the bottom of the container; alternatively, the time of contact of urine with the activated charcoal should be at least one to two hours if the third division with the handle stay closed (5); after, the third horizontal division (5) must be moved, i.e., the user is required to move horizontally to the outside of the container this division, which will allow the flow of urine from the top to the bottom of the container (2);
4. The user should remove the second cover of the bottom (6) of the device to drop the urine into the toilet, and, finally, flush the toilet;
5. The purification device should be cleaned with water: clean water should be added into the container after removing the container top cover (1);
6. The user is required to wait at least a few minutes to allow the flow of the dirty water from the top to the bottom of the container; after, the user may remove the top cap (1) and visually observe whether the water has already drained (or not) into the bottom of the container;
7. The dirty water should be dropped into the toilet after removing the bottom cover (6), and, finally, flush the toilet;

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8. The steps (i) to (vii) should be repeated during the treatment with a medicine essentially excreted in the urine, such as an antibiotic or antifungal and/or other antimicrobials;
9. The purification device may be used for 1 to 10 consecutive days;
10. Recycling of the purification device: the container should be delivered for recycling. Community or hospital pharmacies frequently receive medicines and/or medical devices for recycling (Kusturica et al., 2012; McRae et al., 2021). Thus, these pharmacies may also accept these purification devices for recycling. The purposed purification device may be replaced by a new one (if applicable), such as in the case of longer treatments (more than 10 days). Purification devices should be recycled through an appropriate treatment according to the type of waste/materials. Alternatively, the container may be carbonized to eliminate any residue of adsorbed drugs (or other substances) on the activated carbon or elsewhere in the container.

## **Example of an Application**

The adsorption capacity of the activated charcoal and the % of excreted antibiotic needs to be considered in experiments. For instance, a patient taking 500 mg ampicillin orally (single dose) will excrete about 34% of this antibiotic unchanged after 8 h (Gordon et al., 1972; Haro, 2017), which correspond approximately to 170 mg of ampicillin in 250 ml of urine (0.68 mg/ml) (if 1 L urine in 24 h) or 170 mg of ampicillin in 500 ml of urine (0.34 mg/ml) in 8 h (if 2 L urine in 24h). The urine of this patient should be collected into the purification device (as described in the section “use of the purification device”). The urine needs to be in contact with the activated charcoal until the moment of a new miction. The removable division (5) should be moved to let the flow of urine from the top to the bottom of the container (2). Finally, the urine is dropped from the purification device into the toilet and, after the device needs to be cleaned with water. In this process, it is possible to achieve a reduction in the concentration of ampicillin in the urine of at least 30 to 50%.

## **Issues, Controversies, Problems**

In this section, the potential strengths and weakness of the purification device are described and discussed.

### **Potential Strengths of the Purification Device**

The selected adsorbent material (i.e., activate carbon) is associated with a simple preparation, no high technical requirements, simple operation, a large specific surface area, and a strong capacity for antibiotic adsorption (Li et al., 2021). The purposed purification device allows a relevant reduction of the concentration of drugs (or their metabolites) in urine (30 to 50% reduction). Thus, the risks of spreading antibiotics in nature as well as the risk of developing new antibiotic or antimicrobial resistances will be reduced. The purposed purification device is an ecological and green invention in line with the principles of the United Nations’ sustainable development goals (United Nations, 2015). Preferably, this purification device should be constructed in ecological and recyclable materials. .

Additionally, adsorbents, such as activated carbon are low-cost materials that are capable of adsorbing small molecules, such as, heavy metal ions and toxic substances such as dyes (Liu et al., 2021). Thus, the use of the purposed purification device is likely to reduce the concentration in human urine of other pollutants and dangerous substances, such as, heavy metal ions and toxic substances.

Ideally, this purification device may be available for free when physicians prescribe a certain antimicrobial medicine essentially excreted in urine. The free supply of this device may be supported by governments or laboratories, with a likely higher patients' adherence to the present purification procedure. Economic growth and sustainability should be reconciled since sustainability and/or achieving international SDG are likely to be associated with more costs (i.e., sustainability measures may be expensive and associated with additional costs) (Schütte, 2018).

## Potential Weaknesses of the Purification Device

The present purification device is not 100% efficient, which may be explained by the weak intermolecular interaction between antimicrobial molecules and the activated carbon (Li et al., 2021). Additionally, the purposed device is intended for use during a limited timeframe (i.e., 1 to 10 days). Thus, it needs to be recycled, which may be a disadvantage, for instance in locals without recycling units (Kwenda et al., 2022). Eco-innovative solutions are necessary to intelligibly face and manage waste accumulation (Rena et al., 2022). Purification devices should be recycled and reused aiming at contributing for a circular economy. Circular economic principles and an effective solid waste management strategy should be considered for improving sustainability at global level (Ferronato et al., 2019). Overall, the recycling process of the purification device should ensure the total elimination of contaminants from the environment and follow an ecological and sustainable procedure. Detailed experimental data on the purification of human urine are limited since this invention was only conceptually created.

Patients will be required to buy a purification device of urine when taking medicines essentially excreted in urine, such as antibiotics or antifungals (if the purification device will not be freely available). Costs for patients will necessarily increase, which constitute another potential disadvantage of the present invention.

Additionally, the elimination procedures of antimicrobials present some limitations, as follows: the physical adsorption is not capable of degrading antibiotics, the chemical oxidation is likely to produce secondary pollution, and the photodegradation is expensive. Besides physical adsorption, chemical oxidation, or photodegradation, other degradation techniques of antibiotics are currently receiving an increasing attention, such as biodegradation. Biodegradation present diverse advantages, regarding the process of degradation of antibiotics, such as low cost, ease of operation, and lack of secondary pollution. Thus, degradation techniques of antimicrobials by enzymes could become the key model/paradigm for mitigating pollution by antibiotics in the environment in future (Liu et al., 2021).

## FUTURE RESEARCH DIRECTIONS

Purification devices to reduce the concentration of other drugs may be developed, such as to promote the reduction of anticancer drugs in urine. Residues of chemotherapy represent a significant ecotoxicological risks to the environment since many of these residues may be carcinogenic, mutagenic, and teratogenic (Zhang et al., 2013). Ideally, urine should be fully purified (i.e., a 100% reduction of drugs or their metabolites in urine). Thus, more efficient devices should be developed and tested.

Moreover, opinion surveys on the purposed purification device and a pilot study in real settings are recommended to check the practical benefit and acceptance of this invention by patients. Besides the development of new technologies, other factors, such as political, cultural, social, or economic should be



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understood to successfully operate and implement the use and/or application of new inventions in society (Kiparsky et al., 2013). New guidance and/or regulations may be required to implement and commercialize this device (or other related devices). The real impact on the environmental reduction of antibiotics, as consequence of using the present device should be evaluated. For instance, through the application of the Drug Resistance Index (DRI). Further studies are recommended.

## **CONCLUSION**

The purposed purification device is capable of reducing 30 to 50% the concentration of antimicrobials in human urine. The purification of urine before its elimination through the toilet will contribute to reduce the spread of drugs/chemicals into the environment. This procedure will minimize the risk of environmental pollution and antimicrobial resistances. The purification device should be recycled after being used.

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## **KEY TERMS AND DEFINITIONS**

**Antibiotic:** Active compounds against bacteria. These antimicrobial substances are capable of destroying or slowing down the growth of bacteria.

**Antibiotic Resistance:** When microorganisms, such as bacteria or fungi acquire the capability of resisting to the antimicrobial action of antibiotics through mutations.

**Human Urine:** Urine is a white to yellowish liquid, excreted through the urethra.

**Inventions:** A technical solution to solve a specific technical problem.

**Patents:** Patents are an exclusive right over a certain invention (products, their uses or process). Patents ensure the exclusive right to produce or commercialize a certain product. Patents comprise all the technical characteristics of a certain invention. Preferably, examples of the invention should be described. Patent applications are submitted to national or international Industrial Property Institutes, which are responsible for assessing the patentability of a certain invention.

**Purification:** Any process that results in the reduction or elimination of impurities.

**Research and Development:** Scientific investigations that may led to new and inventive products and/or process.

# Chapter 11

## Scenario of Early Childhood Education in Rural India

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### **ABSTRACT**

*SDG-4 is composed of seven outcome targets and three means of implementation, and early childhood education is one of them. It has been mentioned that by 2030, we should ensure that all children have access to quality early childhood upliftment, care, and pre-primary education so that children are prepared for primary education. Early childhood education aims at the overall development of a child's cognitive, social, and physical needs to a broader foundation for lifelong learning and wellbeing. Though India has taken some strategic policy to the development of early childhood education, the COVID-19 pandemic has disrupted all the ongoing processes. In this context, the main objective of this chapter is to analyze the early childhood education status in rural India. The study also focused on the impact of mother's education in early childhood education. Due to COVID-19, the childhood education has affected a lot, and hence, the authors analyze the pandemic's impact on early childhood education in India.*

### **INTRODUCTION**

The first age 4 - 8 years of the child's life, known as the early childhood stages, is globally acknowledged as the most critical years for lifelong development since the momentum of development during these years is enormously rapid. This early childhood stage is also important as a foundation for inculcating social and personal habits and values that are known to last a lifetime. Quality time investing in these early years to ensure an enabling environment for every child which will impact, in the long term, on the quality of human capital available to a country. Many events have contributed to the worship of the sharpness of the early childhood years for a country's economic progress throughout the world. The beginnings of improvement in child behaviour started with the United Nations Convention on the Child's Rights in 1989. For the first time, there is a group of international standards and measurements intended to conserve and raise the well-being of children in the community. The second important event that

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drew consideration to the issue of early babyhood was the formation of the Human Development Index (HDI), a brief measure of human development, by the United Nations Development Programme (UNDP) in 1990. The HDI measures the gain of countries on three initial dimensions of human development: (i) a long and hygienic life; (ii) knowledge; and (iii) a different standard of living; The basic purpose of the ICDS program is to provide a holistic child development by education, integrating health and nutrition for children. Under the ICDS scheme, children receive supplementary food, health screening, growth, non-formal pre-school education, growth monitoring, and access to health care services such as immunization and vitamin A supplements. Additionally, children's mothers under ICDS programs receive hygiene education and nutrition while pregnant and receive supplementary food from mothers. Universal early childhood education in developing countries like India is a relatively recent development. Throughout in Indian history, formal education for children was very limited. Mass illiteracy among children and low awareness of families had a cumulative impact on the unequal distribution of educational opportunities. The systematic attempt and consciousness to educate the children from all portions of society began in 1937 with Gandhi's educational philosophy. Gandhi's basic education scheme was intended to set up compulsory and free education at the national level. After Maria Montessori's visit to India in 1939 implemented the foundations of pre-school education all over India, teachers were trained through Montessori's method of education. Some major books were converted into many Indian languages. Nowadays, there are many Montessori pre-schools in India; some schools in Delhi and Mumbai are affiliated with Montessori International. Early childhood education had a vast focus of all major commissions and committees established by all governments of post-independent India. In 1953, the Committee on Early Childhood Education recognized some limitations of leaving whole responsibility for early childhood education with parents, and they recommended the inclusion of pre-primary classes in existing primary schools. The national committee on Child Care 1963-64 recommended a holistic overhaul of pre-school educational principles and philosophy to bring programs into line with the needs of Indian society. This child care committee also recommended introducing of mid-day meals in pre-school programs. Again in 1964, the Kothari Commission of India suggested establishing a state-level pre-primary education center. After ten years, The National Policy on Children 1974 formally defined *early childhood education* as providing both education and care to all children in India, especially to those populations where children were the first-generation school attendees. As per the National Policy on Education 1986, early childhood education was considered a cordial factor for compulsory primary education and human resources development in general. Throughout in Indian history, children have constantly enjoyed an eminent status in society. In India, childhood age is regarded as an enjoyable and unique period in human life, so children are favoured by the other adults in the family and in the community. Informal children's learning in a natural atmosphere through play, songs, dance, and talk is an important component for the children's responsibilities of adults and older children in India. However, the need for more structured early childhood education programs and regular government involvement in the education of young children is rapidly emerging. At present world is facing major challenges from the outbreak of covid-19. India is the second largest country in the world as per its population. More than 130 crore people are living here. The pandemic wave has gradually reached India; though India's infection rate was high, but the mortality rate is low compared to the world. Consequently, the government has to decide to give nationwide lockdown to reduce the transmission of the diseases, but later it has extended with time. Hence, with the affection of all economic activity education sector is also disrupted all over India, especially early years education has affected in a bad way because in this

stage children are not only learning from the syllabus they mostly learn from the surrounding homely atmosphere, but due to covid-19, this has stopped. Therefore, the issues need to be analyzed profoundly in the current scenario of early childhood education in rural India.

## **REVIEW OF THE LITERATURE**

The researcher has gone through some existing literature in the concerned area for the purpose of the study. In terms of factors that affect household decision-making, there is literature that specifies the importance of the wife's level of education for important household decisions involving the allocation of all resources. Specifically, the mother's education level seems to have a positive and significant relationship with her children's health, nutrition, and education (Hill and King, 1995). Behrman et al. (2004) studies on pre-school education among some educational programs discussed the expected benefits of such programs in Bolivia. Programs on early childhood education in developed countries give more importance and also found much research on it. The economic case for mention above programs can make on two grounds. The first is equity; individuals who begin life with unequal endowments of human resources are likely to end with unequal outcomes in terms of income growth, employment, etc. A government that always seeks to deal with inequality on outcomes can seek to do so by trying to equalize starting points or initial endowments of human capital (Currie, 2001). Walter K. (2018) studies on the home environment of a secondary school student who could either support or retard their academic performance. The researcher investigated how the home environment is an influencing factor on students' academic performance. Homely environment dominance factors like parental occupation, parents' education level etc. The study revealed that on students' academic performances, the parental occupation worked as a significant role, but parental education level had no significant effect on students' score improvement. McIntosh, (2008) in Canada it is observed that parental education level was an indication of children intellectual ability for a large number of reasons like serving as a better role model in future life, ambitious, promoting upstanding behaviour, and methodical, all of which were likely to contribute to making the child more successful at all school and other fields. Mehta et al. (2012) discussed on interregional disparities in the quality of primary level education in rural India. Their analysis found that Kerala was the only state that scores the highest in all the three indices, whereas states like Assam, Bihar, Uttar Pradesh, Odisha, Jharkhand, and most North Eastern states are at the bottom. Vanitha's (2016) study on the quality of primary education has been compromised with its universality in India and discussed the students' reading fluency and specified whether the quality education among students exists or not in government primary schools in India. Dubow E. et al. (2009) focus on particularly the predictive importance of the parent's level of education during mid-childhood, children's IQ, and controlling other indices of socioeconomic status. The researcher found that low family interactions cause late improvement in adolescents of the child. Also, studies in Kenya by Onderi (2014) found that parental level of education contributed to students' academic performance, a similar study by Ntitika (2014) found that parental level of education affects students' academic performance. Furthermore, studies in Kenya by: Ogweno, et al (2014) observed there is a positive correlation between level of education of the mother and students' academic performance; Makewa, et al (2012) established parental level of education which influence the academic performance among pupils in all level. Finally, in the studies conducted in Nigeria by Muruwei, (2011) and Alokun, (2013) established that parental level of education had a great influence on students' academic performance. (Saha, Mandal, and Kotal 2020) aims to analyze both the positive

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and negative impact of covid-19 on the Indian education system and the study also tries to find out the revival strategy from the pandemic, which help to get back the previous situation. (Accountability Initiative. 2021) discussed on the impact of the covid-19 mainly on public school education; the researcher here also focussed on pre and post-pandemic situations highlighting the government launched the digital platform in India. Jena (2020) shows how the Indian education sector was affected by the pandemic and investigates the advantages and disadvantages of the pandemic and the government's initiatives to tackle the situation. Mahapatra and Sharma (2021) mention various psychosocial issues due to covid-19, which have emerged leading stress of academic activity amongst children and adolescent students as well in India. Kumar (2021) also highlights how the covid-19 pandemic affected the education system globally; the author gives an overview of the experience gained by the student and learned a lesson from the existing situation considering the countries like India, USA, Dubai, Bangladesh, and Indonesia. The study focused on how closures of all educational institutes due to pandemics suffer students, teachers, and families and view the economic and social consequences.

Based on the above extensive existing investigation, the researcher has noted that in the Indian context, maximum studies going on higher education or primary education but in early childhood education have very few literatures. The lack of literature highlighted the quality of early childhood education and how parental education correlated with children. In the early years, especially mothers have a prominent role in the child, and better relations with the mother may directly affect children's education, hence focused on mothers' education. This study attempted to overview early childhood education in rural India as per the Annual Status of Education Report (ASER) with other published reports and explored the covid-19 impact on early childhood education in rural India.

## **OBJECTIVES**

1. To analyze the early childhood education status in India
2. To see the impact of mother education in early childhood education in India
3. Covid-19 impact on early childhood education in India

## **METHODOLOGY**

The study's data and information were collected from various secondary sources like reports and articles published by national and international agencies on early childhood education. The reports like the Annual Status of Education Report (ASER) especially focused on Indian rural early childhood education. It's a citizen-led household survey provides nationally representative estimates of children's schooling status and their foundational reading and arithmetic skills. The reports and some articles are also studied to describe the Covid-19 impact on early childhood education in India.

## FINDINGS AND DISCUSSION

### Pre-School and School Enrollment Patterns

Early Years Education is one of the part Sustainable Development Goals (SDGs) planned for 2030 among all the countries around the globe. The Target by 2030, country's should ensure that all young children have to access to quality early childhood development, care, and pre-primary education so that they are ready for primary education". Many research revealed that the early years including children aged 0-8 years, have proved to be a very crucial period and life-long learning is formed at this stage also 90% of all brain developments taking place. In India, there are two stages that help to achieve the aim operated by the National Policy which includes 1.3 million Anganwadi Centres run by the Ministry of Women and Child Development across the country. Another includes the burgeoning private ownership sector, with approximately 40 percent of privately involved primary schools reportedly offering pre-primary LKG and UKG classes as well. It also observed some states offering a third possibility as well, in the formation of pre-school classes integrated with the govt. primary schools like Assam Jammu & Kashmir etc.

As per the ASER report 2019, it is seen at the age 4 maximum number of children are enrolled in Anganwadi Centre that is 44.2 percent and the maximum remaining child are enrolled in LKG/UKG which is operating by private ownership agencies. At the age of 4 children, the number of the enrolled children is very few in both government and private school which is 2.9 and 1.9 percent respectively. From the report, it is observed that even though the government is taking initiative on early year's education the number of non-enrolled children in school is not negligible that is 8.7 percent. Table 1 also seen that when the age of the children is increasing the number of non-enrolled children is decreasing. When the age of the children increases another thing is seen that the number of children enrolled in pre-primary school is decreasing but the government, as well as private school enrollment, are increasing which is shown in table 1.

Table 2 revealed the sex-wise enrollment status in government as well as private pre-school and school as per their age. At the age of 4-5, it is observed that boys are enrollment proportion is more or less equal in government and private pre-school that is 50-50 but in the case of the girl child, the enrollment percentage is 56.8 percent in a government school and 43.2 percent in private school. In the children age 6-8, the scenario is also the same that is girl child is more enrolling in government school as compared with boys' child which is clearly shown in table 2.

*Table 1. Percentage of pre-school and school enrollment by age 4-8 in India, 2019*

Age	Pre-school			School			Not enrolled	Total
	Anganwadi	Govt. Pre-primary	Pvt./LKG/UKG	Govt.	Pvt.	Other		
Age 4	44.2	5.6	36.7	2.9	1.9	0	8.7	100
Age 5	26.2	5.3	40.6	16.7	7.2	0	4	100
Age 6	5.8	4.4	23.2	40.7	23.6	0	2.1	100
Age 7	1	1	8.3	54.3	34.5	0.1	0.8	100
Age 8	0.4	0.4	2.8	59	36.7	0.1	0.6	100

Source: ASER Report, 2019

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Table 2. Percentage of children age 4-8 enrolled in different types of pre-schools and schools by sex in India, 2019

Sex	Age 4-5		Age 6-8	
	Govt.	Pvt.	Govt.	Pvt.
Boys	50.4	49.6	52.1	47.9
Girls	56.8	43.2	61.1	39

Source: ASER Report, 2019

## Schooling Status at Early Years

The earliest years of a child's life are very crucial. The early years determine a child's uplift and growth in life and lay the base for his/her learning and overall development. During these early years, the children improve the physical, cognitive, social, and emotional skills that they had the need to get success in life. These early experiences exceedingly help in the future learning process of the children in a further study that is elementary as well as higher education. Here have seen the schooling status as per their age-grade in table 3 and observed most of the children at the age 4 and 5 enrolled in pre-primary schools i.e. 83.5 and 70 percent respectively, in std. I only 5.9 children are enrolled and in upper std. enrollment is very few. It is also observed some of the young children are enrolling in pre-school by late that is at the age 6 and 7, 32.8 and 10.2 percent respectively children are enrolled even though they have need to enrolled Std. II and above.

Table 3. Schooling status and age-grade distribution % children age 4-8 by schooling status and grade, 2019

Age	Pre primary	Std I	Std II	Std III	Std IV & Above
Age 4	83.5	5.9	2.2	2.2	2.2
Age 5	70	21.6	4.5	4.5	4.5
Age 6	32.8	46.4	16.1	2.6	2.6
Age 7	10.2	28.3	44.1	14.6	2
Age 8	3.6	8.3	27.1	45.4	15

Source: ASER Report, 2019

## Quality of Early Childhood Education

Every parent wants to better and safe academic performances from his/her child from an early age. However, 124 million children across the world are out of school and 250 million are not learning basic skills as a result of poor quality education (Plan-International.org). So quality education at the childhood level is one of the main influential factors of the above cause. The quality of early years also plays a crucial role in children's development, learning and well-being. Here table 4 shows the ability to identify their own as well as others' emotions and perspectives, establish and maintain relationships, and make responsible decisions are important skills for all human beings. ASER 2019 tasks in this domain

consisted of emotion identification, situation to emotion mapping, and situation reaction test. Answering four questions by pointing to a card: i. which of these girls is sad? ii. which of these girls is angry? iii. which of these girls is afraid? iv. which of these girls is happy?

From the report, it is observed that the identification powers of the child are increasing within their increasing age. At the age of 4 only 24 percent child can correctly identify all the 4 emotions as mentioned above but at age 8 overall 60.5 percent of children can correctly identify all emotions which are shown in table 4.

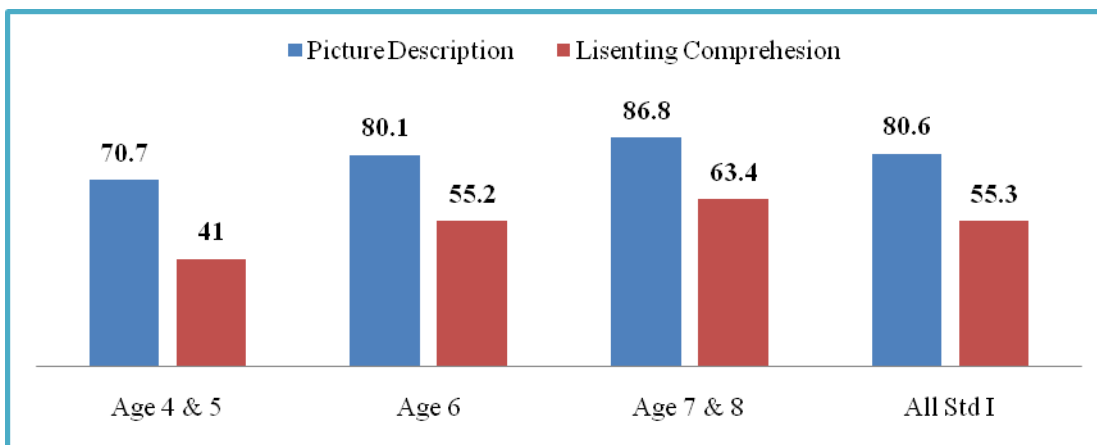
Table 4. Percentage of children age 4-8 who can correctly identify emotions 2019

Age	Happy	Sad	Angry	Afraid	All 4 emotions
Age 4	62.2	43.3	47.7	47.4	24
Age 5	72.3	50.1	57.4	55.8	33.6
Age 6	77.6	56.7	67.2	66.1	44.6
Age 7	82	62.8	73.7	73.3	54
Age 8	83.8	68.2	78	78.6	60.5

Source: ASER Report, 2019

Figure 1 shows the proportion of young children who are correctly able to catch the early language tasks by their age as per the ASER report 2019. At the age of 4 & 5 years, olds enrolled in pre-school or school 70.7 percent can do a picture description task, and 41 percent of children can do the listening comprehension task. At the age of 7 & 8, this proportion is increased by 86.8 and 63.4 percent respectively and it is seen that who enrolling in standard I, 80.6 percent of children can do the picture description task and 55.3 percent can do the listening comprehension task in India as per ASER 2019.

Figure 1. Percentage of children in Std. I who can correctly do early language tasks by age in India, 2019

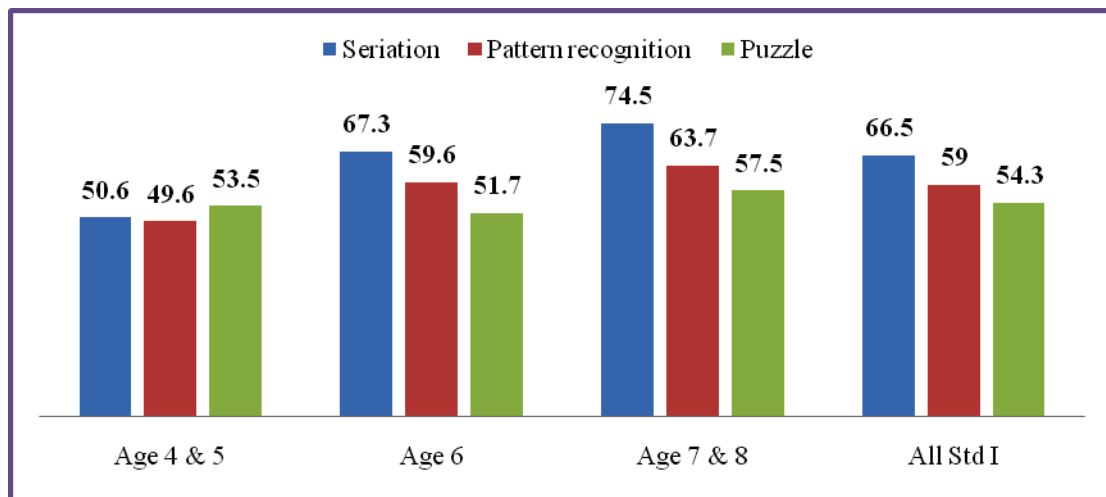




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Figure 2 reveals that the children's performance tasks on cognitive skills such as puzzle seriation, and pattern recognition) is strongly related to their ability to do early language tasks such as describing a picture as mentioned above and also numeracy tasks such as relative comparison etc. the study found that more or less 50 percent of children can correctly identify all the three cognitive tasks i.e. seriation, pattern recognition, and puzzle at the age of 4 & 5. It also observed that the children's seriation power is increasing with their increasing age structure but puzzle-solving tasks are not significantly increasing with age increasing. At standard I the entire seriation, pattern recognition, and puzzle task children can correctly do 65.5, 59, and 54.3 percent respectively.

Figure 2. Percentage of children in Std. I who can correctly do cognitive tasks by age in India, 2019



The performance of children in different standards the 1-digit and 2-digit numeracy tasks are varied from standard to standard. It is found that 1-digit oral word problem addition can do correctly by std. I, std. II and std. III children are 39.5, 58.8, and 74.5 percent, also oral word subtraction problem is improved with the up-gradation of the children education level. In the case of the 2-digit numeracy task, it is observed children who are studying in std. III numeric addition and subtraction is 44 and 30.6 percent respectively which is clearly shown in table 5.

Table 5. Percentage of children who can correctly do 1-digit and 2-digit numeracy tasks by grade 2019

Std	1 Digit		2 Digit		
	Oral word problem addition	Oral word problem subtraction	Relative Comparison (11-99)	Numeric Addition	Numeric Subtraction
Std I	39.5	33.7	29.1	11.3	7.6
Std II	58.8	51.4	49	28	18.4
Std III	74.5	66	63.8	44	30.6

Source: ASER Report, 2019

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Table 6 analyzed the children’s performance differentiation on correctly early numeracy tasks such as counting and relative comparison as per their schooling status and observed the children who are not enrolled in any type of school. Those who are studying in the private pre-school they are more able to early solve the mentioned numeracy task than the children studying in government pre-school. Here the interesting twist is that children who are not enrolled in any private or government school they also performing well which also shown in table 6.

*Table 6. Children age 4-5 who can correctly do early numeracy tasks by schooling status 2019*

Task	Age 4			Age 5		
	Govt. Pre-school	Pvt. LKG/UKG	Not enrolled	Govt. Pre-school	Pvt. LKG/UKG	Not enrolled
Counting objects	23.1	40.1	8.2	36.8	57.6	20.7
Relative comparison (objects)	37.3	51.3	21.7	53.8	71.2	37.8

Source: ASER Report, 2019

Table 7 each row shows the distribution of children’s reading skills in different standards with their age group. It is seen that children who are studying in std. I, only 16.2 percent of children can read at least a std. level of text and 50.8 percent of children who are able to read who are studying in std. III.

*Table 7. Percentage of children who can read at least a Std. I level text by age and grade 2019*

Std	Age 4 & 5	Age 6	Age 7	Age 8	All
Std I	5.7	12.7	24.4	31.6	16.2
Std II	8.6	26	34.5	43.1	34.8
Std III	-	29.4	46.1	53.4	50.8

Source: ASER Report, 2019

## Mother Education Impact on Early Childhood Education

Mainly the most affecting factor in children behaviour as well as in academic performances is mother role, especially in the children early year’s mother like a good teacher and it is expected that better-educated mother has an affordable contribution to their children’s academic performances.

Figure 3 shows the percentage of mothers by education level in India as per the ASER report 2019, it is observed that 22.7 percent of mothers status is no schooling. Mother’s education level std. I-V is very few that is 12.2 percent, mothers’ percentage more who has education level up to Std. IX-X which is represented in figure 3.

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Figure 3. Percentage of mothers by education level in India, 2019

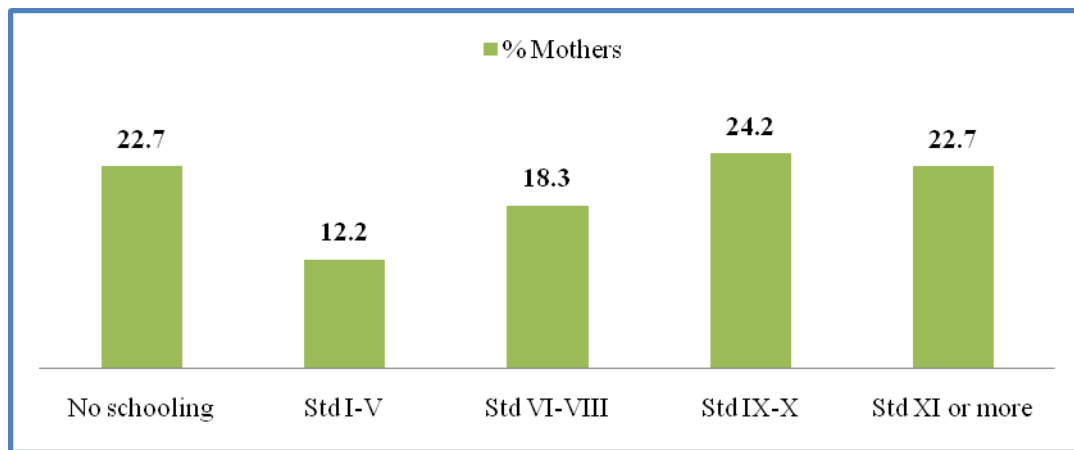


Table 8 shows the enrollment structure of children by their mothers' education. As per the report among children whose mothers never went to school, 18.7 percent go to the government pre-school, 11.2 percent go to the private LKG/UKG, 53.2 percent go to schools operated by the government, 11.8 percent of children go to private ownership schools, and it also observed that 5.1 percent children are not enrolled anywhere. Children whose mothers' level of education is std. I-V, their 20.8 percent child enrolled in government pre-school and 48.7 percent children are enrolled in the government school, in private institute enrollment is very less. Children's enrollment is more in private pre-school and schools whose mother education level is std. XI or more.

Table 8. Percentage of children age 4-8 enrolled in different types of pre-schools and schools by mothers' education 2019

Mothers Education level	Pre-school		School		Not enrolled	Total
	Govt. Pre-school	Pvt. LKG/UKG	Govt.	Pvt.		
No schooling	18.7	11.2	53.2	11.8	5.1	100
Std I-V	20.8	12.3	48.7	14.4	3.7	100
Std VI-VIII	19.8	17.9	40.9	18.1	3.3	100
Std IX-X	18.6	22.9	31.4	25.5	1.6	100
Std XI or more	11.1	37.8	14.3	35.3	1.5	100

Source: ASER Report, 2019

Table 9 gives the scenario of the variation in children's performances to do early language and numeracy tasks by grade as per their mothers' education. The study has seen that among the children in Std I whose mothers never went to school 14.7 percent can read or identify at least words, 28.6 percent can do 1-digit oral word problem of addition, 24.5 percent can do 1-digit oral word problem of subtraction. Children in std. III whose mothers never enrolled in school half of them can early do the two-digit number recognition problem but in number subtraction, the percentage is very less i.e. 20.5 percent.

Table 9. Percentage of children who can correctly do early language and early numeracy tasks by grade and mothers' education 2019

Mothers Education level	Children in Std I			Children in Std III (2-digit)			
	At least words	Oral word problem addition	Oral word problem subtraction	At least std I level text	Number recognition (11-99)	Numeric addition	Numeric subtraction
No schooling	14.7	28.6	24.5	35.6	53.1	29.2	20.5
Std I-V	22.3	27.5	25.8	41.9	63.6	34	23.6
Std VI-VIII	27.4	35.9	30.1	49.8	70.7	39.6	27.1
Std IX-X	37.9	43.7	37.1	60.1	84.6	54	37.8
Std XI or more	49.3	52.5	46.2	69.1	91.8	63.7	43.6

Source: ASER Report, 2019

It is observed that mothers' education is widely correlated with the children's academic performance i.e. those mothers' education level is high, their child academic performances also better than the children whose mother has less education.

### Covid-19 Impacts on Early Childhood Education

The Covid-19 has immense changes to the education sector throughout the world. As per UNESCO (2020), nearly 90 percent of the world's students, over 1.5 billion in 165 infected countries have had their education system disrupted due to measures and policies implemented to dismantle the spread of the disease. Global Director of Education describes this as the 'largest simultaneous shock to all education systems in our lifetimes' (World Bank 2020). Specifically in case of early childhood education has found dramatic changes in the lives of children, their families, and early childhood teachers' educators as well. In one sentence covid-19 has pushed the education system to the verge of collapse worldwide (Singh, 2021). Education works as production houses of any nation; which produces skills, knowledge, wise and thinking mind. The disease has been declared by the World Health Organisation (WHO) as an international public health emergency, worldwide this has led to the closure of all the schools, nearly it has been seen 1 billion children affected due to close the school (Sahu, 2020). India experienced lockdown from 24th March 2020 to May 2020 and thereafter although phase-wise reopen the public services most educational institutions remain closed without a clear view regarding their re-opening. Consequently, the decision has created an unprecedented crisis among the people who are involved with the education sector, most specifically the early childhood education in India. Though covid-19 has created huge challenges, many opportunities are also evolved. The government of India and different stakeholders engaged with education have explored the possibility of e-learning facilities by adopting different digital media to cope with the existing scenario. Though technology helps a lot still India is not fully equipped to cover up or reach e-learning processes via digital platforms. The most rural part of the nation is still far from the digital world, though smart-phone is available it has no proper use, and hence suffer due to the present choice of digital platforms. Shutting down of all educational institutes and the decision of shifting conventional classrooms to digital platforms is not only increasing learning inequality among children but also pushing the huge number of children out of school due to the digital divide (Kundu & Sonawane, 2020). In India, early childhood care and education are largely provided through the An-

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ganwadi Centres (AWCs) under the Integrated Child Development Services (ICDS) scheme. As per the year 2019, there were 30 million children (3 - 6 years) who were beneficiaries of this scheme in 1.37 million operational AWCs (MWCD, 2020). Therefore, ICDS services are highly disrupted due to the lockdown during COVID-19 which has huge consequences on children's health, nutrition, and learning capabilities. Not only early learning plays a crucial role in the formation of physical, psychological, and social development of a child. The closure institution continues to poses an immense threat to their future development potential.

Nationwide, all educational institutes to ensure the children's health safety, early childhood teaching-learning process also moved to digital platforms either through online teaching methods, government portals, or others. However, remote learning is a huge challenge for maximum students in India given the greater differences inaccessibility in adopting all concern infrastructures, instruments Smartphone's, and computers, there is also the problems of electricity and internet connectivity. Although, all over India maximum households are covered with electricity connection through the specific scheme the power supply is still very poor mainly in rural India.

The ASER 2021 shows how the children face the problems mainly engaged with early childhood education in India. Table 10 explores different challenges of children faced (%) by school type in early childhood education where shows average more than 30 percent of children has no smart-phone in their home, who are studying in private school around 20 percent children has no smart-phone to attend their class. In some cases, it has been observed through the household has a phone but parents are not given to the child to use or parents are not able to teach their child to run the Smartphone to access the class.

Table 10. Different challenges of child faced (%) by school type, 2021

School type	No Smartphone	Phone not available for child to use	No one to help child at home	Network issues	Electricity Issues	child not able to learn remotely	child not interested	child is too young so needs help	Other
Govt.	34.7	20.4	9.4	27.1	12.8	20.3	8.3	10	1.9
Pvt.	20.5	14.9	7.4	37.9	14.3	26.9	9.9	10.9	2.1
Govt & Pvt.	31.1	19	8.9	29.8	13.2	22	8.7	10.2	1.9

Source: ASER report, 2021

Though many people have smart-phone another main problem in recent times is huge network issues, it is found around 30 percent of children faced network issues during online classes even they skipped online classes. Some other related problems also mention in the annual status of education report in 2021 like electricity issue, the child not being able to learn remotely, the child not being interested, the child is too young so needing help, etc.

## Challenges of Home-Schooling for Parents

Since the nationwide lockdown implementation and closure of educational institutions in case of early childhood education children parents are primarily responsible for taking care of their children. They are forced to take over the various tasks on a regular basis of home-schooling activity to maintain continuity of children involved with education which becomes an extra load, while parents are already tackling

different problems due to nationwide lockdown such as work from home, financial crisis due to short term unemployment experiences, etc. Mostly it has been seen that many parents would not have the necessary educational qualifications to support the children with assignments provided by their teachers which makes difficulties or disrupted the continuation the early childhood education all over India (Mahapatra & Sharma, 2021). The parents, teachers' students as well are not well trained in terms of technology handling or accessibility of online learning where most of the activities conducted via Zoom or google meet without any dedicated online learning platform (Jena, 2020).

## **Way Forward**

The central government has announced a new National Education Policy (NEP) in 2020. The NEP included the importance of ICT- based learning and the potential risks related to this. At the same time, the policy also mentions the limitations of existing digital media for education and said for the expansion over time. In the long run, the policy visualizes dedication to the building of e-learning infrastructure; e-content within the Ministry of Education (MoE) whenever institutions reopen a large number of measures will need to be adopted specially for early childhood education because all over India the primary educational institutions will take time to reopen in full phase. Whether it is the blended mode of education, higher involvement of parents will be more important, and in India, it has been found that a large number of parents are unable to help their child, so through the new policy, this disruption should be reduced to giving proper training to the parents if possible. The remedial teaching, hygienic atmosphere and social distancing norms also need to be more important in the time of physical class and hence teachers and frontline government officials' roles will be essential to run the early childhood education. Although the Department of School Literacy and Education has taken initiatives that are digital platforms like the National Repository of Open Educational Resources (NROER), Digital Infrastructure for Knowledge Sharing (DIKSHA), e-Pathshala, and a National Online Education platform called SWAYAM, etc. but with this early childhood education also should cover to improve the childhood education system.

## **CONCLUSION**

From the analyses there found the holistic scenario on the early year's education in India. It has been seen the enrollment status in different government and private pre-schools as well as schools in recent times whose age lie 'between' 4-8. Enrollment status in government, as well as pre-school and school of young children by their sex and it is found that boys enrollment in both the government and private institute are same proportion but maximum girls child, are enrolled in the government institute as per the ASER 2019 report. During analysis seen the schooling status as their age level and observed the maximum children at the age of 4 & 5 they enrolled in the pre-primary school and whose age is 6-7 they normally studying on std. I. Quality education is one of the crucial things for children's learning achievement and it helps to stabilize in further higher studies. Here, the analysis shows the identification power of the children with their age distribution and found that the power of identification is increased with their growth. Children's academic performance tasks through cognitive skills such as puzzle seriation and pattern recognition also checked their numeracy tasks and seen in this paper. Mother education has a significant impact on children's behaviour and in bright future; there is a positive correlation of children with their mother education level. After the analysis of this paper, some suggesting points

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should be taken up for the betterment of early year's education in India such as the development of state standards for all achievable preschool programs. Develop some measures for early year's educational quality which incorporate the current research on social-emotional learning, early literacy, mathematical, etc. Provide some continuous training programs and quality uplift efforts to pre-school teachers. Work together with the state, and local levels of government to take place a coordinated system of better quality education for all the young children. From the study, it becomes clear that all over the world in India also suspended academic activities due to the covid-19 outbreak but to avoid discontinuity of learning facilities online learning was adopted through the digital platform. Though this process has been the only feasible solution in the pandemic time it had some sort of limitations, mainly this has great challenges to run the early childhood education.

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# Chapter 12

## Restriction of Addictive Shopping Behavior: Toward a More Responsible Consumption

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### **ABSTRACT**

*This study qualitatively examined the restriction process of addictive buying behaviors using information recalled by four ex-shopaholic Western women. The study identified two reasons why the women decided to regulate their behaviors, including the issues with their financial statuses and the problems they had with their partners and family members. It also found three factors that could support the regulation process in addition to four factors that could distract that process. Regarding the initial results of the regulation process, this study realized that the women had effectively dealt with their debts, improved their relationships with the closest and most important people, maximized the use of the existing physical products, and minimized the purchases of the unnecessary new ones. They seemed to be able to find an alternative lifestyle, frugality and simplicity, which could make them happier individuals. Finally, this study discussed some practical implications for more ethical and responsible business activities.*

### **INTRODUCTION**

Impulsive and compulsive buying behaviors are distinct behaviors toward acquiring excessive amounts of unnecessary things (Dell’Osso, Allen, Altamura, Buoli, & Hollander, 2008; Flight, Rountree, & Beatty, 2012). While the former is an automatized behavior with little forethought, the latter is a conscious behavior with consideration and even deliberation (Dalley, Everitt, & Robbins, 2011). These long-term and repetitive behaviors are different from the short-term and momentary ones of, for example, tourists while holidaying (Ahn, Lee, & Kwon, 2020; Chang, Stansbie, & Rood, 2014).

Although both impulsive and compulsive buying behaviors are addictive cognition-based behaviors, they are heavily driven by buyers’ emotional states (Darrat, Darrat, & Amyx, 2016). Specifically, distress (if not buying) and relief (if buying) are two of the major emotions that drive an individual to buy

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addictively (either impulsively or compulsively) (Darrat, Darrat, & Amyx, 2016; Lejoyeux, Haberman, Solomon, & Adès, 1999; Miltenberger, et al., 2003; Ortiz Alvarado, Ontiveros, & Domínguez, 2020). Moreover, certain environmental conditions can also boost these behaviors, including promotional information, price, discount, and store ambiance and aesthetics, among others (Chan, Cheung, & Lee, 2017; Iyer, Blut, Xiao, & Grewal, 2020). The emotional consequence of addictive buying is the obtainment of certain positive emotions and of a great deal of negative feelings such as guilt (Hausman, 2000; Togawa, Ishii, Onzo, & Roy, 2019). The other consequences include, for example, impaired social and vocational functioning, and financial problems (Dell’Osso, Allen, Altamura, Buoli, & Hollander, 2008). Addictive buyers often are young women, probably in their mid-30s, and may account for approximately 5-10% of a given population (Christenson, et al., 1994; Koran, Faber, Aboujaoude, Large, & Serpe, 2006; Maraz, Griffiths, & Demetrovics, 2016; Mueller, et al., 2010 a, b). Since the consequences of addictive buying can be serious, many shoppers have gone through a regulation process to restrict their behaviors, either involuntarily (forced regulation) or intentionally (self-regulation).

Research on addictive buying behaviors is abundant, especially in the business and psychology sectors. However, research in the business sector often focuses on the conditions of the pre-purchase and purchase processes, and targets a large number of non-impulsive and non-compulsive buyers in their structured surveys. Thus, in many cases, the findings are invalid or overrated. Their practical implications, which usually are directed toward the further exploitation of potential customers, are consequently unreliable or unethical. On the other hand, research in the psychology sector often focuses on the emotions that addictive buyers (in other words, shopaholics) have during the purchase or regulation processes, as well as the antecedents and consequences of these emotions. The outcomes of these studies support and advocate effective methods to regulate and treat addictive behaviors. The interests and principles of the two fields of research, thus, are conflicting (Ali, Tauni, Ali, & Ahsan, 2021; Chan, Cheung, & Lee, 2017; Dittmar and Kapur, 2011; Harnish, Roche, & Bridges, 2021; Iyer, Blut, Xiao, & Grewal, 2020; Leite, Pereira, Nardi, & Silva, 2014).

In this chapter, I will introduce an alternative in researching addictive buying behaviors by examining the regulation process of shopaholic behaviors. Specifically, I investigate all the three stages of the regulation process to see (1) why the addictive buyers choose to regulate their shopping behaviors (before the regulation), (2) what forces can affect their regulation efforts (during the regulation), and (3) what outcomes these regulation efforts can create (after the regulation). Three specific research questions (RQ) direct the research process.

**RQ1:** What are the reasons behind addictive buyers’ intention to regulate their behaviors?

**RQ2:** What are the factors that affect the regulation process?

**RQ3:** What are the initial results of the regulation process?

This study aligns with the 12<sup>th</sup> goal of Sustainable Development: Responsible Consumption and Production. The findings of this study will expand the literature on the regulation process of addictive buying behaviors, on the one hand, and provide practical implications for the more responsible and sustainable business activities, on the other.

## **LITERATURE REVIEW**

In this section, I firstly review the existing literature to see what has already been known about the consumption style under investigation: addictive consumption (either impulsive or compulsive). Next, I discuss the process to restrict one's behaviors (self-regulation), showing a link with addictive shopping. Finally, I introduce alternative consumption styles, which may be adopted once an addictive buyer has successfully regulated their prior behaviors.

### **Impulsive/Compulsive Consumption**

Addictive consumption can be observed in any type of products and services. For example, food addicts may buy and eat more food than necessary, regardless if they are healthy or unhealthy products (Cheval, Audrin, Sarrazin, & Pelletier, 2017). Alternatively, fashion addicts may purchase and own more clothing and accessory items than they actually need (Cengiz, 2017). In many cases, the products concerning the addictive behaviors are attached to a given brand (brand addiction) (Mrad & Cui, 2020), and the addictive consumers are brand lovers and prestige seekers (Kukar-Kinney, Ridgway, & Monroe, 2012).

Addictive consumption is the result of many internal and external mechanisms. In the former sense, these behaviors might be triggered by certain major incidents that happened in the previous stages of the consumers' lives, such as family disruption and relationship deficit (Grougiou, Moschis, & Kapoutsis, 2015; Sinha & Wang, 2013). In addition, they can be fueled by many personal characteristics of the consumers, for example, family resources, materialism orientation, hedonic value orientation, narcissism tendency, envy, social anxiety, and loneliness, among others (Baker, Moschis, Benmoyal-Bouzaglo, & dos Santos, 2013; Baker & Chan, 2020; Chung, Song, & Lee, 2017; Cui, Zhang, Yin, Li, & Zhong, 2021; Harnish, Bridges, Gump, & Carson, 2019; Sun & Wu, 2011; Zhang, Li, Ye, Yu, & Zhong, 2021).

In the latter sense, addictive consumption is supported by a variety of environmental forces, including bank credit, promotional activities, product prices, and store conditions (Badgaiyan & Verma, 2015; Donnelly, Ksendzova, & Howell, 2013; Horváth & van Birgelen, 2015; Luo, et al., 2021; Zhao, Li, Wang, Zhou, & Luo, 2021). In today's world, the Internet and Internet addiction, and social media and the presence of others can also affect the addictive buying behaviors (Hu, Chen, & Davison, 2019; Lee, Park, & Bryan Lee, 2016; Zafar, Shen, Shahzad, & Islam, 2021). Fortunately, these behaviors can be restricted if the consumers realize that the things that they buy mostly are what they want, not what they need, and that they themselves can regulate their consumption styles (Lades, 2014; Sohn & Choi, 2012). Situational factors, such as the appearance of the COVID-19 pandemic, can create some additional help (Li, Zhao, Huang, & Li, 2020). Moreover, businesses can help their customers if they responsibly and ethically regulate their own marketing activities (He & Harris, 2020).

### **Self-Regulation**

Self-regulation is regarded as a controlled process that helps individuals to restrain the usual consequences of an impulse (Baumeister & Heatherton, 1996; Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013; Nomura, 2011). In order to self-regulate, an individual must initially define or adopt a clear and consistent set of standards or goals of a given behavior. Next, they need to monitor the implementation of the standards, and undertake the necessary changes in order to successfully meet these standards. Any errors that happen during these processes may lead to failures in self-regulation.

The self-regulation ability is biologically affected by the autonomic mechanism of one's brain (Heatherton & Wagner, 2011). However, this ability can be strengthened through self-practice, and by the external influences of environmental stimuli and peers (Farley & Kim-Spoon, 2014; Liaw & Huang, 2013; Ramdass & Zimmerman, 2011). Self-regulation has several distinct forms; one of them is emotion regulation (Holodynski, Seeger, Kortas-Hartmann, & Wörmann, 2013; Kobori, Sawamiya, Yoshinaga, Rowe, & Wilkinson, 2020).

With shopping behavior, self-regulation is an important practice since excessive buying can lead to unwanted and bad consequences (Dell'Osso, Allen, Altamura, Buoli, & Hollander, 2008; Hausman, 2000; Togawa, Ishii, Onzo, & Roy, 2019). Self-regulation, as a personality trait, is found to negatively affect shopping addiction behavior (Jiang, Zhao, & Li, 2017). This ability, however, is positively related to the satisfaction with the shopping experience (Orth, Wirtz, & McKinney, 2016). On the other hand, self-regulation may be weakened by the perceived shopping load (Orth, Wirtz, & McKinney, 2016), and the possibility of making shopping choices (Vohs, et al., 2014). In addition, a prior restraining experience may be used as an excuse for the upcoming indulgence (Mukhopadhyay & Johar, 2009), while the presence of cohesive peers may lead to more shopping (Luo, 2005). It should be noted that, as a personality trait, self-regulation ability differs among individuals with regards to their levels of susceptibility to the environmental and social influences (Arnold & Reynolds, 2009; Luo, 2005). The result of shopping regulation may be an alternative style of consumption, such as minimalist or simplicity-oriented consumption.

## **Non-Impulsive/Non-Compulsive Consumption**

Excessive consumption is not the available or suitable style for everybody. Specifically, many people who do not have enough financial resources have to reduce the amount of goods they buy and consume on a daily basis for certain stretches of time (Wanyama, Gödecke, Jager, & Qaim, 2019). In extreme yet not irregular cases, poor consumers may not have food to eat, water to drink, and clothes to wear. They cannot dream about other luxuries rather than the most basic products. On the other hand, many people have more than enough financial and contextual conditions to purchase and possess a lot of material belongings but still choose to consume in a minimalist style (Pangarkar, Shukla, & Taylor, 2021). These consumers do not only think about their own wellbeing but also that of other people, of society and of the future.

The values that minimalist consumers are emphasizing are very diverse. First, these consumers are looking for the utilitarian and functional values of the products available for them (Boutroy, 2021). Some people only have the most basic clothing items in their wardrobes and use them very regularly in very short cycles (several days). Others keep only the most fundamental and necessary cooking tools and appliances in their kitchen and try to be flexible and creative with them. Second, minimalist consumers are seeking for some emotional values, such as happiness and satisfaction, while trying to control the possession of material goods (de Mendonça, Coelho Rocha, & Bogéa da Costa Tayt-son, 2021). The searching of such values is a process, in and through which they can experience different feelings and emotions when planning, implementing and enjoying their simple style. Third, minimalist consumers also appreciate the psychological, symbolic and spiritual values of consuming minimally (de Mendonça, Coelho Rocha, & Bogéa da Costa Tayt-son, 2021; Tosun & Sezgin, 2021). Some people may value the sense of freedom and self-sufficiency. Others may treasure inner peace and personal growth. The saying

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“less is more” is applicable in this manner. Finally, many minimalist consumers care about the wellbeing and sustainability of the earth and its people (Pangarkar, Shukla, & Taylor, 2021). By reducing the current consumption of material goods, they expect to help reduce the exploitation of natural resources, the pollution of living environments, and the existential threats to future generations. These values are moral and altruistic in nature.

## **METHOD**

### **Publications as Research Materials**

Real impulsive or compulsive buyers only account for a relatively small percentage (approximately 5-10%) of the consumer population (Christenson, et al., 1994; Koran, Faber, Aboujaoude, Large, & Serpe, 2006; Maraz, Griffiths, & Demetrovics, 2016; Mueller, et al., 2010 a, b). In these cases, addictive buying behaviors may be considered and treated as a disorder phenomenon, and the buyers the patients (Mueller, et al., 2010 a, b). Thus, the approach to and recruitment of these individuals without a psychiatric background or connection are almost impossible. Fortunately, several recoveries have taken a bold and brave move by retelling their problems and regulation processes in the published forms (Bosnak, 2003; Flanders, 2018; Hall, 2009; Lancaster, 2006). These publications provide important materials to the understanding of addictive shopping regulation.

Printed publications, such as diaries and memoirs, have been quietly used in academic research, in general, and, in consumer research, in particular, over the years. With their richness and minuteness of information, these publications can be examined to reveal the incidents (cognitive) and emotions (affective) that one or several individuals have gone through in their respective experiences (Crane & Crepeau, 1998; Docan-Morgan, Son, & Teimouri, 2019; Fisher, Frazer, & Murray, 1984; Marche, 2015; Stephenson & Zygouris, 2007; Tekin & Outram, 2018; Welch, Polatajko, Rigby, & Fitch, 2019). In one of the related studies, Ureta (2007) analyzed a shopaholic’s diary and found some interesting information about the ways this individual defined her addictive behavior, understood the causes, and related to certain personal values, among others. For example, buying compulsively was explained by the individual as buying because of anxiety and lack of self-control. This was caused by several remote reasons (family background and emotional instability) and one immediate excuse (marital relationship). The addictive behavior, however, could help satisfy the need of the individual to create a favorable self-image (a symbolic meaning). Alternatively, in another study, Molesworth and Grigore (2019) examined a fictional novel about a shopaholic to reveal that shopping could be employed as a means to structure time and relationships with others. In addition, they observed that excessive shopping could be negotiated to give the addict their freedom.

Following previous attempts, this study used several nonfiction publications, all by female authors in their 20s to 40s, as research materials (Table 1). The method applied in this study, thus, is the reverse of “creative nonfiction,” the process of making research reports less boring by turning them into literature works (Caulley, 2008). In this study, real-life materials depicted in nonfictions (Colman, 2007) are interpreted to explore the answers for the research questions.

*Table 1. The informants*

Author	Book title	Age at the time of trial	Occupations at the time of trial	Context
Bosnak, Karyn	Save Karyn	20s	Mostly freelance producer	America
Flanders, Cait	The Year of Less	20s	Editor and freelance writer	Canada
Hall, Alexis	In the Red	40s	Office worker	Scotland
Lancaster, Jen	Bitter is the New Black	30s	Mostly jobless and part-timer	America

## Data Collection and Analysis

The selection and selection of the materials for this study, as the “creative nonfiction” method indicates, are personal and subjective. At the beginning, I accidentally read Hall’s (2009) diary as it was one of the books that I regularly bought on Amazon, and discovered this research topic. Next, I searched for similar publications on Amazon, Goodreads, and Google Books. Partly informed by reader reviews on the first two platforms, and partly directed by my own judgement, I found the other three titles (Bosnak, 2003; Flanders, 2018; Lancaster, 2006), all of them bought as secondhand items.

Guided by the research questions (Katonah, Grafanaki, Krycka, & McDonald, 2018), I deductively content and sentiment analyzed the books to reveal the cognitive and affective states that the writers, as self-identified addictive buyers, encountered during their regulation processes (Elo & Kyngäs, 2008; Liu, 2010). The analysis methods that I chose, therefore, differed from those applied in previous studies, such as narrative analysis (Marche, 2015), script analysis (Molesworth & Grigore, 2019), and thematic analysis (Docan-Morgan, Son, & Teimouri, 2019; Ureta, 2007; Welch, Polatajko, Rigby, & Fitch, 2019). However, they were suitable with the purpose and design of this study (exploratory and descriptive in nature).

Regarding the analysis process, I initially skimmed through all the books to have a sense of their contents. Next, I carefully read the books a second time or more, and wrote down my observations about the reasons (RQ1), the impacting factors (RQ2), and the initial results (RQ3) on the blank spaces around the text. With Hall’s (2009) book, there were entries for days and months, since it was written as a diary. Therefore, I treated each daily entry as a data unit, and compared and contrasted one entry with the others to internally triangulate the data (Oppermann, 2000). With the remaining, I considered each chapter a unit of data, and undertook a similar analysis. After that, I combined the answers of each research question to compare and contrast all the writers’ experiences. In this attempt, each book was regarded as a unit of data, and the process was an external data triangulation one (Oppermann, 2000). Finally, I wrote this report, using information gathered from all the books. It should be noted again that I read and analyzed each book twice or more to guarantee the intra-coder reliability (Kassarjian, 1977).

## Data Saturation

Given the number of informants (four Western women) and the analysis method (single analyst), I did not intend to reach the point of data saturation (Saumure & Given, 2008), at which the data were fully generated. The results of this study only reflect the most prominent contents I found in the books. However, this does not mean that the results are not valid or reliable since they will later be supported by



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outcomes of previous studies on addictive shopping behaviors, in particular, and other addictive behaviors, in general (Polit & Beck, 2010).

## **FINDINGS**

### **The Reasons behind Shopaholics' Intention to Regulate Their Behaviors**

There were two major reasons that forced shopaholics to regulate their behaviors. The first one involved their financial statuses.

*One night, while lying in bed wide awake for the umpteenth night in a row, I again started worrying. Bouncing that check at the grocery store [for food and transportation] made me realize that I needed to make a change. (Bosnak, 2003, p. 297)*

*If I don't keep up the loan and credit card repayments, I could lose my house. (Hall, 2009, p. xvi)*

*After months of ignoring my credit card statements, I finally looked at the numbers in May 2011 and realized I was maxed out with nearly \$30,000 of consumer debt. To make things worse, I only had \$100 left in my checking account and \$100 left on one credit card, all of which had to last for six weeks until I could get my next paycheck. (Flanders, 2018, p. xv)*

A long unrestrained history of impulsive or compulsive buying due to the ease of getting bank credit had led to their immediate financial crisis. When Hall came up with the decision to restrain her behavior, she had a debt of over £30,000 accumulated over twenty years. A similar decision was made by Bosnak when her debt reached approximately \$20,000 in only three years. Facing huge debts without any possibility to get more credit from the banks or to borrow more money from their family members, shopaholics had to choose between losing opportunities to buy, which was a "dilemma" in their own word, and losing everything, which was a huge disaster. While Hall could stay in her house even though her share of the mortgage was not satisfactorily paid, Flanders and Lancaster had to move to other cheaper places. Lancaster and her partner even lost their jobs at almost the same time, and they only had enough money for food at some times. The situation was similar with Bosnak.

In addition to the financial trouble, the second reason was problems with other people as a result of the first one. In all cases, the problems were in the relationships with long-term domestic partners and family members.

*Kevin really is the original long-suffering partner. He's put up with me and my compulsive spending for nearly fourteen years. He once paid off all my credit cards and made me stand at the bin with a pair of scissors cutting up my plastic partners in crime... And let's face it, the roof over my head would seem like a tiny loss in comparison to the damage I could do to the relationships I have with my nearest and dearest. Brick and mortar are far easier to replace than love, trust and respect. (Hall, 2009, p. vi and p. xvi)*

*Fletch sacrificed his mental health to provide for mine... Since Fletch hasn't been paid yet, I don't have enough money to take a train or fly, and my credit cards have been maxed out for months, so I can't rent*

*a car. My mom is scared and alone, and all she wants right now is me. But because of all the selfish, foolish mistakes I made in my past, I can't get to her. (Lancaster, 2006, p. 315 and p. 358)*

*The weight of the debt on its own is crushing. I cried myself to sleep for weeks, feeling as though I'd lost my chance of having any kind of strong financial future. I also worried I couldn't come back from the disappointment my parents must have felt, and that I'd failed to be the role model my brother and sister needed. (Flanders, 2018, p. xv)*

Fortunately, it seems that the four women had come to their senses at the most critical points. The decisions were made at the brink of everything getting lost or ruined. And to save everything and themselves, here came the painful period of shopping regulation.

### **The Factors Affecting Shopaholics' Behaviors during the Regulation Period**

With the women, the financial goal was to reduce and clear their debts. The psychological goal was to maintain and improve the relationships with their significant others and perhaps with themselves. The mental goal was to stop justifying new purchases and lying to others about the purchases. And these goals could only be obtained through the attainment of a material goal: to maximize the use of what they had already had, and to minimize the purchase of new and unnecessary items. This, however, was extremely difficult with frequent and heavy spenders. As Hall (2009, p. 9) put it, this was a "real test" of their "willpower."

### **Supporting Factors**

Luckily, the regulation processes were supported by a variety of factors. The first and foremost one was the paramount amounts of physical products that the women were possessing, including cosmetics, fashion items, and books, among many others. With these stores in hand, they did not have to shop at all, or at least did not have to shop regularly, in a long time. In other words, the goal of not using money could be reached.

*It feels like we've been packing for months now, but it's only been a week. We've already got seventy cartons staked up in the dining room, and we haven't even boxed up our personal items yet. As I pack, I'm struck by the sheer amount of junk that I own. (Lancaster, 2006, p. 265).*

The second supporting factor was the social circle one, including the partners, the family members, and the close friends. A present or a gift card, a sympathetic conversation, a praise, a valuable piece of advice, and some trust, on the one hand, and a silent treatment, a forceful intervention, a refusal, a display of disappointment, and a challenge, on the other, were examples of the supportive acts from said people. Without these supports, the regulation process must be much harder.

*When I originally decided to do the shopping ban, though, the first person I shared the idea with was my best friend, Emma... During the first few months of the ban, I shared with Emma every urge I had to shop... Emma's responses almost always started with a laugh... She was my cheerleader and my champion for success. (Flanders, 2018, pp. 60-62)*

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The third one came in the form of a prior experience with quitting something. The related experience gave the women some motivation and knowledge to overcome their shopping impulse, especially at the beginning of the regulation period. For example, Hall was able to stop smoking, while Flanders was successful at giving up her drinking habit before regulating their shopping behaviors.

*A trip to the shopping center doesn't exactly send my spirits soaring – it's huge, soulless and full of things that I can't buy. Never have I wanted to shop more... Even as we're leaving, I'm still desperately looking for something I can justify buying and almost cave in and buy a watch... I'd have been furious with myself for having blown the experiment so early on... I've felt like this before. When I stopped smoking! I managed that with nicotine patches – shame there isn't a shopping version. (Hall, 2009, pp. 19-20).*

## **Distracting Factors**

In addition to the supporting factors, there also were some distracting factors. The first one was the commercial information. Information about new products and sale campaigns displayed on the Internet, broadcasted on television, sent through emails, and arrived at home doors could weaken any attempt to stop shopping. To deal with this factor, Hall and Flanders had to delete all of their favorite Internet sites, and unsubscribed all the mail magazines. However, as information was limitlessly powerful, it sometimes leaked through unfiltered and uncensored sources.

*Having managed to avoid most of the emails tempting me into forbidden purchases, I find myself ogling the Charles Tyrwhitt sale catalogue that slipped through the letterbox this morning. Never have so many candy-striped shirts looked so sweet. (Hall, 2009, p. 47)*

The second one was committed by the availability of shopping facilities and cheap products in urban areas. Close-by shopping malls and seasonal or periodical sale and discount campaigns gave these shoppers more chances to make a purchase and less determination to resist it. However, Hall admitted that when she was in the countryside, she did not care much about her appearance so as to buy excessive amounts of cosmetics or clothes to project her self-image and to satisfy her ego.

*I stared at the poster for a shop that I could barely go two days without dropping into – on the off chance that everything my size had been reduced to £9.99... (Hall, 2009, p. 57)*

The third one was another environmental factor, but it was related to the culture and tradition of the society in which a woman was born and lived. As four Western women, all the writers grew up in consumerism societies (e.g., America, Canada, and Scotland). Their people's and their own consumption habits have made regular and excessive shopping a normal behavior, especially during festive seasons, such as at Christmas. If one did not conform to the norms, one might be excluded from their social circles. Here, a certain level of compromise was of definite necessity.

*In the early months of the shopping ban, I will admit, I thought I would have a list of things to ask for by the time Christmas rolled around... [Nonetheless] my mom and I first came up with the idea of exchanging no gifts at all this year. But not everyone was so quick to jump on board. My grandma, in particular, could not stomach the thought of giving her grandchildren nothing for Christmas. (Flanders, 2018, pp. 87-88)*

The fourth one, sadly, involved social circles. Here, an act or a comment, performed at the wrong time and with an unsupportive attitude, might also distract the restriction efforts. Evidence included, for example, surrounding people purchasing and displaying new items, complaining about the writers' skin or clothes, and asking the writers' opinions about shopping, among others. To eliminate the negative influences, Flanders decided to "compartmentalize" some of her connections. Nonetheless, as people came and went, new distracting elements would constantly arrive for her and other women to deal with.

*I was naïve when I started the shopping ban. I never could have imagined I would find myself in the same trenches I had been when I gave up meat and alcohol... Aside from the friend who made fun of my teeny-tiny wardrobe, I had a friend who constantly tried to convince me to give up on the ban so we could go to the outlet malls. (Flanders, 2018, p. 56)*

### **The Results of the Regulation and Restraining Process**

Within two years, Flanders had paid off her debt. And after a year of restraining, Hall had reduced approximately one third of her financial burden. Bosnak could even clear her debt in twenty weeks, with the help of 2,718 people who crowd-donated to her campaign. Thus, the financial goal had been attained. The women also realized that their excessive shopping behaviors were making themselves poorer but others richer in a somewhat ridiculous manner. And that must stop.

*But what has really shocked me is the interest I'm paying. Now all those little percentage signs in the terms and conditions section of my statements suddenly makes sense to me. In some cases almost a quarter of my payment I'm making is completely bypassing my outstanding balance and going straight into my creditors' coffers. (Hall, 2009, p. 26)*

As a result, the relationships with the closest ones had been improved since the financial issues had been effectively dealt with. The relationships with themselves were getting better too, because the writers did not feel guilty and depressed as often as before, and they did not have to lie to other people about their financial statuses and their purchases. In other words, they became happier living with new sets of values (more internal and intrinsic) and purposes (simpler and more fundamental).

*Our values have changed completely and our wants are now vastly different. I could care less about Dior's newest line of lip gloss. What I want is for my husband not to get those furrows in his brow every time the phone rings. I want to him walk in the door, whistling after a pleasant day in the office... I want to get up in the morning and have a purpose... We've learned what is and isn't important, and all we need is one more chance to prove it. (Lancaster, 2006, pp. 345-346)*

And by maximizing the use of what they had already had, and minimizing the purchase of new and unnecessary items, the women had learnt a precious lesson: less (material) is more (happiness). Hall described her new consumption style as frugal, as she was trying to wear out her trainers (and other stuff) before buying a new pair (and new products) for not only her own benefits but also for those of the others. Flanders mentioned about simplification, a consumption style with which she could reduce her needs to the most basic and necessary items, such as moisturizer for her face instead of a full set of make-up goods. And in order to follow the new consumption styles, they had become very creative, for example,

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in expanding the utilities of kitchen tools, or in combining clothing items. Self-image projected for the sake of other people, given they were friends, colleagues or sellers, was no longer the main purpose of shopping. How they thought and felt about themselves, or their self-images, had become more important.

*I'm finally managing to get it into my head that none of my colleagues are actually sniffing as I pass, muttering under their breath what a disgrace it is that I'm not wearing the deodorant to match my perfume, body lotion and body wash. (Hall, 2009, p. 109)*

*I'm finding it easier to identify the items in my life that are genuine necessities, as opposed to the things I had imagined I couldn't live without. And I'm enjoying watching the contents of my dressing table diminish. The things I see there now are carefully selected, well used and greatly appreciated. (Hall, 2009, p. 127)*

*There's more to life than highlights and high heels. In the long run, it's not going to matter what kind of purse I carried. What's going to matter is how many lives I've touched, how many people I made smile, and how I made this world a better place. (Bosnak, 2003, p. 443)*

Finally, by slowing down their paces, the women had more time to consider what they really needed, to differentiate their needs and wants, and to think of alternatives. At first, these considerations were battles of cognitive thinking (justifiable or unjustifiable) and affective feelings (negative vs. positive). Gradually, they became daily habits. After that, the women did not want to let these habits go, as they were freer with both their money and their material possessions.

## **DISCUSSION**

The findings of this study are in line with the observations found in the existing literature. Regarding the reasons of the regulation (RQ1), it is found that addictive buying was caused by many factors, and can lead to several serious consequences, including the financial and relationship issues (Dell'Osso, Allen, Altamura, Buoli, & Hollander, 2008; Grougiou, Moschis, & Kapoutsis, 2015; Sinha & Wang, 2013; Ureta, 2007). Coincidentally, these also are the immediate reasons (Ureta, 2007) that force addictive buyers to start regulating their behaviors.

Concerning the process of the regulation (RQ2), it is observed that self-regulation is a very long and difficult attempt, with a lot of emotional and mental struggles (Togawa, Ishii, Onzo, & Roy, 2019). It is heavily affected by many factors, some of which initiated and facilitated the addictive behaviors in the very beginning, including commercial information, shopping facilities, and price and discount offers (Chan, Cheung, & Lee, 2017; Iyer, Blut, Xiao, & Grewal, 2020; Luo, et al., 2021).

Finally, in relation to the results of the regulation (RQ3), the success will bring in comfort and happiness to the addicts, as the negative cognitive and affective troubles are lifted (Dell'Osso, Allen, Altamura, Buoli, & Hollander, 2008; Togawa, Ishii, Onzo, & Roy, 2019). It will also help to reshape the relationships between the addicts and their closest people, making them healthier, more peaceful, and more meaningful (Molesworth & Grigore, 2019; Skinner, Haggerty, Fleming, Catalano, & Gainey, 2010). However, the most important and critical point in regulating addictive buying behaviors is to realize that one has had enough material belongings (Lades, 2014). The realization itself will serve as

another supporting factor of the regulation process. In addition, previous successful experiences of quitting something can also be referred to.

## **Theoretical Contribution**

The regulation of addictive buying behaviors is doubtlessly a personal process, which differs from one person to another. However, as the literature suggests, this process must include the definition of goals, the control of the undertaking, and the correction of the errors (Baumeister & Heatherton, 1996; Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013). In addition, it can either be supported or distracted by surrounding people, including spouses or domestic partners, family members, and close friends or colleagues, among others (Farley & Kim-Spoon, 2014). Moreover, the regulation process is also disturbed by cultural and traditional norms and values, such as consumerism (Dittmar & Kapur, 2011). In this sense, the regulation of compulsive or impulsive buying behaviors, thus, is similar to that of other addictive behaviors, such as alcohol consumption (Room, 2011).

The positive outcome of the regulation process, however, can transform a shopaholic into a frugal or simplicity-oriented consumer, who will increase the efficiency and autonomy of material consumption and reduce indebtedness (Devuyst & Van Volsem, 2001; Gatersleben, Murtagh, Cherry, & Watkins, 2019). The reduction of the quantity of possessions does not lead to the decrease in quality of life. Here, both the egoism and altruism values (Krebs, 1991) can be satisfactorily met, and a certain sense of freedom (Molesworth & Grigore, 2019) can be felt. Customers can become more responsible individuals.

## **Practical Implication**

Nowadays, companies are engaging in responsible and sustainable activities, such as environmental protection, charity and volunteer work, and social investment, among others (Orlitzky, Siegel, & Waldman, 2011). Nonetheless, many of them are implicitly taking advantage of the customers by promoting consumerism values and providing extensive conditions to fulfil these values, such as credit, commercial information, shopping facilities, and sales and discount campaigns. As a result of such (partly) irresponsible visions and activities, stability and sustainability cannot be guaranteed since a great deal of consumers are financially and mentally suffering, and societies have to deal with the related consequences. Thus, in order to truly commit to doing things responsibly and sustainably, companies may consider the following proposals.

First, companies should respect customers' right to refuse or reject commercial information. Specifically, in addition to inviting customers to subscribe to an information source, companies also need to give them a chance to unsubscribe (Dev, Rader, & Patil, 2020). Once they did unsubscribe, companies should carefully consider the follow-up tactics since many of the customers may be tired of information overloading (Bawden & Robinson, 2009), or they simply want to get rid of addictive consumption behaviors. Today, as the role of social media as an information tool has been significantly established and maintained, the un-subscription policy must be clearly stated and adequately implemented. Companies may consider developing and using artificial intelligence (AI) programs to maximize the matching between customers and information, thus, the financial benefits (Demchuk, Lytvyn, & Vysotska, 2019). AI can also be employed by banks to identify addictive shoppers through their financial resourcefulness and spending habits, and to undertake prompt intervening methods. This will be helpful for both banks and their customers.

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Second, companies should carefully consider the further expansion of their businesses to rural and remote areas. Although such an implementation can help companies to cut their operation expenses and to increase their business opportunities, it may not be much welcomed by local residents (Hurst & Niehm, 2012). Compared to those living in the urban areas, rural residents have a slower and simpler lifestyle (Davies, 2008). Many of them are avoiding excessive consumption, or trying not to return to such a habit. Thus, before expansion, companies should thoughtfully survey and consult the local communities. A harmonious coexistence will be beneficial for the responsible and sustainable reputation companies are building.

## **CONCLUSION**

Based on the experiences of four ex-shopaholics, I identified two reasons why they decided to regulate their behaviors, including the issues with their financial statuses, and the problems they have with their partners and family members. I also found three factors that can support the regulation process (the amount of the material belongings, the previous quitting experiences, and the social circles) in addition to four factors that can distract that process (the commercial information, the availability of shopping facilities and cheap products in urban areas, the culture and tradition of their society, and unfortunately, the social circles). Regarding the results of the regulation process, I realized that the women had effectively dealt with their debts, improved their relationships with the closest and most important people, maximized the use of the existing physical products, and minimized the purchases of the unnecessary new ones. They seemed to be able to find an alternative consumption style, frugality and simplicity, which could make them happier and more responsible individuals.

These results show another piece of positive evidence that impulsive or compulsive shopping, an addictive behavior, can be successfully regulated (Molesworth & Grigore, 2019). The initiating point, as I observed, is when the shoppers realized that they had enough, both material belongings, and financial, emotional and mental burdens. The key to the success, as one of the women had stated, is the willpower. Thus, shopaholics must rely on and trust in themselves during and after the regulation process. However, companies could also give them some practical support by implementing more ethical and responsible business visions and activities.

## **LIMITATIONS AND FUTURE DIRECTIONS**

This study, however, had several weaknesses. First, the number of informants was limited, which made the results not extensive. Second, the information was contributed by professional writers, who might be better in describing and organizing their thoughts and feelings than ordinary people, which made their experiences somewhat skewed or biased. Third, the cultural background of all the informants was the West, which made the situations in the East and other cultures unidentified. Fourth, the personal background of the informants could not be thoroughly examined due to its lack, which made the differences among individuals and groups unknown.

In order to address these issues and further facilitate the research on addictive shopping regulation, future studies could make an attempt to generate a larger sample of participants, including individuals from different cultural and personal backgrounds. A study on the post-regulation period to see if the

recovers really succeed in restraining themselves, and how they are thinking and feeling about their new consumption styles is also strongly recommended. Outcomes of these studies will provide more preferences for customer advocacy activities of social organizations, on the one hand, and for responsible and sustainable activities of businesses, on the other.

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## KEY TERMS AND DEFINITIONS

**Addictive Buying Behaviors:** Either compulsive or impulsive buying behaviors.

**Compulsive Buying Behaviors:** The conscious behaviors toward acquiring excessive amounts of unnecessary things.

**Emotional Consequences:** The positive and negative feelings individuals have after buying excessively.

**Impulsive Buying Behaviors:** The automatized behaviors toward acquiring excessive amounts of unnecessary things.

**Self-Regulation:** A controlled process that helps individuals to restrain the usual consequences of an impulse.

**Shopaholics:** Individuals who buy things addictively.

**Voluntary Simplicity:** The voluntary reduction of material belongings purchased and used.



# Chapter 13

## Urban Energy Efficiency Assessment Using Stochastic and Deterministic Data Analysis: A Proposed Sustainable Urban Energy Assessment

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### **ABSTRACT**

*The present study puts forward an approach that aids in the achievement of significant technical urban energy efficiency results and that identifies the coherence of different frontier methods through a case study. The aim of the study is to show the effects and results of deterministic and stochastic approaches in urban energy efficiency measurement and to evaluate how data envelopment analysis (DEA), stochastic data envelopment analysis (SDEA), and stochastic frontier analysis (SFA) can be used to derive measures of efficiency and productivity change over time in complex multi-output multi-input contexts. With stochastic models, the authors aim to decrease the effect of extreme values on the efficiency frontier. It was found that nonparametric methods are sensitive to measurement error, while stochastic models have a more flexible frontier than deterministic models. This is the first study to put forward a novel approach to the measurement of urban energy efficiency of Turkey's metropolitans involving both deterministic and stochastic methods.*

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## INTRODUCTION

In recent years, increased energy consumption has led to social, economic and environmental problems that are detrimental to healthy urban sustainability, and that prevent the development of appropriate urban energy policies. The accurate measurement of urban energy consumption is vital if metropolitan areas want to achieve sustainable urban energy development and energy efficiency. Urban energy efficiency necessitates the use of less energy for the production of similar outputs, and the sustainment of a healthy urban life. Daily urban life activities and economic factors are both influential in the energy consumption of those living in metropolitan areas (CCICED, 2009).

Urban energy efficiency data is usually incomplete and imprecise, as previous studies that make use of classical approaches provide only limited insight into the randomness and complexity of urban energy efficiency data. In neglecting to make use of stochastic techniques in their measurement of the noise and uncertainty in data sets, it is necessary to include probability theory in their measurement techniques.

Energy policy makers should identify and implement more robust approaches to energy efficiency that include factors that are sensitive to the daily variations associated with energy investment, energy demand, data availability, local circumstances and any other local policy options. The frequent use of uncertain and poor quality data in policy making and planning have compelled researchers to make use of stochastic techniques in the study of urban energy efficiency (Keirstead, et al., 2012).

Benchmarking the efficiency of urban energy use within electricity consumption is thus an important area of study in the energy field. Among the parametric and nonparametric approaches to benchmarking, the Data Envelopment Analysis (DEA) method has emerged as the leading methodology for the benchmarking of the efficiency of various systems, being based on multiple factors, and has entered into widespread use for the calculation of the efficiency of the related decision-making units (DMUs) (Azadeh et al., 2015).

Since urban energy consumption is a leading factor in industrial development, increasing energy efficiency in the urban field is essential for urban sustainability. Accordingly, the present study makes use of stochastic approaches in its assessment of Turkey's 30 largest metropolitan areas, as decision making units (DMUs), over the 2018–2019 period in an evaluation of urban energy efficiency. The main purpose of the present study is to carry out a deterministic and stochastic measurement of the urban energy efficiency of these cities based on six indicators, being total invoiced consumption (MWh), total installed power (MW), line length (Km), population and GDP per capita as inputs, and total generation (MWh) as the sole output.

For the purpose of the study, all indicators were determined as random in the stochastic models, and are frequently applied to the performance benchmarking of energy efficiency in literature (Jamashb et al., 2001). The present study extended input oriented deterministic and stochastic CCR DEA and two SFA models to consider the stochastic variations in the data and in the efficiency score of each DMU. It was found in the study that uncertainty in the data leads to fluctuations in the efficiency analysis results, which hinders the establishment of actual and consistent energy policies. These results suggest a need to place more importance in the error scores when measuring stochastic efficiency. The identified technical efficiencies of cities differ when measured using deterministic or stochastic methods. While in the deterministic DEA approach there is no consideration of randomness in the data, the Stochastic Data Envelopment Analysis (SDEA) and SFA method allowed for the calculation of the noise in the data. These approaches can be referred to as parametric and nonparametric methods.

In the classical DEA method, the inputs and outputs are deterministic, which leads to consistent outputs against future inconsistencies. The disadvantages of classical DEA were overcome by including SDEA in the analysis. Stochastic programming provides an effective framework in which optimization problems are formulated under uncertainty. (Birge et al., 1997).

The present study fills gaps in literature on the uncertainty of energy policy-making within Turkey's metropolitan areas with the consideration of noisy in data. To this end, a comparison is made for the results of DEA, SFA and SDEA by proposing a method for the measurement of the efficiency of the different models. In the end, various technical efficiency scores of models show significance and insignificance between parametric and nonparametric benchmarking approaches.

As a consequence, this study proposes a new method to measure efficiency of different models'. By new method there is a proposed method such as taking average of all models and finding new ranks according to new average scores.

## **BACKGROUND**

### **The Importance of Urban Energy Efficiency**

Energy is a establishment for a metropolitan to create economic adequacy, satisfaction, and the other general needs. However, the increasing unbalance between energy supply and demand have highlighted the importance of improving urban energy performance, so the number of studies related to urban energy efficiency is increasing.

Metropolitan areas are the centers of economic and cultural activity of a country, providing essential urban life indicators to both developed and developing countries (Keirstead et al., 2007). The energy efficiency of a city is the difference between the energy required for urban life and the actual energy consumption. Urban energy consumption as regards to the electricity sector relates to energy expenditures, environmental factors, the population and the economy. Literature contains many studies of energy efficiency, and here there is an overview of urban life energy efficiency studies.

Doherty et al. (2013) categorized the energy consumption of cities and determined that the strategies developed for energy efficiency in cities were related to the integration of energy technologies into the city in the form of renewable power plants at different scales, smart grid infrastructure, district heating and energy efficient services (Doherty et al., 2013).

Forsström et al. (2011) analyzed energy field output indicators for service, process, goods and consumption, identifying energy efficiency as a ratio of energy output to energy input, and energy efficiency as an essential component of environmental sustainability. The authors claimed that natural energy resources are a result of ecological efficiency, and can be defined as part of sustainability. Accordingly, energy efficiency is a subset of ecological efficiency, and both are encompassed by sustainable development (Forsström, et al. 2011).

Jiang et al. (2008) reported that costs, energy dependency, local and global pollution could be decreased, local employment could be increased, and living conditions could be improved by paying attention to energy efficiency and adopting proven approaches in settlements.

Sınmaz (2015) stated that, energy efficiency studies should deal with the energy efficiency of residential areas as a whole in Turkey in order to address the urban structures and urban vehicles.

For energy efficiency, it is essential to make use of different approaches that maximize outputs and decrease investments (Li et al., 2017). There are different urban energy efficiency input and output parameters that Patterson (Patterson et al., 1996) has introduced generally used indicators such as “thermodynamic, physical-thermodynamic, economic-thermodynamic and economic”. But each indicators has positive and negative sides and each of them are optional indicators.

Energy usage per unit of Gross Domestic Product (GDP) factor shows total industry sectors’ energy requirement to generate one unit of prospected output factor. Urban energy consumption is generally relates with energy services provided for people, that is an essential indicator for the production of GDP. When people save more goods and money, living standards such as GDP increase, This is generally causes increase in energy use in industrialized countries (CCICED, 2009). Hence, GDP is a necessary component for urban energy efficiency studies, reliable economical decision making strategies and energy investment policies.

Researchers tried improving urban energy efficiency by considering investment, consumption and production. According to these literature studies and perspectives, urban energy efficiency components in cities must be an integration of energy usage within lifecycle needs.

## **Researches on Energy Efficiency within DEA and SFA**

There are many researches in literature on energy efficiency measurements within DEA and SFA. Keirstead (2013) implemented various methods in performance evaluation of urban energy efficiency in United Kingdom and used regression residuals, ratio calculation and DEA methods.

Dizdarevic et al. (2012) measured energy efficiency in the EU countries between 2000 to 2010. They used input oriented CCR DEA with capital, labour, energy use as input parameters and gross domestic product as the output. Here, GDP was the most essential indicator because of the energy economy policies.

Baycan and İlhan (2015) tried to measure urban energy efficiency by nonparametric DEA approach and they evaluated efficiency scores for 81 provinces of Turkey. According to study; to make detailed and reliable studies in urban energy efficiency, there should be correct and high quality energy data, planned economical decisions and registered outputs.

Li et al. (2017) used BCC and CCR methods of DEA and SFA for assessment of energy efficiency in high energy using industry. According to the study, DEA is the best approach for benchmarking with multiple factors. In addition, energy economic models present authorities how to make decisions and plans for future energy policies.

Yang et al. (2018) studied a method of determining the energy intensive urban built environment for developing urban energy efficiency and understanding of how urban buildings use energy. Building energy usage may include imprecise, unpredictable cases like energy supply and demand imbalance, system faults, service quality problems, climate changes, weather uncertainty and data input failures. This randomness and noisy may show either positive or negative effect on efficiency analysis scores and can be interpreted as probable differences of energy efficiency. Since the random indicators, uncertain issues and noise in data have essential impacts on building energy performance, this study implements SFA methodology to find out the efficiency frontier and to remove influences of random error (Yang et al., 2018).

According to the used methodologies, DEA was first introduced by Farrell (1957), then, the methodology was improved by Charnes et al. (1959) who instructed the basics of operational research. Charnes, Cooper, Rhodes (1978) improved the first data envelopment analysis approach that was named the CCR

model. Banker, Charnes, Cooper (1984) introduced the data envelopment analysis to get a variable returns to scale of the CCR named BCC model. Farrell (1957) presented SFA model to set the differences between empirical and theoretical searches. SFA approach showed us a parametric relation between model's input and output indicators. In 1970s, SFA was first implemented in the evaluation of production function frontier by Aigner et al. (1968).

DEA is a nonparametric linear programming methodology that creates a frontier function for measuring efficiency by including a convex linear model of parameters. The feature of SFA is the estimation of a conventional function and the determination of efficiency or inefficiency by calculating the distance of each decision unit to the curve created by this function. SFA includes a parametric method of frontier efficiency function and indicates error, which shows separations from the efficiency limit. The error is the accumulation of the stochastic inefficiency scores and data noisy. StoNED approach also assumes stochastic error and a nonparametric, piecewise linear frontier formulation (Gil et al., 2017). Lopes and Mesquita (2015) stated that SFA, DEA and StoNED models are commonly used among the European energy efficiency field for benchmarking.

Liu et al. (2020) aimed to study on differences in urban land use efficiency by SFA. They used labour, land and capital as indicators of production in frontier production function and selected the GDP to represent desirable output indicator, while the emissions are undesirable output indicators.

Wang et al. (2017), studied a group of urban life energy usage assessment factors by SFA method. According to them, urban economic structure, energy usage, technological progress in environmental perspective are important in urban energy efficiency assessment and they are influencing indicators. Moutinho et al. (2020) analyzed effect of urban air pollution in ecological efficiency through DEA and SFA in Germany. They found out that randomness and noisy in data like in climate change effects efficiency results.

By studying on random parameters and analyzing the possibility of uncertain situations, different perspectives of the available information can be obtained in energy markets. The main positive side of studying on random data, is determination of accurate future energy efficiency policies by the help of future optimization problems (Mirbolouki et al., 2014). Analyzing of case study variables causes errors and noise. The noise and errors in random indicators generally leads to faulties in frontier production function and in efficiency scores (Brazdik et al., 2004).

Yenioğlu and Toklu (2021) used deterministic and stochastic DEA approaches for the evaluation of energy efficiency. They used multiple input and output indicators as random variables in stochastic models. This study found out that SDEA scores are more flexible than classical DEA and stochastic models give more results closer to the production frontier.

In addition, Land et al. (1993,1994), Li (1998), Cooper et al. (2004), Sengupta (2002), Huang and Li (2001), Olesen (2002), Khodabakhshi (2008,2010) Behzadi et al. (2009) and Jahanshahloo et al. (2010) led stochastic DEA approaches in their researches.

Recent SDEA approaches made modifications in the constrained optimization problems. In these hard problems, linearization way allows solving large sized chance constrained optimization problems (Brazdik et al., 2004).

Land et al. (1993) analyzed the efficiency of an education system like in Charnes et al. (1978). Land et al. (1993), presented the probability of SDEA model. They formulated the stochastic approach of DEA within chance constrained methodology. Land et al. (1993) transformed stochastic optimization problems into their deterministic equivalents to detect the efficiency scores.

## **Urban Energy Efficiency Assessment Using Stochastic and Deterministic Data Analysis**

Charnes et al. (1959, 1962) tried modelling efficiency under noisy data, by the CCDEA method that provided the constraints to be violated. The concept of CCDEA studied by Khodabakhshi (2010) to get an stochastic output oriented super efficiency methodology. Khodabakhshi (2010) worked on SDEA, which assessed 17 Iranian energy companies by using cost, population of employees, power of transformer and line length as inputs, the amount of distributed energy, the number of subscribers and the service area as outputs. Mirbolouki et al. (2014) developed a stochastic CCDEA model within chance constrained approach for measuring the efficiency of 15 Iranian electricity markets. In the study, line length, population of employees, capacity of transport were determined as the input indicators, number of subscribers, total electricity usage were chosen as the random output indicators. Olesen (2002), Taluri et al. (2006), Demireli and Özdemir (2013), Behzadi et al. (2012) also used CCDEA in their studies.

In the chapter, a new urban energy efficiency evaluation method presented within DEA, SDEA and SFA models for 30 metropolitans in Turkey as a case study. These cities accepted as metropolitans by government according to their number of districts, service limits, total population, physical settlement status and economic development levels (Yetkin, 2020).

As a summary of the literature review, researches on urban energy efficiency are presented below in Table1.

*Table 1. Literature review summary for urban energy efficiency studies.*

Author(s)	Category	Study Descriptions
<b>Moutinho et al. (2021)</b>	Effect of urban air pollution in ecological efficiency through DEA and SFA in Germany.	Study found out that randomness and noisy in data like in climate change effects efficiency results.
<b>Yang et al. (2018)</b>	Energy efficiency and understanding of how urban buildings consume energy.	Building energy use may include imprecise, random error terms and this randomness may have either positive or negative effect on measurement and can be interpreted as stochastic differences of energy efficiency. Since the random factors, uncertain situations and error in data have important impacts on building energy performance, this study utilized SFA to find out the efficiency frontier and to remove influences of random error.
<b>Baycan and İlhan (2015)</b>	Urban energy efficiency measurement by nonparametric DEA method.	According to study; to make detailed and reliable studies in urban energy efficiency, there should be correct and high quality energy data, planned economical decisions and registered outputs, regular data evaluations of CO2 emissions and energy efficient buildings in each city.
<b>Doherty et al. (2013)</b>	Energy consumption in urban environments.	According to study; energy consumption of cities can be measured into three categories as; operational, embodied and transport energy
<b>Keirstead (2013)</b>	Benchmarking Urban Energy Efficiency	Study used ratio calculation, regression residuals and DEA methods. The input indicators of DEA model were total energy consumption, land area, climate and population, while the output indicators were life expectancy, carbon dioxide emissions as undesirable output and access time to services.
<b>Dizdarevic et al. (2012)</b>	Energy efficiency measurement in the EU countries.	They implemented input-oriented CCR DEA model within capital, labour, and energy use as input parameters and gross domestic product as the output. Here, GDP was the most important factor because of the energy economy policies.
<b>Forsström, et al. (2011)</b>	Urban energy efficiency study through, complex energy measurement output indicators defined for service, process, goods and consumption.	Energy efficiency is an important component of environmental sustainability and urban sustainable development. Natural energy resources are the results of ecological efficiency that can be defined as a part of sustainability. Hence, they said that; energy efficiency is a subset of ecological efficiency and sustainable development encompasses both of them
<b>Proposed Model</b>	DEA, SDEA and SFA approaches used in urban energy efficiency.	This paper shows the strengths and weaknesses in estimating urban energy efficiency through noisy on the frontier. Technical efficiencies of cities differ between two methods.

## MAIN FOCUS OF THE CHAPTER

Chapter is devoted to DEA, SDEA and SFA approaches used in urban energy efficiency of the chosen metropolitans. In order to make assessment of healthy energy efficiency benchmark and to be sure that the system components do not affect the scores of the measurement, the indicators should be random.

The aim of using deterministic and stochastic methodologies in urban energy efficiency problem is measuring inefficiency of a DMU as the distance between an efficient DMU frontier and actual performance of the DMU and showing the divergent efficiency results of stochastic and deterministic methods. However, the two methods had different advantages and disadvantages. DEA needs no assumptions about the probability density of inputs and outputs on frontier. It joins noise as part of the efficiency score and assumes no errors and deviations from the efficient frontier. SFA allows deviations from the efficient frontier into a random error term that is statistical noise and a one-sided error term representing inefficiency. SFA needs the determination of a functional form for the frontier and assumptions about the distributions of the random error and inefficiency error terms. SFA can separate random noise from frontier.

In this instance, an energy efficiency comparison of urban life field was made by the classical CCR DEA, chance-constrained CCR DEA and Battese and Coelli 1992 (BC92), Battese and Coelli 1995 (BC95) SFA models. The presentation of chosen methodologies are given with below subsections.

### Deterministic Input-Oriented CCR Model

CCR approach was studied to analyze the DMUs that were calculated by the efficiency production function with constant returns to scale. The reason for choosing CCR DEA model was to ensure the prospect of separately calculating each DMU's efficiency that measures the DMU's total success at utilizing its minimized random inputs in order to get optimal random outputs. CCR model calculates the sector efficiency of a decision unit which includes technical and scale efficiency. In this approach the assumption is that, outputs rise with rising in inputs (Li et al., 2017).

Mathematical equation of input oriented CCR model is given below. It is supposed that there are  $n$  homogenous DMUs ( $DMU_j, j = 1, \dots, n$ ) and all of them use  $m$  inputs  $x_{ij} (i = 1, 2, \dots, m)$  to obtain  $s$  outputs  $y_{rj} (r = 1, 2, \dots, s)$ ,  $x_j = (x_{1j}, \dots, x_{mj})$  and  $y_j = (y_{1j}, \dots, y_{sj})$  which are not negative and not zero vectors. The CCR model's production probable set suggested by Charnes, Cooper, Rhodes in 1978 is as follows:

$$T_{CCR} = \{(X, Y) \mid \sum_{j=1}^n (X_j \lambda_j) \leq X, \sum_{j=1}^n (Y_j \lambda_j) \geq Y, \lambda_j \geq 0, j = 1, \dots, n\}$$

CCR efficiency results can be gained by implementing the envelopment input oriented expression (1), respectively where  $x_{i0}$  and  $y_{r0}$  represent the  $i$ th input and the  $r$ th output indicator vector of  $DMU_0$  under calculation in models.

A DMU is named input oriented CCR efficient if its expected value in model (1) is equal to unity.

$$\min \theta_0 + \varepsilon \left( \sum_{i=1}^m s_i^- + \sum_{r=1}^s s_r^+ \right)$$

s.t.

$$\sum_{j=1}^n x_{ij} \lambda_j + s_i^- = \theta_0 x_{i0}; \quad \sum_{j=1}^n y_{rj} \lambda_j - y_{r0} - s_r^+ = 0 \quad (1)$$

$$\lambda_j \geq 0, s_i^- \geq 0, s_r^+ \geq 0; \quad i=1,2,\dots,m; \quad r=1,2,\dots,s; \quad j=1,2,\dots,n$$

Here  $\lambda_j$  represents structural variables,  $s_i^-$ ,  $s_r^+$  represent slacks and  $\varepsilon > 0$  is a “non-Archimedean infinitesimal” that is assumed to be smaller than any positive real number. That is  $\varepsilon$  is not a real number.

### Stochastic Input Oriented CCR Model Under Chance Constraint

In the stochastic framework, the production possibility set is determined in terms of random indicators with mean and standard deviation values of inputs and outputs. In the model development and solution, the transformation from the chance constrained model to its deterministic model is used. The general production possibility set of the CCR production function was used by Charnes et al. (1978).

Assuming that the inputs and outputs in the stochastic models are random variables,

$$\tilde{x}_j = (\tilde{x}_{1j}, \dots, \tilde{x}_{mj})$$

$$\tilde{y}_j = (\tilde{y}_{1j}, \dots, \tilde{y}_{sj})$$

represent the random input and output vectors of  $DMU_j, j=1, \dots, n$ .

It is accepted in the model that all input and output indicators have normal distribution as in below expressions.

$$\begin{aligned} \tilde{x}_{ij} &\sim N(x_{ij}, \sigma_{ij}^2), \quad i = 1, 2, \dots, m \\ \tilde{y}_{rj} &\sim N(y_{rj}, \sigma_{rj}^2), \quad r = 1, 2, \dots, s \end{aligned} \quad (2)$$

Using notation (2) and considering the indicators were random, the chance constrained input oriented CCR model introduced by Cooper et al. in 1996 is as follows:

Min  $\theta$

s.t.

$$\begin{aligned} P\left(\sum_{j=1}^n \tilde{x}_{ij} \lambda_j \leq \theta \tilde{x}_{i0}\right) &\geq 1 - \alpha, \quad i = 1, \dots, m \\ P\left(\sum_{j=1}^n \tilde{y}_{rj} \lambda_j \geq \tilde{y}_{r0}\right) &\geq 1 - \alpha, \quad r = 1, \dots, s \end{aligned} \quad (3)$$

$$\lambda_j \geq 0, j = 1, \dots, n$$



In model (3),  $P$  represents the probability measure,  $\alpha$  is the level of error between 0 and 1.

### Deterministic Equivalent of the CCR Model Under Chance Constrained

This subsection introduces the deterministic equivalent of the stochastic input oriented CCR model (3). It is assumed that  $\tilde{x}_{ij}$  and  $\tilde{y}_{rj}$  are the mean values of the input and output variables. Implementing methodologies obtained by Cooper et al. (1996), it can be transformed into quadratic form. The deterministic equation of model (3) which is obtained by the method described by Cooper et al. (1996,2004) is as follows:

$$\text{Max } \theta + \varepsilon \left( \sum_{i=1}^m s_i^- + \sum_{r=1}^s s_r^+ \right) \theta$$

s.t.

$$\begin{aligned} \sum_{j=1}^n x_{ij} \lambda_j + s_i^- - \phi^{-1}(\alpha) v_i &= \theta x_{i0}, \quad i = 1, \dots, m \\ \sum_{j=1}^n y_{rj} \lambda_j - s_r^+ + \phi^{-1}(\alpha) u_r &= y_{r0}, \quad r = 1, \dots, s \end{aligned} \tag{4}$$

$$\begin{aligned} v_i^2 &= \sum_{j \neq 0} \sum_{k \neq 0} \lambda_j \lambda_k \text{cov}(\tilde{x}_{ij}, \tilde{x}_{ik}) + 2(\lambda_0 - \theta) \sum_{j \neq 0} \lambda_j \text{cov}(\tilde{x}_{ij}, \tilde{x}_{i0}) + (\lambda_0 - \theta)^2 \text{var}(\tilde{x}_{i0}), \\ u_r^2 &= \sum_{j \neq 0} \sum_{k \neq 0} \lambda_j \lambda_k \text{cov}(\tilde{y}_{rj}, \tilde{y}_{rk}) + 2(\lambda_0 - 1) \sum_{j \neq 0} \lambda_j \text{cov}(\tilde{y}_{rj}, \tilde{y}_{r0}) + (\lambda_0 - 1)^2 \text{var}(\tilde{y}_{r0}), \end{aligned}$$

$$\lambda_j, s_i^-, s_r^+ \geq 0; v_i \geq 0; u_r \geq 0; j = 1, \dots, n; r = 1, \dots, s; i = 1, \dots, m$$

Expression (4) is a quadratic programming form.  $\phi$  is the cumulative distribution representation of the standard normal distribution and  $\phi^{-1}(\alpha)$  is its inverse in level of  $\alpha$ . If the predetermined value of  $\alpha$  is equal to 0.5, then  $\phi^{-1}(\alpha)=0$ .

DMU0 is determined as stochastic efficient DMU if and only if when  $\theta_0^* = 1$  and slack values  $s_i^-, s_r^+ \geq 0$  are all zero for all optimal solutions in the model. Here, \* is used to define an optimum value (Cooper et al., 2004).

### Stochastic Frontier Analysis

This subsection introduces Stochastic Frontier Analysis, which is a parametric methodology and is used in efficiency measurement within mathematical and econometric assumptions. The SFA approach was presented by Aigner et al. (1968) and has been implemented by researchers for the estimation of a conventional function and the determination of efficiency or inefficiency by calculating the distance of each decision unit to the curve created by related frontier function.

SFA method's frontier model emphasizes the limit of production and related stochastic term implies calculated error. Literature showed that the random indicators may affect production frontier assessment. Therefore, the statistical error, which has normal and one sided distribution, included into the model. SFA solves negative sides of measurement frontier errors and efficiency scores. In the paper, BC92 and BC95 models are used since both of these SFA models are determined as time varying inefficiency approaches and they provide technical efficiency scores which change over time.

In 1977, Aigner et al. (1977) established production function of SFA in deterministic and stochastic ways. Broeck et al. (1977) introduced a new stochastic production function with symmetric random error for statistical noise calculation. The basic SFA form is shown below:

$$Y_i = f(X_i, \beta_i) + v_i - u_i = f(X_i, \beta_i) + \varepsilon_i \quad i = 1, 2, \dots, N \quad (5)$$

where  $v_i$  independent random variable showing the  $N(0, \sigma_i^2)$  that is normal distribution and  $\varepsilon_i \leq 0$ . In expression (5) it is assumed that  $\varepsilon_i$  is a composite error parameter consisting of two independent parameters,  $v_i$  and  $u_i$ .  $v_i$  consists noisy errors that occur in production function.

If a DMU provides expected production with full efficiency, the technical efficiency is "1", but if it produces expected outputs under the optimal capacity its efficiency measure is less than 1, that is this DMU is inefficient. Another point to be considered is how the efficiency is calculated. If the problem is output maximization (production maximization), then the composite error term calculation is valid and it is  $\varepsilon_i = v_i - u_i$ . If the efficiency problem is input minimization (cost function), then the equation  $\varepsilon_i = v_i + u_i$  is valid (Aigner et al., 1977).

This paper uses Battese and Coelli (1992) BC92 and Battese and Coelli (1995) BC95 models with panel data as follow:

$$Y_{it} = f(X_{it}, \beta_{it}) + v_{it} - u_{it} \quad (6)$$

where  $Y_{it}$  is total power production as output,  $X_{it}$  is the vector of input indicators,  $u_{it}$  represents technical efficiency and is accepted as truncated normal distribution,  $v_{it}$  consists of statistical random noise,  $i$  denotes each DMU and  $t$  is the each year of sample data .Hence in this specification  $u$  can change over time. This feature of the BC92 model is very necessary when the time period is long.

A form of the production frontier function indicates an assessment of cost that captures all the related indicators. The functional form of the model with indicators in logarithms is as follow:

$$\ln(Y_{it}) = \beta_0 A + \ln(\beta_1 X_{1it}) + (v_{it} - u_{it}) \quad (7)$$

where  $Y_{it}$  represents the production frontier for the  $i$ th DMU at the  $t$ th period of observation.  $X_{it}$  is the cost as random inputs,  $\beta_1$  is unknown parameter for cost, A is a constant.

The Battese and Coelli (1992) as in model (7) shows that the technical inefficiency is the product of an exponential function of time and positive random variable.

The BC95 Battese and Coelli (1995) model identifies unexpected factors which can change the degree of efficiency through production efficiency frontier that is given in expression (8).

$$\begin{aligned}\ln(Y_{it}) &= \beta_0 A + \ln(\beta_1 X_{1it}) + (v_{it} - u_{it}) \\ u_{it} &= z_{it} \delta + W_{it} \\ W_{it} &\geq -z_{it} \delta\end{aligned}\tag{8}$$

where  $W_{it}$  is the random variable associated with the impact of  $x_{it}$  variables on  $u_{it}$  following a truncated normal distribution with zero mean,  $z_{it}$  is a set of time factors and  $\delta$  is the corresponding variables to be calculated.

As a consequence, the technical efficiency of production for the  $it$ th DMU at the  $t$ th observation is determined as expression (9).

$$TE_{it} = \exp(-U_{it}) = \exp(-z_{it} \delta - W_{it})\tag{9}$$

## **CASE STUDY**

Urban energy policy issues consist of input and output parameters such as energy supply- demand, energy usage, total energy production, energy sector process components as installed power, line length, population, GDP. Through analyzing optimal energy efficiency scores, these indicators are essential components.

This case study compares DEA, stochastic DEA and SFA models including cross sectional data to minimize inputs and maximize output. According to literature, DEA, SDEA and SFA are techniques that can be best measurement of urban energy efficiency of cities with multiple inputs and outputs.

## **Data and Related Statistics**

In this section of the study, there is implementation of datasets from 2018 to 2019 to evaluate urban energy efficiency of Turkey's 30 metropolitans within deterministic and stochastic framework. Our inputs are invoiced consumption (MWh), total installed power (MW), line length (Km), population and GDP per capita, while output is total generation (MWh). Data collected from Turkish Statistical Institute (TURKSTAT) and Energy Market Regulatory Authority (EMRA). In the study, 30 metropolitans of Turkey are accepted as Decision Making Units (DMUs) of methods.

Table 2 shows the average statistics of data that were added to DEA and SDEA models. In addition, descriptive statistics of the input and output indicators are presented in Table 2.

Table 3 and Table 4 show the logarithm of data that were added to SFA models. In addition, correlations (Pearson) between input and output parameters, all the parameters significantly correlated and positively related with each other.

*Table 2. Descriptive statistics of the indicators*

	Mean	Median	Std. Deviation	Minimum	Maximum
<b>Inputs</b>					
x1-Invoiced Consumption (MWh)	6.290.560,04	3.893.568,91	75.065.449,78	879.856	40.452.119
x2-Total Installed Power (MW)	1.965,17	2.002,95	1.328,02	100	4.527
x3-Line Length (Km)	24.853,73	20.782,00	14.186,71	10.593	71.709
x4-Population	2.116.510,47	1.362.698,00	2.665.698,78	767.848	15.067.724
x5-GDP per capita	8.261,07	7.666,00	3.294,46	3.382	16.707
<b>Output</b>					
y1-Total Generation (MWh)	6.388.647,71	5.690.800,06	5.434.535,62	16.639	18.584.686

## RESULTS

Efficiency scores of models are presented in this subsection. The results of deterministic DEA, chance constrained stochastic CCR DEA and Battese and Coelli 1992 (BC92), Battese and Coelli 1995 (BC95) SFA models were implemented on mathematical programming and optimization systems, General Algebraic Modeling System (GAMS) and FRONTIER 4.1.

In Table 5 and Table 6 this can be observed; BC92 and BC95 SFA models' production function analysis results. According to Table 5 the parameter  $\gamma=0.839$  represents statistical significance at the 1% level. That means most sources of inefficiency, in combined error term ( $\mathcal{E}$ ) caused with almost 84% of technical inefficiency and 16% of random errors. In this context, although the technical inefficiency has a high rate within the combined error term, the existence of random errors cannot be ignored. There is a calculation of a time period into input distance function of BC92 model to show the changes in the efficiencies due to any shift in the production function. Since the result of parameter  $\eta$  is positive, the technical efficiencies grow through years. In addition estimated score of the parameter  $\eta$  has no significant changes in the technical efficiency scores over time. Since the parameter  $\eta$  represents positive but insignificant values, the efficiency results of all DMUs show a slight increase during data time period. The likelihood ratio test shows that inefficiency scores are statistically significant according to urban energy efficiency among metropolitans were identified. In Table 5 coefficients of total installed power and line length are positive and significant. Invoiced consumption, population and GDP per capita have negative sign and they aren't statistically significant. Consideration of the one sided error LR test is essential to evaluate the technical efficiency of DMUs. LR ratio was found to be approximately 16.73 and this value should be compared with the table value of 2.706 in the Kodde-Palm with a restriction of 1 at 0.05 significance level (Coelli et al., 1995).

$$H_0: \gamma=0$$

$$H_1: \gamma \neq 0$$

Since 16.73 score is bigger than the table value of 2.706 according to Kodde-Palm, the null hypothesis  $H_0$  hypothesis is rejected. This situation implies that, there is a statistically significant technical inefficiency in the model.

*Table 3. Estimated input and output parameters of 2018*

	x1	x2	x3	x4	x5	y1
ADANA	15,71863	8,259919	10,23225	14,61307	8,838697	16,72174
ANKARA	16,47614	7,947527	11,00471	15,52098	9,450144	16,28190
ANTALYA	15,92878	7,550624	10,72322	14,7019	9,204825	15,37748
AYDIN	14,79935	7,213547	9,926813	13,90877	8,826294	15,54773
BALIKESİR	15,01754	7,949247	9,807362	14,01974	8,97221	16,21013
BURSA	16,28544	7,876471	9,857025	14,91229	9,305741	15,98165
DENİZLİ	15,07510	7,478481	9,965147	13,84291	9,116579	15,57676
DIYARBAKIR	14,82812	7,734121	9,807307	14,36502	8,360539	15,36927
ERZURUM	13,68751	6,202596	9,774233	13,55135	8,645762	14,11538
ESKİŞEHİR	14,90925	6,560125	9,411565	13,67761	9,221379	13,85659
GAZİANTEP	15,82764	6,528689	9,609787	14,52284	8,873608	13,76599
HATAY	15,33529	7,918425	9,806536	14,29166	8,780941	16,52292
İSTANBUL	17,51563	8,014197	11,18037	16,52807	9,696586	15,94592
İZMİR	16,61626	8,416362	10,44599	15,27889	9,34688	16,73785
KAHRAMANMARAŞ	15,21100	8,417715	9,743730	13,95079	8,649974	16,01713
KAYSERİ	15,11067	6,818793	10,10135	14,14458	8,983565	14,40703
KOCAELİ	16,14421	7,651577	9,380421	14,46072	9,723583	15,61601
KONYA	15,66414	6,725058	10,74231	14,60651	8,932609	13,96152
MALATYA	14,31964	5,123369	10,07234	13,58866	8,583917	12,56287
MANİSA	15,34944	7,758163	9,980078	14,17294	9,149634	16,05141
MARDİN	14,37754	5,096018	9,338558	13,62821	8,485496	9,719519
MERSİN	15,30502	6,958306	9,939530	14,41130	8,956351	15,09836
MUĞLA	15,10634	7,74119	10,16439	13,78246	9,139703	16,26748
ORDU	14,04910	6,172869	10,10545	13,55665	8,596374	13,96561
SAKARYA	15,13731	7,838182	9,417111	13,82615	9,120525	16,47421
SAMSUN	14,97997	8,276003	10,23218	14,10498	8,781555	15,76155
ŞANLIURFA	15,37350	8,211953	10,29675	14,52640	8,129175	15,56095
TEKİRDAĞ	15,71038	7,374942	9,267949	13,84500	9,393162	14,85750
TRABZON	14,22131	6,355013	9,944150	13,60220	8,929568	14,21329
VAN	13,77971	4,602567	9,776903	13,93221	8,126223	12,05714

In Table 6 the parameter  $\gamma=0.999$  is represents statistical significance at the 1% level. That means most sources of inefficiency, in combined error term ( $\mathcal{E}$ ) caused with almost 99% of technical inefficiency and 1% of random errors. That is, the existence of random errors is very little. In Table 6, coefficients of total installed power, population and GDP per capita are positive and significant. Invoiced consumption and line length have negative sign and they aren't statistically significant. The one sided error LR ratio was found to be approximately 24.05 and comparing the table value of 2.706 in the Kodde-Palm with a restriction of 1 at 0.05 significance level,  $H_0$  hypothesis is rejected. So that, there is a statistically significant technical inefficiency in the model BC95 also.

*Table 4. Estimated input and output parameters of 2019*

	x1	x2	x3	x4	x5	y1
ADANA	15,72576	8,26380	10,25171	14,62107	8,77550	16,68923
ANKARA	16,46120	7,91317	11,02580	15,54523	9,34991	16,07575
ANTALYA	15,96831	7,61494	10,75081	14,73647	9,12706	15,42432
AYDIN	14,80828	7,18267	9,958020	13,92075	8,76695	15,67355
BALIKESİR	15,03267	7,98557	9,81891	14,02140	8,92656	16,06117
BURSA	16,28476	7,89266	9,88466	14,93266	9,24257	15,81965
DENİZLİ	15,05028	7,52474	9,98806	13,85204	9,06347	15,53683
DIYARBAKIR	14,76965	7,74527	9,84776	14,37875	8,28864	16,01321
ERZURUM	13,69901	6,78294	9,77968	13,54378	8,60290	14,05736
ESKİŞEHİR	14,91706	6,50031	9,48189	13,69614	9,15011	13,96560
GAZİANTEP	15,88966	6,52258	9,63763	14,54275	8,83407	14,02400
HATAY	15,29485	7,91739	9,831620	14,30341	8,74715	16,42892
İSTANBUL	17,49228	7,94069	11,18238	16,55759	9,62791	15,79041
İZMİR	16,55707	8,58435	10,47813	15,28964	9,29779	16,42709
KAHRAMANMARAŞ	15,17722	8,42674	9,750630	13,95883	8,59841	16,15144
KAYSERİ	15,10096	6,81161	10,13539	14,15726	8,88784	14,61633
KOCAELİ	16,11513	7,62393	9,401790	14,48490	9,65778	15,20160
KONYA	15,63730	6,80549	10,78230	14,61858	8,84645	14,33773
MALATYA	14,30469	5,21602	10,08134	13,59257	8,51945	13,02776
MANİSA	15,28788	8,01597	10,01118	14,18058	9,13580	16,32692
MARDİN	14,36473	5,20872	9,361520	13,63970	8,42247	11,34265
MERSİN	15,34276	7,01728	9,975620	14,42551	8,88854	15,33807
MUĞLA	15,05618	7,75022	10,19062	13,79851	9,06843	16,33687
ORDU	14,02365	6,19644	10,11286	13,53341	8,58093	14,11983
SAKARYA	15,10651	7,84569	9,430520	13,84361	9,04674	14,55491
SAMSUN	14,92495	8,14014	10,24409	14,11453	8,72328	15,64022
ŞANLIURFA	15,36226	8,23454	10,32302	14,54480	8,07689	16,28768
TEKİRDAĞ	15,74325	7,36822	9,446680	13,86944	9,33061	14,46854
TRABZON	14,21124	6,39145	9,942280	13,60352	8,88672	14,11226
VAN	13,81124	4,86738	9,807970	13,94369	8,07372	12,44851

BC92 and BC95 models consistent according to structure of error variance and it has been shown that the size of elasticity of variance ratio  $\gamma$  is positive and statistically significant and rather close to 1, this means that the importance of inefficiency effects rather than random data error effects in our study.

The size of elasticity of the invoiced consumption is found to be negative and statistically insignificant in both models, implies that taking the invoiced consumption into models does not change the efficiency results notably. This input indicator may not be included in future studies. The analyzed coefficients aren't consistent within both models results'; but technological inefficiencies consistent, for example, economically and socially underdeveloped cities inefficient according to developed ones.

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*Table 5. Analysis results of BC92 production function model*

Parameter	Coefficient	Standard Error	T Ratio
$\beta_0$ (Constant)	6.17	1.90	3.25
$\beta_1$ (Invoiced Consumption)	-0.034	0.043	-0.782
$\beta_2$ (Total Installed Power)	1.25	0.093	13.4
$\beta_3$ (Line Length)	0.334	0.203	1.64
$\beta_4$ (Population)	-0.176	0.166	-1.05
$\beta_5$ (GDP per capita)	-0.019	0.218	-8.91
$\sigma^2$	0.762	0.269	2.82
$\gamma$	0.839	0.079	10.5
$\mu$	-1.60	0.690	-2.31
$\eta$	0.361	0.201	1.79
Log-likelihood	-37.23		
LR test of the one-sided error	16.73		

*Table 6. Analysis results of BC95 production function model*

Parameter	Coefficient	Standard Error	T Ratio
$\beta_0$ (Constant)	9.24	0.793	11.8
$\beta_1$ (Invoiced Consumption)	-0.607	0.233	-2.60
$\beta_2$ (Total Installed Power)	1.40	0.049	28.3
$\beta_3$ (Line Length)	-0.106	0.023	-4.54
$\beta_4$ (Population)	0.318	0.167	1.89
$\beta_5$ (GDP per capita)	0.207	0.224	0.925
$\sigma^2$	2.735	0.440	6.20
$\gamma$	0.999	0.00014	681.2
Log-likelihood	-31.98		
LR test of the one-sided error	24.05		

In the input oriented CCR SDEA model data was added into model with mean and variance values. In stochastic DEA model,  $\alpha$  levels were considered as 0.005, 0.02, 0.05, 0.1, 0.2, 0.3, 0.4, 0.5, and 0.6 and the program was run separately for each  $\alpha$  value. The results of the SDEA model for all  $\alpha$  levels are shown in Table 7. In the models if technical and pure technical efficiency scores equal 1, that implies full efficiency. But, if the score is lower than 1, it means inefficiency. Beside these, from the perspective of  $\alpha$  levels, as seen in Table 7, at  $\alpha = 0.6$  degree the urban efficiency results become zero. The results introduce that, when the error increased from 0.5 to 0.6, the estimated value of efficiency deviates sharply. In summary, the urban efficiency results deviated when the level of error was higher than a half. Additionally, the efficiency of each DMU increased during the decreasing levels of error. In this context from the results, it is clear that, when the  $\alpha$  values increased, the number of efficient units decreased.

*Table 7. Average efficiency results of CCR SDEA for each  $\alpha$  level*

DMU	$\alpha=0.005$	$\alpha=0.02$	$\alpha=0.05$	$\alpha=0.1$	$\alpha=0.2$	$\alpha=0.3$	$\alpha=0.4$	$\alpha=0.5$	$\alpha=0.6$
ADANA	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	0.00000
ANKARA	0.78990	0.78990	0.78990	0.78990	0.78879	0.77619	0.75624	0.73676	0.00000
ANTALYA	0.53333	0.52786	0.52391	0.51411	0.50098	0.49186	0.48443	0.47652	0.00000
AYDIN	0.89453	0.89453	0.89453	0.89453	0.89339	0.88509	0.87501	0.86525	0.00000
BALIKESİR	0.99516	0.98548	0.97809	0.97157	0.96357	0.95773	0.94530	0.92953	0.00000
BURSA	0.60617	0.60617	0.60617	0.60617	0.60579	0.60057	0.59165	0.58287	0.00000
DENİZLİ	0.67451	0.66474	0.65598	0.64478	0.63072	0.62090	0.61287	0.60425	0.00000
DIYARBAKIR	1.00000	1.00000	1.00000	1.00000	1.00000	0.95874	0.87805	0.79839	0.00000
ERZURUM	1.00000	1.00000	1.00000	0.75712	0.55522	0.46493	0.44109	0.43706	0.00000
ESKİŞEHİR	0.32396	0.32396	0.32396	0.32396	0.32153	0.31679	0.31235	0.30814	0.00000
GAZİANTEP	0.32990	0.32990	0.32990	0.32990	0.32984	0.32552	0.31614	0.30683	0.00000
HATAY	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	0.00000
İSTANBUL	0.55341	0.55341	0.55341	0.55341	0.55164	0.53979	0.52643	0.51373	0.00000
İZMİR	0.90947	0.86992	0.83696	0.80508	0.76722	0.71943	0.67073	0.63315	0.00000
KAHRAMANMARAŞ	0.91611	0.91431	0.91297	0.91181	0.91041	0.90941	0.90198	0.89380	0.00000
KAYSERİ	0.44756	0.44756	0.44756	0.44756	0.44745	0.44298	0.43364	0.42436	0.00000
KOCAELİ	0.56088	0.56073	0.56062	0.56052	0.56039	0.56030	0.56023	0.53853	0.00000
KONYA	0.37156	0.37156	0.37156	0.37156	0.37028	0.35632	0.33478	0.31412	0.00000
MALATYA	0.49719	0.49719	0.49719	0.49719	0.49520	0.47261	0.43722	0.40341	0.00000
MANİSA	1.00000	1.00000	1.00000	1.00000	0.98727	0.91198	0.83955	0.77697	0.00000
MARDİN	0.09959	0.09950	0.09800	0.09567	0.09293	0.08473	0.06998	0.05594	0.00000
MERSİN	0.80076	0.80076	0.80076	0.80076	0.79876	0.77960	0.75167	0.72472	0.00000
MUĞLA	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	0.00000
ORDU	0.51817	0.51817	0.51817	0.51817	0.51768	0.51264	0.50499	0.49750	0.00000
SAKARYA	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	0.89028	0.00000
SAMSUN	0.66272	0.66005	0.65809	0.65641	0.65441	0.65278	0.64688	0.64112	0.00000
ŞANLIURFA	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	0.98758	0.00000
TEKİRDAĞ	0.38836	0.35579	0.33480	0.32469	0.32463	0.31763	0.30218	0.28682	0.00000
TRABZON	0.47763	0.47763	0.47763	0.47763	0.47527	0.47115	0.46735	0.46372	0.00000
VAN	0.50432	0.50432	0.49950	0.49147	0.47805	0.43743	0.39453	0.35665	0.00000

Table 8 shows that average p values of normality test of each  $\alpha$  level. According to table results, for  $\alpha=0.5$ , average p value is higher than others. Therefore, this value was chosen for the optimum SDEA efficiency results and this results are added into Table 9 for urban energy efficiency comparison between models.

Table 9 shows that, average estimated 2018 and 2019 efficiency results and ranks of the DEA, SDEA and SFA models.



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Table 8. Average p values of normality test of each  $\alpha$  level

$\alpha$ level	0.005	0.02	0.05	0.1	0.2	0.3	0.4	0.5	0.6
p-value	0.005	0.007	0.007	0.021	0.020	0.033	0.075	<b>0.203</b>	<0.005

Table 9. Average efficiency estimated results and ranks of the models

DMU	DEA		SDEA		BC92		BC95	
	T.E.	Rank	T.E.	Rank	T.E.	Rank	T.E.	Rank
ADANA	0,840	5	1	1	0,856	11	0,857	6
ANKARA	0,739	6	0,736	11	0,865	8	0,97	1
ANTALYA	0,445	20	0,476	20	0,728	24	0,652	14
AYDIN	0,739	6	0,865	8	0,916	2	0,799	9
BALIKESİR	0,865	4	0,929	5	0,863	9	0,583	16
BURSA	0,588	12	0,582	16	0,875	7	0,783	10
DENİZLİ	0,584	13	0,604	15	0,843	12	0,648	15
DİYARBAKIR	0,451	19	0,798	9	0,811	17	0,308	27
ERZURUM	0,485	17	0,437	22	0,784	20	0,459	24
ESKİŞEHİR	0,262	27	0,308	27	0,738	23	0,37	26
GAZİANTEP	0,246	28	0,306	28	0,776	22	0,517	20
HATAY	0,969	2	1	1	0,926	1	0,963	2
İSTANBUL	0,494	16	0,513	18	0,807	19	0,834	7
İZMİR	0,73	8	0,633	14	0,833	15	0,898	5
KAHRAMANMARAŞ	0,699	10	0,893	6	0,631	26	0,304	28
KAYSERİ	0,35	22	0,424	23	0,777	21	0,491	21
KOCAELİ	0,51	15	0,538	17	0,858	10	0,688	12
KONYA	0,246	28	0,314	26	0,597	28	0,469	23
MALATYA	0,302	26	0,403	24	0,843	12	0,671	13
MANİSA	0,709	9	0,776	10	0,887	5	0,744	11
MARDİN	0,018	30	0,055	30	0,2	30	0,392	25
MERSİN	0,609	11	0,724	12	0,913	3	0,824	8
MUĞLA	0,896	3	1	1	0,908	4	0,944	3
ORDU	0,43	21	0,497	19	0,835	14	0,536	18
SAKARYA	1	1	0,89	7	0,808	18	0,944	3
SAMSUN	0,573	14	0,641	13	0,525	29	0,243	30
ŞANLIURFA	0,345	23	0,987	4	0,608	27	0,279	29
TEKİRDAĞ	0,315	24	0,286	29	0,67	25	0,47	22
TRABZON	0,459	18	0,463	21	0,831	16	0,534	19
VAN	0,306	25	0,356	25	0,878	6	0,578	17

As seen from SDEA results in Table 9, Adana, Hatay, Muğla are efficient metropolitans. Hence, these cities are technical efficient through chance constrained stochastic CCR DEA model. As mentioned before, CCR models calculate both technical and scale efficiency scores globally. On the other hand, Antalya, Erzurum, Eskişehir, Gaziantep, Kayseri Konya, Malatya, Mardin, Ordu, Tekirdağ, Trabzon, Van are inefficient with around under %50 scores. According to DEA model, Sakarya is the most efficient state. Hatay, Muğla, Balıkesir and Adana follows it. Although there are 15 efficient metropolitan cities in DEA model with over %50 scores, in SDEA this number changes as 18. As a result of this comparison, the stochastic model of SDEA approach provides a more flexible production boundary than the classical DEA structure. Mardin is the most inefficient city according to both models and authorities should check this situation through invoiced consumption, total installed power, line length, population, GDP per capita and total generation. Here invoiced consumption is the most important indicator because of loss-leakage ratio that causes unregistered electricity use. There should be paid attention to Şanlıurfa since there is a big difference between SDEA and DEA results of it. It is inefficient in DEA with 0,345 score, but efficient in SDEA with 0,987 score. This difference causes from availability of data and the randomness in SDEA model that shows more flexible boundary, so the registered data should be examined in this metropolitan.

According to BC92 model; Aydın, Hatay, Mersin, Muğla are technical urban energy efficient with around %90 scores. In BC95 model; Ankara, Hatay, Muğla, Sakarya are technical efficient but Diyarbakır, Erzurum, Eskişehir, Kahramanmaraş, Mardin, Samsun, Şanlıurfa, Tekirdağ inefficient cities. Mardin is the most inefficient city in four models.

## **DISCUSSION**

The results of three stochastic models show that, Hatay and Muğla have the best performance. But the results of four models show that, Sakarya, Hatay and Muğla have the best performance. This situation displays that Sakarya hasn't got available and good registered data and there is some noisy in data through stochastic framework. Erzurum, Eskişehir, Mardin, Tekirdağ have the lowest scores, and the other energy efficiency performances are higher than fifty percentages in stochastic framework. Here there should be examination of Mardin again. This city is inefficient in deterministic CCR model and its performance is also under fifty percentages in stochastic framework. This confirms the situation of our SFA  $\gamma$  parameter which sources of stochastic inefficiency, caused with technical operations and some sources caused with random errors. Consequently, 'reliable urban energy efficiency evaluation highly relates with stochastic models' actual and reliable data' can be inferenced.

When comparing average efficiency results of models; DEA has 0,573, SDEA has 0,678, BC92 has 0,867 and BC95 has 0,717 scores. Hence, BC92 shows highest efficiency scores than others. DEA has lowest efficiency scores as it should be in deterministic models.

Total generation, population, total installed power, invoiced consumption are impacted by unregistered energy usage within loss-leakage ratio. These issues affect energy supply-demand imbalance that is the main reason for uncertainty of inputs and outputs and different size of parameter coefficients of models. GDP impacts the correct investment decisions, line length impacts the low amount of energy distribution issues. This seem to be the cause of inefficiency, but it can be said that inefficiency will be eliminated by providing supervision and smart controls and balance the demands in line with the needs.

Table 10 shows us correlations between models' ranks. DEA, SFA and SDEA models has positive and significant correlation coefficients. BC92 and BC95 models have compatibility degree of 74,1%. The highest compatibility is between DEA and SDEA with 84,6% and the lowest compatibility is between SDEA and SFA models that have 42,4% and 46,8% ratios. As can be seen from the results, it is not possible to make a precise energy efficiency measurement with different results of different models.

*Table 10. Correlations between ranks of the models*

		<b>DEA</b>	<b>SDEA</b>	<b>BC92</b>	<b>BC95</b>
<b>DEA</b>	Pearson Correlation	1	,846**	,610**	,683**
	Sig. (2-tailed)		,000	,000	,000
	N	30	30	30	30
<b>SDEA</b>	Pearson Correlation	,846**	1	,468**	,424*
	Sig. (2-tailed)	,000		,009	,020
	N	30	30	30	30
<b>BC92</b>	Pearson Correlation	,610**	,468**	1	,741**
	Sig. (2-tailed)	,000	,009		,000
	N	30	30	30	30
<b>BC95</b>	Pearson Correlation	,683**	,424*	,741**	1
	Sig. (2-tailed)	,000	,020	,000	
	N	30	30	30	30

This study proposes a new method to measure efficiency of deterministic and stochastic models'. A novel approach is proposed by taking average of all models and finding new ranks according to new average scores.

Table 11 presents average results of used deterministic and stochastic methods and the new ranks of average results. According to Table 11, Hatay, Muğla, Sakarya are the most efficient first three metropolitans and Mardin,Konya,Eskişehir are the most inefficient last three cities. The results of new method's Table 11 shows consistency with Table 9.

It is seen from Table 12, the new efficiency rank scores of proposed method has highest compatibility with the results of deterministic DEA method at 94.7% and it has lowest compatibility with the results of SFA BC92 method at 74.8%.

This novel approach shows these; among different stochastic and deterministic models, the most consistent results are between CCR DEA and CCR SDEA models and the differences between used models could be specified as randomness of data in stochastic models, constant returns to scale approaches and the energy implications of each metropolitan that differs in energy demand around used indicators of the chapter.

*Table 11. Average efficiency scores of used models and the related new ranks*

DMU	Average Efficiency Scores and Ranks	
	T.E.	Rank
ADANA	0,888	4
ANKARA	0,827	6
ANTALYA	0,575	17
AYDIN	0,829	5
BALIKESİR	0,810	7
BURSA	0,707	11
DENİZLİ	0,669	12
DIYARBAKIR	0,592	16
ERZURUM	0,541	22
ESKİŞEHİR	0,419	28
GAZİANTEP	0,461	26
HATAY	0,964	1
İSTANBUL	0,662	13
İZMİR	0,773	9
KAHRAMANMARAŞ	0,632	15
KAYSERİ	0,510	24
KOCAELİ	0,648	14
KONYA	0,406	29
MALATYA	0,555	20
MANİSA	0,779	8
MARDİN	0,166	30
MERSİN	0,767	10
MUĞLA	0,937	2
ORDU	0,574	18
SAKARYA	0,910	3
SAMSUN	0,495	25
ŞANLIURFA	0,555	21
TEKİRDAĞ	0,435	27
TRABZON	0,571	19
VAN	0,529	23

## **SOLUTIONS AND RECOMMENDATIONS**

This chapter highlighted the significance and insignificance of stochastic and deterministic optimization methods are presented by a novel measurement suggestion. Through the methodologies and objectives of the chapter solutions and recommendations can be concluded as below for deterministic and stochastic implementations in the field of urban energy efficiency.

*Table 12. Correlations between new ranks of the proposed method*

		DEA	SDEA	BC92	BC95
<b>Average of the used models' efficiency scores</b>	Pearson Correlation	0,947**	,843**	,748**	,788**
	Sig. (2-tailed)	,000	,000	,000	,000
	N	30	30	30	30
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

- BC92 model shows highest efficiency scores than others. DEA has lowest efficiency scores as it should be in deterministic models.
- From the analysis results, it is seen that the effective DMUs use their inputs and output at optimum level and these metropolitans operate their energy policies at optimum scale.
- As CCR scores increase, efficiency scale of DMUs increases. That is, there is a positive relationship between efficiency scale and CCR scores. Therefore, investment decisions should be planned according to urban energy demand, consumption and generation rates.
- In order to ensure overall technical efficiency for future and improving inefficient DMUs; increasing the capacity of generation for requested consumption is essential, hence there should be true policies and investment strategies.
- According to the results, DMUs are effective in scale, therefore SFA and DEA methods, can be used to evaluate urban energy efficiency accurately.
- This chapter shows that; the determination of methodology for measuring urban energy efficiency depends on the scope of research, related input and output parameters and randomness of data.
- Consistency testing with various technical efficiency scores of models are essential to show significance and insignificance between parametric and nonparametric benchmarking approaches.
- As can be seen from the results, it is not possible to make a precise urban energy efficiency measurement with different results of different models. Therefore, urban energy efficiency results of different stochastic and deterministic approaches need to be investigated within novel methods for extended urban energy policy studies.
- According to results invoiced consumption is not significant indicator due to uncertainty in registered electricity consumption. Hence the benefit of remote meter communication, remote data access are fully realized rather than smart meters by policy makers, energy and customer management systems should be more institutional; especially within the e-invoice applications.

## **FUTURE RESEARCH DIRECTIONS**

In future studies, application of random variables to other stochastic models for urban energy efficiency and effect of analyzing uncertainty in random input and output parameters can be examined. In addition, performance comparisons can be implemented by different input and output parameters with high relationship status, different but homogeneous DMUs and different parametric and nonparametric methodologies involving quantitative and qualitative approaches. The authors suggest investigating new indicators that can affect the production and consumption capacities of urban energy to enhance the resolution of the

empirical results. The methods that were presented by the paper can also be considered to investigate the capabilities of metropolitans in other aspects of energy. Implementing SFA and DEA methods can provide calculation of noise in data and can fit the criterias to see readiness and efficiency of utilizing needed energy production and low cost energy consumption.

## **CONCLUSION**

Stochastic evaluation of urban energy efficiency has different methods and implementations. That can be seen from the literature, there is no definite methodology to evaluate energy efficiency on urban researches. The chance constrained approach is one of the essential methodologies of stochastic approaches for modelling optimization problems that indicates stochastic random data. Chance constrained SDEA models create a more flexible efficiency limit than classical DEA models, since they are situated on the assumption that the inputs and/or outputs are randomly determined.

In addition, urban energy consumption relates with the generation, and therefore relates with the GDP. When GDP increases, people save more money, so life standards rising. This is generally causes rising in energy consumption, since high levels of per capita GDP are corporated with high degrees of energy consumption. Uniform degrees of GDP per capita can return very various levels of per capita urban energy usage. Hence, urban life energy consumption cannot be disassociated from GDP, due to urbanization patterns and energy prices.

Examining the effect of uncertainty in our country that has a high tendency, there should be transparency in terms of predicting reactive or proactive approaches of organizations in uncertain environments. This study shows us that stochastic models, which consider uncertainties and random variables, can decrease the effect of extreme outliers in data on the frontier function and can be implemented to calculate the urban energy efficiency for reliable decision making in energy policies.

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## **KEY TERMS AND DEFINITIONS**

**Data Analysis:** The process that collects raw data and turns it into meaningful and useful information using statistical methods.

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**Data Envelope Analysis:** A non-parametric method used in operations research and economics for estimating production limits.

**Efficiency:** A performance dimension determining the degree of achievement of the objectives as a result of the activities.

**Non-Parametric Model:** The tests used for data series that are not suitable for normal distribution in statistics.

**Parametric Model:** The statistical model accepting that the data comply with the random distribution principle and makes inferences according to the probability distribution parameters.


**Stochastic Frontier Analysis:** A parametric method used to measure the effectiveness of decision-making units.

**Urban Energy Efficiency:** The balance of electricity demand, generation and consumption and less environmental pollution.

# Chapter 14

## The Organizational–Level Analysis of Corporate Social Responsibility in Serbia in Light of the COVID–19 Pandemic

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### ABSTRACT

*Corporate social responsibility (CSR), as a business concept that balances between economic, environmental, and social goals of a company, is usually seen as a good response to all mentioned challenges. Since the theory on CSR still does not prove an unambiguous conclusion on the role and importance of CSR for business success in developing economies, there is a need of investigating this concept and the level of its implementation. The main aim of this chapter is to investigate the concept of CSR, the level of its implementation, and the organizational-level predictors of CSR practice. The methodology is based on the analysis of the sample of 151 large private companies in Serbia. The authors used a specially designed questionnaire, based on the standardized ones, with respect to the context of Serbia, as a developing economy, in order to get responses on CSR. The single-respondent methodology was used, too. The data analysis is carried on in the SPSS program. The main conclusions, implications, and limitations of the research are given at the end of the chapter.*

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## INTRODUCTION

Corporate social responsibility (CSR) is not a new concept. It emerged in the 1950s in the sense that is an event, as acceptable today, but the ideas that constitute CSR have been present in the literature since much earlier. CSR emerged as a response to the great challenges that shook the business in the last century. Those are many financial frauds and economic crises, political affairs, degradation and destruction of the environment, social problems like poverty, inequality, discrimination, etc. CSR is seen as a concept that can make business organizations more “human”, more ethical, and responsible to a wider business and natural environment.

CSR can be defined in different ways, as many authors all around the world have tried to provide a possible explanation of this concept. Most of them agree that CSR can be defined as the aspiration of an organization to contribute to the community in which it operates through its activities. It involves the organization’s interaction with different stakeholder groups: employees, customers, suppliers, local community, governmental and non-governmental organizations, etc. Moreover, the concept of corporate social responsibility enables organizations to achieve a balance between their economic, social, and environmental goals (Hopkins, 2005; Dahlsrud, 2008; Berber et al., 2019). Also, “CSR is a socially constructed value, and legitimacy is a core principle both for defining CSR and for determining the success of CSR activities” (Lee & Carroll, 2011, p. 117). According to the World Business Council for Sustainable Development, CSR is the “continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large” (Moir, 2001, p. 18). Therefore, CSR always incorporates the ethical, economic, and social components, and in the new era, environmental, too.

Since early 2020 the world has been faced with the new challenge, the Covid-19 pandemic, which is one of the largest epidemics that influenced all countries of the world, with different, but definitively negative implications to the life, economy, safety, and health of people. Some of the implications of the pandemic are seen in the economic recession that was caused by the closing of many companies due to health issues. Some organizations closed down their business for a few months, others operated in a very limited manner. Donthu and Gustafsson (2020) stated that the pandemic has led to dramatic changes in how businesses act, and consumers, employees, and leaders behave. Many problems arise from a pandemic, and it is a question now whether CSR could be a factor for overcoming these issues in business (Qui et al., 2021). Also, not all industries and sectors were hit by this crisis, which is another intriguing question to be answered. Seetharaman (2020) stated that “industries that produce and deliver information products and services have continued to function while those that manufacture physical products especially labor-intensive firms were forced to minimize operations or temporarily shut down” (p. 1).

Having in mind the previously mentioned statements, this chapter is dedicated to the investigation of the concept of CSR, the level of its implementation, and the organizational-level differences of CSR practice in companies in Serbia. The methodology was based on the analysis of the sample of 151 large private companies in Serbia, by using descriptive statistics, factor analysis, correlation, and tests for group comparisons. The authors used a specially designed questionnaire, based on the standardized ones, concerning the context of Serbia, as a developing economy, to obtain responses on CSR. The single-respondent methodology was used to gain the organizational level data from managers. It must further be mentioned that the whole research was based on the stakeholder theory. The data analysis was carried on in the SPSS program. In the following pages the authors will present the data from the mentioned research to investigate the manner in which that large private companies in Serbia were managing their

responsibility towards different stakeholders. For this study, the authors used the following organizational characteristics implemented in the further analysis: the industry which organization was operating in, the location of the company, national or international headquarters, market on which organization was selling its products or services, type of organization according to capital ownership, national or international company, and the existence of written documents and reports on CSR.

The chapter consists of five parts. The first part presents the main theoretical ideas on CSR and its role in modern business. The second section is dedicated to the investigation of the CSR in times of pandemic, caused by the Covid-19 virus, in the context of the Republic of Serbia, including the main issues, controversies, and problems, which are also detailed. The third part focuses the methodology of the research, while the fourth part offers the results of the empirical research on CSR in large private companies in Serbia. The chapter closes with a discussion of results, the authors point out some limitations and future potential directions for research, and offer concluding remarks.

## **THEORETICAL BACKGROUND**

The concept of corporate social responsibility has gone through several stages during its evolution. In the beginning, from the period of the industrial revolution until the 1930s, the main idea in business was maximizing profit and focusing on no other but economic interests. All actions, activities, and decisions of managers were aimed at achieving the basic goal which was projected as maximizing the profit of the business system. From the 1930s (times of great economic crisis) until the 1960s, it was the time of trust in management. Managers cared for employees, consumers, and society as long as they protect the interests of owners (shareholders). From the 1960s to the 1990s of the 20<sup>th</sup> century it was the time of activism in terms of equality in employment, protection of the human environment, consumerism, and the like. The last decade of the 20<sup>th</sup> and the beginning of the 21<sup>st</sup> century has been characterized by the social sensitivity and the ability to effectively and efficiently meet the requirements of social responsibility. Managers have developed decision-making processes where the reactions of the environment are anticipated and social and societal values are respected (proactive action) (Kurtić, 2009, p. 6 in: Aleksić, 2022).

Before moving on to the detailed description of the research, it is important to understand the concept of CSR. The most commonly used definition is that corporate social responsibility implies ethical, economic, and discretionary expectations of society from the organization at a given time (Caroll, 1979). CSR is also seen as an integral part of corporate strategy as it is increasingly viewed in the context of improving competitive advantage (Porter & Kramer, 2006; Sila & Ceka, 2017). Companies that have a strategic approach to the application of the CSR concept and have built relationships with stakeholders, can gain benefits that will allow them to survive and be successful in a competitive market. These advantages are likely to improve financial performance and reputation, increase sales, customer satisfaction and loyalty, strengthen customer relationships as well as expand market share, while also promote competitive advantage, increase the satisfaction, creativity, and commitment of employees (Luo & Bhattacharya, 2006; Rettab et al., 2009; Saedi et al., 2015; Xie et al., 2018; Ngai et al., 2018; Hur et al., 2018; Marić et al., 2021). In such case, organizations reduce their negative impact on the environment and create preconditions for sustainable development (Moon, 2007; Ye et al., 2020). All the abovementioned characteristics point to one of the most important approaches in investigating CSR, i.e., the stakeholder approach.

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The definition of stakeholders was presented by the authors Nuseibeh and Easterbrook (2000), and according to them, depending on the success or failure of the system, stakeholders as an organization can make a profit or loss. Ramirez (2007) took a similar view as the authors of Nuseibeh and Easterbrook, who defined stakeholders as people who can make a profit. In addition to the definitions given above, the division of stakeholders into primary and secondary groups is presented in the literature. The group of primary stakeholders consists of stakeholders who have some direct benefits from the corporation, and the group of secondary stakeholders consists of those who do not directly benefit from the corporation (Carroll & Buchholtz, 2003). Overall, stakeholders include employees, managers, shareholders, consumers, clients, suppliers, business partners, investors, banks, local community, government, local and wide environment, among others. (Aleksić, 2022).

Corporate social responsibility implies activities that contribute to the common good, which are outside the interests of the company and the minimum requirements of the law (McWilliams & Siegel, 2001). The basic idea of corporate social responsibility is the intertwining of business and society because although the most crucial role of companies is to serve the needs of society or products and services that society wants, their mutual conditionality cannot be ignored because only a stable environment can provide adequate workforce (Wood, 1991). The World Business Council for Sustainable Development (WBCSD) views corporate social responsibility as the ethical behavior of companies towards society, as well as the company's relationships with other stakeholders (Málovics, Csigéné & Kraus, 2008; Androniceanu, 2019). Mintzberg (1983, pp. 3-5) broke down the definition of corporate social responsibility into four forms:

- “The first form represents corporate social responsibility as the responsibility of companies towards a society in which they do not expect any benefit, but because it is noble. This form is the purest and the only one that can be considered ethical.
- The second form, the less pure form of corporate social responsibility, is the responsibility of the company guided by the “light of its interests” (Mintzberg, 1983, p. 4). Companies behave responsibly towards society but expect to benefit from it materially and intangibly.
- The third form views corporate social responsibility as an investment to which the market will respond, and thus responsible social behavior will pay off.
- The fourth form views corporate social responsibility as activities carried out by companies to avoid situations in which they are forced to behave responsibly through legislation and other regulations by the state”.

Box 1 presents a comparative analysis of the essence of the two concepts, i.e., socially responsible business and socially irresponsible business of companies. The main idea of CSR is wider and more complex than the ideas of traditional business. CSR is a business concept based on fairness in terms of ethical, legal, economic, social, and environmental sense.

After presenting the main historical development of the CSR concept, main definitions and ideas, the following section of the chapter will focus on investigating the organizational level of CSR, with special regard to the Covid-19 pandemic.

*Box 1. Socially irresponsible vs. socially responsible business*

CSI	CSR
Environmental degradation and pollution are inevitable and little precaution is taken	Environmental degradation and pollution is not inevitable and should not be tolerated, and it is important to raise awareness and commit to action
Employees are a resource to be exploited	Employees are a resource to be valued
Minimal community consultation and involvement	Maximize community consultation and involvement
Only basic, and sometimes reluctant, compliance with legislation on CSR	Compliance with, as well as policy and practical actions that go beyond the minimum legislative requirements for CSR
Ethical issues are on the periphery	Ethical issues are central to the organization
New technologies should be developed and introduced to the market	New technologies should be developed, tested, evaluated, and only introduced to the market if they do not cause harm
Treating suppliers and customers unfairly	Working fairly with suppliers and customers
Sustainability is defined in terms of business survival	Sustainability is defined in terms of business, environmental and community survival, and mutual growth
Profit is the sole purpose of business and should be achieved at any cost	Profit is one of many purposes of business and should be achieved, but not at any cost

Source: Murhpy & Schlegelmilch, 2013, p. 1808.

## **ORGANIZATIONAL LEVEL ANALYSIS OF CORPORATE SOCIAL RESPONSIBILITY IN SERBIA AND COVID-19 PANDEMIC**

### **Issues, Controversies, Problems**

This section starts off with a summary of the actual state of CSR in Serbia. According to Mijatovic, Horvat, and Tomic (2021), the Republic of Serbia has a specific tradition of CSR “due to the still-ongoing transition from planned and central to the market economy. Previous research showed that the concept of CSR is broadly perceived more in the context of philanthropy and financial support. In the last decade, practices of multinational companies which operate in Serbia have a high impact on how CSR is practiced and perceived in Serbia”. The analysis of the publically available reports related to the CSR practices of the top 100 companies operating in Serbia, revealed the following:

- “Companies operating in Serbia generally perceive CSR practices in five main areas: environment, education, health, sports, and volunteerism;
- Companies in Serbia are most familiar with CSR practices related to the environmental area, as well as, volunteerism, and they recognize the local community, society in general, and vulnerable groups as main CSR beneficiaries;
- Company size and location are not proven to be in association with areas and beneficiaries of CSR practices;
- The MNCs have more categories of CSR beneficiaries comprehended and they tend to develop CSR practices in which they consider the influence on society in general” (Mijatovic et al., 2021, pp. 327).



In investigating the organizational factors that affect CSR practice, the authors Mijatovic and Stokic (2010) examined the differences between CSR practice in multinational companies (MNCs) and in domestic companies operating in Serbia, as well as the influence of internal self-regulation such as statements of corporate values and codes of conduct, versus external self-regulations such as the implementation of the ISO 9001 and ISO 14001 standards on CSR practice. They observed CSR practice through five CSR areas such as employee relations, customer relations, environmental practice, community and social involvement, and transparency in business activity. The findings indicated that “the CSR practice of the MNCs was significantly different in comparison to domestic companies only in the area of employee relations. Furthermore, the overall results suggested that internal self-regulation had more influence on CSR practice than the implementation of generic management system standards. However, the existence of transparent corporate values, codes of conduct and implemented management systems according to ISO 9001 and ISO 14001 standards did not prove to be strong predictors of CSR performance” (Mijatovic & Stokic, 2010, pp. 533). Based on this research the authors of this chapter used internal self-regulation such as the existence of CSR statement and CSR/sustainability report to investigate the differences in CSR practice. Moreover, they used the differentiation based on domestic and foreign companies as a control variable in their study.

The results of the research of Berber et al. (2021) indicated that CSR activities in Serbian processing companies were on a relatively high level. This was more evident in companies that operated on global and international markets, and in those companies which were from EU countries. In terms of company type, there was no statistically significant difference between different the types of organizations related to international or national headquarters, international or national subsidiaries (Berber et al., 2021).

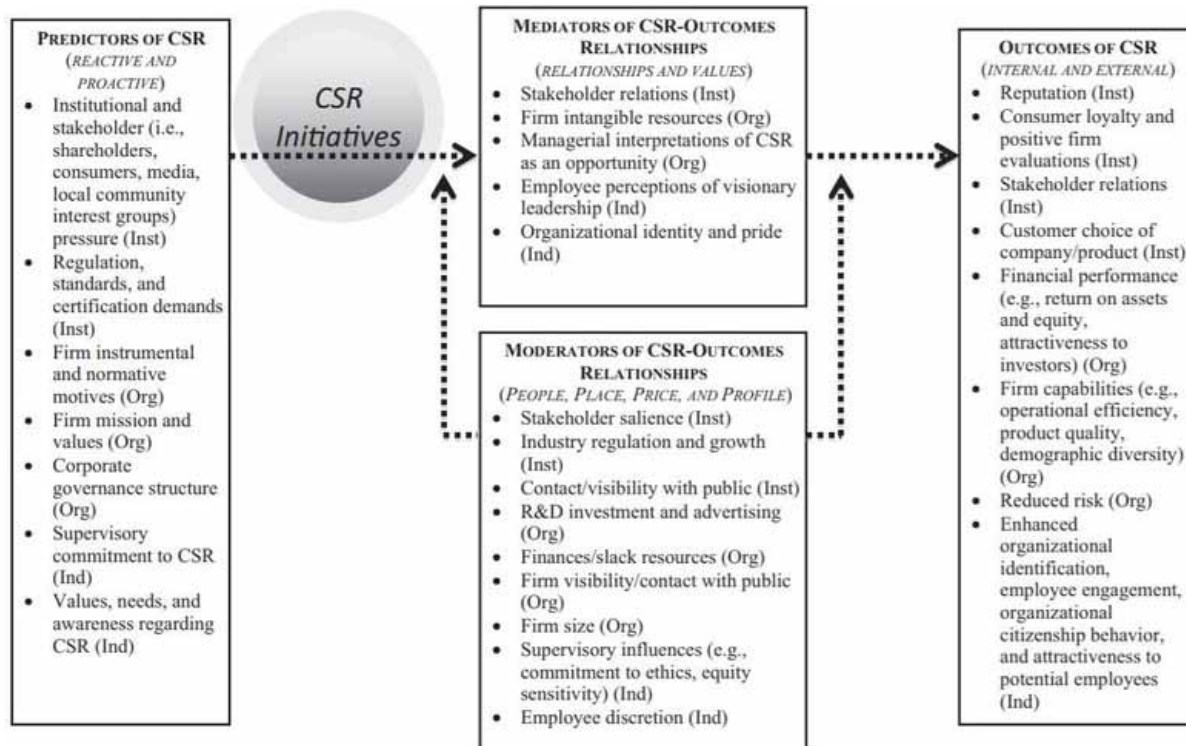
It must also be mentioned that most of the latest study works on CSR in Serbia were based on the investigation of stakeholders’ views on CSR, including the perception of employees and consumers (Arsić et al., 2019; Vuković et al., 2020a, 2020b; Nikolić et al., 2021), and wider community (Dragičević-Radičević et al., 2020). However, the research of Krstić et al. (2018) investigated the participating managers’ strategic approach regarding the integration of CSR into business, while Ivanović-Đukić and Lepojević (2015) examined managers’ opinion on CSR and firm efficiency in Serbia, and Marić et al. (2021) and Berber et al. (2021) studied the managerial perception of CSR.

In a wider geographical context, apart from the mentioned studies related to Serbia, the work of Aguinis and Glavas (2012) must also be mentioned, who analyzed corporate social responsibility at the organizational level in the theoretical sense and concluded that in addition to improving the financial performance of companies, the implementation of CSR activities increased the quality of products, the attractiveness for investors grows, and resulted in a greater efficiency by the management (Aguinis & Glavas, 2012). Factors influencing the involvement in CSR activities may be that their implementation reduces costs and business risk, improves the company’s reputation, and gains a competitive advantage (Kurucz, Colbert, Wheeler, 2008). Therefore, the investigation of CSR on the organizational level is important in terms of becoming familiar with the nature of CSR in different types of organizations. The primary aim is to be aware of the level of CSR implementation in organizations that are different according to several factors. Some are systematized and presented in Figure 1.

Figure 1 summarizes the basic determinants of corporate social responsibility, i.e., the factors that influence companies to get involved in corporate social responsibility activities, as well as the outcomes that may arise from such activities. The first part of the picture shows the predictors of CSR, the second part the mediators and moderators of CSR, while the third segment displays the possible outcomes that may arise from inclusion in this concept of activity. This model was used in the empirical research

Figure 1. Predictors, outcomes, mediators, and moderators in the model of CSR

Source: Auginius & Glavas, 2012, p. 952.



detailed in this chapter as a starting point in the selection of organizational characteristics that would be analyzed concerning CSR. The authors opted for the use of size, as measured by the number of employees, industry, strategic orientation, and firm mission and values as organizational characteristics that influenced CSR practices.

Before the empirical research is presented, one more important issue must be addressed, namely, the problem of the Covid-19 pandemic, which emerged in 2020, and still affects many countries, raising serious problems related to health, business, environment, political insecurity, among others. In these new challenging times, it is vital to emphasize the state of CSR and its potential implications for the future.

Tan and Kalyebara (2021) investigated the financial impact of this epidemic on the global economy using the Malaysian market index i.e., FTSE Bursa Malaysia KLCI before and during COVID-19. The goal of that study was to determine the financial impact of incorporating CSR into the investment portfolio of stocks listed on KLCI in Malaysia before and during COVID-19. The study used Sharpe optimal and Naive diversification model to solve a scenario that factors in the level of corporate social responsibility (CSR) exhibited before and during the epidemic to measure the financial impact on the stock portfolio. The authors claimed that CSR helped a firm in withstanding the negative financial impact of financial crises (Tan & Kalyebara, 2021, pp. 1034).

Bae et al. (2021) examined the relationship between CSR and stock market returns during the COVID-19 pandemic and the post-crash recovery. Based on a sample of 1750 firms and two major sources of CSR ratings (MSCI ESG Stats and Refinitiv ESG databases) in the USA, the authors found that CSR

did not affect stock returns during the crash period, but in additional cross-sectional analysis, they found some weak positive relation between CSR and stock returns during the pandemic-related crisis if CSR is congruent with a firm's institutional environment. This result pointed to the conclusion that "pre-crisis CSR was not effective at shielding shareholder wealth from the adverse effects of a crisis, suggesting a potential disconnect between firms' CSR orientation (ratings) and actual actions. Our evidence suggests that investors can distinguish between genuine CSR and firms engaging in cheap talk" (Bae et al., 2021, pp. 1).

The author Carroll (2021), who is also one of the seminal and most cited authors in CSR literature, conducted a comprehensive research in which he investigated the influence of the Covid-19 pandemic on the world, and the CSR practice in context. Carroll stated that the pandemic continued to be "an unprecedented financial shock to global economies. It has created concurrent disruptions in an interrelated world economy. The infectious disease has reduced the supply of labor. Productivity has been affected as well. Business closures, suspensions, and lockdowns have caused supply disruptions. Layoffs and the loss of income from illness, confinements, unemployment, and deteriorated economic predictions have reduced household consumption and business firms' investments" (2021, pp. 319). In such an environment, CSR needs to be taken into account from a different angle. More action must be taken in terms of retaining equality, concerning employee's compensation, staffing, workers' rights, safety on the job, in terms of legal fairness during legal problems of workers, and following safety protocols on the job, in terms of ethics and philanthropy, too.

So far, the focus of this section was on research works that used different characteristics of organizations that were crucial in the organizational-level analysis of CSR, as well as the challenges of the Covid-19 pandemic in relation to CSR, and previous results from studies on CSR in Serbia.

The following sections provide a detailed description of the investigation of the CSR practices in the context of the Republic of Serbia.

## **METHODOLOGY**

The underlying goal of this research was to explore the level of CSR in large private companies that operate in Serbia, as well as determine the differences between the levels of CSR in companies regarding different organizational contexts.

The authors used a questionnaire specially designed for this purpose, based on previous successful research in the area, especially in developing countries. It was made up of two parts. In the first part of the questionnaire, respondents were asked about organizational characteristics, like the number of employees, sector, industry, type of organization related to the market of business, national headquarters, etc. There were also questions related to strategy and sustainability reports, as written documents that confirm organizational dedication to CSR. The second part of the questionnaire included questions related to CSR, according to the stakeholder approach. The corporate social responsibility construct was measured through 26 questions, on a Likert scale (1 to 5). "A CSR variable was developed as a formative construct, from 6 factors (dimensions) of CSR: responsibility to the environment (four questions), employees (five questions), community (four questions), investors (four questions), suppliers (five questions), and customers (four questions)" (Marić et al., 2021). The questions were chosen from the research of Rettab et al. (2009), and Turker (2009b).

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The study was based on a single-respondent methodology, where only one questionnaire was filled in for each organization. Questions were asked of the organization as a single entity, not of the employees or consumers. Therefore, the respondents were managers at higher levels in the organization because they had access to information about CSR activities and since “it is expected that the level of professionalism and internal regulations of the analyzed organizations will not allow respondents (who stated that they have managerial responsibilities) to give false answers” (Berber et al., 2020, p. 993).

As part of this study, the authors used the following control variables, organizational characteristics that were used in the further analysis:

- Industry which the organization operates in;
- Location of the company, national or international headquarters;
- Market which the organization sells its products or services on;
- Type of organization according to capital ownership, national or foreign company;
- Existence of written documents and reports on CSR- internal self-regulation;
- A number of employees - size.

### **Data Processing**

For the analysis of the level and organizational characteristics that influenced CSR in Serbian companies, first, the explanatory factor analysis was performed to map the dimensions of CSR, according to stakeholder theory. After that, the authors made the investigation of the normality of distribution of the data. Based on those results, non-parametric tests were used to investigate the differences in CSR level regarding organizational characteristics (Spearman’s correlation, Mann Whitney, and Kruskal Wallis tests).

### **Sample**

The sample used for this chapter consisted of 151 large private companies that operated on the territory of the Republic of Serbia, with more than 250 employees, mostly from the processing industry (35,8% of the sample), that were in private ownership, with 66% national companies and 34% foreign subsidiaries” (Grubor et al., 2020). A total of 450 questionnaires were sent out, with 158 responses collected until the deadline. Seven responses out of the 158 had many missing answers, so they were disregarded in terms of further analysis. The final sample consisted of 151 valid responses (n=151). The response rate was 33.55%.

Data collection was performed by using an online questionnaire, created in Google forms. Given that the questionnaire was created for the managerial staff, the respondents were managers in senior positions. Most of the respondents belonged to the top management board (51.7%) and middle management level (44.4%), while only 4% were respondents from the level of line managers. The sample consisted of 57.6% of male and 42.4% female respondents. Most of them were in the age group of 35 to 45 years old (48%), and held higher education degree (BSc/MSc).

The sample of companies in this research included companies that worked mostly on national and international markets (about 62% out of 151 companies). Most of them had their headquarters in Serbia, 62.3% of them were national companies, while 25.5% were companies from the EU, and less than 4% were companies from other countries.

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Table 1. Characteristics of the sample

	Frequency	%
<b>Gender</b>		
Female	64	42.4
Male	87	57.6
<b>Total</b>	<b>151</b>	<b>100.0</b>
<b>Age</b>		
Below 25	4	2.6
25-34	40	26.5
35-44	72	47.7
45-55	33	21.9
55+	2	1.3
<b>Total</b>	<b>151</b>	<b>100.0</b>
<b>Education</b>		
High School	4	2.6
Professional studies	5	3.3
BSc	84	55.6
MSc	46	30.5
Mr	11	7.3
Dr	1	.7
<b>Total</b>	<b>151</b>	<b>100.0</b>
<b>Management level</b>		
Line management	6	4.0
Middle management	67	44.4
Top management	78	51.7
<b>Total</b>	<b>151</b>	<b>100.0</b>

	Frequency	%
<b>Market</b>		
Local	2	1.3
Regional	27	17.9
National	52	34.4
International	42	27.8
Global	28	18.5
<b>Total</b>	<b>151</b>	<b>100.0</b>
<b>Headquarters location</b>		
Serbia	107	70.9
EU	38	25.2
Europe non-EU	2	1.3
Other	4	2.6
<b>Total</b>	<b>151</b>	<b>100.0</b>
<b>Type of organization</b>		
Domestic company	94	62.3
A subsidiary of a domestic company	8	5.3
International company	30	19.9
A subsidiary of an international company	19	12.6
<b>Total</b>	<b>151</b>	<b>100.0</b>

Source: Authors' research

## RESEARCH RESULTS

The research results are presented in two parts. First, the results of the factor analysis for the factors of CSR are laid out. This is followed by the comparison between the organizations based on their organizational characteristics regarding the level of CSR.

The first results referred to the reliability of the data. Cronbach's Alpha Based on Standardized Items scored 0.945 for 25 items from the questionnaire, and 0.846 for six factors created based on the factor analysis of 25 items. Both Cronbach's Alpha coefficients were higher than 0.7 in both cases, which was considered satisfactory and surpassed the threshold of 0.6 (Dakduk et al., 2019; Berber et al., 2021). The authors used the Kaiser-Meyer-Olkin and Bartlett spherical tests to investigate whether the sample was adequate. Bartlett's spherical test needed to be significant ( $p < 0.05$ ) for the application of factor analysis to be justified. "The Kaiser-Meyer-Olkin KMO indicator takes the values between 0 and 1; and 0.6 is recommended as the least acceptable" (Marzouk & Elkadi, 2016; Berber et al., 2021).

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The results of the research for the KMO were 0.874, and Bartlett’s test of sphericity was 3173.948 ( $p < 0.000$ ). Based on the results, the data was deemed suitable for factor analysis. Table 2 presents the results of the factor analysis (rotated matrix).

*Table 2. Factor analysis and rotated component matrix (n=151)*

	Component					
	1	2	3	4	5	6
INV2	.861					
INV3	.859					
INV1	.858					
INV4	.837					
SUP3		.832				
SUP2		.820				
SUP5		.794				
SUP4		.693				
SUP1		.574				
CUS3			.861			
CUS4			.847			
CUS2			.801			
CUS1			.774			
ENV2				.781		
ENV1				.780		
ENV4				.729		
ENV3				.728		
HR4					.836	
HR5					.814	
HR3					.787	
HR2					.626	
LC1						.808
LC4						.781
LC3						.736
LC2						.650
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 7 iterations.						

Source: Authors’ research

Exploratory factor analysis (EFA) was used to identify factors from a total of 26 items. Based on the results presented in Table 2, there were six factors with a higher significance than 1, which described 79.97% of the total variance (Table 3). Similar to the original factors created in the original questionnaire

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(Rettab et al., 2009), the authors identified six factors in the study on the CSR attitude in Serbia. Only one item did not pass the 0.4 threshold set in the analysis, namely an item related to the HR dimension of CSR (HR1), which was therefore erased from the subsequent analysis.

Table 3 below presents the data on total variance explained.

*Table 3. Total variance explained (n=151)*

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.860	43.441	43.441	10.860	43.441	43.441	3.526	14.103	14.103
2	2.320	9.282	52.723	2.320	9.282	52.723	3.475	13.901	28.004
3	2.195	8.779	61.502	2.195	8.779	61.502	3.341	13.365	41.369
4	1.967	7.868	69.370	1.967	7.868	69.370	3.155	12.620	53.989
5	1.133	4.533	73.904	1.133	4.533	73.904	3.095	12.380	66.369
6	1.018	4.071	77.974	1.018	4.071	77.974	2.901	11.605	77.974
7	.747	2.988	80.963						
8	.563	2.253	83.216						
9	.544	2.175	85.391						
10	.471	1.885	87.276						
11	.416	1.666	88.942						
12	.356	1.425	90.367						
13	.306	1.225	91.592						
14	.294	1.176	92.768						
15	.285	1.139	93.907						
16	.256	1.026	94.933						
17	.215	.862	95.794						
18	.192	.766	96.561						
19	.176	.704	97.264						
20	.147	.590	97.854						
21	.139	.556	98.410						
22	.133	.531	98.941						
23	.119	.478	99.419						
24	.079	.317	99.735						
25	.066	.265	100.000						

Extraction Method: Principal Component Analysis.

Source: Authors' research

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The first factor, INVS represented responsibilities to investors, with an eigenvalue of 10.860 and 43.441% of variance explained. The second factor was SUPP, related to the responsibility to suppliers, as stakeholders, and its eigenvalue was 2.320 and 9.282% of explained variance. The third factor was CONS that represented the responsibility to customers, with an eigenvalue of 2.195 and 8.779% of variance explained. The fourth factor was ENV that stood for a responsibility toward the environment (nature), with an eigenvalue of 1.967 and 7.868% of variance explained. The fifth factor indicated responsibility toward employees (HRM), with an eigenvalue of 1.133 and 4.533% of variance explained. The final, sixth factor was COMM, the responsibility towards the local community, with an eigenvalue of 1.018 and 4.071% of variance explained.

The common method bias was also investigated by using Harman's single factor score (Podsakoff et al., 2012). Based on the results from Table 3, Harman's single factor score showed that the total variance for a single factor was 43.441%, which was below 50% (set as threshold), meaning that common method bias did not affect the data.

The subsequent part of the analysis revolved around the investigation of the contours of CSR in organizations in Serbia. For this analysis, the authors of this chapter decided to explore the normality of the distribution of the data in the sample. For statistical analysis non-parametric tests (Mann-Whitney and Kruskal Wallis) were used based on a non-normal distribution in the sample, confirmed by a Kolmogorov-Smirnov test ( $p > 0.200$ ) and the Shapiro-Wilk test ( $p < 0.05$ ).

Moreover, the authors investigated the differences in the level of CSR, according to the stakeholder approach, between various organizational characteristics. At the beginning of the analysis, the level of CSR and its dimensions were investigated by means and standard deviations.

*Table 4. Means and standard deviations of the CSR and its dimensions (n=151)*

	CSR	ENV	HRM	COMM	INVS	CONS	SUPP
Mean	4.5732	4.7152	4.5596	4.4470	4.3990	4.7368	4.5801
Std. Deviation	.45611	.52045	.60119	.71625	.72926	.46169	.59945
Variance	.208	.271	.361	.513	.532	.213	.359
Minimum	1.80	1.50	2.00	1.00	1.00	2.00	2.00
Maximum	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Source: Authors' research

According to the data in Table 4, the level of CSR in Serbia was at a high level of implementation. The CSR index and all six dimensions were above the means of 4.40, the CSR index was 4.5732 (out of 5), which indicated that in the total sample of Serbian companies, CSR was at a very high level, especially the responsibility to customers and consumers (CONS; M=4.7368, SD=0.46169), environment, as nature preservation and environmental management activities (ENV; M=4.7152, SD=0.52045), suppliers (SUPP; M=4.5801, SD=0.59945), and responsibility towards employees in the organization (HRM; M=4.5596, SD=0.60119). The dimensions that achieved a means below 4.5 were responsibility to the community (COMM; M=4.4470, SD=0.71625), and responsibility towards investors (INVS; M=4.399, SD=0.72926).



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Another level of analysis was related to the investigation of the differences regarding the level of CSR in organizations in Serbia. The Kruskal Wallis test was performed as a non-parametric technique to investigate the differences.

Table 5. Differences between the level of CSR and its dimensions in different industries in Serbia (n=151)

Industries	CSR Mean Rank	ENV Mean Rank	HRM Mean Rank	COMM Mean Rank	INVS Mean Rank	CONS Mean Rank	SUPP Mean Rank
Manufacturing	77.08	75.97	77.25	74.32	74.71	74.91	78.17
Wholesale trade and retail trade	84.25	83.61	70.75	84.82	83.18	84.61	85.00
Financial and insurance	80.67	83.00	80.77	88.10	77.43	78.00	59.57
Construction	61.75	23.25	40.50	40.50	78.25	104.00	116.50
Transport and storage	64.57	65.29	50.57	78.57	72.79	61.21	75.00
Other service activities	80.00	39.38	88.13	82.00	97.25	90.38	46.50
Mining	41.50	74.88	60.00	63.50	44.88	72.88	77.13
Administrative and support service activities	58.50	28.00	53.75	46.25	78.25	76.75	95.25
Information and communication	115.92	106.00	101.58	121.50	81.83	92.33	106.83
Agriculture, forestry and fishing	46.33	78.83	74.56	33.61	77.67	63.17	58.33
Accommodation and catering services	34.00	52.50	114.50	62.00	13.50	21.50	20.00
Electricity, gas, steam and air conditioning supply	140.50	106.00	114.50	121.50	123.50	104.00	116.50
Real estate business	73.25	79.25	70.25	101.75	78.25	69.00	40.50
Kruskal-Wallis H	16.585	16.703	10.412	22.949	7.308	8.454	16.856
df	12	12	12	12	12	12	12
Asymp. Sig.	.166	.161	.580	.028	.837	.749	.155

Source: Authors' research

Based on the data in Table 5, in most of the cases, there were no statistically significant differences among companies on CSR level ( $p > 0.05$ ). Only in the case of the COMM dimension, indicating the responsibility of the company towards its local community, was there a statistically significant difference between organizations from different industries ( $p < 0.028$ ). Companies in the IT and communication industry, electricity, gas, steam and air conditioning supply, and real estate business expressed a higher level of responsibility towards their local communities in which they were operating, when compared to other industries.

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*Table 6. Differences between the level of CSR and its dimensions in different types of organizations in Serbia (n=151)*

	Type of organization	N	Mean Rank		
CSR	National company	94	68.88	Kruskal-Wallis H	7.370
	A branch of a national company	8	75.44	df	3
	An international company	30	89.92	Asymp. Sig.	.061
	A branch of an international company	19	89.47		
	Total	151			
ENV	National company	94	70.39	Kruskal-Wallis H	5.494
	A branch of a national company	8	86.50	df	3
	An international company	30	87.10	Asymp. Sig.	.139
	A branch of an international company	19	81.79		
	Total	151			
HRM	National company	94	73.37	Kruskal-Wallis H	2.300
	A branch of a national company	8	78.63	df	3
	An international company	30	75.38	Asymp. Sig.	.513
	A branch of an international company	19	88.87		
	Total	151			
COMM	National company	94	66.69	Kruskal-Wallis H	14.318
	A branch of a national company	8	75.63	df	3
	An international company	30	98.42	Asymp. Sig.	.003
	A branch of an international company	19	86.84		
	Total	151			
INVS	National company	94	70.35	Kruskal-Wallis H	4.868
	A branch of a national company	8	79.38	df	3
	An international company	30	83.98	Asymp. Sig.	.182
	A branch of an international company	19	89.95		
	Total	151			
CONS	National company	94	74.16	Kruskal-Wallis H	.601
	A branch of a national company	8	78.81	df	3
	An international company	30	79.53	Asymp. Sig.	.896
	A branch of an international company	19	78.34		
	Total	151			
SUPP	National company	94	74.96	Kruskal-Wallis H	1.098
	A branch of a national company	8	69.88	df	3
	An international company	30	82.67	Asymp. Sig.	.777
	A branch of an international company	19	73.21		
	Total	151			

Source: Authors' research

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Table 6 revealed that in most cases there were no statistically significant differences among companies on CSR level ( $p \geq 0.05$ ). Only in the case of the aforementioned COMM dimension was there again a statistically significant difference between organizations that varied according to the type of ownership of the capital ( $p < 0.003$ ). International companies (either as headquarters or subsidiaries) expressed a higher level of responsibility towards the local communities in which they were operating, compared to national companies in Serbia.

When analyzing the data in Table 7 it can be seen that in most of the cases, there were no statistically significant differences among companies on CSR level ( $p \geq 0.05$ ). Yet again, it was only for the COMM dimension that distinctions could be detected. In the responsibility of the company towards its local community, there was a statistically significant difference between organizations that differed according to the location of their headquarters ( $p < 0.000$ ). Companies from the EU expressed a higher level of responsibility towards their local communities in which they were operating, compared to national companies in Serbia, companies from other European countries, and other countries (USA, Tunis). In the case of ENV, a dimension that represented a responsibility of the company towards the environment, companies from European companies outside the EU expressed a higher level than other companies (MR=106.00), accompanied by EU companies (MR=95.34). Overall, there was a difference detected that was statistically significant among companies from different countries regarding the overall CSR index. Companies from the EU showed a higher level of corporate social responsibility compared to companies from Serbia and other countries (MR=97.08,  $p < 0.007$ ).

The data in Table 6 pointed to the fact that in most of the cases, there were no statistically significant differences among companies on the CSR level ( $p \geq 0.05$ ). Only in the case of the COMM dimension, referring to the responsibility of the company towards its local community, was there a statistically significant difference between organizations that operated in different markets ( $p < 0.003$ ). Companies that operated on the global international market expressed a higher level of responsibility towards the local communities in which they were operating, compared to companies that operate on the local, regional, national, and international markets. In the case of other dimensions and the overall CSR index, there were no statistically significant differences, but the mean ranks were higher in companies that operate on the global market.

On the basis the results of the Mann-Whitney U test, as summarized in Table 9, it can be stated that in most of the cases, there were statistically significant differences among companies on CSR level ( $p \leq 0.05$ ). Companies that had CSR statement, as a written document, expressed a higher level of responsibility towards the environment (ENV, MR=80.26,  $p < 0.000$ ), employees (HRM, MR=78.78,  $p < 0.015$ ), local community (COMM, MR=81.09,  $p < 0.000$ ), investors (INV, MR=78.87,  $p < 0.016$ ), and consumers (CONS, MR=78.46,  $p < 0.020$ ) than companies that did not have this kind of statement. In the case of the SUPP dimension, which represented the responsibility of the company towards its suppliers, there was no statistically significant difference between organizations that did or did not have CSR statements ( $p \geq 0.05$ ). Finally, companies that did have written CSR statements expressed a higher level of corporate social responsibility (CSR, MR=80.52,  $p < 0.000$ ), compared to companies that did not have CSR statements.

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*Table 7. Differences between the level of CSR and its dimensions in various types of organizations in Serbia based on the location of the headquarters (n=151)*

	v4	N	Mean Rank		
ENV	Serbia	107	69.50	Kruskal-Wallis H	15.463
	EU	38	95.34	df	3
	Europe Non-EU	2	106.00	Asymp. Sig.	.001
	Other	4	51.25		
	Total	151			
HRM	Serbia	107	73.52	Kruskal-Wallis H	2.615
	EU	38	84.45	df	3
	Europe Non-EU	2	53.75	Asymp. Sig.	.455
	Other	4	73.13		
	Total	151			
COMM	Serbia	107	67.61	Kruskal-Wallis H	19.916
	EU	38	101.51	df	3
	Europe Non-EU	2	91.75	Asymp. Sig.	.000
	Other	4	50.25		
	Total	151			
INVS	Serbia	107	71.50	Kruskal-Wallis H	6.335
	EU	38	90.67	df	3
	Europe Non-EU	2	60.75	Asymp. Sig.	.096
	Other	4	64.63		
	Total	151			
CONS	Serbia	107	75.48	Kruskal-Wallis H	.412
	EU	38	76.74	df	3
	Europe Non-EU	2	69.00	Asymp. Sig.	.938
	Other	4	86.50		
	Total	151			
SUPP	Serbia	107	72.66	Kruskal-Wallis H	7.015
	EU	38	89.41	df	3
	Europe Non-EU	2	44.00	Asymp. Sig.	.071
	Other	4	53.88		
	Total	151			
CSR	Serbia	107	69.25	Kruskal-Wallis H	11.979
	EU	38	97.08	df	3
	Europe Non-EU	2	62.25	Asymp. Sig.	.007
	Other	4	63.25		
	Total	151			

Source: Authors' research

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*Table 8. Differences between the level of CSR and its dimensions in a different types of organizations in Serbia based on the market they serve (n=151)*

	v3	N	Mean Rank		
ENV	Local	2	43.75	Kruskal-Wallis H	3.515
	Regional	27	83.00	df	4
	National	52	71.89	Asymp. Sig.	.476
	International	42	74.45		
	Global	28	81.50		
	Total	151			
HRM	Local	2	31.75	Kruskal-Wallis H	5.540
	Regional	27	67.17	df	4
	National	52	73.59	Asymp. Sig.	.236
	International	42	81.76		
	Global	28	83.52		
	Total	151			
COMM	Local	2	64.50	Kruskal-Wallis H	10.909
	Regional	27	83.19	df	4
	National	52	61.79	Asymp. Sig.	.028
	International	42	79.11		
	Global	28	91.63		
	Total	151			
INVS	Local	2	60.75	Kruskal-Wallis H	4.114
	Regional	27	82.00	df	4
	National	52	66.98	Asymp. Sig.	.391
	International	42	80.05		
	Global	28	81.98		
	Total	151			
CONS	Local	2	30.50	Kruskal-Wallis H	4.693
	Regional	27	83.80	df	4
	National	52	72.46	Asymp. Sig.	.320
	International	42	75.46		
	Global	28	79.11		
	Total	151			
SUPP	Local	2	65.50	Kruskal-Wallis H	2.539
	Regional	27	76.35	df	4
	National	52	69.37	Asymp. Sig.	.638
	International	42	80.60		
	Global	28	81.84		
	Total	151			

*continues on following page*

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*Table 8. Continued*

	v3	N	Mean Rank		
CSR	Local	2	41.25	Kruskal-Wallis H	7.825
	Regional	27	79.06	df	4
	National	52	64.89	Asymp. Sig.	.098
	International	42	80.61		
	Global	28	89.25		
	Total	151			

Source: Authors' research

*Table 9. Differences between the level of CSR and its dimensions in different types of organizations in Serbia based on the existence of CSR statements in the company (n=151)*

	CSR statement	N	Mean Rank	Sum of Ranks		
ENV	Yes	135	80.26	10835.00	Mann-Whitney U	505.000
	No	16	40.06	641.00	Z	-3.942
	Total	151			Asymp. Sig. (2-tailed)	.000
HRM	Yes	135	78.78	10635.50	Mann-Whitney U	704.500
	No	16	52.53	840.50	Z	-2.423
	Total	151			Asymp. Sig. (2-tailed)	.015
COMM	Yes	135	81.09	10947.50	Mann-Whitney U	392.500
	No	16	33.03	528.50	Z	-4.310
	Total	151			Asymp. Sig. (2-tailed)	.000
INVS	Yes	135	78.87	10647.00	Mann-Whitney U	693.000
	No	16	51.81	829.00	Z	-2.420
	Total	151			Asymp. Sig. (2-tailed)	.016
CONS	Yes	135	78.46	10592.00	Mann-Whitney U	748.000
	No	16	55.25	884.00	Z	-2.321
	Total	151			Asymp. Sig. (2-tailed)	.020
SUPP	Yes	135	77.89	10514.50	Mann-Whitney U	825.500
	No	16	60.09	961.50	Z	-1.625
	Total	151			Asymp. Sig. (2-tailed)	.104
CSR	Yes	135	80.52	10870.50	Mann-Whitney U	469.500
	No	16	37.84	605.50	Z	-3.701
	Total	151			Asymp. Sig. (2-tailed)	.000

Source: Authors' research

Based on the results of the Mann-Whitney U test in Table 10, in most of the cases, there were statistically significant differences among companies on CSR level ( $p \leq 0.05$ ). Companies that created CSR or sustainability reports, as a written document, expressed a higher level of responsibility towards the

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environment (ENV, MR=81.47,  $p<0.000$ ), employees (HRM, MR=79.04,  $p<0.016$ ), local community (COMM, MR=82.45,  $p<0.000$ ), and consumers (CONS, MR=78.94,  $p<0.012$ ) when compared with the companies that did not have these kinds of reports. In the case of the SUPP dimension, which showed the responsibility of the company towards its suppliers, and INVS, which shows responsibility towards investors, there was no statistically significant difference between organizations that did or did not create CSR reports ( $p>0.05$ ). Finally, companies that had written CSR or sustainability reports expressed a higher level of corporate social responsibility (CSR, MR=81.07,  $p<0.000$ ), compared to companies that failed to generate such reports.

Based on the results of Spearman’s correlation test in Table 11, there were positive, statistically significant mainly strong correlations between the overall CSR index and all CSR dimensions, and weak positive statistically significant correlation between the CSR index, its dimensions, and the number of employees in organizations. Based on these results, it can be concluded that the size of an organization measured through the number of employees was associated with the level of CSR in a company. Larger organizations with more employees had a higher level of CSR.

*Table 10. Differences between the level of CSR and its dimensions in different type of organizations in Serbia based on the existence of CSR report in the company (n=151)*

	CSR/sustainability report	N	Mean Rank	Sum of Ranks		
ENV	Yes	132	81.47	10753.50	Mann-Whitney U	532.500
	No	19	38.03	722.50	Z	-4.591
	Total	151			Asymp. Sig. (2-tailed)	.000
HRM	Yes	132	79.04	10433.50	Mann-Whitney U	852.500
	No	19	54.87	1042.50	Z	-2.404
	Total	151			Asymp. Sig. (2-tailed)	.016
COMM	Yes	132	82.45	10884.00	Mann-Whitney U	402.000
	No	19	31.16	592.00	Z	-4.957
	Total	151			Asymp. Sig. (2-tailed)	.000
INVS	Yes	132	78.04	10301.50	Mann-Whitney U	984.500
	No	19	61.82	1174.50	Z	-1.564
	Total	151			Asymp. Sig. (2-tailed)	.118
CONS	Yes	132	78.94	10420.00	Mann-Whitney U	866.000
	No	19	55.58	1056.00	Z	-2.517
	Total	151			Asymp. Sig. (2-tailed)	.012
SUPP	Yes	132	78.47	10358.00	Mann-Whitney U	928.000
	No	19	58.84	1118.00	Z	-1.932
	Total	151			Asymp. Sig. (2-tailed)	.053
CSR	Yes	132	81.07	10701.50	Mann-Whitney U	584.500
	No	19	40.76	774.50	Z	-3.766
	Total	151			Asymp. Sig. (2-tailed)	.000

Source: Authors’ research

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*Table 11. Correlations between the level of CSR and its dimensions and the number of employees in the company (n=151)*

		E	ENV	HRM	COMM	INVS	CONS	SUPP	CSR
E	rho	1.000							
	Sig. (2-tailed)	.							
	N	151							
ENV	rho	.145	1.000						
	Sig. (2-tailed)	.075	.						
	N	151	151						
HRM	rho	.126	.480**	1.000					
	Sig. (2-tailed)	.124	.000	.					
	N	151	151	151					
COMM	rho	.291**	.503**	.474**	1.000				
	Sig. (2-tailed)	.000	.000	.000	.				
	N	151	151	151	151				
INVS	rho	.203*	.322**	.286**	.339**	1.000			
	Sig. (2-tailed)	.013	.000	.000	.000	.			
	N	151	151	151	151	151			
CONS	rho	.111	.361**	.221**	.249**	.329**	1.000		
	Sig. (2-tailed)	.176	.000	.006	.002	.000	.		
	N	151	151	151	151	151	151		
SUPP	rho	.047	.326**	.377**	.381**	.442**	.388**	1.000	
	Sig. (2-tailed)	.569	.000	.000	.000	.000	.000	.	
	N	151	151	151	151	151	151	151	
CSR	rho	<b>.228**</b>	<b>.612**</b>	<b>.678**</b>	<b>.724**</b>	<b>.688**</b>	<b>.529**</b>	<b>.722**</b>	<b>1.000</b>
	Sig. (2-tailed)	.005	.000	.000	.000	.000	.000	.000	.
	N	151	151	151	151	151	151	151	151
**. Correlation is significant at the 0.01 level (2-tailed).									
*. Correlation is significant at the 0.05 level (2-tailed).									

Source: Authors' research

## SOLUTIONS AND RECOMMENDATIONS

The research outcomes highlighted several crucial areas of CSR in large private enterprises in Serbia. As described above, the authors tested the data and identified 6 CSR dimensions in factor analysis. The



Cronbach Alpha coefficients were confirmed to be acceptable, and therefore, the data and the questionnaire were deemed valid for further analysis. This was a vital research step since this particular questionnaire had not been used in the context of Serbia before. Further, the large private companies in Serbia showed quite peculiar results related to their CSR practices.

In the case of industry, it was determined that in most of the cases there were no statistically significant differences among companies on the CSR level. Only in the case of dimension that showed the responsibility of the company towards its local community was there a statistically significant difference between organizations from different industries. Companies in the IT and communication industry, electricity, gas, steam and air conditioning supply, and real estate business expressed a higher level of responsibility towards their local communities in which they were operating, compared to other industries. Regarding the CSR index, the results were similar, but the differences were not statistically significant. This conclusion was crucial because now it revealed which business sectors were in need of improvement in their CSR practices. The lowest mean ranks were found for mining, agriculture, forestry and fishing, and accommodation and catering services sectors. Companies from these sectors of business should develop their CSR policies and practices to provide a higher level of CSR, as a part of their sustainable development strategy.

Concerning the type of the company according to the origin, whether national or international, in most cases there were no statistically significant differences among companies on the CSR level. Only in the case of the COMM dimension, which, as mentioned before, showed the responsibility of the company towards its local community, was there a statistically significant difference between organizations that differed according to their origin of capital. International companies (be it headquarters or subsidiaries) expressed a higher level of responsibility towards the local communities in which they were operating, compared to national companies in Serbia. The results given in the table highlighted that in the case of overall CSR index the result was similar, too, whereas the differences were not statistically significant. This means that companies originally from Serbia would need to raise their CSR to a higher level so as to reach their competitors from an international background. This is vital from the business logic point of view, given that most of the participating companies stated that they were doing business on the international market. Therefore, their CSR practices are just as important since their products and services are going to be placed on the same market like those from their international competitors. Namely, CSR is seen not only as a way for implementing sustainable development ideas into practice, but also as a driver of corporate reputation (Lin-Hi & Blumberg, 2018; Rothenhoefer, 2019; Javed et al., 2020), and it is about “doing social and environmental good where consumers may use associations with corporate responsibility to define themselves and retain a positive inner and social self-image... that can make consumers feel better about themselves, helping customers understand who they are as people, and ultimately satisfying self-definitional and self-expressive need” (Ho, 2017, p. 3). In order to come into close business contact with their international consumers and customers, Serbian companies need to develop their CSR and implement it on a higher level.

Similar recommendations can be made in the areas where the analysis revealed the differences in CSR levels between Serbian and EU companies. In most cases, there were no statistically significant differences among companies on the CSR level. However, in the case of the dimension that indicated the responsibility of the company towards its local community, there was a statistically significant difference between organizations that were different according to the location of the headquarter. Companies from the EU expressed a higher level of responsibility towards their local communities in which they were operating, compared to national companies in Serbia, companies from other European countries,

and other countries. In the case of the dimension representing the company's responsibility towards the environment, companies from European businesses outside the EU expressed a higher level than other companies, accompanied by EU companies. Also, there was a statistically significant difference among companies from various countries regarding the overall CSR index. Companies from the EU demonstrated a higher level of corporate social responsibility, as compared with the companies from Serbia and other countries. The underlying reasons for these differences was explained in the work Berber et al. (2021): "the European Union possesses several CSR policies, strategies and initiatives and environmental initiatives for businesses and that companies are aware of all benefits but also requirements that are necessary to implement in their business" (Berber et al., 2021, p. 236). Undeniably, the development of CSR and sustainable business strategies, policies, and practices are imperative for the future.

Regarding the CSR policies and reports it was confirmed that in most of the cases there were statistically significant differences among companies on the CSR level. Companies that had CSR statements, as written documents, expressed a higher level of responsibility towards the environment, employees, local community, investors, and consumers. Also, companies with written CSR statements portrayed a higher level of corporate social responsibility index, compared to the companies without CSR statements. Further, companies that created CSR or sustainability reports, as written documents, expressed a higher level of responsibility towards the environment, employees, local community, and their consumers, than the companies that did not formulate such reports. Companies that had written CSR or sustainability reports showed a higher level of corporate social responsibility index in comparison to companies that did not generate said reports. The creation of written statements and reports means that companies were dedicated to the implementation of the CSR concept as a serious business strategy. Also, CSR reporting was seen as a communication tool that modern companies would use to indicate their transparency on the market. It was also a tool available for managers to assess the continuous improvement in the non-financial area of business (Fernandez-Feijoo et al., 2014). Therefore, companies that generated statements and reports were confirmed to practice CSR on a higher level.

The size of an organization, as measured based on employee numbers, was associated with the level of CSR in a company, thus larger organizations with more employees had a higher level of CSR. Firm size was seen as an internal moderator in the relation between CSR and its outcomes (Auginius & Glavas, 2012, p. 952), and therefore, it was an important variable in the organizational level analysis of CSR.

Companies in Serbia should follow the best practice in their sectors of business to improve their CSR. Also, following the stakeholder theory, it is important to direct specific actions to different stakeholders to satisfy all of them in terms of economic, social, and environmental responsibility. In terms of reporting, companies can implement specific models for CSR reporting. One of the well-known approaches for CSR reporting is the GRI approach (Global Reporting Initiative). While it does have some limitations, it is still "the most likely to become model for the harmonization of CSR reporting because they enable higher levels of comparability, consistency, reliability, and relevance" (Garcia-Torea et al., 2020, p. 953). The methods described in above are some of the possible ways that companies can improve their social responsibility in business.

## **FUTURE RESEARCH DIRECTIONS**

The monograph "Handbook of Research on SDGs for Economic Development, Social Development, and Environmental Protection" draws attention to the mounting challenges in the area of sustainable

development. In the new normal it is going to be very difficult to balance all interests of all stakeholders in the business. Challenges such as economic crisis, already present in many countries, new ways of doing jobs (with teleworking as one of the most prominent work forms at the moment), new ways of traveling and tourism development, health and safety issues on the job and in life, political issues raised from the pandemic, have all had considerable impact and have changed people's lives and businesses. One possible response to this new normal state is the implementation of CSR practices in business firms, that will strive to be a more responsible, more fair, more sustainable business. Companies need to be strategic partners of governments all around the world in solving problems that affect people. They need to follow ethical principles, present examples of good practice, be aware of their employees, clients, consumers, their local community, and perform their business activities in such a manner so as to increase the wellbeing of key stakeholders, accompanied by their business success. In this way companies can remain relevant actors on the business scene and become sustainable in the future.

Future research in this field ought to include small and medium-sized companies as well, since those companies make up a significant share of the Serbian economy. However, this research was based only on a sample of managerial staff. It would be beneficial for researchers to conduct interviews and to collect data from consumers, employees, and other stakeholders, too, in order to gain greater insight into the CSR practice in Serbia. To date, numerous investigations have been based on the attitudes of employees, consumers, or managers, but there have been no inclusive studies until now. This type of research would bring new information and provide possible conclusions.

## **CONCLUSION**

CSR is seen as the aspiration of an organization to contribute to the community in which it operates through its activities. It involves the organization's interaction with different stakeholder groups: employees, customers, suppliers, local community, governmental and non-governmental organizations, etc. The concept of corporate social responsibility also enables organizations to achieve a balance between their economic, social, and environmental goals (Hopkins, 2005; Dahlsrud, 2008; Berber et al., 2019).

The chapter "The organizational level analysis of the corporate social responsibility in Serbia in the light of Covid19 pandemic" investigated the concept of CSR, the level of its implementation, and the organizational-level differences of CSR practice in companies in Serbia. The methodology was based on the analysis of the sample of 151 large private companies in Serbia. The authors used a specially designed questionnaire, based on the standardized ones, concerning the context of Serbia, as a developing economy, in order to obtain responses on CSR. The single-respondent methodology was used to gather the organizational level data, from managers.

The research outcomes indicated the several important areas of CSR in large private enterprises in Serbia. The authors tested the questionnaire and the data, showed a high level of validity of the data, and made possible all other analyses.

In the case of industry, it was found that in most of the cases there were no statistically significant differences among companies on the CSR level. Only in the case of dimension that showed the responsibility of the company towards its local community, companies from the IT and communication industry, electricity, gas, steam, and air conditioning supply, and real estate business expressed a higher level of responsibility towards their local communities in which they were operating, compared to other

industries. Regarding the size of an organization measured through the number of employees, the results confirmed that organizations with more employees experienced a higher level of CSR.

In relation to the type of the company according to the origin, be it national or international, in most cases there were no statistically significant differences among companies on the CSR level. Only in the case of the COMM dimension, international companies (irrespective of whether they were headquarters or subsidiaries) expressed a higher level of responsibility towards their local communities in which they were operating, compared to national companies in Serbia.

The analysis revealed some differences in CSR levels between Serbian and EU companies. Although in most cases, there were no statistically significant differences among companies on the CSR level. In the case of the dimension that showed the responsibility of the company towards its local community, companies from the EU expressed a higher level of responsibility towards their local communities in which they were operating, as compared to national companies in Serbia, companies from other European countries, and other countries. A difference that was statistically significant was detected among companies from different countries regarding the overall CSR index, namely, companies from the EU showed a higher level of CSR compared to companies from Serbia and other countries.

Regarding the CSR policies and reports, in most of the cases there were statistically significant differences among companies on the CSR level. Companies that had CSR statements, as written documents, expressed a higher level of responsibility towards the environment, employees, local community, investors, and consumers. Also, companies that had written CSR statements expressed a higher level of corporate social responsibility index, compared to companies that did not have CSR statements. Similarly, companies that generated CSR or sustainability reports, as written documents, expressed a higher level of responsibility towards the environment, employees, local community, and their consumers, compared with companies that did not have this kind of report. Companies that have written CSR or sustainability reports expressed a higher level of corporate social responsibility index, compared to companies that did not create such reports.

To sum it up, it is vital to underline that there is a need for stronger relations between business companies and the rest of the business, natural, and social environment in order to overcome problems raised during the pandemic. It is not enough to implement the concept of socially responsible business in its business activities and business strategy, instead, it must be done transparently and publicly, so that employees, business associates, and consumers are informed about the activities undertaken. The companies achieve the best results from the implementation of socially responsible business if they conduct their organization strategically and in the long run. If such strategic approach is chosen, it is important to bear in mind differences in CSR that were investigated in this chapter, but to implement it in the correct manner so as to avoid poor CSR performances.

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## **KEY TERMS AND DEFINITIONS**

**Corporate Social Responsibility:** Procedures, practices, and activities that are in the line with economic, legal, social, environmental, and philanthropy goals of a firm.

**Responsibility to Consumers:** A firm intention and business practices in providing goods and services that are health, safe, and that are not making any damage to them. Providing consumers with all necessary information on goods and services.

**Responsibility to Employees:** Business practices and human resource management practices that are fair, that makes employees satisfied, secure, that are non-discriminatory, balancing between private and business life.

**Responsibility to Environment:** Activities of a firm in preserving natural resources, reducing the amount of waste, developing alternative technologies, reducing the usage of fossil fuels.



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**Responsibility to Investors/Shareholders:** Business practice to preserve their capital and invested money, based on ethical and fair managerial activities. Reduced agency problem. Informing shareholders about all important business changes, risks, and issues.

**Responsibility to Local Community:** Providing local community with workplaces, goods and services that are health, safe, and that are not making any damage to them, paying local taxes, helping local institutions.

**Responsibility to Suppliers:** Fair business practice in making agreement with suppliers, respecting their needs also, and making business transparent as needed.

## Chapter 15

# A Triple–Bottom–Line Approach–Based Clustering Study for the Sustainable Development Goals of the European Countries: Sustainable Development Concept

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### **ABSTRACT**

*The Sustainable Development Goals (SDGs) are universal actions that provide a common plan and agenda to maintain the balance of sustainability and development. This study is aimed to measure and analyze the sustainability performances of the European countries in the context of Sustainable Development Goals in three (social, economic, and environmental) dimensions. In this respect, it is aimed to cluster the countries within the scope of the European Economic Area according to their success in achieving each sustainable development goal with its social, environmental, and economic dimensions. This study highlights the similar European country groups based on social, economic, and environmental dimensions in terms of sustainable development. The study also enables us to identify the development topics where the clusters obtained as a result of the analysis are weak and strong. The findings of this chapter create a point of view to determine development politics for countries.*

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## INTRODUCTION

Increasing demand in parallel with the increasing world population has increased the production rate. This situation has led to the emergence of global competition with the effect of globalization. In this competitive environment where industrialization has accelerated, economies have focused on quantitative dimensions to survive. However, environmental and social values were mostly ignored. In the early twentieth century, negotiations started at the global level in order to prevent the damage of industrial production to nature and ecological balance (National Geographic Society, 2020).

While the countries are primarily focused on growth and economic activities, production continues with snowballing speed and innovative products. Although most people living in OECD countries have standards that enable them to access goods and services along with some basic needs, poverty and deprivation problems still cannot be eliminated worldwide (Brundtland Commission, 1987). In order to eliminate the destructive results that occur with the increasing global competition, the fact that natural resources are not an inexhaustible raw material should be accepted and development strategies should be determined while making use of resources for needs (OECD, 2012).

In order to create a global agenda program under the leadership of the United Nations, the World Commission on Environment and Development met for the first time in Stockholm in 1987 under the chairmanship of the then Norwegian Prime Minister, Gro Harlem Brundtland. As a result of the conference, the concept of sustainable development was officially defined for the first time and the World Environment and Development Commission Our Common Future Report was published in order to examine critical issues related to both environment and development and to find solutions to problems (OECD Environmental Outlook, 2012).

The United Nations is developing policies in order to maintain sustainability and development balance by moving away from the devastating policies of the current order and it is also working to ensure that all member states adopt Sustainable Development Goals (SDG) centered on environmental, economic and social development.

Ensuring corporate sustainability requires radical changes in social, economic and environmental performance. The relationship between social and environmental issues and corporate reporting has gained a new dimension after the definition of the concept of sustainable development in the report. A movement towards sustainability reporting is emerging in companies and government agencies in various countries. The multidimensional approach of sustainability and the aim of sustainable development raise the issue of how to balance institutional goals and how to evaluate the success or failure situation. The concept of the Triple Bottom Line (TBL), which deals with the measurement of corporate sustainability with its social, environmental and economic dimensions has guided the way businesses, nonprofits, and governments measure sustainability and the performance of projects or policies (Elkington, 1997).

There are some difficulties in implementing the TBL. These difficulties are; measuring each of the three categories separately, obtaining the data to be implemented, and calculating the contribution of a project or policy to sustainability. These difficulties aside, the TBL framework allows organizations to evaluate the consequences of their decisions in the long term from a different perspective (Slaper and Hall, 2011).

The aim of this study is to measure and analyze the sustainability performances of the European countries in the context of Sustainable Development Goals. In this respect, In this direction, it is aimed to cluster the countries according to their success in achieving the sustainable development goal in social, economic and environmental dimensions.

The SDG indicator dataset analyzed were obtained from the reports prepared by the UN Department of Economic and Social Affairs with data from international and regional organizations. At the core of the development agenda are the 17 SDGs, a call to action by all countries in a global partnership. The concept of sustainable development is analyzed with its social, environmental and economic sub-dimensions.

The dataset is analyzed by clustering method, one of the data mining techniques. The data mining process applied to the SDGs data for cluster analysis; it consists of the steps of preparing and processing the dataset, determining the optimum number of clusters, normalization and applying the clustering algorithms in the Weka package program.

In the first stage, the raw data set of candidate countries within the scope of the European economic area has been reduced to 92 indicators by making use of expert opinions. Then, data cleaning, completion and summarization operations are carried out on the database to create the dataset for the research. It was reduced to 52 indicators under the 13 SDGs by the data cleaning process and countries have been clustered by considering the latest shared indicator data of 13 SDGs.

After determining the appropriate number of clusters as four via R Programme, the dataset is clustered in the Weka (Waikato Environment for Knowledge Analysis) software according to the K-Means algorithm which gives the optimum result among the clustering algorithms used in the analysis. Later, the strengths and weaknesses of the clusters were analyzed on the basis of indicators (Sustainable Development Goals, 2018).

## **SUSTAINABLE DEVELOPMENT CONCEPT**

Sustainability; it is the maintenance of supportable conditions that are not harmful, can be proven by legal and scientific approach and can be expressed as good (Ratiu, 2013). The concept of sustainability, which emerged due to the pressure created by human beings on the environment throughout life, can be defined in its simplest form as the pursuit of the purpose of preserving the continuity of the existence of the existing (Meadowcroft, 1997).

The essence of sustainability is to create the environmental and social conditions for an earth-resilient system. It shows the absolute dependence of humans on the permanent system on earth. The starting point of sustainability is focused on solving environmental problems and protecting the ecosystem in parallel with advances in economy and technology (Turi and et al., 2015).

For the concept of development, different approaches have been emphasized over time. While the goal of the economic development policy is to raise the living standards of the whole world by providing goods and services to the growing population, the World Bank, the United Nations and the International Monetary Fund (IMF) etc. institutions are structured with this approach.

In the late 1970s, while the tendency to focus on basic needs was advocated, productive agriculture and industrialization were put at the center of development. Later on, within the scope of the United Nations' Development Program, based on the Human Development Index, scales, such as health, nutrition, education and employment were adopted in addition to the Gross National Product (GNP). The effects of development, beyond providing material wealth, have caused deterioration on the social structure, environment and natural resources over time. If these negative effects are not brought under control as soon as possible, destructive results will occur on the ecosystem. With this awareness, new paradigms such as "development that protects the environment" and "development that improves social rights" emerge for the concept of development (Harris and Özmete, 2000).

The concept of sustainable development was first brought to the agenda in 1987 in the report “Our Common Future”, also called the Brundtland Report. Towards the end of the 1980s, it began to be widely discussed. The World Environment and Development Commission realized by the United Nations and the “Limits to Growth Report” in 1972 are the first global initiatives in which the concept of sustainable development is discussed in all its dimensions. The most accepted definition of the concept of sustainable development was made with the report by the Environment and Development Commission in 1987; it is the definition of meeting the needs of the present without compromising the ability of future generations to meet their own needs. The main reason why the discourse of sustainable development has attracted attention and gained prevalence; it is seen that it successfully brings together the concepts of development and sustainability, which are contradictory concepts, and is an attempt to reconcile. If a general framework is drawn about the definition of the concept of sustainable development, it is primarily aimed at meeting the basic needs of everyone, reducing poverty, integrating development strategies with environmental policies, the desire to meet the needs of future generations as well as the present generation, rational use of resources for the common interests of humanity (Şahin, 2004).

At the Massachusetts Institute of Technology, Prof. Meadows and many scientists carried out work with a team including national and international employees. The consequences of the work were published as a report called “The Limits to Growth” by the Strategy Development Center. This report, which is the first study that states that unlimited growth is not possible with limited resources, which has a wide repercussion in the world, maintains its importance today (Aksu, 2011).

There are two important approaches to sustainable development. First of all, it is to accept that economic growth alone is not enough as a solution to the problems that the world is facing and to realize that every problem addressed for sustainable development should be evaluated in terms of economic, social and environmental dimensions. Sustainability will not be achieved when problems are approached unidimensionally. Considering only one of these at a time leads to evaluation errors and “unsustainable” results. For example, focusing only on profit margins can have harmful long-term consequences for society and the environment. Secondly; it is the recognition that strategies must be carried out in a coordinated manner in order to achieve success in sustainable development, and therefore the necessity of transcending geographical or institutional boundaries (OECD Insights, 2008). In this direction, the principles that should be considered as a whole in order to achieve sustainable development are as follows (Alptekin and Saraç, 2017):

- **Principle of Economic Welfare:** Economic development should be a pillar of sustainable development by not consuming limited resources recklessly, and taking into account social justice without disturbing the ecological balance.
- **Principle of Social Justice:** It expresses the necessity that all individuals have equal rights in accessing natural resources in a society and that future generations can benefit in the same way.
- **Environmental Integrity Principle:** It explains that human beings can contribute to sustainable development by being aware of the consequences of practices (greenhouse gas emissions, etc.) that may be harmful to the environment and ecosystem.

Companies and individuals can have a great impact on sustainable development, but governments can play a more active role by determining appropriate production and consumption practices with the right political tools due to their more impressive and unifying power. As in the case of Japan, the policies followed by the government together with the private sector has produced successful results in protecting

the environment, improving energy efficiency and combating global warming. Japanese factories and power plants introduced the world to the most advanced energy saving Technologies (TMMOB, 2020).

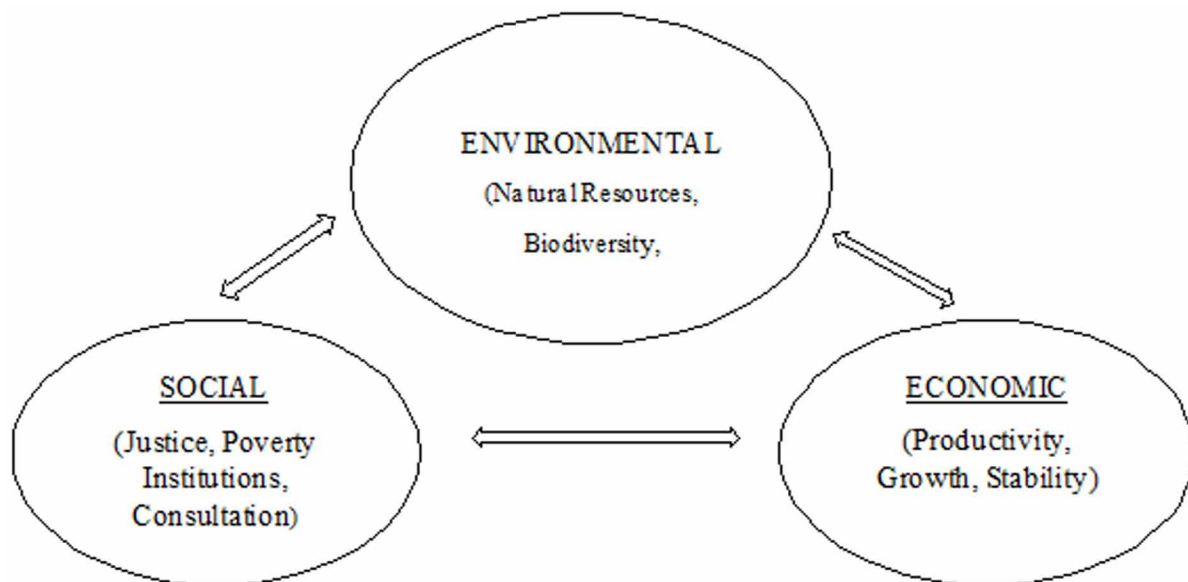
It is possible for governments to contribute to sustainable development through the policies they implement. Governments can direct social movements by analyzing the data that emerges as a result of these policies. In this way, society can also have an impact and contribution to sustainable development policies. As the sustainable development movement is a global movement, providing a solution depends on international cooperation. A high level of international cooperation is also needed for joint action. Governments have the necessary tools to ensure this cooperation with their authorities and powers.

### **Dimensions of the Concept of Sustainable Development**

While classical development theories basically only deal with the quantitative dimensions of the economy, environmental and social values are not taken into account for the concept of development. However, the increasing world population, needs and the effect of globalization have increased the consumption of natural resources day by day and the resource capacity of nature has reached its limits. For this reason, it is seen that the concept of development is related to the environment and social dimensions as much as the economy. Thus, the sustainability of development with all its dimensions began to be discussed (Aksu, 2011).

While expressing sustainable development, Munasinghe discussed the society with its economic, social and environmental dimensions and explained the balance from all three aspects as seen in Figure 1.

*Figure 1. Sustainable development elements  
(Munasinghe, 1993)*



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When the concept of sustainable development is handled with these three elements, the original definition of sustainability becomes a bit complicated. Questions such as how the goals will be balanced and which goals will be prioritized are inevitable. Each of these three areas represents a system in itself. Therefore, it is difficult to consider these systems as a whole (The Balaton Group, 2019).

As suggested in the report of the Balaton Group, an international network of researchers and practitioners of more than three hundred professionals involved in systems science, sustainable development, established in 1982; subsystems should be evaluated separately and the scaling of the different three dimensions of sustainability should be done with different determinants (Harris and Özmete, 2000). In Table 1., sustainable development indicators determined for each of the three dimensions are presented.

*Table 1. Dimensions of sustainable development indicators*

<b>ENVIRONMENTAL DIMENSION</b>	<b>ECONOMIC DIMENSION</b>	<b>SOCIAL DIMENSION</b>
Accessible and Clean Energy	Zero poverty	Zero Hunger
Sustainable Cities and Communities	Decent Work and Economic Growth	Healthy and Quality Life
Responsible Production and Consumption	Industry, Innovation and Infrastructure	Qualified Education
Climate Action		Social gender equality
Life in the Water		Reducing Inequalities
Terrestrial Life		Peace, Justice and Strong Institutions
Clean Water and Sanitation		Partnerships for Purposes

Source: (Harris and Özmete, 2000)

The multidimensional approach of sustainability and the aim of sustainable development raise the issue of how to balance the goals and how to evaluate the success or failure situation. These three elements of sustainability bring many potential complications to the original simple definition. Set goals require understanding of multiple disciplines (Harris, 2009). When society, natural habitats and economic systems are considered as separate but interdependent systems, these three systems, which are the cornerstones of sustainable development, should be considered together and the problems should be considered multidimensionally. Although economic, historical, political and social conditions differ in all countries, the basic principles necessary for sustainable development are equally valid in all countries. E.g; economic growth is an important factor for development, but economic growth alone is not sufficient to eradicate or reduce poverty unless all the necessary conditions for community welfare are met (OECD Insights, 2008).

### **Sustainable Development with its Economic Dimension**

The basic idea in sustainable development is to act by considering the welfare of the present generation and the welfare of future generations together. The “Capital Approach” method, which advocates the necessity of renewing and protecting resources for the continuity of social welfare, can be used to establish a link between the welfare of the future and the present generation. In this method, the total capital consists of five different approaches (Munier, 2005):

- **Financial Capital:** Capital consisting of financial instruments such as stocks, bonds, bills and loans that are subject to financial investment.
- **Capital Produced:** Machinery, buildings, telecommunications and other types of infrastructure.
- **Natural Capital:** Ecosystems, soil, air, water resources.
- **Human Capital:** An educated and healthy workforce that increases productive capacity.
- **Social Capital:** Public goods derived from certain social structures.

According to standard economic theory, efficient resource allocation should have the effect of maximizing utility from consumption. If time reduction is used as a method when comparing the economic values of consumption at different times; from an economic point of view, it is seen that the concept of sustainability does not mean anything different from efficient resource allocation. Against the capital approach, which advocates resource efficiency for the continuity of social welfare, some economists argue that traditional neoclassical economic concepts such as the maximization of welfare already include the concept of sustainable development and there is no need for attempts to define sustainability or make it functional. According to Herman Daly, on the other hand, sustainability is related to natural capital and Daly argues that sustainable development can be made functional in terms of conservation of natural capital. This policy objective leads to two decision rules for renewable and non-renewable resources. The rule for renewable energies is to limit resource consumption to sustainable yield levels. For non-renewable resources, it is reinvesting revenues from non-renewable resource use into renewable natural capital. This sustainability decision rule proposal for natural capital is quite different from the standard neoclassical approach (Harris, 2009).

An economically sustainable system must be able to continuously produce goods and services. For a manageable economy and balanced levels of external debt, it must avoid excessive sectoral imbalances that harm agricultural or industrial production.

## **Sustainable Development with its Environmental Dimension**

The increase in environmental problems based on population, urbanization and industrialization brought about by development, made it necessary to consider the concept of development in a multidimensional way (Aksu, 2011).

An environmentally sustainable system must provide a stable resource base. Excessive consumption of renewable resource systems should be avoided and non-renewable resources should be encouraged to be consumed to the extent that substitute resources are invested. Ensuring environmental sustainability includes conservation of biodiversity, atmospheric stability, and the continuity of other ecosystem functions that are not normally classified as economic resources. In this process, the concept of sustainable development, which explores the ways of long-term development in the quality of life, has emerged while trying to protect the productive assets, which are especially natural resources, for the benefit of future generations (Munasinghe, 1993).

There are two clear sustainable development principles for the management of renewable resources. First, production rates must equal sustainable yields and then waste emission rates should equal the natural absorptive capacity of ecosystems. Regenerative and absorptive capacities should be regarded as natural capital and failure to maintain these capacities should be seen as capital consumption (Daly, 1990).

There is no set limit to growth in terms of population or resource use beyond ecological damage. However, it is aimed to delay the consumption of limited natural resources such as water, energy and



raw materials as much as possible with sustainability. Renewable energy sources are generally not in danger of extinction as a result of their use, but most renewable energy sources are part of a complex and interconnected ecosystem. The use of non-renewable energy sources such as fossil fuels and minerals reduces the amount of stock available for future generations. However, this does not mean that non-renewable energy sources should not be used, but that appropriate technologies should be used to reduce their consumption (Brundtland Commission, 1987).

Decision makers seek proactive policies and projects to help predict and minimize environmental damage. After countries such as France, the Netherlands and the UK, when plastic bags were made chargeable in Turkey in 2019, the use of plastic bags decreased by 77.27% (T.C. Çevre ve Şehircilik Bakanlığı, 2020). Environmental policies such as enacting legislation regulating production in terms of the environment, environmental taxes, balancing emission values can be counted among the government's effective practices.

## **Sustainable Development with its Social Dimension**

The social dimension is people-oriented; it is important in ensuring the continuity of social and cultural systems. Ensuring inter-communal equality (reducing poverty), protecting pluralism and cultural diversity are important requirements of the social dimension (Moffat, 1996).

A socially sustainable system must ensure distributional equity, adequate delivery of social services, including health and education, gender equality, political accountability and participation. The focus on basic needs and equality in development is presented in the Human Development Reports of the United Nations Development Programme. Human development reports that offer a different measure of development than per capita GDP or GDP in calculating the human development index, each year, focuses on a different aspect of social and economic development such as democratic governance (1993), gender equality (1995) and poverty (1997) (HDRO, 1990).

The first Human Development Report in 1990 introduced a new approach to advancing human well-being. The report is about increasing the richness of human life for human development rather than the richness of the economy. There is an approach that focuses on people, their opportunities and choices. In the report developed by economist Mahbub Ul Haq, ideas about the links between economic growth and development in the second half of the 20th century also had a formative impact on the human development approach. Gross Domestic Product (GDP) and economic growth have been rated as leading indicators of national progress in many countries (UNDP, 1995).

While the approach of the development phenomenon has changed dimensions, it has begun to focus on issues that were not discussed much before, such as meeting basic needs, income distribution, poverty, and unemployment. In addition, social development indicators such as employment, whether the basic needs of people are met and equality are emphasized. These ideas have helped pave the way for human development. It has been revealed that development is not only economical, but also human and social dimensions are very important (Griffin and Knight, 1992).

## **A Method for Measuring the Concept of Corporate Sustainability: A Triple Bottom Line Approach**

The concept of corporate sustainability emerged while transferring the concept of sustainability, which was shaped by a series of political, public and academic influences over time, to the business level.

Corporate sustainability can be defined as meeting the needs of a company's direct and indirect stakeholders (shareholders, employees, customers, pressure groups, communities, etc.) without compromising its capacity to meet the needs of future stakeholders. To this end, companies must maintain and grow their economic, social and environmental capital bases while actively contributing to sustainability in the political arena (Elkington, 1997).

Corporate sustainability refers to a much broader interpretation of the concept of capital than is normally used by economists or ecologists. The three different types of capital have different economic, natural and social characteristics and therefore require different approaches (Dyllick and Hockerts, 2002).

Driving companies towards sustainability will require radical changes in their social, economic and environmental performance. A single focus on economic sustainability can be successful in the short run; however, sustainability in the long run requires fulfilling all three dimensions simultaneously. For this reason, the concept of 'tripartite reporting', which emerges by focusing on the three main elements of sustainability, namely economic welfare, environmental quality and social justice and integrating the three basic elements of sustainability, is taken into account (Russo, 1997). The tripartite reporting concept requires businesses to report not only their financial results but also their environmental and social activities. Since the three dimensions of the concept of 'tripartite-responsibility' are interrelated, they can affect each other in various ways (Elkington, 1997).

This performance appraisal differs from traditional reporting frameworks as it includes social and environmental dimensions for which it would be difficult to identify appropriate measurement tools. TBL sizes do not have a common unit of measure. This creates an unfavorable situation as it allows the overall framework to be tailored to the needs of different organizations (businesses or nonprofits), projects, policies (investment in infrastructure or training programmes), or different geographic boundaries. If profits are measured in dollars, it will be very difficult to find units of measurement for social capital, environment or ecological health. Another solution would be to calculate the TBL in terms of an index. As a result of eliminating the problem of incompatible units, comparisons can be possible. The level of organization, type of project and geographic scope will guide the decision about which metrics to include. However, measurement tools will ultimately be determined by subject matter experts based on their ability to collect the required data. While there is substantial literature on appropriate measures to use for sustainability at regional or national levels, ultimately data availability will drive TBL calculations (Slaper and Hall, 2011).

Since, there is no universal criterion to measure the level of sustainable development, the United Nations has determined economic, social and environmental variables in order to guide the measurement of sustainable development. with sub-titles such as education, climate change, energy, green economy, health and population, science, climate change, sustainable consumption and production. Determined variables are measured with sub-headings such as education, climate change, energy, green economy, health and population, science, climate change, sustainable consumption and production. For this purpose, member states are gathered periodically and studies are carried out to determine the variables and policies to be followed (Diesendorf, 1999).

## **Sustainable Development Goals**

The Sustainable Development Goals are based on long-term work by the UN Department of Economic and Social Affairs and UN member states. States should set indicators and monitor accordingly in order to determine success rates in achieving sustainable development goals. However, the process of deter-

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mining indicators becomes difficult due to the multidimensional nature of the concept of sustainable development (Çelik, 2006).

Sustainable development goals can be achieved through partnership understanding where the right choices are made to change and improve life in a sustainable way (T.C. Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı, 2016). For this purpose, critical targets for environment and development policies within the framework of the concept of sustainable development are listed as follows in our Common Future Brundtland Report (Brundtland Commission, 1987):

- Stimulating growth,
- Changing the nature of growth,
- Meeting basic needs for work, food, energy, water and sanitation,
- To provide a sustainable population level,
- Protecting and developing resources,
- Risk management and reorienting technology,
- To combine environment and economy in decision making.

Adopted by all United Nations member states, the 2030 Agenda for Sustainable Development offers a common plan for peace and prosperity for humanity today and in the future. In this context, Decleris, who claims that Sustainable Development has a law, has put forward some principles. According to this; it is important to ensure sustainability that strategies such as protecting the oceans and forests, ending poverty and other deprivations, reducing inequality through improvements in health and education, promoting economic growth while tackling climate change (Decleris, 2000).

There are 17 Sustainable Development Goals set by the UN, a call to action by all developed and developing countries in a global partnership. The 2030 Sustainable Development Goals summarized as 17 main goals are as follows (Department of Economic and Social Affairs, 2019):

- Goal 1. No Poverty: Ending all forms of poverty everywhere
- Goal 2. Zero Hunger: Ending hunger, achieve food security and good nutrition and support sustainable agriculture
- Goal 3. Good Health and Well-Being: Ensuring a healthy and quality life at all ages
- Goal 4. Quality Education: Nitelikli Eğitim: To provide inclusive and equitable quality education and to promote lifelong learning opportunities for all
- Goal 5. Gender Equality: Cinsiyet Eşitliği: Achieving gender equality and empowering all women and girls
- Goal 6. Clean Water and Sanitation: Ensure accessible water and wastewater services and sustainable water management for all
- Goal 7. Affordable and Clean Energy: Providing access to affordable, reliable, sustainable and modern energy for all
- Goal 8. Decent Work and Economic Growth: Promoting stable, inclusive and sustainable economic growth, productive employment and decent work for all
- Goal 9. Industry, Innovation and Infrastructure: To build resilient infrastructures, support inclusive and sustainable industrialization and strengthen innovation
- Goal 10. Reduced Inequalities: Reducing inequalities within and between countries

- Goal 11. Sustainable Cities and Communities: Making cities and human settlements inclusive, safe, resilient and sustainable
- Goal 12. Responsible Consumption and Production: Ensuring sustainable production and consumption patterns
- Goal 13. Climate Action: To take urgent action to combat climate change and its effects
- Goal 14. Life Below Water: To protect and sustainably use the oceans, seas and marine resources for sustainable development
- Goal 15. Life On Land: To protect and improve terrestrial ecosystems and to support their sustainable use; ensuring sustainable forest management, combating desertification
- Goal 16. Peace, Justice and Strong Institutions: To build peaceful and inclusive societies for sustainable development, provide access to justice for all, and create effective, accountable and inclusive institutions at all levels
- Goal 17. Partnerships for The Goals: Strengthening the means of implementation and reinvigorating the global partnership for sustainable development.

## **ANALYSIS OF EU COUNTRIES ACCORDING TO SUSTAINABLE DEVELOPMENT INDICATORS WITH CLUSTERING METHOD ON THE BASIS OF TRIPLE REPORTING APPROACH**

### **The Purpose and Scope of the Research**

The competitive environment created by the effect of globalization in the current period and environmental disasters, especially with the effect of the development policies followed by developed and developing countries, necessitated the implementation of development strategies by taking measures to protect the environment. In the new world age, in the context of economic developments, although the welfare levels of the countries have increased, social and legal problems continue. It is thought that this study can contribute to the analysis of the indicative values of the 2030 Agenda Sustainable Development Goals, which is a program established by the UN to determine strategies to protect the environment and promote economic growth while combating climate change.

Purpose of the study is the grouping of European member and candidate countries according to their success in reaching each target and evaluating their success levels according to the indicator titles. In addition, it is aimed to contribute to sustainable development activities by identifying the weak points of each country. Within the scope of the study, countries are divided into clusters according to their sustainability performances, using the data and reports published on the websites of the UN, UN Turkey, World Bank, OECD (Economic Development and Cooperation Organization) and the official institutions of the Ministry.

### **Implementing the Data Mining Process**

The data mining process applied to the SDG data for clustering analysis consists of the steps of preparing and processing the dataset, determining the optimum number of clusters and applying the clustering algorithms in the Weka package program.

## The Dataset of the Research

In the research, firstly, the raw data set of 169 Targets (T) belonging to 17 main Sustainable Development (SD) goals of European countries was discussed. Then, the raw data set was reduced to 92 indicators by using expert opinions. Finally, after the data pre-processing (data reduction-cleaning-combination) process, the research was conducted by taking into account the 52 SD indicators belonging to 13 SDG main headings with their social, economic and environmental dimensions. After the data cleaning process, especially in the process started with the aim of clustering all European countries according to sustainable development indicators, 27 EU countries, United Kingdom, Norway and candidate countries Turkey and Serbia were able to participate in the cluster analysis. The raw data set consisting of the indicator values of the social, environmental and economic sub-dimensions of the concept of sustainable development are given in Table 2, Table 3 and Table 4.

*Table 2. Sustainable development indicators for social dimension*

<b>SOCIAL DIMENSION</b>	G2: ZERO HUNGER	*T10- Obesity rate by body mass index (%)
		T12- State support for agricultural research and development (\$)
		T13- Organic farming field (%)
	G3: GOOD HEALTH AND WELL-BEING	T14- Life expectancy at birth by sex (%)
		T15- Percentage of people perceived to be in good or very good health by gender (%)
		*T16- Mortality rate from chronic diseases by gender (within 1000 people)
		*T17- Mortality rate from tuberculosis, HIV and hepatitis by gender (%)
		*T18- Reported unmet need for medical examination and care by gender (%)
		*T21- Population living in households exposed to noise pollution according to poverty status (%)
	G4: QUALITY EDUCATION	*T24- Early leavers from education and training by gender (%)
		T26- Participation in early childhood education by gender (%)
		*T27- Disability rate in reading, math or science (2015) (%)
		T28- Employment rates of recent graduates by gender (%)
		T29- Adult participation in learning by gender (%)
		*T30- Young population not in employment and education (%)
	G5: GENDER EQUALITY	*T31- Employment gap by gender (%)
		*T32- Inactive population due to care responsibilities (%)
		T33- Number of active women in national parliaments and governments
		T34- Number of active women in senior management positions (%)
		T36- Rate of higher education education (%)
G10: REDUCED INEQUALITIES	T61- GDP per capita in purchasing power index (\$)	
	*T62 Relative poverty risk range (%)	
	T63- Income distribution (P80/P20)	
	T64- Income share of the bottom 40% of the population (%)	
	*T65- People at risk of income poverty after social transfers (%)	
G16: PEACE, JUSTICE AND STRONG INSTITUTIONS	*T88- Death rate due to murder (ratio per 100000 population)	
	*T92- Corruption perceptions index (0-100)	

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*Table 3. Sustainable development indicators of economic dimension*

<b>ECONOMIC DIMENSION</b>	G1: NO POVERTY	*T1- People at risk of poverty or social exclusion (%)
		*T3- People who are severely financially deprived (%)
		*T4- People living with low work intensity in the household (%)
		*T5- Employees in jobs at risk of poverty (%)
		*T6- A population living in unfavorable home conditions (%)
		*T8- Population whose house cannot be sufficiently heated by poverty (%)
		*T9- Overcrowding rate in terms of poverty (%)
	G8: DECENT WORK AND ECONOMIC GROWTH	T46- Real GDP per capita (\$)
		T49- Employment rate (%)
		*T50- Long-term unemployment rate (%)
		T54- Resource efficiency and domestic material rate (\$/kg)
	G9: INDUSTRY, INNOVATION AND INFRASTRUCTURE	T55- Gross domestic product expenditure by sectors (% GDP)
		T56- Employment in high and medium-high technology production and knowledge-intensive services (% active population)
T57- Sectoral R&D personnel (% active population)		
T59- Share of buses and trains in total passenger transport (%)		

*Table 4. Sustainable development indicators for environmental dimension*

<b>ENVIRONMENTAL DIMENSION</b>	G7: AFFORDABLE AND CLEAN ENERGY	T39- Final energy consumption (tonnes of oil)
		T40- Final energy consumption per capita in households (kg /oil)
		T41- Energy efficiency (Euro /kg)
		T42- Share of renewable energy in gross final energy consumption by sectors (%)
		*T43 Energy import dependency by products (% total usable energy)-
	G11: SUSTAINABLE CITIES AND COMMUNITIES	T71- Recycling rate of municipal waste
		*T74- Population (% population) reporting crime, violence or vandalism occurring in their area
	G12: RESPONSIBLE CONSUMPTION AND PRODUCTION	T77- Waste generation excluding dangerously large mineral wastes (2016)
		T78- Primary energy consumption (tonnes of oil)
	G13: CLIMATE ACTION	*T82- Greenhouse gas emissions (tonnes CO2)
		*T87- Average CO2 emissions per km from new passenger cars (g/km)

The SDG indicator data analyzed in practice was developed by the SDG Expert Group by evaluating data from international and regional organizations to the UN Department of Economic and Social Affairs, and inputs from UN offices, expert agencies and programmes.

## Data Preparation and Processing

Missing data, called unknown values, that have no value in data sets, cause problems in scientific research. Calculating and estimating missing values in preparation for data analysis is an important step in the knowledge discovery process. In this case, classical methods such as replacing the missing data with zero, ignoring the relevant attribute, replacing it with the mode value, or filling the relevant attribute by averaging the row or column can be used (Cheng vd., 2011; Meng ve Shi, 2012).

Although the data are generally for 2017, missing data is completed with data for 2016 and 2018. Missing data in the indicators “Greece/ population living in unfavorable home conditions”, “Malta/ exposure to polluted air particles” and “Croatia/ GDP investment share by corporate sectors” were completed by averaging the two closest points.

$$X_n = (X_{n-1} + X_{n+1}) / 2 \quad (1.1.)$$

Let  $(X_n)$  be the missing data period and this equality (1.1) was used while averaging was taken.

Before the data mining process, data aggregation, reduction and cleaning processes were performed in the data preprocessing process in order to make the dataset suitable for knowledge discovery. The titles of Clean Water and Sanitation, Life in Water, Partnerships for Terrestrial Life and Purposes and the EU candidate countries North Macedonia, Montenegro and Albania were not included in the evaluation due to the abundance of missing data. After the data pre-processing stages, 92 SD indicator titles for 31 countries were reduced to 52 and the final version of the data set was created. The data set consisting of 52 indicators analyzed in the application is given in Table 5.

*Table 5. Sustainable development indicator set used in the analysis*

<b>No Poverty</b>	*T1	People at Risk of Poverty or Social Exclusion (%)
	*T3	Severely Financially Deprived People (%)
	*T4	People Living with Low Work Intensity in the Household (%)
	T5	Employees in Jobs at Risk of Poverty (%)
	*T6	Population Living in Unfavorable Home Conditions (%)
	*T8	Population whose House is Not Warmed Enough by Poverty Status
	*T9	Poverty Overcrowding Rate (%)
<b>Zero Hunger</b>	*T10	Obesity Rate by Body Mass Index (%)
	T12	State Support for Agricultural Research and Development (\$)
	T13	Organic Farming Area (%)
<b>Good Health and Well-Being</b>	T14	Life Expectancy at Birth (%)
	T15	Proportion of Persons in Good or Very Good Health (%)
	*T16	Mortality from Chronic Diseases (per 1000 people)
	*T17	Mortality Rate due to Tuberculosis, HIV and Hepatitis (%)
	*T18	Reported Unmet Need for Medical Examination and Care (%)
	*T21	Population Living in Houses Exposed to Noise Pollution by Poverty Status (%)

*continues on following page*

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Table 5. Continued

<b>Quality Education</b>	*T24	Early Leavers from Education and Training (%)
	T26	Participation in Early Childhood Education (%)
	*T27	Disability Rate in Reading, Mathematics or Science (2015) (%)
	T28	Employment Rates of Recent Graduates (%)
	T29	Adult Participation in Learning (%)
	*T30	Ratio of Young People Not in Education and Employment (%)
<b>Gender Equality</b>	*T31	Employment Gap (%)
	*T32	Population Inactive Due to Care Responsibilities (%)
	T33	Number of Active Women in National Parliaments and Governments
	T34	Number of Active Women in Senior Management Positions
	T36	Higher Education Education Rate (%)
<b>Clean Water and Sanitation</b>	T39	Nihai Enerji Tüketimi (Ton Petrol)
	T40	Final Energy Consumption Per Capita in Households (oil equivalent/kg)
	T41	Energy Efficiency (Euro/kg)
	T42	Share of Renewable Energy in Gross Final Energy Consumption by Sectors (%)
	*T43	Energy Import Dependency by Products (% Total Usable Energy)
<b>Decent Work and Economic Growth</b>	T46	Real GDP per Capita (\$)
	T49	Employment Rate (%)
	*T50	Long Term Unemployment Rate (%)
	T54	Resource Efficiency and Domestic Material Ratio (\$/kg)
<b>Industry, Innovation and Infrastructure</b>	T55	Gross Domestic Product Expenditures by Sector (% GDP)
	T56	Employment in High and Medium-Advanced Technology Production and Knowledge Intensive Services (% Active population)
	T57	Sectoral R&D Personnel (% Active Population)
	T59	Share of Buses and Trains in Total Passenger Transport (%)
<b>Reduced Inequalities</b>	T61	Purchasing Power Indexed GDP per Capita (\$)
	*T62	Relative Median at Risk of Poverty Gap (% distance to poverty threshold)
	*T63	Income Distribution (P80/P20)
	T64	Income Share of 40% of the Population According to the Lowest Income (%)
	*T65	People at Risk of Income Poverty after Social Transfers (%)
<b>Sustainable Cities and Communities</b>	T71	Recycling Rate of Municipal Waste (% Total waste)
	*T74	Population Reporting Crime, Violence and Vandalism Occurring in the Region (% Population)
<b>Responsible Consumption and Production</b>	*T77	Hazardous large mineral wastes (kg per capita)
	T78	Primary Energy Consumption (million tons of oil)
<b>Climate Action</b>	*T88	Murder Mortality Rate (per 100000 population)
<b>Peace, Justice and Strong Institutions</b>	*T92	Corruption Perceptions Index (0-100)
	T93	Population Secured by EU Institutions (%)

(High values for indicators marked with \* are considered negative.)



## Determining the Number of Clusters

In the clustering method, determining the number of clusters from the beginning is one of the basic steps. Determining the optimum number of initial clusters is a basic requirement for correct clustering. The homogeneous division of a population consisting of certain  $N$  units into  $M$  clusters such that the sum of the diameters of the clusters is minimal was investigated by Brucker (1978). Separation and homogeneity can be expressed in many different ways. Generally, differences between unit pairs are used for this purpose. The division of a cluster is the minimum difference between any unit in that cluster and any unit outside it. Commonly used single link algorithm ensure maximum division for all possible cluster numbers. The maximum difference between two units in the same cluster can be the diameter of the cluster (Jaumard, 1987).

While running the algorithms, there are no specific classes, and giving a certain number of clusters may not be appropriate as a requirement of unsupervised learning. However, many algorithms require the user to enter the initial cluster number. Accordingly, the user should run the algorithm by determining the optimum number of clusters. Determining the optimum number of clusters can be done by trial and error by entering the estimated number of clusters and evaluating the results, or by calculations based on some indexes. Dunn's validity index, Davies-Bouldin's validity index, Silhouette and C indexes are some of them (Silahtaroglu, 2013):

In this study, the optimum number of initial clusters was obtained using Dunn's Index. According to the DUNN Index; the minimum distance between the points of different clusters is  $d_{min}$  and the longest distance between the clusters is  $d_{max}$ ; the distance between the  $C_k$  and  $C_{k'}$  clusters is measured by the distance between the closest points of the two clusters.

The formula to be used for the measurement of this distance is given in equity (1.2.) and (1.3.)

When it is taken  $i \in I_k, j \in I_{k'}$  and  $k \neq k'$

$$d_{kk'} = \min \| M_i^k - M_j^{k'} \| \quad (1.2)$$

and  $d_{min}$  is the smallest one of the distances  $d_{kk'}$ .

From (1.2.) it is concluded;

$$d_{min} = \min d_{kk'} \quad (1.3)$$

For each set  $C_k$ , equation (3.4) is applied to find the longest distance separating two different points in the set  $D_k$ :

$$D_k = \max \| M_i^{\{k\}} - M_j^{\{k\}} \| \quad i, j \in I_k \text{ and } i \neq j \quad (1.4)$$

$$d_{max} = \max D_k \quad 1 \leq k \leq K \quad (1.5)$$

To find the Dunn's Index, equation 1.6 is calculated;

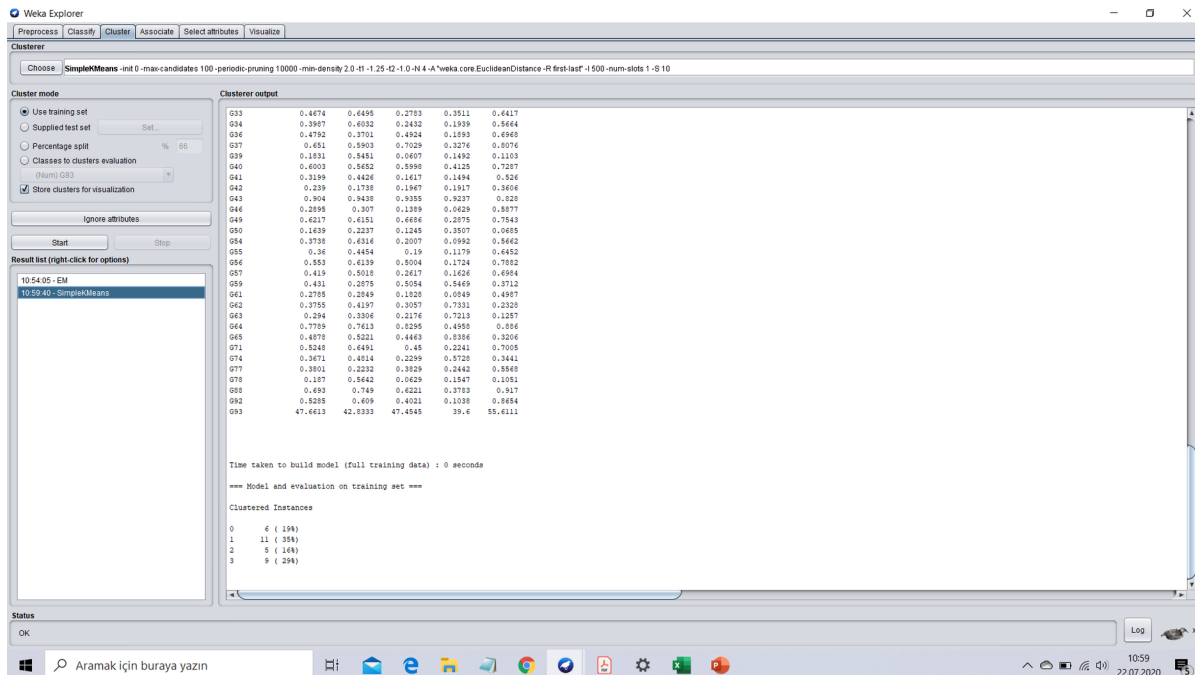
$$C = \frac{d_{min}}{d_{max}} \quad (1.6)$$

As the C coefficient increases, the quality and number of clusters increase. In the application, Dunn's Index analysis was performed on the data set using the R Studio program and the optimum number of clusters was calculated as four (Desgraupes, 2013).

### The Method of the Research

The data mining models used in the research were carried out in Weka software. Necessary corrections, reductions and merging of databases were made in Microsoft Excel program. Data mining clustering method applications were made by converting the final data set obtained in the Microsoft Excel program to arff file type. After the steps of normalization and determination of the number of clusters, the application was carried out with the clustering algorithms in WEKA. By applying the clustering algorithms EM, FarthestFirst, LVQ, Canopy, X-Means and SimpleKMeans, it was seen that the SimpleKMeans algorithm gave the most reasonable clustering output as a result of expert opinions In the study, the sustainable development indicators and the dataset of European countries were divided into groups using the widely used "K-means" clustering algorithm. Figure 2. shows the output of the cluster analysis with the K-Means algorithm.

Figure 2. Cluster analysis output with simple K-Means algorithm in Weka



## RESULTS

After determining the optimum four clusters for the Sustainable Development Indicators data set, the result of the cluster analysis with the K-Means algorithm is presented in Table 6.

*Table 6. Cluster analysis result of SDG data set with K-means algorithm*

Cluster-1	Cluster-2	Cluster-3	Cluster-4
Germany	Czech Republic	Bulgaria	Belgium
Spain	Estonia	Greece	Denmark
France	Croatia	Romania	Ireland
Italy	Cyprus	Serbia	Luxembourg
Portugal	Latvia	Turkey	Holland
United Kingdom	Lithuania		Austria
	Hungary		Finland
	Malta		Sweden
	Poland		Norway
	Slovakia		
	Slovenia		

In Table 7, the indicator values are analyzed according to whether they contribute to sustainability or negatively affect them.

**Cluster 1:** It consists of economies with the capacity to steer the EU and the most densely populated members of the union, Germany, Spain, France, Italy and Portugal, and the UK leaving the union. The cluster ranks first in terms of primary energy consumption, final energy consumption, resource efficiency and domestic materials, the number of active women in national parliaments and governments, and the number of active women in senior management positions, which show their level of development. In addition, it is the cluster with the lowest rate of government support for agricultural research and development and the share of renewable energy in gross final energy consumption. When evaluated in terms of sustainability in general, the cluster ranks second.

**Cluster 2:** The cluster consisting of Czechia, Estonia, Croatia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Portugal, Slovenia and Slovakia; it ranks first in terms of state support for agricultural research and development, survival rate at birth, participation in early childhood education and income share of the bottom 40% of the population. In addition, it ranks first in the headings that will negatively affect sustainability such as obesity, death rate from chronic diseases and energy import dependency. It is seen that it is in the 3rd place in the general evaluation made according to the sustainability targets.

**Cluster 3:** The group consisting of Bulgaria and Romania, which joined the EU in 2007, with Turkey and Serbia as candidate countries, and Greece from the early period member countries; It is the cluster with the lowest rating in most of the social, economic and environmental development indicators.

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*Table 7. Cluster averages and rankings according to sustainable development indicators*

		Average (1st Cluster)		Average (2nd Cluster)		Average (3rd Cluster)		Average (4th Cluster)	
*T1	<b>People at risk of poverty or social exclusion</b>	22.82	(2.)	24.22	(3.)	37.48	(4.)	18.47	(1.)
*T3	<b>People who are severely financially deprived</b>	5.62	(2.)	8.68	(3.)	23.38	(4.)	2.93	(1.)
*T4	<b>People living with low work intensity in the household</b>	9.92	(2.)	8.13	(1.)	12.74	(4.)	10.30	(3.)
*T5	<b>Employees in jobs at risk of poverty</b>	10.25	(3.)	8.48	(2.)	12.76	(4.)	6.48	(1.)
*T6	<b>A population living in unfavorable home conditions (%)</b>	12.97	(2.)	17.81	(3.)	21.63	(4.)	11.16	(1.)
*T8	<b>Population whose house cannot be warmed enough according to poverty</b>	9.62	(2.)	11.15	(3.)	21.46	(4.)	2.71	(1.)
*T9	<b>Overcrowding rate by poverty status</b>	9.97	(2.)	25.48	(3.)	43.56	(4.)	7.66	(1.)
*T10	<b>Obesity rate by body mass index</b>	50.70	(1.)	61.82	(4.)	57.02	(3.)	51.24	(2.)
T12	<b>Government support for agricultural research and development (\$)</b>	331.42	(4.)	4249.31	(1.)	4242.57	(2.)	4169.06	(3.)
T13	<b>Organic farming field</b>	7.72	(3.)	9.15	(2.)	2.90	(4.)	9.17	(1.)
T14	<b>Life expectancy at birth by sex</b>	82.20	(2.)	85.88	(1.)	77.12	(4.)	81.93	(3.)
T15	<b>Percentage of people perceived to be in good or very good health by gender</b>	67.97	(2.)	65.13	(4.)	66.88	(3.)	74.52	(1.)
*T16	<b>Mortality rate from chronic diseases by gender (per 1000 people)</b>	103.63	(2.)	172.39	(4.)	170.48	(3.)	95.58	(1.)
*T17	<b>Mortality rate due to tuberculosis, HIV and hepatitis by gender (%)</b>	3.12	(2.)	4.17	(4.)	3.04	(3.)	1.20	(1.)
*T18	<b>Reported unmet need for medical examination and care by gender</b>	1.47	(2.)	3.25	(3.)	4.84	(4.)	1.42	(1.)
*T21	<b>Population living in households suffering from noise by poverty status</b>	18.57	(4.)	15.68	(2.)	14.90	(1.)	16.50	(3.)
*T24	<b>Early leavers from education and training by gender</b>	12.42	(3.)	9.50	(2.)	15.10	(4.)	7.87	(1.)
T26	<b>Participation in early childhood education by gender</b>	97.18	(2.)	99.67	(1.)	75.66	(4.)	96.43	(3.)
*T27	<b>Inability in reading, math or science (2015)</b>	21.98	(2.)	26.93	(3.)	41.62	(4.)	18.28	(1.)

*continues on following page*

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*Table 7. Continued*

		Average (1st Cluster)		Average (2nd Cluster)		Average (3rd Cluster)		Average (4th Cluster)	
T28	<b>Employment rates of recent graduates by gender</b>	76.62	(3.)	88.65	(1.)	65.66	(4.)	85.68	(2.)
T29	<b>Adult participation in learning by gender</b>	11.50	(2.)	8.69	(3.)	3.62	(4.)	19.34	(1.)
*T30	<b>Young people who are neither in employment nor in education</b>	14.15	(3.)	13.63	(2.)	21.44	(4.)	8.83	(1.)
*T31	<b>Employment gap by gender</b>	10.87	(2.)	11.82	(3.)	20.08	(4.)	7.37	(1.)
*T32	<b>Inactive population due to care responsibilities</b>	20.85	(2.)	26.62	(3.)	30.84	(4.)	14.31	(1.)
T33	<b>Number of active women in national parliaments and governments</b>	33.48	(1.)	23.32	(3.)	22.74	(4.)	33.23	(2.)
T34	<b>Number of active women in senior management positions</b>	29.12	(1.)	17.63	(3.)	14.38	(4.)	27.79	(2.)
T36	<b>Rate of higher education education</b>	38.03	(3.)	44.95	(2.)	32.30	(4.)	48.39	(1.)
T39	<b>Final energy consumption</b>	119.52	(1.)	15.37	(4.)	33.16	(2.)	24.68	(3.)
T40	<b>Final energy consumption per capita in households</b>	496.17	(3.)	549.18	(2.)	362.40	(4.)	639.34	(1.)
T41	<b>Energy efficiency</b>	9.02	(2.)	5.35	(3.)	4.50	(4.)	10.30	(1.)
T42	<b>Share of renewable energy in gross final energy consumption by sector</b>	17.64	(4.)	21.68	(2.)	18.80	(3.)	29.75	(1.)
*T43	<b>Energy import dependency by products</b>	63.12	(3.)	64.50	(4.)	48.93	(2.)	-18.62	(1.)
T46	<b>Real GDP per capita</b>	28050	(2.)	16963.64	(3.)	9640	(4.)	49211.11	(1.)
T49	<b>Employment rate by gender</b>	71.63	(3.)	79.69	(1.)	62.92	(4.)	75.29	(2.)
*T50	<b>Long-term unemployment rate</b>	4.27	(3.)	3.23	(2.)	6.12	(4.)	2	(1.)
T54	<b>Resource efficiency and domestic material (2016)</b>	2.65	(1.)	1.14	(3.)	0.65	(4.)	2.40	(2.)
T55	<b>Gross domestic product expenditures by sectors</b>	1.79	(2.)	1.17	(3.)	0.84	(4.)	2.37	(1.)
T56	<b>Employment in high and medium-high technology production and knowledge-intensive services</b>	45.48	(2.)	45.39	(3.)	31.40	(4.)	51.04	(1.)
T57	<b>Sectoral R&amp;D personnel</b>	1.27	(2.)	0.93	(3.)	0.66	(4.)	1.63	(1.)
T59	<b>Share of Buses and Trains in Total Passenger Transport (%)</b>	14.97	(4.)	20.61	(1.)	20.44	(2.)	16.73	(3.)
T61	<b>GDP per capita purchasing power index</b>	29916	(2.)	25445	(3.)	17060	(4.)	43666	(1.)

*continues on following page*

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Table 7. Continued

		Average (1st Cluster)		Average (2nd Cluster)		Average (3rd Cluster)		Average (4th Cluster)	
*T62	Relative poverty risk range (%)	24.23	(3.)	23.83	(2.)	32.10	(4.)	19.54	(1.)
*T63	Income distribution (P80/P20)	5.42	(3.)	5.25	(2.)	7.80	(4.)	4.17	(1.)
T64	Income share of the bottom 40% of the population	20.42	(3.)	23.54	(1.)	17.32	(4.)	22.81	(2.)
*G65	People at risk of income poverty after social transfers	17.77	(3.)	18.17	(2.)	23.02	(4.)	14.42	(1.)
T71	Recycling rate of municipal waste	43.98	(2.)	33.16	(3.)	15.38	(4.)	47.44	(1.)
*T74	Population reporting crime, violence or vandalism occurring in their area	12.92	(3.)	8.45	(1.)	14.80	(4.)	10.09	(2.)
T77	Waste generation, excluding dangerously large mineral wastes (2016)	603	(4.)	1033.39	(2.)	659.37	(3.)	1502.31	(1.)
T78	Primary energy consumption	168.67	(1.)	21.59	(4.)	46.84	(2.)	32.08	(3.)
*T88	Mortality rate by sex (2016)	67.17	(3.)	62.36	(2.)	42.40	(1.)	81.11	(4.)
*T92	Corruption Perceptions Index	67.67	(3.)	62.73	(2.)	41.40	(1.)	81	(4.)
T93	Population Supported by EU-Guaranteed Institutions (%)	42.83	(3.)	51.91	(2.)	39.60	(4.)	55.61	(1.)
	Cluster Rankings (Average)		<b>2.</b>		<b>3.</b>		<b>4.</b>		<b>1.</b>

**Cluster 4:** The cluster consists of Belgium, Denmark, Ireland, Luxembourg, Netherlands, Austria, Finland, Sweden and Norway. The lowest values are observed for the indicators showing low quality of life such as the population at risk of poverty or social exclusion, population at risk of income poverty after social transfers, people severely financially deprived, population living in unfavorable living conditions, workers at risk of poverty, early leavers from education and training, employment gap, reading, mathematics and inadequacy in science, energy import dependency. In addition, it is seen that sustainable development scores on organic agriculture field, R&D personnel, higher education education rate, energy efficiency, employment rate, share of renewable energy in gross final energy consumption, high and medium-high technology production and employment in knowledge-intensive services, GDP per capita purchasing power indexed are higher than other clusters. When all the headings participating in the analysis are evaluated together, it is seen that it is the most sustainable cluster according to the averages obtained in Table 3.6.

## CONCLUSION

The global political community must first realize that humans are not the only inhabitants of the planet and that humans must live in harmony with all other living things. Afterwards, it should design strategies that will enable institutions to move away from their current destructive policies and growth and development processes on the way to sustainable development. This situation will require policy changes in all countries that will affect both their own development and the development opportunities of other countries. With the publication of the Brundtland Report, the European Union has undertaken joint policy efforts with the United Nations and achieved successful results. The EU has determined a number of projects and programs by integrating environmental, social and economic sustainable development goals into its policies.

There is a strong understanding that national governments and multinational institutions cannot separate economic development issues from environmental, social and legal issues. Many forms of development consume environmental resources and deterioration in environmental and social structure weakens economic development. Therefore, the performance of institutions based on social and environmental results, as well as financial results, has also gained meaning. Recent studies on corporate sustainability have also shifted from what the concept is to how to achieve this paradigm shift, how to measure and report results.

In this study, sustainable development performances of the countries were evaluated by cluster analysis by considering the sustainable development indicators determined by the UN with their three dimensions (social, economic and environmental). For this, the reached indicator data of EU member and candidate countries are discussed. For this, the reached indicator data of EU member and candidate countries were handled and as a result, it was decided to group 31 countries into 4 separate clusters.

Cluster analysis was performed by applying the K-means algorithm to the data set compiled from the indicator values of 31 countries via WEKA software. According to this; it is seen that Belgium, Denmark, Ireland, Luxembourg, Netherlands, Austria, Slovenia, Finland, Sweden and Norway have the best scores according to sustainable development indicators data. It is seen that the countries that make up the group are generally northern countries with low population and surface area, geographically far from the problematic regions of the world, not affected by regional crises in socioeconomic terms and with high living standards. When we look at the cluster consisting of Germany, France, Spain, Italy, Portugal and the United Kingdom, which have indicator values close to the first group, it is seen that G7 countries dominate the world economy, but despite this, they are not in the first place. The 3rd cluster countries, including Czechia, Estonia, Croatia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland and Slovakia, are the countries that were affected by the cold war period, their living standards were relatively behind, and they were included in the 2004 enlargement by meeting the EU criteria. The fourth cluster is the Balkans Region group, which includes Turkey, Bulgaria, Greece, Romania and Serbia.

In the study, many indicators available in the database were eliminated before the application due to the lack of data. To prevent this situation, countries can be more transparent in sharing their policy reports and data so that a full and accurate assessment can be made.

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## **KEY TERMS AND DEFINITIONS**

**Brundtland Report:** The report titled “Our Common Future” published by the World Commission on Environment and Development (WCED) in 1987 is also known as the “Brundtland Report” because of the commission chairman, Gro Harlem Brundtland.

**Clustering Analysis:** Cluster analysis is one of the Pattern Recognition techniques that may be characterized by the use of resemblance or dissemblance measures between the objects to be identified. Clustering analysis is a computer-oriented data analysis technique that is a product of many research fields: statistics, computer science, operations research, and pattern recognition.

**Data Mining:** Data mining is the process of modeling, selecting and discovering knowledge from large amounts of data to discover implicit knowledge or relationships in order to derive clear and useful results from the available data.

**Data Processing:** Preparing and pre-processing the data is one of the most important stages of data mining for the solution of data problems that would prevent the application of any type of analysis on the data and to achieve meaningful data analysis. It consists of data cleaning, data merging, data transformation and data reduction stages.

**Simple K-Means Clustering:** K-means is one of the most commonly used clustering algorithms. The method initially selects K randomly from the data set and generates K membership clusters. It is aimed that the intra-cluster similarity is maximum and the inter-cluster similarity is minimum.

**Sustainable Development:** Sustainable development is the meeting the needs of the present without compromising the ability of future generations to meet their own needs.

**Sustainable Development Goals:** Sustainable development goals are an urgent call strategies for action about peace and prosperity adopted by all United Nations Member States, provides a shared blueprint for people and the planet, now and into the future.

**Triple Bottom Line:** The concept of the Triple Outcome Line (TBL), which deals with the measurement of corporate sustainability with its social, environmental, and economic dimensions, is an approach to measuring the sustainability of businesses, non-profit organizations and governments and the performance of related projects or policies.

**Weka (“Waikato Environment for Knowledge Analysis”):** Weka is an open source software developed at the University of Waikato. It includes many of the machine learning algorithms and tools for data preparation, classification, regression, clustering, association rules mining, and visualization.

## Chapter 16

# Assessment of the Overall Impact of the COVID-19 Pandemic on the Energy System in China

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### ABSTRACT

*As the world faces the COVID-19 pandemic, there has been an instinctive and abrupt change in the global energy portfolio. Traditional fossil fuels that serve as the foundation of the modern economy have found their demand has rapidly decreased across most categories due to strict lockdown and limiting measures that have been adopted to control the infection. These shifts consequently caused various clean energy advantages across the world in recent times. This article investigates these energy benefits and reversals that have been materialized in this unfolding situation due to the reduced demand for fossil fuels. Outcomes from the study insist that COVID-19 has delivered impressive changes in the global energy demand, with about 11–25% curtailment in all the impacts mentioned above in 2020 compared to their corresponding readings in 2019. Although these changes might have been short-term changes, the long-term impacts of the R&D investments on fossil fuels are essential role players of the future of the energy portfolio.*

### INTRODUCTION

Since China's first case of a new type of coronavirus was confirmed on December 8, 2019, the covid-19 epidemic has rapidly spread across the country along with the Spring Festival travel crowd. As of February 10, 31 provinces (autonomous regions, municipalities directly under the Central Government) and Xinjiang Production and Construction Corps have reported a total of 40,235 confirmed cases, which have spread to Southeast Asia, Oceania, Europe, and North America. All provinces and cities in China

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initiated first-level response measures for the first time. Wuhan, the epicenter of the outbreak, shut down expressways, railway stations, and airports as soon as possible to strictly control the flow of people (Akrofi & Antwi, 2020).

This paper analyzes the impact of the epidemic impact in various energy industries from the macro-level based on the current development of the epidemic. It analyzes the obstacles to the smooth operation and development of the short-term industry and the prospects for medium- and long-term development from the perspective of supply and demand. This report believes that due to the dual impact of supply and demand, the development of various industries will be inhibited to varying degrees in the short term. Ensuring emergency energy supply in epidemic areas is the focus of the current work; in the medium and long term, various industries will gradually adjust and adjust after the epidemic. Rebound to the original development track, my country's energy industry should continue to develop following the established route and goals and provide continuous and stable support for economic recovery. This report puts forward relevant policy recommendations in response to the current epidemic's obstacles to developing the energy industry (Brosemer et al., 2020). At present, the epidemic has severely affected the cross-regional movement of migrant workers across the country and has had a phased impact on my country's economy in the short term. The following mainly analyzes the impact of the epidemic on my country's macroeconomy.

First of all, whether theoretically or empirically, the medium- and long-term trend of economic growth will not be substantially changed due to external shocks caused by the epidemic. The public epidemic will only cause economic growth to slow in the short term, temporarily deviating from the original steady growth trend. After the epidemic is over, as long as the policy is adjusted promptly, the macroeconomic indicators and household consumption levels can still return to the original growth trend. At present, the operation of major industries is stable. If the epidemic can be completely controlled in the first quarter, the annual economic growth rate in 2020 can still reach 5.6-5.8% (Fell et al., 2020).

Second, the sharp decline in domestic oil and gas consumption demand has led to a drop in international oil and gas prices. Since the tertiary industry mostly requires direct contact between people, the four industries that bear the brunt of the epidemic are tourism, catering, accommodation, and entertainment. Take tourism as an example: during the Spring Festival in 2019, the national tourism output value reached 510 billion (data Source: China Tourism Consumption Big Data Report 2018) (IEA, 2020). After the outbreak, almost all 5A-level tourist attractions were forced to close down, and major travel companies, airlines, and hotels were forced to withdraw their orders and suffered heavy losses. The tertiary industries affected by the epidemic also include transportation, warehousing, and postal services, leasing, business services, education, culture, sports, and other industries with certain attributes of travel and gathering. Affected by this, the sharp drop in domestic oil and gas consumption has led to a decline in international oil and gas prices. According to a report in the Financial Times on February 5, my country's LNG importers are considering whether to suspend natural gas supply contracts following force majeure regulation. At present, the price of LNG in Asia has dropped to US\$3 per million British thermal units, which is far lower than the US\$5 in mid-January, a record low (Lalas et al., 2021).

In addition, delays in resuming work and traffic jams will cause domestic energy production and utilization to fall simultaneously. Up to now, many provinces and cities across the country have issued notices on delayed resumption of work many times, including energy-related industries such as petroleum refining, coal mining, and power supply. Taking the coal industry as an example, the National Energy Administration issued a notice "to effectively utilize the role of coal as a ballast in energy security, and to effectively and orderly release high-quality and advanced coal production capacity." However, according

to Cinda Coal's estimates, it is likely that coal mines will not be able to promptly respond to the Energy Administration's request to resume work and production promptly. Assuming that 50% of the power coal mines, the resumption of work one week later will affect the output of the first quarter by 4.36%, which is about 29.43 million tons (Mastropietro et al., 2020; Norouzi et al., 2020).

Finally, the epidemic has also brought opportunities and challenges. The opportunity is that the epidemic will provide an opportunity for transformation to promote the improvement of the energy system, especially the emergency energy security system, to make relevant departments pay more attention to emergency preparedness, and to improve the energy supply capacity of disaster-stricken and epidemic areas in my country at critical times; in the energy industry, the Internet of Energy, Grid reform and other processes are expected to take advantage of corners to overtake; Chinese energy companies can seize low prices and expand energy reserves. As the world's factory and the world's second-largest economy, China will face huge hidden losses due to the epidemic: more than 70 countries have imposed entry controls on Chinese citizens, which will result in such things as obstruction of commodity exports, international energy procurement or delivery Delays, suspension of international energy cooperation projects and other major impacts. Hidden losses also include the international reputation established through long-term efforts, and it isn't easy to estimate with numbers. So how fast adjusting the macro-economy and rebuilding international credit are huge challenges facing China(Norouzi et al., 2021).

## **Background**

Some existing literature and studies overviewed the changes and challenges with various focuses. A study by Brosemer (Brosemer et al., 2020) provided a perspective review of the energy and power crises related to the intersections of inequity, indigeneity, and health. Another study by Zhong (Zhong et al.,2020) reviewed the implications and challenges of COVID-19 for the electricity sector. They stated that increased uncertainty of electricity demand posed greater pressure on system operators. Fell et al. (Fell et al., 2020) studied the considerations, challenges, and responses for the energy social research during and after pandemics. Mastropietro et al. (Mastropietro et al., 2020) reviewed global emergency measures on energy consumer protection during the pandemic. More studies are focusing on problems in specific countries or regions, such as the analysis of the short-term impacts on the USA electricity sector (Ruan et al., 2020), the review of government innervations in South Africa (Akrofi & Antwi, 2020), the review of solar energy development in Malaysia, the impact analysis for electricity sector performance in India, the impact overview analysis of impacts on electricity grid dynamics in Europe (Werth et al., 2020), the overview of impacts on electricity and oil demand in China (Norouzi et al., 2020), and the impacts of containment measures on European electricity consumption. The studies mentioned above are dedicated to knowing the impacts of the coronavirus outbreak from different perspectives. In the urgent and emergent ambient under coronavirus outbreak, more dedication is vital, and it is beneficial for the whole energy industry and society by providing more views. This study investigates the global impacts and challenges of coronavirus outbreak on oil and gas upstream and downstream industry and its market status and highlights energy-related lessons and emerging opportunities. Data used in this paper are based on currently available data from the relevant agencies, and due to fast development, cannot be precise. The value of this paper aims to be presenting an overall view of the oil and gas industry in the post-covid-19 world and add some new points on strategic energy management of challenges.

## **Results and Discussion**

### **Impact on the Coal Industry**

The covid-19 epidemic will have a certain impact on the coal industry in the short term, but the coal industry is still mainly affected by reducing capacity in the long term. Affected by the epidemic, downstream companies in the coal industry have delayed work, and demand for coal in steel and other industries will decline. Moreover, due to stricter logistics control during the epidemic, the market's demand for coal will be suppressed to a certain extent and lead to demand lag. At the same time, due to the delay in resuming production, the coal supply level is also at a low level. As of February 3, the total inventory of Qinhuangdao, Caofeidian, and Jingtang Port was 14.85 million tons, which is more than January 23. There was a decrease of 720,000 tons, a year-on-year decrease of 3.89 million tons, which was low (Norouzi, 2021). After the epidemic is over, downstream companies will inevitably speed up production to meet the backlog of market demand so that the coal industry may usher in a short-term rebound in the future. However, subject to the national de-capacity policy, the coal supply will gradually decrease to the original capacity level.

### **Impact on the Power Industry**

The covid-19 epidemic will have a certain impact on the power industry. Affected by the epidemic, many companies have postponed the start of operations, commercial power demand and industrial power demand will drop sharply in the short term, and the supply of the upstream and downstream industrial chains of the power equipment manufacturing industry is also facing suspension or “parties labor” in the short term. It will also have an impact on the power industry. From a regional perspective, the growth rate of electricity consumption in the Middle East, where the epidemic is severe, will drop sharply. In contrast, the contribution rate of electricity consumption in the western region, where the epidemic is weak, will increase. In 2019 alone, the proportion of consumption in the eastern, central, western, and northeastern regions in the country was 47.2%, 18.7%, 28.3%, and 5.8%, respectively (Norouzi & Ataei, 2021), so it is expected that in 2020, the proportion of electricity consumption in the central and eastern regions will decrease, and the proportion of electricity consumption in the western regions will increase.

### **Impact on the Petrochemical Industry**

Among many energy industries, the oil and gas industry has been the hardest hit by the epidemic. Due to the outbreak and spread of the new coronavirus, international oil prices have entered a new round of decline since January 21, 2020, and domestic natural gas prices have also shown a downward trend. As of February 10, The spot price of WTI crude oil fell to US\$50/barrel, a 14% drop from January 21; the spot price of Brent crude oil fell to US\$54.0/barrel, a 15% drop from January 21 (Norouzi & Fani, 2020). As a major oil and gas consumer globally, the epidemic will greatly weaken global oil and gas demand. Therefore, the OPEC Technical Committee finally gave a 600,000 barrels/day production reduction recommendation (data source: Huatai Futures Research Institute). On the demand side, due to the continuous spread of the covid-19 epidemic, many domestic highways have adopted restrictions on traffic, public transportation in many areas has ceased operation, a series of outdoor entertainment activities and indoor gathering entertainment activities have been suspended, so private car travel has

been greatly reduced., Residents' travel demand has dropped significantly. Affected by the delayed resumption of work policy, it is difficult for industries such as large outdoor projects, industrial and mining enterprises, and logistics and transportation to resume work in the short term, and industrial demand will also decline. Under the influence of restricted business policies and hindered logistics and transportation, oil and gas companies have increased inventory pressure on the supply side. Destocking to ensure sales has become an important issue faced by oil and gas companies in the short term, and oil and gas companies also need to implement postponement resumption policies. The supply of oil and gas resources has a downward trend(Ruan et al., 2020).

## **Impact on the Renewable Energy Industry**

Covid-19 epidemic will not have a major impact on the renewable energy industry. On January 23, 2020, the National Energy Administration issued the "Notice of the National Energy Administration on Matters Related to the Construction of Wind Power and Photovoltaic Power Generation Projects in 2020 (Draft for Solicitation of Comments)" (starting now referred to as the "Draft for Soliciting Comments"), which is the 2020 domestic wind power The development of photovoltaics provides policy support(Rashedi et al., 2020).

The impact of the epidemic on the photovoltaic industry is mainly reflected in three aspects: delays in resuming work restricted logistics, and blocked exports. The postponement of construction will cause the PV bidding subsidy projects carried over from 2019 to the beginning of 2020 to be unable to complete the grid connection on time, thus missing the two subsidies on March 31 and June 30, 2020, which will increase the financial burden of enterprises. However, unlike 2019, the relevant policies in 2020 will be introduced earlier, and companies wishing to declare have a preparation period of about three months. Therefore, the epidemic will have less impact on photovoltaic power generation projects in 2020. Affected by the epidemic, logistics inspections have become stricter, and the flow of goods has slowed down. It is difficult for some equipment to reach the designated area within the scheduled time, resulting in delays in the construction period. In terms of import and export restrictions, the original orders for photovoltaic power generation projects may be delayed in fulfillment risks, and new orders may be reduced. However, the overseas production capacity of large enterprises will help the supply of photovoltaic products in the global market, thereby effectively alleviating the impact of the epidemic. Although the epidemic will have a short-term impact on the photovoltaic industry after the epidemic is over, international personnel exchanges and trade flows will return to normal, and domestic production capacity exports will also quickly recover. Therefore, the overall impact of the epidemic on the photovoltaic industry throughout the year is limited(Werth et al., 2021).

As far as the wind power industry is concerned, the impact of the epidemic is not significant. Affected by the spread of the epidemic, although some projects will be affected due to the postponement of resumption of work, the postponement of resumption of work does not affect the annual installed grid-connected capacity. Wind power projects will continue to rush to install and welcome Come to the grid peak in the long run.

## DISCUSSION

The energy demand has diminished with the enormous economic contraction that followed the global pandemic outbreak of COVID-19. Even before it happened, the economic slowdown had stalled global energy consumption growth to 0.6% in 2019 from an average of around 2% growth per year (Werth et al., 2021) in the previous two decades. An IEA study (IEA, 2020) estimates a decline in global energy demand of 5% and corresponding waning oil and gas demands of 9% and 4%, respectively, by the end of 2020. With surplus supplies, the energy market is presently at a historic low.

A fall in global coal and electricity demands led to a downward rally, followed by oil and gas. The fossil fuels that were already reeling under the pressure of surplus induced low prices have been further affected by the extended lockdowns that caused people to work and learn from home and use less road or air transport. Brent crude, which had been plunging since June 2014 and in a more pronounced manner since September 2018, hit a 19-year low (Rashedi et al., 2020) in April 2020 before bouncing back slightly. The Henry Hub natural gas price has been declining since September 2005 and stayed below US\$2 for a good part of 2020 (Norouzi & Ataei, 2021).

Millions have lost their jobs, homes, businesses, or savings. The main change brought about by the pandemic has been an increased reliance on digital platforms. All these affect electricity usage, fuel consumption, and emissions. Some believe that these direct impacts on energy consumption, mobility, and the environment are not likely to last, while others argue that it may trigger a worldwide transition towards a low carbon and low-contact economy. For the oil and gas companies, whose bottom lines have already been affected by low fuel prices, it means adopting all measures required to survive, including decisions to pursue, cancel, postpone or reduce investments in low-carbon technologies (Norouzi & Ataei, 2021).

The concern regarding peak oil happening around 2020 was laid to rest for a short while, introducing new technologies in the extraction and deep-ocean drilling that opened up possibilities of vastly increasing the global reserves. Despite the ongoing transition to renewable and nuclear energy and the declining demand for fossil fuel transportation in Europe, Japan, and the US, oil demand was projected to marginally increase in the next two decades with increased demand in Asia, the Middle East, and Africa. Unless there is a paradigm shift in policies, oil demand will continue to rise slowly in the next decade or so, after which we can expect to see a decline (Norouzi & Ataei, 2021).

The renewable and nuclear energy market accounted for about 15% of the energy basket in 2019 as per EIA reports and was forecasted to replace fossil energy in about two decades' substantially. The last few years have seen substantial work in this regard, but the energy transition has been plagued with huge investments, reliability, low productivity, affordability, sustainability, and energy security (Norouzi & Ataei, 2021).

The pandemic created challenges as well as opportunities for the energy transition. Renewable energy has been more resilient than other sectors during this period. The global use of renewable energy saw an increase of 1.5% worldwide in all sectors between 1Q19 and 1Q20. The use and generation are expected to rise by around 1% and 5%, respectively, in 2020 (Norouzi & Ataei, 2021). Before the pandemic halted or delayed projects and investments, this year was predicted to set records for new, combined renewable energy capacity. IEA estimates that the lockdown could set back the 2020 renewable energy investment and capacity by as much as 18% and 13%, compared to last year.

Various entities publish long-term energy outlooks, but the inconsistencies and impracticality of direct comparisons make it difficult for decision-makers to understand energy futures comprehensively and engage in erudite discussions. But it will be reasonable to expect the following:



## ***Assessment of the Overall Impact of the COVID-19 Pandemic on the Energy System in China***

The pandemic may accelerate the transition from fossil fuels economy, but not in every country. The conflict between the immediate goal to revive the economy after the lockdown and the continuing global objective to decarbonize will arise. Global energy demand may bounce back to the pre-pandemic levels in about 3 to 5 years, depending on how fast the pandemic is controlled(Norouzi, 2021).

The pandemic has brought together leading EU countries to integrate their finance and efforts for greener energy. In the US, the development in fracking and shale had made the country more self-reliant, paving the way for major changes in demand and supply. The new government is likely to implement more stringent rules on drilling, emissions, and fracking. Many countries in the Middle East and Africa, whose economies relied heavily on fossil fuel reserves, will face the crisis with the devaluation of reserves prompted by low prices and future demand(Norouzi, 2021).

Any major government support is likely to be for projects that accelerate the energy transition to a zero-carbon emission economy or transition from the fossil fuels industry. The stimulus plans, government support, and the post-pandemic recovery of China (which leads the solar panels and wind energy sectors) will determine the pace of recovery. Despite government interventions, full recovery may not be possible given that many of the energy-related infrastructure projects and related economic activities are shelved or indefinitely postponed (Zhong et al., 2020).

The relatively higher prices associated with renewable or cleaner energy are likely to dampen its demand shortly with the economy reeling under the pressure of the pandemic and buyers' predictable reluctance to switch to new contracts in an unpredictable market. In the next few years, the deciding factors will be countries and cities moving away from polluting vehicles, the possible introduction of carbon-free compliant trucks by 2025, and the reopening of the aviation and automotive sectors (Norouzi et al., 2020).

The success of renewable energy will depend on shifting from reliable and constant but rigidly centralized power stations to decentralized, smart, and reactive grids that can transmit energy from diverse sources with the ability to accommodate fluctuations in generation and demand. Simultaneous technological breakthroughs in developing efficient and effective energy storage capabilities in niche areas such as biofuel generators, hydrogen fuel, and offshore wind harnessing are critical.

Major oil and gas companies are observing the development of green hydrogen with keen interest. This is also a part of Europe's green deal package with numerous investment support policies, pilot projects, and a dozen roadmaps for using hydrogen for energy(Norouzi et al., 2021).

In the current situation, for the next couple of years, it will be difficult for oil and gas operators to show noticeable progress in their decarbonization goals. Accelerating the transition to cleaner energy may disrupt the business models and possibly undermine the bottom-line of many fossil fuel operators, which is where they will look for cost-sharing or subsidies from the government. It will be important to balance medium and long-term strategies for transition and short-term recovery to meet the current energy demands(Rashedi et al., 2020).

Following the pandemic, the trends and behavioral patterns suggest relatively slower growth in the fossil fuel sector than predicted. This, alongside the irreversible decline in coal demand, will encourage major oil players to divert their investments to carbon-free energy sources. While the next few years are likely to see massive job losses in fossil fuel, it could substantially add jobs in the clean energy sector(Rashedi et al., 2020).

Oil prices are likely to hover at around the US\$40 - 45 bracket until the end of 2021. In the absence of delays in developing a vaccine and its distribution, an increase in price to the pre-pandemic levels was expected only after travel resumed. With most borders remaining closed for the rest of the year and the

resurgence of the second wave in many countries, jet fuel demand, which was reduced to half of 2019 levels, is expected to recover slower than road fuel, with the global oil demand likely to return to the pre-pandemic levels only in or after 2022 (Norouzi et al., 2021).

Natural gas, which will act as the transitional energy during this period, is likely to bounce back more quickly than oil; but it is unlikely to see the highs of even 2014 in the next couple of years. We should anticipate Henry Hub gas price in the US\$3 - 5 range until the end of 2021, while Asia oil-index prices could be in the US\$7 – 9/million Btu range. The demand for natural gas is likely to see growth for the next few years, especially in Europe, Asia, and the Middle East. Even with a spike in gas prices, the demand will continue for some time, but the lower-income countries may continue to use the cheaper liquid options given that they cannot afford the costlier LNG-based gases or alternative energy sources in the immediate future (Rashedi et al., 2020).

It is anticipated that the sector will also gear towards less human intervention in its chain of operations. This presents investment opportunities around management and optimizes assets using the latest technology for more sustainable operations. This is expected to attract potential investors in greener exploration and exploitation of hydrocarbons in the long run. Still, in the current unpredictable environment, investments may not be immediately forthcoming with low oil prices rendering most of the exploration and development activities unviable.

Due to the falling production costs in the next couple of decades, fossil fuels will continue to lead as the primary energy source, even with increased investments in and generating renewables. Oil will continue to remain the dominant energy source for transport, while natural gas will take the lead role in the heating sector. Faster transition resulting in an earlier end of fossil fuel dependence is possible with strong and consistent sustainable development policies and efficient disbursement of investments. Still, there may not be major renewable projects that can be brought online in the immediate future. Therefore, at the global level, cheaper fossil fuels may continue to support demand and discourage clean energy solutions for some time (Rashedi et al., 2020).

The effects of COVID-19 and the associated global recession will last for a couple of years. The delay or loss of economic activity in these years will contract energy demand, extend reliance on fossil fuels and delay alternative energy initiatives. As is always the case, the recovery of the overall economy will decide that of the energy sector, depending on how soon the virus can be contained and a vaccine made available. The recovery from the effects of the pandemic will be gradual, but there will be a paradigm shift in the way the energy industry runs. The silver lining in the present crisis is the decline in emissions to the levels ten years or so before, but there is little merit in sustaining that without economic growth, and hopefully, it will catalyze an accelerated change to a more sustainable and secure energy world (Mastropietro et al., 2020).

## **CONCLUSION**

Covid-19 epidemic will have a certain negative impact on my country's macroeconomy. This negative impact will be mainly concentrated in the first quarter, mainly manifested in consumption reduction, interruption of some economic activities, rising unemployment, and slowing GDP growth. The backlog of market demand affected by the epidemic will break out in the second quarter. Therefore, it is expected that some industries in my country will rebound significantly in the second quarter. The epidemic will

not have a big impact on economic growth throughout the year and will not affect the steady improvement of my country's economy. Development trend.

To alleviate the negative impact of the epidemic on my country's economic development and smoothly pass this extraordinary period, this article puts forward the following macro policy recommendations:

1. Do a good job of power supply in the epidemic area to meet the power demand for epidemic prevention and control. The epidemic has caused industry, commerce, manufacturing, and heavy chemical industries to suspend production and postpone work. This has caused a decline in electricity demand, and the power industry has been affected to a certain extent. However, the power industry also shoulders the responsibility of meeting the production and living power of hospitals and residents in epidemic areas. Therefore, the power department needs to do a good job in power protection to ensure a stable supply of power for key epidemic prevention hospitals, key production enterprises, and residents. Non-stop electricity and other measures.
2. Increase the strategic reserve of crude oil to ensure sufficient supply and stable prices of chemical raw materials such as polypropylene and other masks and protective clothing. Affected by the epidemic, international oil prices continued to fall, with the two oil prices hitting their lowest level in the past three months. As a country with more coal and less oil, my country encourages relevant companies to increase crude oil imports and increase strategic reserves in the face of falling international oil prices. All polypropylene manufacturers should continue to expand their production capacity. At the same time, polypropylene manufacturers other than PetroChina and Sinopec should also stabilize the price of polypropylene to ensure a sufficient and stable supply of important anti-epidemic materials such as masks and protective clothing.
3. It is recommended that the two-time nodes in the subsidy policy for photovoltaic bidding projects be extended for 1-2 months from March 31 and June 30, 2020, to ensure product safety and the basic economic benefits of photovoltaic power generation enterprises. The central government should investigate the number of photovoltaic bidding projects that cannot be completed at two key time points due to the delayed opening of labor unions caused by the epidemic, implement precise measures, and appropriately adjust the two key subsidy timings for such photovoltaic bidding projects.

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## **KEY TERMS AND DEFINITIONS**

**Circularity:** A circular economy (also referred to as “circularity”) is an economic system that tackles global challenges like climate change, biodiversity loss, waste, and pollution. Most linear economy businesses take a natural resource and turn it into a product that is ultimately destined to become waste because it has been designed and made. This process is often summarised by “take, make, waste.” By contrast, a circular economy uses reuse, sharing, repair, refurbishment, remanufacturing, and recycling to create a closed-loop system, minimize resource inputs, and create waste, pollution, and carbon emissions. The circular economy aims to keep products, materials, equipment, and infrastructure in use for longer, thus improving the productivity of these resources. Waste materials and energy should become input for other processes through waste valorization: either as a component or recovered resource for another industrial process or as regenerative resources for nature (e.g., compost). This regenerative approach contrasts with the traditional linear economy, which has a “take, make, dispose of” production model.

**Eco Commerce:** Eco commerce is a business, investment, and technology-development model that employs market-based solutions to balancing the world’s energy needs and environmental integrity. Through green trading and green finance, eco-commerce promotes the further development of “clean technologies” such as wind power, solar power, biomass, and hydropower.

**Eco-Tariffs:** An Eco-tariff, also known as an environmental tariff, is a trade barrier erected to reduce pollution and improve the environment. These trade barriers may take the form of import or export taxes on products with a large carbon footprint or imported from countries with lax environmental regulations.

**Emissions Trading:** Emissions trading (also known as cap and trade, emissions trading scheme, or ETS) is a market-based approach to controlling pollution by providing economic incentives for reducing the emissions of pollutants.

**Environmental Enterprise:** An environmental enterprise is an environmentally friendly/compatible business. Specifically, an environmental enterprise is a business that produces value in the same manner which an ecosystem does, neither producing waste nor consuming unsustainable resources. In addition, an environmental enterprise rather finds alternative ways to produce one's products instead of taking advantage of animals for the sake of human profits. To be closer to being an environmentally friendly company, some environmental enterprises invest their money to develop or improve their technologies which are also environmentally friendly. In addition, environmental enterprises usually try to reduce global warming, so some companies use environmentally friendly materials to build their stores. They also set in environmentally friendly place regulations. All these efforts of the environmental enterprises can bring positive effects both for nature and people. The concept is rooted in the well-enumerated theories of natural capital, the eco-economy, and cradle-to-cradle design. Examples of environmental enterprises would be Seventh Generation, Inc., and Whole Foods.

**Green Economy:** A green economy is an economy that aims at reducing environmental risks and ecological scarcities and that aims for sustainable development without degrading the environment. It is closely related to ecological economics but has a more politically applied focus. The 2011 UNEP Green Economy Report argues "that to be green, and an economy must be not only efficient but also fair. Fairness implies recognizing global and country-level equity dimensions, particularly in assuring a Just Transition to an economy that is low-carbon, resource-efficient, and socially inclusive."

**Green Politics:** Green politics, or ecopolitics, is a political ideology that aims to foster an ecologically sustainable society often, but not always, rooted in environmentalism, nonviolence, social justice, and grassroots democracy. It began taking shape in the western world in the 1970s; since then, Green parties have developed and established themselves in many countries around the globe and have achieved some electoral success.

**Low-Carbon Economy:** A low-carbon economy (LCE) or decarbonized economy is based on low-carbon power sources with minimal greenhouse gas (GHG) emissions into the atmosphere, specifically carbon dioxide. GHG emissions due to anthropogenic (human) activity are the dominant cause of observed climate change since the mid-20th century. Continued emission of greenhouse gases may cause long-lasting changes worldwide, increasing the likelihood of severe, pervasive, and irreversible effects for people and ecosystems.

**Natural Resource Economics:** Natural resource economics deals with the supply, demand, and allocation of the Earth's natural resources. One main objective of natural resource economics is to understand better the role of natural resources in the economy to develop more sustainable methods of managing those resources to ensure their future generations. Resource economists study interactions between economic and natural systems intending to develop a sustainable and efficient economy.

**Sustainable Development:** Sustainable development is an organizing principle for meeting human development goals while simultaneously sustaining the ability of natural systems to provide the natural resources and ecosystem services on which the economy and society depend. The desired result is a state of society where living conditions and resources are used to continue to meet human needs without


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undermining the integrity and stability of the natural system. Sustainable development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability goals, such as the current UN-level Sustainable Development Goals, address the global challenges, including poverty, inequality, climate change, environmental degradation, peace, and justice.

# Chapter 17

## COVID-19 and the Middle East Energy Industry: An Investigation on the Impacts of the Coronavirus Outbreak on the Energy Industry in the MENA Region

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### ABSTRACT

*Coronavirus caused several challenges to the energy industry. This chapter overviews the impacts and challenges of the Coronavirus outbreak on energy demand, supply, and market and illustrates energy-related lessons and emerging opportunities. The changes in energy industry requirements are compared and studied from multiple views according to available data and oil and gas information markets. In general, although the overall energy demand declines, the spatial and temporal variations are complicated. The energy intensity has presented apparent changes, the extra energy for coronavirus facing is not negligible for energy supply side, and the energy industry recovery in different regions presents significant differences. A crucial issue has been to allocate and find energy-related emerging opportunities for the post-pandemic. This study could offer a direction in opening a new perspective for increasing energy industry stability during emergencies such as pandemics or war in the Middle East region.*

### INTRODUCTION

According to the July 2020 report of the Ristad Energy Research Institute, new scenarios are being considered due to the second wave of the Covid-19 virus outbreak in the world (Dong et al., 2020). As the countries gradually reopened their economic activities, with the corona's escalation, especially in the United States, Brazil, India, and Europe, the scenarios for predicting world oil demand changed once again. Although the second wave of the corona epidemic has become widespread globally, this level of

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demand does not return to the level of April (Faust & Del Rio, 2020). However, the global economic crisis is not easily manageable. According to the Energy Ministry, global oil demand in October will not recover as quickly as previously forecast, and its level will be steady and without growth. Global oil demand is expected to average 90.2 million barrels per day in July and to 90.6 million barrels per day in August, September, and October. It will reach 93 million barrels per day in November and 94.7 million barrels per day in December. This is while the global oil demand level last year was more than 99 million barrels per day. It is predicted that even in February 2021, due to the second wave of the corona epidemic, the level of global oil demand will still be lower than in 2019 (Faust & Del Rio, 2020; Brosemer et al., 2020).

The annual estimate of global oil demand will be 89.7 million barrels per day, and the average in 2021 will be about 97.1 million barrels per day. In the institute's previous report, the projected demand level by the end of this year was estimated at 88.8 million barrels per day, and the total demand for the next year was estimated at 98.1 million barrels per day. In fact, in terms of energy recovery, global oil demand will not be fully restored by the end of 2022 to reach pre-corona levels.

According to Ristad Energy, the rate of adherence of OPEC+ to the reduction of production in May and July 2020 compared to the agreed amount shows that 88% of the obligations have been fulfilled in the mentioned months, and in the meantime, the violations will be compensated in the coming months. In other words, countries that have violated OPEC Plus' commitment will see the effect in the coming months in the oil market. Figure 1 shows the level of adherence to OPECPlus commitments and member violations during May and July 2020. Overall, the outbreak of the second wave of the coronavirus seems to have drastically reduced global oil demand, and since most governments will no longer impose those strict restrictions, the second wave will be a serious threat that could affect oil prices.

As mentioned in the facts above, COVID-19 has been swiping the world. And by late 2020, reached to more than 75 million confirmed cases and more than 1.7 million deaths in 220 countries all over the world had been reported to the World Health Organization (Dong et al., 2020). In comparison to the early 2020 COVID-19 outbreak and the 1918 Spanish flu pandemic, A study done by Faust ((Faust & Del Rio, 2020) suggests that the coronavirus pandemic might get more severe than the most deadly pandemic twentieth century. Many indexes such as quarantine, social distancing, and lockdown have been implemented to face the COVID-19 pandemic (Walensky & Del Rio, 2020). Coronavirus pandemic has harmed many industries, including agriculture, manufacturing, finance, education, healthcare, sports, tourism, and food (Nicola et al., 2020). And the energy industry was not immune to those harms (Mastropietro et al., 2020). According to foresight and projection data from the International Energy Agency (IEA) (IEA. Global Energy Review 2020), the shock to energy demand-side in 2020 is set to be the largest in the last seven decades. World's energy demand in 2020 is estimated to decrease by 6% compared to 2019, a decline more than seven times greater than the 2009 financial crisis.

In comparison to the average amount from 2015 to 2019, the total average power production from 16 European countries in April 2020 declined by 9% (25 GW), where conventional energy generation decreased by 28% (24 GW), nuclear energy decreased by 14% (11 GW), while renewables increased by 15% (15 GW) (Werth et al., 2020). Although overall energy demand declines are simple and clear, the repercussions are very complicated in different energy types and consumption patterns. The energy industry is on the way to understand the complicated impacts and identify emerging opportunities.

## Background

Some existing literature and studies overviewed the changes and challenges with various focuses. A study by Brosemer (Brosemer et al., 2020) provided a perspective review of the energy and power crises related to the intersections of inequity, indigeneity, and health. Another study by Zhong (Zhong et al., 2020) reviewed the implications and challenges of COVID-19 for the electricity sector. They stated that increased uncertainty of electricity demand posed greater pressure on system operators. Fell et al. (Fell et al., 2020) studied the considerations, challenges, and responses for the energy social research during and after pandemics. Mastropietro et al. (Mastropietro et al., 2020) reviewed global emergency measures on energy consumer protection during the pandemic. More studies are focusing on problems in specific countries or regions, such as the analysis of the short-term impacts on the USA electricity sector (Ruan et al., 2020), the review of government interventions in South Africa (Akrofi & Antwi, 2020), the review of solar energy development in Malaysia (Vaka et al., 2020), the impact analysis for electricity sector performance in India (Elavarasan et al., 2020), the impact overview analysis of impacts on electricity grid dynamics in Europe (Werth et al., 2020), the overview of impacts on electricity and oil demand in China (Norouzi et al., 2020), and the impacts of containment measures on European electricity consumption (Bahmanyar et al., 2020). The studies mentioned above are dedicated to knowing the impacts of the coronavirus outbreak from different perspectives. In the urgent and emergent ambient under coronavirus outbreak, more dedication is vital, and it is beneficial for the whole energy industry and society by providing more views. This study investigates the global impacts and challenges of coronavirus outbreak on oil and gas upstream and downstream industry and its market status and highlights energy-related lessons and emerging opportunities. Data used in this paper are based on currently available data from the relevant agencies, and due to fast development, cannot be precise. The value of this paper aims to be presenting an overall view of the oil and gas industry in the post-covid-19 world and add some new points on strategic energy management of challenges (Bahmanyar et al., 2020). This paper aims to contribute to the new lessons and emerging opportunities by capturing main trends rather than details with precise data. And in the final discussion, challenges and opportunities caused by the covid-19 pandemic are analyzed, and recommendations are made for OPEC member countries (Le Quéré et al., 2020).

## RESULTS AND DISCUSSION

### Completion of the Turkish Tanap natural Gas Pipeline Project by 2020

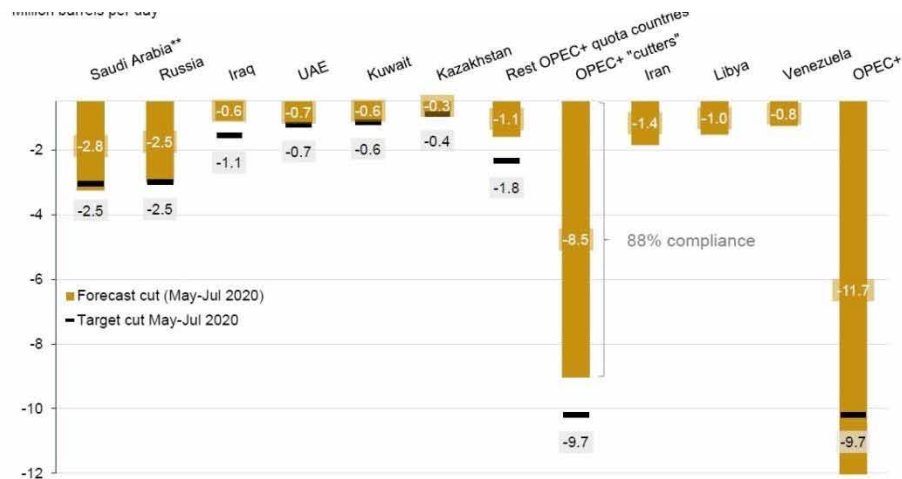
According to the British Energy Institute, the Trans-Anatolian natural gas pipeline (Tanap) is expected to reach the desired point by the end of late 2020 in the contract between the Azeri and Turkish companies (Bahmanyar et al., 2020), according to which about 6 billion cubic meters of natural gas. The \$ 7 billion pipelines will be transferred to Turkey in June 2018 with an initial supply of 2 billion cubic gas meters. The project, also known as the Southern Gas Corridor, is a 3,500-kilometer network that includes several transmission pipelines ((Le Quéré et al., 2020). Gas from the Shah Deniz 2 gas reservoir in the Republic of Azerbaijan to southern Europe, said Dozio Saltuk, one of the Tanap pipeline managers, which will have the potential to deliver 10 billion cubic meters of natural gas a year to Europe. He also said that 21.4 million cubic meters of gas had recently been injected into the pipeline for final tests

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and commissioning tests, citing a Kalanish Energy Institute report (EIA., July 2020). The 1,850-kilometer Tanap pipeline is the longest gas pipeline project in the Middle East and Europe. He also told the Turkish state news agency that the line would initially reach 16 billion cubic meters and then expand to a capacity of 24 to 31 billion cubic meters. This will turn Turkey into a hub for gas supplies to Europe via pipelines and natural gas imports from Azerbaijan and Russia (Geiger, 2020).

Figure 1. Adherence to OPEC Plus commitments in May and July 2020

Source: Rystad Energy and analysis



## Advantages of the Casa 1000 Pakistan Project

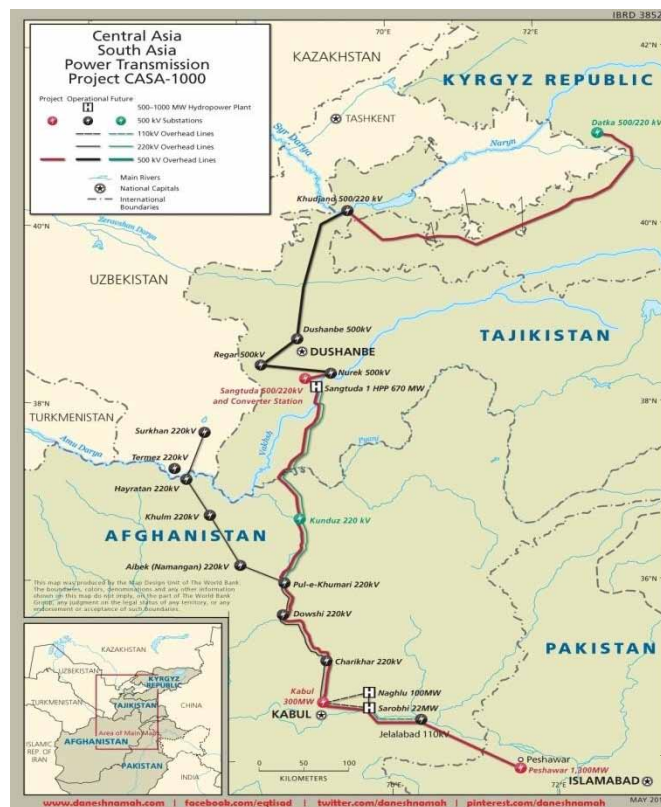
The CASA 1000 Transmission and Transmission Project was reviewed in Pakistan in 2006. Tajikistan, Kyrgyzstan, Afghanistan, and Pakistan have agreed to cross-border electricity exchanges in these countries (Central Asia and South Asia) through their hydropower resources. The project was implemented with the financial support of international organizations, focusing on the World Bank. Based on this project, through 1,200 km of surplus power transmission lines with a capacity of 1,300 MW in the summer from Tajikistan and Kyrgyzstan through Afghanistan to Pakistan. Transformed (Figure 2) (Henderson, 2020).

According to the World Bank, the project consists of three parts: The first part is creating high voltage power transmission infrastructure with a high voltage direct current transmission line (HVDC) with a capacity of 13,000 MW (RFE/RL Staff., October 26, 2019). The second part includes technical and engineering support for project implementation between member countries and the third part is related to financial and security issues, international financing and project security. The Asian Development Bank and the Eurasian Development Bank are financing the turbines' modernization, which French and Swiss's companies are replacing. One of the issues of concern in the project's initial studies is the geopolitical risks, including the risks in Afghanistan and the level of demand and completion. The use of hydropower plants throughout Tajikistan and Kyrgyzstan is the key part of the Central Asia-South Asia project (CASA 1000), which transports 300 megawatts of electricity per year to Afghanistan and

1,000 megawatts per year to Pakistan. Under the project, Kyrgyzstan’s more than 40-year-old hydropower plants will be modernized and designed, and commissioned for operation for at least the next 40 years. Tajikistan and Kyrgyzstan can generate revenue and sell electricity to Afghanistan and Pakistan. According to Wassim Mukhtar, a Pakistani power and power official, Islamabad intends to have an “open access” line in the CASA 1000 project, meaning that Pakistan will export electricity from Kyrgyzstan and Tajikistan. Tajik expert Sangtoda 1 power plant deployed in 2009, and Iranian expert forces assisted in Tajikistan’s Sangtoda 2 power plant in 2011(Rystad Energy, July 2020).

Pakistan’s main concerns in the project, as noted, were the geopolitical dangers of Afghanistan and the attacks that took place in Afghanistan in the spring and summer of last year, just as Tajikistan and Kyrgyzstan were exporting electricity to South Asia. The development of Iran’s cooperation in this project and the export of Iranian technologies and specialized knowledge in the hydroelectric industry can bring many benefits to the country. Considering the investments made in the Iranian electricity industry in recent years, Iran can exchange energy with Afghanistan and Pakistan, and electricity exports will be a source of foreign income for the Ministry of Energy (Le Quéré et al., 2020).

Figure 2. Status of cross-border power transmission lines in a project called Casa 1000



## Design of the First Digital Gas Exchange Platform in India

On June 15 this year, the first digital exchange platform for physical gas trading in India was launched. One of the advantages of this plan is transparency in gas trade between sellers and buyers. The project is implemented in three poles (Hub) Dahj and Hazira in Gujarat and Kakinada pole in Andhra Pradesh; Figure 3 shows the mechanization positions of the Indian gas exchange pole (EIA., July 2020).

Figure 3. Position of the three poles of gas exchange in India



As shown in Figure 3, pipeline construction is underway in almost all parts of India. Some of these pipelines, which branch off from the main poles, have been put into operation, such as the east-west pipeline, which connects the Dahj and Hazira poles to the Kakinada pole, as well as extending to north-western India. Several pipelines from other poles in the northeast and central regions are on the agenda and will be operational soon (Wood Mackenzie, 2020).

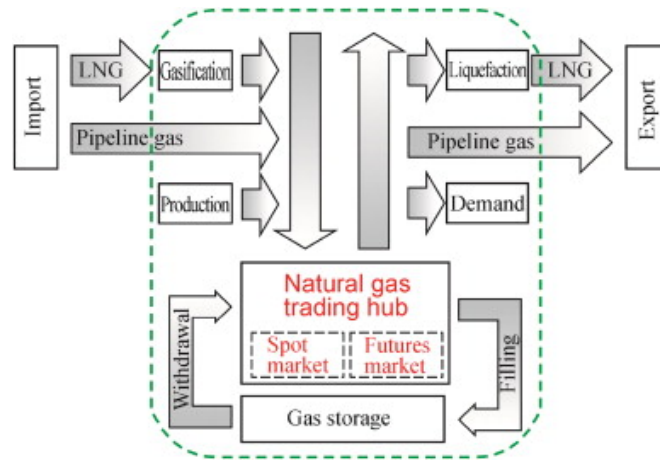
Buying, selling and sending gas in these poles is done both instantly and daily, weekly and monthly.

New developments in gas exchanges challenge the current patterns of gas trading in India and facilitate price transparency and greater use of gas. The Indian gas market is currently dominated by local gas intermediaries such as BPCL, IOCL and Torrentgaz, which use their supplied Alnaj gas directly

from refineries, petrochemical plants and power plants. Figure 4 summarizes the current structure and potential structure of the scheme (Geiger, 2020).

Gas exchange in the new plan structure allows independent buyers and sellers to branch off from the main gas intermediaries. Suppliers such as Reliance and BP can supply spark plugs through the pole. Independent buyers can do the same. As a result, the possibility of competition increases, and buyers are assured that when world prices are low, they too can benefit and have the same low price in their transactions. India needs government support, both politically and relatively, to increase gas share in its energy portfolio from 6% to 15% (Le Quéré et al., 2020; Rystad Energy, July 2020).

Figure 4. Gas exchange process in the hubs



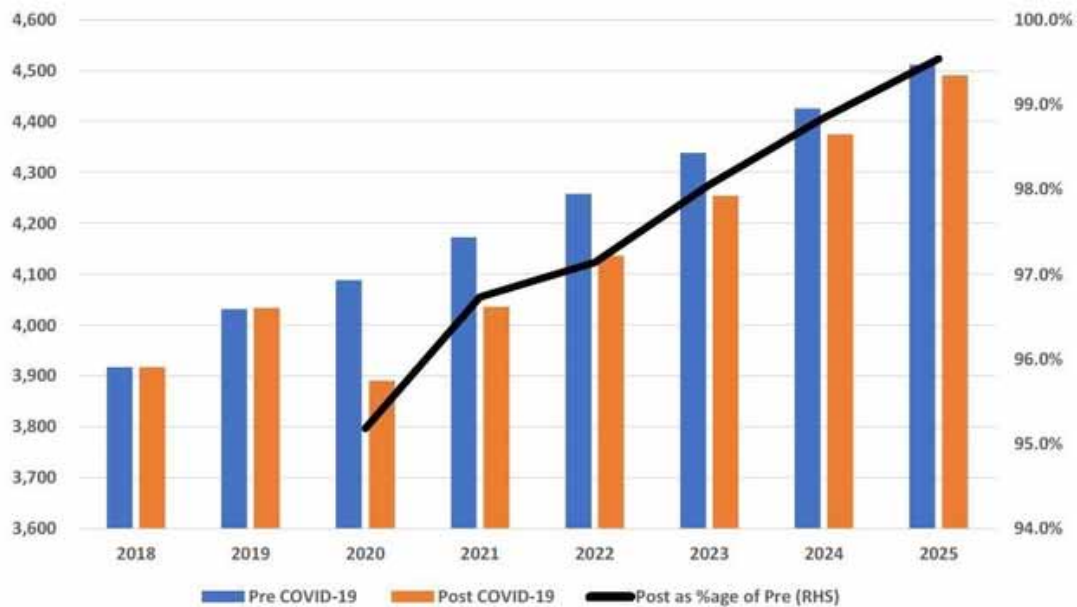
## DISCUSSION

An examination of analytical models of world gas markets has shown that GDP is fluctuating. One of the factors influencing these fluctuations is the prevalence of corona. In this memo, while reviewing the results of economic forecasts and world gas market demand, the trend of its changes between major producing and supplying countries is examined (Werth et al., 2020). The results of gas demand forecast models by various international organizations such as Oxford Energy, the International Energy Agency, and the US Energy Information Administration show that global gas demand will be 140 billion cubic meters lower this year than last year. Demand will be reduced by about 3.5 percent. In countries that use gas in electricity generation, such as the United States and some European countries, a better gas demand level can be expected, while coal-fired power plants will suffer more losses than gas-fired power plants due to the prevalence of corona. In addition to the Covid-19 pandemic effect, low gas prices play a role. China has a better demand picture among Asian countries, and the level of gas demand in the region is higher than in other countries on the continent (Brosemer et al., 2020). Next year, gas demand is expected to return to 2019 levels with a jump of 3.7 percent. By 2025, the annual growth in gas demand will be more than 2.5 percent and will reach pre-corona levels. Meanwhile, the world's GDP by 2025 will still be lower than before the Corona outbreak, and in some countries, with the continuation of low gas prices, especially in some Asian markets, the level of demand will increase. Figure 5 shows the growth trend of global gas demand before and after corona until 2025 (Geiger, 2020).



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Figure 5. Global gas demand by 2025 (billion cubic meters), Source: IEA, Nexan World Gas Model, OIES Analysis



According to the International Monetary Fund, the largest decline in demand, both in percentage and volume, will occur in North America, Europe, and Russia. This reduction in Europe (8.5%) will be approximately 50 billion cubic meters (compared to gas demand in China with a growth of 5.5%) will be equivalent to 17 billion cubic meters (and this level in 2021 in China is about 35 billion cubic meters). 14% (and other Asia-Pacific, including Japan, will revive. Growth in Middle East demand will resume, but demand in North Africa will remain low. European gas demand in 2025 will be around 550 billion cubic meters equivalent). It will be 2019, and China will demand growth of at least 150 billion cubic meters between 2019 and 2025. Other Asia-Pacific countries will demand growth of 50 billion cubic meters and the Middle East 180 billion cubic meters (Rystad Energy, July 2020). According to the International Energy Agency, gas demand in 2021 will offset the decline in demand from 2020 and will return to 2019 levels. However, according to IEA forecasts, the growth rate of gas demand from 2020 to 2025 will be slow, and even in this five-year interval will not reach the level of pre-corona demand. The International Energy Agency estimates that gas demand growth in 2019 to 2025 will be less than 400 billion cubic meters. According to the Oxford Institute for Energy Studies, this is 450 billion cubic meters. Besides, except for the Middle East, gas demand growth between 2025-2019 is estimated at 275 billion cubic meters, while the IEA, with more cautious forecasts, estimates this figure at 260 billion cubic meters (Ruan et al., 2020).

## CONCLUSION

The forecast for world gas demand by the end of this year and next year shows that despite the expectation of a gradual recovery of the gas market, the corona crisis's impact on the world market will be longer. In addition to the corona outbreak crisis, emerging markets such as China will gradually grow next year due to falling gas prices, but overall global demand growth will decline by next year. Meanwhile, liquefied natural gas (LNG) is considered the most important driver of global gas trade growth.

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## KEY TERMS AND DEFINITIONS

**Circularity:** A circular economy (also referred to as “circularity”) is an economic system that tackles global challenges like climate change, biodiversity loss, waste, and pollution. Most linear economy businesses take a natural resource and turn it into a product that is ultimately destined to become waste because it has been designed and made. This process is often summarised by “take, make, waste.” By contrast, a circular economy uses reuse, sharing, repair, refurbishment, remanufacturing, and recycling to create a closed-loop system, minimize resource inputs, and create waste, pollution, and carbon emissions. The circular economy aims to keep products, materials, equipment, and infrastructure in use for longer, thus improving the productivity of these resources. Waste materials and energy should become input for other processes through waste valorization: either as a component or recovered resource for another industrial process or as regenerative resources for nature (e.g., compost). This regenerative approach contrasts with the traditional linear economy, which has a “take, make, dispose of” production model.

**Eco Commerce:** Eco commerce is a business, investment, and technology-development model that employs market-based solutions to balancing the world's energy needs and environmental integrity. Through green trading and green finance, eco-commerce promotes the further development of "clean technologies" such as wind power, solar power, biomass, and hydropower.

**Eco-Tariffs:** An Eco-tariff, also known as an environmental tariff, is a trade barrier erected to reduce pollution and improve the environment. These trade barriers may take the form of import or export taxes on products with a large carbon footprint or imported from countries with lax environmental regulations.

**Emissions Trading:** Emissions trading (also known as cap and trade, emissions trading scheme, or ETS) is a market-based approach to controlling pollution by providing economic incentives for reducing the emissions of pollutants.

**Environmental Enterprise:** An environmental enterprise is an environmentally friendly/compatible business. Specifically, an environmental enterprise is a business that produces value in the same manner which an ecosystem does, neither producing waste nor consuming unsustainable resources. In addition, an environmental enterprise rather finds alternative ways to produce one's products instead of taking advantage of animals for the sake of human profits. To be closer to being an environmentally friendly company, some environmental enterprises invest their money to develop or improve their technologies which are also environmentally friendly. In addition, environmental enterprises usually try to reduce global warming, so some companies use environmentally friendly materials to build their stores. They also set in environmentally friendly place regulations. All these efforts of the environmental enterprises can bring positive effects both for nature and people. The concept is rooted in the well-enumerated theories of natural capital, the eco-economy, and cradle-to-cradle design. Examples of environmental enterprises would be Seventh Generation, Inc., and Whole Foods.

**Green Economy:** A green economy is an economy that aims at reducing environmental risks and ecological scarcities and that aims for sustainable development without degrading the environment. It is closely related to ecological economics but has a more politically applied focus. The 2011 UNEP Green Economy Report argues "that to be green, and an economy must be not only efficient but also fair. Fairness implies recognizing global and country-level equity dimensions, particularly in assuring a Just Transition to an economy that is low-carbon, resource-efficient, and socially inclusive."

**Green Politics:** Green politics, or ecopolitics, is a political ideology that aims to foster an ecologically sustainable society often, but not always, rooted in environmentalism, nonviolence, social justice, and grassroots democracy. It began taking shape in the western world in the 1970s; since then, Green parties have developed and established themselves in many countries around the globe and have achieved some electoral success.

**Low-Carbon Economy:** A low-carbon economy (LCE) or decarbonized economy is based on low-carbon power sources with minimal greenhouse gas (GHG) emissions into the atmosphere, specifically carbon dioxide. GHG emissions due to anthropogenic (human) activity are the dominant cause of observed climate change since the mid-20th century. Continued emission of greenhouse gases may cause long-lasting changes worldwide, increasing the likelihood of severe, pervasive, and irreversible effects for people and ecosystems.


**Natural Resource Economics:** Natural resource economics deals with the supply, demand, and allocation of the Earth's natural resources. One main objective of natural resource economics is to understand better the role of natural resources in the economy to develop more sustainable methods of managing those resources to ensure their future generations. Resource economists study interactions between economic and natural systems intending to develop a sustainable and efficient economy.

**Sustainable Development:** Sustainable development is an organizing principle for meeting human development goals while simultaneously sustaining the ability of natural systems to provide the natural resources and ecosystem services on which the economy and society depend. The desired result is a state of society where living conditions and resources are used to continue to meet human needs without undermining the integrity and stability of the natural system. Sustainable development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability goals, such as the current UN-level Sustainable Development Goals, address the global challenges, including poverty, inequality, climate change, environmental degradation, peace, and justice.

# Chapter 18

## Impacts of Pollutants in Different Sectors of the Economy on Healthcare Expenditures

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### ABSTRACT

*This study aims to assess the effects of environmental pollutants (air pollutants) in various sectors on healthcare expenditures in Iran. The data are analyzed using the panel data method using SPSS 26 software for 2000-2020 Dickey-Fuller and Fisher's unit root tests indicate co-existence between variables. The results of the Hausman test show a fixed-effects model for long-term estimation. The effectiveness of emissions of industrial pollutants (carbon dioxide, nitrogen dioxide, and sulfur dioxide) in the studied industries is equal to 0.012. Also, the share of fossil fuels in greenhouse gas emissions in different sectors is equal to 0.056 and positive, and the logarithm of research and development costs is equal to -0.12, which by increasing the research and development budget can provide solutions to reduce pollution, as well as the transfer of new technologies and innovations, has significantly reduced the destructive effects of industrial, commercial, etc. pollution.*

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## **INTRODUCTION**

The process of economic development of countries and the set of economic policies in recent decades has been such that environmental challenges have become one of the most important concerns of policymakers. Therefore, examining the role and impact of government economic policies on environmental quality can be important. All types of pollution from economic activities enter the environment and destroy plants, animals, and environmental systems. Air pollution, surface and groundwater pollution, soil pollution, increasing disease rates, human mortality, and generally reducing the quality of the environment and reducing human enjoyment of nature result from productive activities for economic growth. For this reason, examining the relationship between economic growth and environmental quality is very important for economists (Aşıcı, 2013). Today, the environment is considered one of the most important pillars of sustainable development, and the development of other economic and social sectors depends on its sustainability and proper functioning. For this reason, in recent years, and especially since the early 1990s, at the same time as the 1992 Earth Summit in Rio de Janeiro, Brazil, the international community has increasingly focused on environmental protection (Arouri et al., 2012).

And for this reason, several regional and international memoranda of understanding have been concluded to protect the environment in the international community. International environmental developments, on the one hand, and the spread of environmental degradation processes in the country, like many other countries, on the other hand, have made the issue of environmental protection more in the spotlight of policymakers and decision-makers (Sehrawat & Giri, 2018). The relationship and governing laws between economic development and environmental degradation are important and very complex issues. Environment and natural resources are the suppliers of many production institutions, and the production process, in addition to desirable outputs (consumer goods), also brings undesirable outputs (environmental pollutants). Therefore, if there are no changes in production techniques and processes, then the loss from undesirable outputs will outweigh the benefits of desirable output (Brunekreef & Holgate, 2002). This issue is more important in the macro dimension. Air pollution imposes costs on people's lives, including reducing the health and longevity of people, reducing productivity, increasing health care costs, lack of full use of resources and economic facilities, increasing government spending to control pollution. From this perspective, increasing pollution is considered an obstacle in the path of economic development of countries (Bayat et al., 2019). Accordingly, it is necessary to identify the factors affecting it and adopt appropriate policies to reduce this phenomenon (Bloch et al., 2012). In most experimental studies, the Kuznets environmental curve has been used to identify the factors affecting environmental pollution in which the emission of pollution is assumed to be a function of income or per capita production (Cristea et al., 2013). The question now is which part of the Kuznets curve are the world's economies and whether the economic model of developing countries conforms to this theory. This study seeks to find an appropriate answer to this question (Danish & Wang, 2018). The data panel model is studied and experimentally analyzed after entering the necessary variables in the model and the effect of environmental pollution in different sectors on health care costs (health care costs) in Iran. Also, as mentioned in detail in the experimental model of variables (technology, research, development costs, and population growth), the relationship between these variables and health care costs has been discussed.

## **Background**

One of the main challenges in health is identifying the factors that determine the number of resources that the country allocates for health care. The literature (Deng & Huang, 2009; Etokakpan et al., 2020) in this field confirm the direct and significant relationship between environmental quality and community health in the long run. In other words, although environmental degradation does not pose a significant threat to public health in the short term, it poses a serious threat to public health in the long run. Countries that have inadvertently caused more damage to the environment have been fined for heavy health care costs in the long run. Finally, the environment's quality can be considered one of the determinants of health costs in the short and long term.

The definition of health from the perspective of the World Health Organization is to enjoy complete physical, mental, and social well-being and not just to have no disease or disability (Franklin et al., 2015).

According to this definition, it is considered that the issue of health in society is a multidimensional category that encompasses a wide range of aspects of human life. Therefore, a country can be considered at an acceptable level of health that has an acceptable status in various aspects involved (effective) in this issue (Fazli & Abbasi, 2018).

As a result, in the comparison between countries in this field, a set of indicators should be considered, or use indicators calculated as a result of other indicators in the fields of disease and health, welfare, social indicators, etc., which will be addressed in the following (Grossman & Krueger, 1995).

On the other hand, in the economic literature, it has been proven that a country with a higher level of production and productivity will inevitably have a higher level of savings and investment, and more investment will mean more production and national income. This cycle can go on continuously. This is well evident in developed countries with high per capita incomes (Danish & Wang, 2018). On the other hand, higher per capita income means higher purchasing power (and spending) in various areas, including (purchase) of consumer goods, durable goods, welfare, recreational services, health services, environmental expenditures, cultural affairs, etc. Therefore, it is obvious that in a country with a higher national (or per capita) income, the expenditures on consumer goods, recreation, health, environmental services, etc. (compared to other countries) are higher than in a developing country. Therefore, it can be said that the relationship between economic growth and health is a direct relationship. This means that the higher the level of economic growth, the better one can expect to be in terms of health indicators. Obviously, in this case, along with economic growth in its general sense, factors such as increasing health awareness of citizens, the quality of health services, etc., for example, using the capabilities of information and communication technology and in the electronic field, in particular, are involved (Grossman & Krueger, 1996).

Based on theoretical foundations and empirical observations, the importance of health expenditure challenge in health economics is due to the relationship between health expenditure and growth, examined directly and indirectly. In the direct effect approach, if health expenditure is seen as an investment in the accumulation of human capital, then by considering human capital as the engine of economic growth, any increase in health expenditure through an improvement in human capital stock will increase revenue. Will follow. In the indirect effect approach, the increase in health expenditures leads to an increase in life expectancy and longevity and a reduction in working days, which loses the workforce and increases the supply of labor and production (Huang & Chen, 2020).

Also, because a healthier workforce has higher motivation and productivity, health expenditures can lead to increased production if it promotes health in the community. Meanwhile, some economists believe that government health spending can harm output growth because it is part of consumer spending and reduces investment opportunities. On the other hand, improving health if other conditions are stable means fewer resources will be spent on treatment in the future. Therefore, some resources that should be spent on treatment in the future can be used for other purposes (Hao et al., 2018; Jalil & Feridun, 2011). In this regard, it seems that countries are seeking to reduce environmental waste as the development process simultaneously, and in other words, they are pursuing different approaches to sustainable development. But what is common in different development approaches is the observance of environmental considerations and the reduction of various types of pollution. Because the first consequence of pollution is an increase in some diseases and endangering human health, however, this phenomenon seems to have a long-term nature. Among all types of pollution, air pollution, which has recently become one of the main problems of life in large cities, is a complex problem that requires national and even international determination to solve. Cases such as pulmonary respiratory diseases, pediatric anesthesia, decreased intellectual and worked efficiency of the community, nervous stress, and physical and mental fatigue are the effects of this type of infection on the economic and mental health of the community and reciprocally medical costs of the community. In Iran, pollution in different wards affects factors such as mortality, increased respiratory disease, suicide, the increased occupancy rate of hospital beds, other social costs, etc. has negative effects on the economy and the community's health (Kaput & Roschelle, 2013).

The relationship between economic growth and inverted U-quality is known as the Kuznets environmental curve. In the early years of economic growth, environmental degradation increases, but after reaching a certain level of growth, the environment improves. In other words, in the high stages of growth, environmental degradation decreases (Kurt, 2015).

Researchers have proposed various methods to study the relationship between economic growth and the environment. One of these methods is EKC, which examines the impact of economic growth on various aspects of environmental quality. This method is based on the U-curve of Kuznets (Li & Fang, 2011).

Researchers (Li et al., 2021) explain the relationship between economic growth and environmental pollution in an experimental study based on the Simon Kuznets curve. According to this curve, Kuznets concludes that economic growth in a developing country does not increase uniformly over time, but rather that income increases to a certain level and then enters a downward trend. By generalizing the Kuznets curve to the relationship between economic growth and environmental quality, two main points can be made: First, the environment is like a commodity. In underdeveloped and less developed economies, the demand for tangible goods is more important than the demand for the environment. When an economy develops and reaches a certain level, the demand for a good quality environment increases. The second is the impact of economics and technology on the environment. As the economy grows, more natural resources are consumed, and carbon and waste production increase. But when the scale of the economy reaches a certain threshold, more technologically advanced sectors replace the consumption resources of the industrial sector. In this situation, the emission of pollution and waste is reduced, and in parallel, policies to protect environmental health and the use of appropriate technologies improve the environmental situation. When a country specializes in producing one or more goods due to the special conditions of trade and the international division of labor, it can export the said goods and exchange them for goods that other countries produce at lower costs and with better quality. In this case, the country with a relative advantage in producing that product will increase its national income. Researchers have shown that



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unbalanced economic growth and various factors such as trade liberalization and environmental policies create curves like the Kuznets curve (Meadows & Randers, 2012).

Based on theoretical foundations and empirical observations, the importance of health expenditure challenge in health economics is due to the relationship between health expenditure and growth, examined directly and indirectly. In the direct effect approach, if health expenditure is seen as an investment in the accumulation of human capital, then by considering human capital as the engine of economic growth, any increase in health expenditure through an improvement in human capital stock will increase revenue. In the indirect effect approach, an increase in health expenditures leads to an increase in life expectancy, longevity, and a reduction in working days that the workforce loses due to illness or that of its relatives, and will increase labor supply and production. Also, because a healthier workforce has higher motivation and productivity, health expenditures can lead to increased production if it promotes health in the community. Meanwhile, some economists believe that government health spending can harm output growth because it is part of consumer spending and reduces investment opportunities. On the other hand, improving health if other conditions are stable means fewer resources will be spent on treatment in the future (Olulu et al., 2014; Pelletier et al., 2014).

Therefore, some resources that should be spent on medical expenses in the future can be used for other purposes (Ricci, 2007).

In a study, authors (Tamazian & Rao, 2010) examined the relationship between air pollution and heart disease and the costs to patients. They found that air pollution impacts cardiovascular disease and the spread of acute heart disease and has high costs for these individuals and the community. Accordingly, people with known or suspected cardiovascular disease, including the elderly, diabetics, pregnant women, and lung disease, are advised to exercise their leisure activities outdoors when air pollution is high. In the long run, this will harm economic growth and reduce society's efficient workforce (Solaymani, 2021).

In a study, researchers examined data from 213 countries, including low-, middle- and high-income countries, between 1970 and 2008. The results indicate a positive relationship between per capita income and per capita pressure on nature, and this effect is more pronounced in middle-income countries than in low-income and high-income countries. Also, the use of various institutional and structural auxiliary variables showed the existence of this positive effect. The researchers recognized the negative impact of increased trade on the environment and confirmed the instability of economic growth, especially in middle-income countries (Tamazian & Rao, 2010). A study examined the effects of air pollutant abuse on health. They found that exposure to air pollutants increased mortality and hospitalization due to cardiovascular and respiratory diseases (Zhang & Meihan, 2020). In another study, due to high consumption and growing demand for coal in China, short-term and long-term relationships between coal consumption and national income were examined in a two-way supply-demand pattern to find economic effects and air pollution (Zhang et al, 2017). For this purpose, they used econometric models for vector error correction and collective. The results show a direct two-way relationship between coal consumption, carbon dioxide emissions, and pollution emissions in the short and long term. It was also concluded that there is an indirect relationship between coal consumption and GDP on the supply side, while on the demand side, the opposite is true (Zafar et al., 2019; Liu & Ao, 2021).

A study investigated the impact of economic growth and energy consumption on environmental pollution using the ARDL method in China from 1995-2011. The results indicate that China's negative financial development rate does not increase carbon dioxide emissions and reduce pollution. Also, in the long run, carbon dioxide emissions are mainly explained by national income, energy consumption, and trade liberalization (Yazdi et al., 2014).

In their study of 24 economies in transition, researchers examine that it can be detrimental to the environment if financial liberalization is not placed in a strong institutional framework. Also, according to the study results, the EKC hypothesis is valid for the target countries (Coccia, 2021).

Using the panel data method, a study investigated the impact of air pollution (as an indicator of environmental quality) on health economics in the group of selected middle-income countries and countries with the highest air pollution. Estimating the models using the fixed effects method in the group of selected countries in 2000-2016 shows that air pollution has a positive and significant effect on health in developing countries (Blázquez-Fernández et al., 2019).

A novel study using Johansson and Joselius co-integration method 1995-2014 or considering carbon dioxide emissions and arable land for environmental quality, concluded that in addition to the long-term balance between exports and Environmental quality indicators, export variables and foreign direct investment have a significant negative impact on environmental quality indicators (Zhang et al., 2020).

The relationship between energy consumption, economic growth, and carbon dioxide emissions as a measure of environmental pollution worldwide is studied. For this purpose, they used time-series data for 1990-2015 and used the error correction model. This study indicates a positive relationship between independent variables such as energy consumption, economic growth, trade liberalization, population, and carbon dioxide emissions (Kubatko & Kubatko, 2019). An article examined the causal relationship between variables using the Toda and Yamato methods. They result from three one-way causal relationships: carbon dioxide emissions to per capita income, carbon dioxide emissions to per capita energy consumption, and per capita energy consumption to water pollution (Apergis et al., 2020)

A study examined the Granger causality relationship between energy consumption, national income, and carbon dioxide emissions by adding labor and capital variables. Their results indicate a one-way causal relationship between national income, energy consumption, and carbon dioxide emissions, but the causality between national income and carbon dioxide emissions is not confirmed (Zhang et al., 2018).

## **METHODS AND MATERIALS**

In this study, to investigate the factors affecting air pollution caused by major sectors of the Iranian economy (industry, trade and household, agriculture, and transportation) as an indicator of pollution on health care costs and to understand the importance of each factor of the proposed model using the following (Kurt, 2015; Tamazian & Rao, 2010).

$$LHS_{it} = \beta_0 + \beta_1 LFG + \beta_2 LFU + \beta_3 LIT + \beta_4 LR \& D + \beta_5 LNP + \varepsilon_{it} \quad (1)$$

LFG: The logarithm of emissions of carbon dioxide, nitrogen dioxide, and sulfur dioxide for the domestic and commercial sectors, industry, transportation (road, air, sea, rail), and agriculture in million USD.

LFU: Logarithm of the share of fossil fuels in greenhouse gas emissions in different sectors in million USD.

LIT: Technology Index Logarithm.

LR&D: R&D logarithm.

LNP: Statistics of the population employed in various industry sectors, trade and housing, agriculture, and transportation.

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LHS: The country's healthcare expenditures are considered as a dependent variable. This index includes the share of total health care costs in the country's GDP (daily bed costs, primary health care costs, pharmaceutical costs, respiratory and asthma referral costs, and other costs).

The model is then estimated using the data panel technique and SPSS 26 software.

To calculate the technological capacity, Arco and Coco assume that all four factors play the same role in building capacity based on the same weight of each index and (Arco) the technology of each country.

$$IT = \sum_{i=1}^n \lambda_i I_i \quad (2)$$

The total technology index, which " $I_i$ " represents the four factors of technology capacity for each country, and " $\lambda_i$ " is a constant coefficient whose value is 1.4. The same steps have calculated the index of each group, and a total of eight basic sub-indices have been considered to calculate each dimension of the capacity index. Two indicators of patents and scientific articles to calculate the amount of Arco technological capacity to create technology in each country, two indicators of Internet penetration and use and the amount of electricity used to calculate the amount of technology infrastructure in each country, three indicators of engineering skills registration, average school years and Literacy rates have been used to calculate the amount of progress in the development of human skills and ultimately only the index of foreign direct investment inflows as a share of each country's GDP to calculate technology imports (Jalil & Feridun, 2011).

## RESULTS AND DISCUSSION

The F-Limer test is often used to choose between the fixed effects pooling model. The structure of the hypothesis of this test is:

$$\begin{cases} H_0 = y - \text{intercept parameters of the origin are equal in all sections} \\ H_1 = y - \text{intercept parameters from the source are not equal in all locations} \end{cases} \quad (3)$$

The test statistics using the sum of bound square residuals (RRSS) obtained from the OLS hybrid model estimate and the sum of unconditioned residual squares (URSS) derived from the intragroup regression estimation is presented below.

$$F_U = \frac{\frac{R-U}{N-1}}{-U} \sim F_{N-1, N(T-1)-K} \quad (4)$$

In test F, hypothesis  $H_0$ , that the width of the sources is the same (Polling method) is accepted against hypothesis  $H_1$ , opposite to the panel data method.

The statistic of this test, which is calculated to determine whether the cross-sectional differences are constant or random, has a chi-square distribution with a degree of freedom equal to the number of independent variables (k).

$$W = \chi^2 = [b - \bar{b}] \tag{5}$$

$$cVar [b - \bar{b}] = var [b] - var [b - \bar{b}] \tag{6}$$

The zero of the Hausman test is the equality of the estimators of both the generalized least squares method and the virtual variable. Thus we have:

$$\begin{cases} H0 = \bar{b} = b \\ H1 = \bar{b} \neq b \end{cases} \tag{7}$$

If the calculated test statistic is larger than the  $\chi_k^2$  table, the hypothesis  $H_0$  is rejected, so the equivalence of the estimates of this method is rejected, and it is recommended to use the random method for receiving in cross-sectional units (Danish & Wang 2018). The unit root test results for the surface values and the first interval of the variables are given in Table (1).

*Table 1. The results of the aggregate test and the study of the significance of the variables*

Parameter	PF-Fisher		ADF-Fisher	
	Prob.	Stat.	Prob.	Stat.
L(FU)	0.033	25.33	0.001	23.13
L(FG)	0.024	32.10	0.011	17.12
L(HS)	0.000	32.88	0.024	27.14
dL(IT)	0.000	49.36	0.000	49.33
L(NP)	0.000	18.35	0.053	12.44
L(R&D)	0.014	18.35	0.053	12.54

According to the results of the above tables, the evidence from the Dickey-Fuller and Phillips-Prone tests mainly indicate that the null hypothesis of the existence of a single root in the current values of the variables is confirmed. Therefore, the null hypothesis that there is a single root is rejected. As a result, the stability of the data used in this paper is confirmed before estimating the model.

The results of the Chow test (Table 2) show that the p-value is less than 0.05. Thus, hypothesis H0 is rejected, so it can be concluded that individual heterogeneity (invisible individual effects) should be estimated from the combined data method. Model used. As a result, the Hausman test is performed to determine the use of the fixed-effect model versus the random effect model in the next step.

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Table 2. Chao test results

Effect test	Stat.	Freedom degree	P-value	Result
F-test	41.46	4&12	0.000	Hybrid
$\chi_k^2$ - test	32.12	4	0.000	

According to the estimated panel-data model findings, the Hausman test confirms the existence of a fixed-effects model; Because the value of the test statistic is larger than the table statistic, the reason for rejecting the null hypothesis is that there is a random model.

Table 3. Hausmann test results

Test summary	Stat.	Freedom degree	P-value
Cross-section random	42.11	4	0.000

In the following, according to the fixed effects model in the previous step, the estimation of the long-term model is given in Table (4).

Table 4. Results of the model of the fixed effects of health care expenditures

Parameter	t-stat.	Coefficient	P-Value
C	2.05	2.33	0.000
L(FU)	3.04	0.02	0.000
L(FG)	5.66	0.06	0.000
L(R&D)	- 4.69	- 0.13	0.044
L(IT)	- 5.23	-0.96	0.000
I(NP)	6.41	0.02	0.000
R <sup>2</sup> Std.=0.88 D-W=2.05 F-stat(Prob.)=12.11 (0.000)			
Sector		Coefficient	
Industry		0.39	
Residential and commercial		0.18	
Agricultural		0.23	
Transportation		0.25	

The results obtained from the fixed effects model (Table 4) show that the value of the F statistic is equal to 12.01, so with a 95% confidence interval, we can say that the assumption of zero coefficient of all variables is rejected and the model is significant. The corrected coefficient of determination of the

model is 0.83, i.e., 83% of the dependent variable is explained by independent variables (the model has a high explanatory power). According to the results obtained from the model estimation, the values of the coefficients of the explanatory variables are as follows(aligned with (Jalil & Feridun, 2011; Yazdi et al., 2014)) .

The logarithm coefficient of carbon dioxide, nitrogen dioxide, and sulfur dioxide emissions for commercial and domestic sectors, industry, transportation (road, air, sea, and rail), and agriculture is equal to 0.012 and is significant at a 95% confidence level. The logarithm of the share of fossil fuels in greenhouse gas emissions in different sectors is equal to 0.056 and is significant at the error level of 0.05. And for one percent change in the explanatory variable, 0.056 percent changes the share of the dependent variable(Coccia, 2021).

Research and development costs are equal to -0.12 and are significant at the 5% error level and increase health expenditures by 0.12% for one percent change in the explanatory variable. The logarithm of the population of employees in different sectors is equal to 0.015 and is significant at the error level of 0.10. And for one unit of change in the variable of different employees, it increases health expenses by 0.015%(Li et al., 2021). Of course, the impact of the population in different sectors is very small, and this is because with the increase in the number of employees, the use of fuels and energy that emit pollution has increased, and on the other hand, the number of educated people in, In the long run, it reduces pollution and ultimately this variable has a very small but positive effect on health expenditures. The logarithm of the technology index is -0.95 and is significant at the 5% error level(Deng & Huang, 2009).

And for one percent change in the explanatory variable, 0.95 percent increases the cost of health care. Increasing and using modern and new technologies that reduce pollution has a positive and significant effect on health care costs. In this study, the index of technology used as a pollution-reducing variable has been identified, which means that upgrading the level of technology leads to improved environmental quality. Technology affects the rate of pollution in two ways. First, with the improvement of technology and the use of new technologies, production functions will have less need for environmental goods, or as a complementary product, less pollution will be produced, which means producing goods with less environmental degradation. Second, with the improvement of technology, pollution reduction can also occur in industries and cause these industries to operate more efficiently and act with fewer costs to eliminate pollution, which results from both effects of technology improvement, reducing the intensity of pollution(Danish & Wang, 2018).

This study shows that pollution in the industrial sector, the main cause of industrial pollution, had the greatest impact on the variable of health care expenditures. The impact factor of this section is 39%. This is due to the existence of large industries and the lack of modern and up-to-date technology. Also, the transportation sectors are in the second row, which is equal to 25%(Franklin et al. 2015; Pelletier et al., 2014).

## **CONCLUSION**

The results of this study indicate that with the increase of industries (investment volume), the amount of pollution has also increased. This means that the Kuznets environmental hypothesis is true for the Iranian economy. The results show that environmental quality is still an essential commodity due to its low level of income. In other words, the Iranian economy is more concerned with increasing revenue and industrial growth than environmental pollution and its negative effects.

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According to the results of this study, it can be said that Iran's economy is in the first stage of the Kuznets curve. In the first stage of economic growth, environmental degradation is high, and in this stage, the bad and harmful effects of environmental factors have negative effects on GDP. Until this issue reaches its peak and then in the high stages of growth, quality The environment is improving, and this in itself has a positive effect on GDP and the added value of economic sectors and health spending. Also, the severity of the spread of pollution can be influenced by political actions, i.e., environmental laws and requirements imposed by governments. At low levels of economic activity, anti-pollution laws are almost ineffective and have little effect on reducing pollution, as we need to set up a regulatory system to reduce pollution. At low-income levels, the tendency to pay for pollution reduction is less than the set amount. In this case, setting up a legal system to reduce pollution is of no value, and in the absence of such a system, pollution will certainly increase with economic growth. However, at high-income levels and after the economy reaches an income threshold, the intensity of pollution is reduced, and in the phase of reducing pollution, anti-pollution policies have been implemented or intensified. Therefore, it is expected that along with economic growth and increased revenues, the intensity of pollution emissions due to the enactment and implementation of environmental laws will decrease.

One of the most important areas for realizing this is to pay attention to information and communication technology infrastructure and its various applications. Because it causes economic growth to be associated with less environmental degradation, and in this regard, the level of health of communities (negatively) is less affected. At the same time, information and communication technology in topics such as e-health can significantly impact public health. This argument also applies to Iran and can be the basis of policy-making.

On the other hand, research and development should provide the basis for replacing clean and environmentally friendly technologies with destructive and polluting technologies at the lowest cost and manage the flow of investment in such a way as to increase its environmental efficiency. Energy consumption should be managed so that the consumption of a certain level of the highest environmental efficiency. This is especially important in countries with energy-dependent economies. In a way, there should be more coordination between energy supply and economic growth. In general, developing countries should pursue a dual policy to increase the environmental efficiency of energy and control pollution caused by energy consumption. First, in the energy supply sector, by investing in infrastructure, they can provide the environmental efficiency of the supplied energy. Also, in energy demand, they should adopt energy-saving policies and use new methods and methods to prevent unnecessary energy consumption and waste as much as possible. The initiative seems to be an effective way to reduce pollution emissions by reducing and controlling demand and maintaining energy reserves in these countries.

Over time, various projects have been implemented to improve the quality of the environment and reduce pollution in Iran, especially in metropolitan areas. A strong institutional structure for various policies and programs will lead to the successful implementation of these projects. Policymakers, academia, industry owners, and representatives of non-governmental organizations are needed to increase cooperation and collaboration through specialized workshops and conferences. This is necessary for the population awareness and active participation of individuals to adopt pollution control policies. Also, given that economic growth causes pollution and on the other hand, reducing growth is not logical. Therefore, emission reduction policies should consider investment's initial cost and efficiency while encouraging economic growth and development.

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## Chapter 19

# Relationship Between Governance Quality and Public Health in Light of COVID-19 Pandemic Control: A Case Study for Southwest Asian Countries

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### **ABSTRACT**

*The World Bank defines good governance based on six indicators: accountability, political stability, government efficiency, quality of law and regulation, the rule of law, and corruption control. On the other hand, the ultimate goal is the development of human health and well-being. Given the importance of health in society, government investment in this area is recognized as one of the government's main tasks, and the lack or inadequacy in providing health services in any country is considered one of the weaknesses of governments. Therefore, examining the quality of governments in the health sector is of particular importance. This study also examines the effects of good governance on managing the severity of the COVID-19 crisis, considering the importance of public health, especially in control of the COVID-19 pandemic, using the new 2021 public health definition index. This study examines data from Southwest Asian countries from 2003 to 2021.*

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## **INTRODUCTION**

Given that the model of government, at the very least, has been accompanied by a sharp increase in financial crises that have imposed heavy costs on the economies of developing countries and the global economy, inequality between countries increased during the 1980s and 1990s and is implemented in most Eastern European and former Soviet countries. This policy model has led to a sharp increase in poverty, inequality, and inflation, so that these consequences have led to a shift away from the model of minimal government and the acceptance of the model of good governance (Lomazzi, 2014). As this model considers the development strategy as neither a big government nor a minimal government, a good government, in other words, more or less government intervention does not solve the development problem, but the quality of the government is the main issue in the best possible way. Realize the process of development and comfort for the community. In addition to economics, the model of good governance has also considered other areas of society. The point of this theory is not the quantity of government intervention but the quality of the intervention, which at the same time play a moderating role with the other two pillars of society, the market and civil society (Makuta, 2015; O'Hare, 2015).

Now, considering that one of the most important factors in the difference between the social and institutional structures of countries with each other is the government and the market, which should act as two complementary institutions in the economy, the government as an institution-building social institution should be Creating efficient and capable institutions will provide a suitable environment for regulating the economic relations of the people of the society in a costly, simple and time-wasting way, and through this, as a market helper, will provide the conditions for economic growth. Successful procurement of these institutions is often referred to as good governance (Novignon, 2012). Good governance involves the creation, protection, and enforcement of property rights without restricting market exchanges, so that good governance, involving the cooperation and coordination of government, the private sector, and civil society, enables all pillars to work together to strengthen each other. Finally, to help make government more efficient and improve economic and social performance. This model has been proposed as indicators of good governance that have eliminated the shortcomings of previous governments (Wagstaff, 2004). Also, inadequate criteria of per capita income and economic growth. Determining the welfare of citizens caused some economists to pay attention to indicators that, in addition to economic variables, also include social and human variables (Davoodi, 2000; Anyanwu, 2009; Grigoli, 2018).

## **Background**

The World Bank and the International Monetary Fund (IMF) have, since the early to mid-1980s, encouraged governments in developing countries to adopt major policy and policy reforms as conditions for lending (Evans, 2001). This new approach, called structural adjustment policy, was the consensus of policymakers in Washington (such as the World Bank, the International Monetary Fund, the US Treasury, and the Federal Reserve), which is why Williamson called it the Washington Consensus in the mid-1990s (Jayasuriya, 2003). Modification policies were widely criticized by institutional economists, led by Joseph Stiglitz (Herrera, 2005). He expressed his critical views in the context of the post-Washington consensus policies of 1998. In the post-Washington consensus, government and the market are two complementary institutions, not two (Moore, 1999). Rival, therefore, instead of discussing government intervention or non-intervention, we should talk about the efficiency and effectiveness of government intervention (Summers, 1996).

As a social institution that builds institutions, the government must provide efficient and capable institutions, a suitable environment for regulating the economic relations of society in a costly (Filmer, 1999), simple, and time-wasting way, and thus, as a market helper, provide economic growth. Successful provision of these institutions is often referred to as good governance (Bokhari, 2007; O'Hare, 2013). Although the concept of governance has been widely discussed among politicians and schools, there is no strong consensus on a unique definition of governance or institutional quality. The World Bank defines governance as the traditions and institutions by which power is exercised in the public interest in a country and consists of the following three components (Norouzi, 2020): (1) The process by which those in power are elected, supervised, and replaced; (2) The capacity of the government to manage resources and implement sound policies effectively; and (3) Respect the citizens and the government for the institutions that manage their social and economic interactions. The indicators are: 1- the right to comment and accountability, 2- political stability, 3- the effectiveness of the government, 4- the quality of laws and regulations 5- the rule of law and 6- the control of corruption; Each component includes two governance indicators (Norouzi, 2021; Minsat, 2015):

- A. The process by which those in power are elected, supervised, and replaced, which includes two indicators of the right to comment and accountability and an indicator of political stability and non-violence/terrorism (Musgrove, 1996):
  - A1. Voice and accountability (VA): The degree of participation of the country's citizens in the election of governments and freedom of expression, freedom of cooperation, and free media (Anyanwu, 2009; Gupta, 2002).
  - A2. Political stability (no violence) (PV): The likelihood that the government will be destabilized and opposed by unconstitutional and legitimate means, including political motives for violence and terrorism (Akinkugbe, 2006).
- B. The capacity and ability of the government to effectively manage resources and implement sound policies, which includes two indicators of government effectiveness and quality of regulation (Gupta, 2002).
  - B1. Government effectiveness (GE): The quality of public services, the quality of civil services and its degree of independence from political pressures, policy formulation and implementation, and the validity of the government's commitment to these policies (Akinkugbe, 2006).
  - B2. Regulatory quality (RQ): The ability of the government to formulate policies that allow for the promotion and development of the private sector (Bayati, 2013).
- C. Respect of citizens and the government for the institutions that govern social and economic interactions between them. It includes two indicators of the rule of law and the control of corruption.
  - C1. Rule of law: Agents' trust in the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
  - C2. Control of corruption: The extent to which public power is used to pursue private interests includes large and small forms of corruption (Lin, 2014).

## **Mechanism of the Impact of Governance Quality Indicators on the Health Sector**

One of the most important indicators for measuring development is the Human Development Index, which was introduced as a measure of national development and well-being in 1990 by Amartya Sen and Mahboub-ul-Haq, Pakistani economists, as a tool of development (Kaufmann, 2000). Education and health are two important components of this index. Health is a capability that values human life. Promoting health causes human capital to increase through the accumulation of health capital and directly on. On the other hand, improving health by increasing life expectancy and reducing the number of working days that the workforce achieves due to improved technology indirectly increases labor productivity indirectly affects production. Life expectancy, as a result of the increased tendency to save among the people, increases investment and economic growth, and given the importance of the health sector in promoting the human development index and, consequently, increasing social welfare, the cold government is recognized in this sector as one of the main tasks of the government. On the other hand, due to the failure of the private sector in the production and provision of public goods and services, especially the health sector, government intervention is necessary in which a good governance model can play a constructive role in promoting health sector indicators(Lin, 2014).

## **Good Governance and COVID-19**

Now that countries worldwide are infected with the Covid-19; Many challenges have arisen in various fields of economic, political, social, health, and so on. As of 4th May 2020, more than 3.5 million people worldwide have been infected with the virus, according to the World Health Organization. However, the incidence is still increasing. Also, the lack of definitive specific treatment has caused the death of more than 240,000 people during this period. On the other hand, for economic and social reasons, people in society need to interact with each other; This makes it harder to control the disease. Infectious diseases and quarantine cause widespread destruction in people's lives due to limited employment(Halleröd, 2013). Therefore, given the current situation, society needs good governance.

Good governance requires the creation of public value. Public value is created in many ways; But the main area of support is public service organizations, where there is the most direct interaction between public service stakeholders, citizens, and local communities, and one of the most important services at this time is the provision of educational, health and social care services during the Covid 19 crisis. The United Nations has provided various indicators for good governance; These include participation, equality, transparency, accountability, the rule of law, consensualism, effectiveness and efficiency, strategic insight, and flexibility (Dehn, 2002). The government needs coordination, classification, and cooperation to contain the crisis in this situation. In the coordination department, the medical team needs to integrate with other resources. In the discussion of classification, it requires risk assessment in different provinces and sectors, and in the discussion of cooperation, it requires the cooperation of government, social organizations, and individuals to defeat the covid-19 virus (Norouzi, 2020).

Only with national leadership can any society be equipped with behavioral health resources. The government can help the vulnerable these days by giving confidence to the vulnerable to meet the family's basic needs, just as free loans can be helpful. Also, efficient and effective mobilization of the people can meet part of the needs of low-income people because social distance has caused many families to lose their source of income(Lewis, 2006). On the other hand, it is very important to pay attention to people's

mental health, in which the use of online counseling services and psychological interventions for patients and family members can also be fruitful. Because performing medical interventions independently and without communication with other organizations paralyzes the health care system; Therefore, timely diagnosis of the disease, cooperation of other organizations with the health care system, and the use of psychologists and social emergencies increase the effectiveness(Rajkumar, 2008). Also, psychiatrists these days, with their support through media and social networks, can help in family's well-being;e awareness is very important to deal with stress. Things like activity planning, sports, social communication, relaxation techniques, encouraging health-promoting behaviors, and publishing credible information news are very effective; Because incorrect information causes panic in society(Ugur, 2011).

On the other hand, the closure of schools and universities affects students' mental health during the quarantine period. Research has shown that students living in rural areas without a steady income and students who have been infected with the virus have a higher level of anxiety. Students living in urban areas have less anxiety than in rural areas; Because the urban economy has a more prosperous life and more financial security for citizens. On the other hand, more education is available for prevention in cities, so it is necessary to create a solution(Lewis, 2006). On the other hand, people with underlying diseases such as diabetics and the elderly are more prone to infection, and the results of the research indicate the failure of current coping strategies in diabetic patients; Therefore, managing these patients and preventing them from becoming infected with Covid 19 virus is very valuable. Because anxiety also causes their blood sugar to rise(McWilliams, 2007). With screenings of people with diabetes, the Department of Health can identify people who are most at risk for diabetes and take steps to prevent them, including health and proper nutrition, exercise instructions at home, and assessing their anxiety levels for prevention. The National Health Commission of China has acknowledged that more than 3,300 medical personnel have been infected with the virus. Therefore, access to protective equipment is critical for employees. If the safety of the medical staff is not observed, the virus will threaten their family in a fundamental way (Klomp, 2008). Therefore, appropriate solutions for the safety equipment of medical staff, support for their families, and psychological support can be an action guide. Statistics show that with the spread of the virus, people turn to the wrong treatment methods and turn to appropriate preventive measures, leading to death due to ignorance(Grossman, 1972) Researchers' modeling of the spread of the virus suggests that reducing social intervention can help prevent the spread of the virus. Appropriate solutions such as screening people traveling from cities, stopping public travel equipment outside cities, closing schools and all educational centers(Holmberg, 2011).

Therefore, the government must, in addition to exploiting good governance, use all the capacities of the public and non-governmental sectors, transparency of procedures and information, accountability to society, law enforcement for all, consensus-based on popular belief, structural pressure and social motivation and effective strategies to deal with With the outbreak of the disease with a strategic vision with flexibility in the current situation to create more public value in social distance, to overcome the crisis of the outbreak of Covid 19.

## **LITERATURE**

Some papers(Ugur, 2011) examined the effect of good governance indicators on human development, which show a positive and significant effect of these indicators on the human development index. Researchers(Grossman, 1972) studied the impact of governance indicators on its development in national



welfare and improved government spending in terms of health and health expenditures; research findings show that good governance has a significant effect on the variables. And the study of the impact of good governance on human development during the period 2005 to 2012 for the two groups of selected Islamic countries and member countries of the Organization for Economic Cooperation and Development using balanced panel data (Makuta, 2015). The results showed a positive and significant relationship between the index. There is good governance and economic freedom for OECD countries. Still, in Islamic countries, this relationship is not statistically significant, which indicates the weakness of good governance and economic freedom in these countries and its adverse effect on the human development index. Other studies, including research (O'Hare, 2015), examined the impact of economic freedom on life expectancy from 2000 to 2009. The results showed a positive and significant economic freedom index on life expectancy; Therefore, more economic freedom can increase life expectancy in selected countries. Another reference assessed socio-economic inequality in under-five mortality in Iran from 1985 to 1999. The findings showed a downward trend in under-five mortality from the lowest to the highest five, and the lowest odds ratio to The highest five in the whole country was 2.63 (confidence interval with 95% probability from 1.83 to 30.5). Besides, the inequality of mortality of children under five years between the lowest and highest five in all provinces is significant and in favor of the population. It was prosperous, yet the amount of inequality varied from province to province (Lomazzi, 2014). Methodology

This research is applied in terms of purpose and is quantitative in terms of the secondary analysis method. Secondary data analysis with the advantage of higher speed, minimum cost, and excellent sample opens up the field of research to a much wider range of researchers that they would not otherwise be able to do. This data set is a great opportunity for college students and researchers who rarely have the time or money to get the right sample, and it also means that repeated analyzes of certain data lead to more complete analyzes rather than cobra analysis. Without this type of data set, comparative analysis and longitudinal analysis will be practically impossible. This type of analysis has a high status in management and marketing today. The difference between secondary analysis and meta-analysis is that meta-analysis re-analyzes several studies, but secondary analysis re-studies one study. The secondary study does not produce any data directly, and instead, it is possible to analyze a set of primary studies. In social science research, this method can greatly help the research team (Makuta, 2015).

The required information and data are extracted from the World Bank's Global Development Indicators and the Good Governance Quality Index from the Gany and Duncan model (Wagstaff, 2004), and its data and information are extracted from the Global Governance Indicators. Also, the statistical population of this study includes 32 countries out of 52 countries in the Southwest Asia region that Bahrain and Palestine were excluded from the statistical population due to lack of data and information. The countries of the Southwest Asia region are Afghanistan, Armenia, Azerbaijan, Cyprus, Georgia, Iran, Iraq, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lebanon, Oman, Pakistan, Qatar, Saudi Arabia, Syria, Tajikistan, Turkey, Turkmenistan, UAE, Uzbekistan, Yemen.

This study is based on economic and econometric reasons and based on data availability and past studies on health status results in Southwest Asian countries. Considering that the purpose of this research was to investigate the effect of governance quality index on health sector development components for selected countries in the Southwest Asia region, the research model is from the modified model of Hovinio as follows (Evans, 2001): The most widely used components of the health sector, the measuring components of which are: neonatal mortality rate (imr), infant mortality rate under five years (cmr), life expectancy at birth (leb), the raw mortality rate (cdr) for country  $i$  at time  $t$ , these indicators of the

health sector determine the overall performance of the health system so that it is impossible to compare the results with previous studies.

X vector control of variables, which is a combination of socio-economic characteristics. Control variables included in this model: real per capita income (gdppc) to measure economic performance, assuming that a country with good governance performance is likely to spend more on public services such as health care, which can be used as a demand for services. It is expected that having a higher real per capita income will improve the health care sector's performance. Frate fertility rate, higher fertility rate emphasizes the increase in the share of children, so health costs for pregnant women and children have increased And this in itself harms health indicators. Prienrate the index of children's education. It is expected that more children's access to education will expand knowledge and breadth of knowledge in them, which is part of the function of health products and is a measure of physical infrastructure Percentage of the population with access to safe drinking water has been used as an indicator to measure physical infrastructure (denpop), which is expected to increase per capita the cost of providing services per capita as well as cost. Reduce health facilities such as transportation costs and opportunity costs, including travel time. Therefore, population density has a positive effect on health sector development indicators. Urbanization rates (urate) can also have different effects on health sector indicators depending on the situation in the country. The new indicators of epidemic severity (Esness) introduced by a study in 2020 are used to study the effects of pandemics on society (Norouzi, 2020).

Considering the various variables affecting the indicators of health sector development, to examine the effect of good governance indicators on the health sector in the four components of the health sector from the selected countries of Southwest Asia mentioned above, the Hovinio model has been used. Simple arithmetic means, six indicators of good governance introduced by the World Bank are considered as indicators of governance quality, and health sector development was calculated with it to estimate the effect of governance quality on income distribution, as mentioned earlier, based on the Gany and Duncan method.

## **RESULTS AND DISCUSSION**

Considering that four components of health sector development have been used to investigate the effect of governance quality index on these components. Now the results of the F-Limer test and Hausman test are presented.

According to the Limer F test results, it can be seen that in all models, the opposite hypothesis is accepted against the null hypothesis, i.e., the data are estimated as a panel. Also, the results of the Hausman test showed that due to the significance level below 0.05 for statistics F, the fixed effects model is accepted as opposed to the random-effects model. Given that the models are estimated as fixed effects, two tests are needed to estimate the models: 1) the parent test and 2) the serial correlation test.

Considering that in all models, the fixed effects model has been selected to estimate the models. The parent test has been used to identify the variance heterogeneity. The null hypothesis is based on variance homogeneity, and the opposite hypothesis is based on variance heterogeneity. Considering that the probability of the parent test statistic in all models is less than 0.05, the variance heterogeneity hypothesis is accepted. Valderidge test was also used to examine the autocorrelation of the models. Also, the null hypothesis is based on the lack of autocorrelation, and the opposite hypothesis is based on the existence of autocorrelation; The test results show that there is autocorrelation in all models.

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*Table 1. Results of unit root test for all three groups*

South Asian countries										
variable	Hadri test		First-order difference		Test IPS		First-order difference		Test LLC	
	Sig.	value			Sig.	value			Sig.	value
cmr	>0.001	14.12			>0.001	-15.12			>0.001	-18.9
Frate*	>0.001	10.9	>0.001	-3.98	0.44	-0.17	>0.001	-6.44	0.99	2.43
gdppc	>0.001	6.32			>0.001	49	>0.001	-2.77	>0.001	-2.55
gov	>0.001	12.7			0.07	-1.8			>0.001	-4.26
ldenpop	>0.001	9.12	>0.001	12.45	1	7.9			>0.001	-2.17
leb	>0.001	12.7			>0.001	-13.7			>0.001	-7.22
lfrate	>0.001	6.55	>0.001	4.66	0.66	0.21			0.05	-1.51
lgdppc	>0.001	7.66			>0.001	-3.56			>0.001	-5.11
limr	>0.001	14.42			0.001	3.44			>0.001	-6.44
lprienrate	>0.001	6.12			>0.001	-1.89			>0.001	-7.56
lsanf	>0.001	11.43			>0.001	-3.07			>0.001	-2.22
lup	>0.001	14.56			>0.001	-2.55			>0.001	-8.41
sanf	>0.001	11.11			>0.001	-3.4			>0.001	-10.17
up	>0.001	11.53	>0.001	-12.97	0.6	0.33			0.01	-2.11
denpop	>0.001	8.96	>0.001	4.31	0.18	-0.55			>0.001	-5.12
lleb	>0.001	12.66			>0.001	-3.8			>0.001	-9.08
lcdr	>0.001	11.17			>0.001	-11.9			>0.001	-5.12
lcmr	>0.001	10.12	0.001	-2.73	0.38	-0.17			>0.001	-7.99
lcdr	>0.001	10.12			>0.001	-7.12			>0.001	
esness	>0.001	19.31			>0.001	-17.43			>0.001	-15.72

*Table 2. Homogeneity and Hausman test results*

	Model 4		Model 3		Model 2		Model 1	
	Sig.	value	Sig.	value	Sig.	value	Sig.	value
F-test	<0.001	766.91	<0.001	59.94	<0.001	65.36	<0.001	61.99
Hasman test	<0.001	14.62	<0.001	199.64	<0.001		<0.001	1191.82

*Table 3. Parent test and serial correlation test*

	Model 4		Model 3		Model 2		Model 1	
	Sig.	value	Sig.	value	Sig.	value	Sig.	value
Parent-test	<0/001	513.58	<0.001	57.99	<0.001	4662.370	<0.001	4489.24
Valderich-test	<0/001	31.351	<0.001	377.175	<0.001	5542.037	<0.001	39.9270

### ***Relationship Between Governance Quality and Public Health in Light of COVID-19 Pandemic Control***

Considering that the four components of infant mortality rate, infant mortality rate under five years, crude mortality rate, and epidemic severity of governance quality index have a negative and significant effect on them. Asia showed that in all three models, the governance quality index had a negative and significant effect on these components; However, the effect of the governance quality index on the fourth component (severity of the epidemic studied in Covid-19) has a positive and significant effect, and the results indicate the positive and significant effect of the governance quality index on the severity of the epidemic effects; This means that if this index improves by one percent, life expectancy at birth will be 2.015 percent better. For example, the first component is the infant mortality rate. So that if one unit of this index is upgraded, the mortality rate will decrease by 0.10. The effect of the control variable on the indicators of the health sector is as follows: GDP per capita (lgdppc), which is used as a measure of economic performance, has a negative and significant effect on three components that are in line with expectations and also have a positive effect and Expectations are based on life expectancy at birth, i.e., the higher the per capita GDP, the higher the government spending on health and education, which leads to better services for citizens and better facilities for the community. Lsanf, a measure of the physical infrastructure in countries, is the criterion for the percentage of people who have easy access to safe drinking water. The results show that in the third model, the better the standard of physical infrastructure, the higher the life expectancy at birth; But in the other three models, for the second model, the criterion of physical infrastructure has a negative and insignificant effect on the mortality rate of children under five years of age; However, in the first model, this criterion has a positive and insignificant effect, and in the fourth model, it has a positive and significant effect on the mortality rate of children under five years old. The urbanization rate in the third model shows that the urbanization rate has a positive and significant effect on life expectancy at birth; in other words, with the increasing urbanization rate, which is also one of the development components, life expectancy increases. Still, in the other three models, the urbanization rate negatively affects infant mortality rate (first model), infant mortality rate under five years (second model), and raw mortality rate.

The population density variable has a positive and significant effect on life expectancy at birth. Still, in the other three models, it has a negative and insignificant effect on the mortality rate (infants, children under five years, and raw mortality rate). The education index variable (prienrate) in the third model harms life expectancy at birth. This means that the higher the enrollment rate of students due to the lack of educational facilities and low quality of teaching in these schools, although in terms of a little education index is advanced, but in terms of entering the labor market and employment and entrepreneurship production in good condition to They do not realize that this, in turn, increases the unemployment of the educated and increases the despair of the future and reduces life expectancy. Also, the education index has a positive effect on the mortality rate of infants and children under five years of age. Besides, this variable has a positive and insignificant effect on the raw mortality rate, which is also due to inappropriate government policies, little attention to prevention. Diseases in infancy, families' neglect of the use of public education in the field of public health, etc., have caused this index to have a positive effect on the mortality rate of infants and children under five years. Fertility rate (frate) Although due to health sector costs, the higher the rate harms health sector indicators, which the results of the model estimate also indicates that the higher the rate of mortality of infants, children under five years and rates Crude mortality is also rising, which is to be expected, and the higher the rate, the lower the life expectancy at birth due to the decline in the per capita government spending on health.

## **DISCUSSION**

The shock to the world, the earthquake on human civilization, and the creation of a strange and unfamiliar situation have resulted from the emergence of the covid-19. One of the most exceptional crises in human history has spread rapidly around the globe due to globalization. In a very short time, the world witnessed great changes. Of course, we are now in the midst of the turmoil of this rebellious wave, and naturally, more accurate and in-depth analyzes of the Covid-19 event will be possible after the turmoil and excitement of the world subside. However, so far, it can be said that the covid-19 is a silent killer, and at the same time, it is agile. He acts smart for his survival. Covid-19 has shown that it is one step ahead of man and surprises man. To deal with this new and unusual virus, conventional management methods do not work anywhere in the world. Although the health care system and the medical staff are doing well in the countries surveyed, the policies and management of this sector have been weak and slow. Inconsistencies between devices, changes in decisions, inaction, criticism of some experts and specialized organizations, and inaccurate forecasts and statistics are examples of some of the weaknesses in curbing covid-19 in these countries. In the context and time of covid-19, the main and most important need of the people is to minimize the damage caused by this virus and protect the health of society and the authorities' responsibility towards it. According to scientific findings, the most vital action to combat this virus is to break the transmission cycle from person to person, i.e., to create conditions that prevent the increase of human hosts. The most effective way to achieve this goal is to deal aggressively and severely with the virus. Most countries that have succeeded in controlling the covid-19 have adopted the same strategy. Even countries such as the United Kingdom, Switzerland, and Germany, which took a lenient approach to the covid-19, were forced to change their minds under pressure from public opinion and criticism from neutral experts. This is even though most expert teams based in the surveyed governments do not agree with this approach.

Some responsible, active, and aggressive measures to maximize covid-19 protection include closing all government offices and public organizations for at least a month and encouraging telecommuting, urban (and possibly rural) quarantine, and curfews. Home except for urgent work, closure of public transportation, prohibition of gathering more than two people outside the place of residence only with family members, considering fines for violators, these rules separating infected from healthy people and to prevent them from mixing, test people with suspected covid-19tion extensively so that a covid-19 test is taken from any volunteer or suspect. The dangerous feature of the covid-19 is that the virus can be transmitted even from people without symptoms or mild symptoms. In such global pandemics and diseases, the time and place of action are crucial (for example, the United States did not take the covid-19 seriously at first, and its late actions made it now the world's number one sufferer, unlike Austria, which made timely decisions. Covid-19 has now taken control of the disease). The inability to make difficult decisions and choose the easiest ways does not necessarily lead to the best results. At the same time, it is necessary to provide financial and economic support to high-risk households, which will be suggested in the section on the fairness index.

## **CONCLUSION**

According to the results of the panel data estimates, it can be said that the governance quality index as a measure of good governance indicators has a significant effect on the outputs of the covid-19 health

sector; in other words, they have helped to improve the status of these indicators, and It has reduced the mortality rate during the pandemic, which is consistent with the findings of the authorities. Also, the variable of GDP per capita, which is considered an indicator for per capita income, significantly affects health sector indicators. The higher the income level, the lower the level of poverty in society and the higher the educational and health standards. In other words, there is a higher life expectancy in them. Also, the unfavorable conditions of the region in terms of adult education and its impact on health and treatment can be referred to as the serious efforts of educational institutions in eliminating illiteracy from these communities. Also, considering that the growth of urbanization in developing countries is inevitable, considering its positive impact on the indicators of this sector, the positive dimensions of this variable should not be ignored, i.e., with proper planning to control and guide the migrant population from rural to Cities and marginalized concerns, which is a negative aspect of this issue, can help improve the indicators of this sector.

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## Chapter 20

# Green Human Resources and Its Implications on Green Organizational Social Responsibility and Organizational Green Image

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### ABSTRACT

*This chapter aims to analyze the implications between the green human resources and green organizational social responsibility and organizational green image. It is assumed that green organizational image is determinant of organizational social responsibility and in turn on green competitive advantage based on the green human resources management. The method employed is the analytical and reflective sustaining on a review of theoretical and empirical literature. It is concluded that the environmental green human resources management is a critical factor of organizations to achieve broader objectives in green organizational social responsibility practices, relevant to building green image, improving green brand reputation and stakeholder's engagement, which determine a positive impact in growth, enhancing green competitiveness.*

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## **INTRODUCTION**

The green human resources movement is in its growing awareness and significance within organizations to embrace environment practices focusing on producing green goods and services, recycling, waste management and reduction of carbon footprint.

Research on green human resources is concerned with corporate social responsibility related to sustainability reporting and sustainable development decision making in the economic and social effects. There are several theoretical and managerial implications in the context of the interrelated concepts, environmental organizational social responsibility, green organizational image, and green competitive advantage concerning the safeguard environment. Organizations take efforts to create positive green images (Hillestad *et al.*, 2010; Widyastuti, Arif and Yunizar, 2017). Green organizational image is sustainable development to conduct operations without disturbing the needs of future generations (Bathmanathan and Hironaka 2016).

Green initiatives are delivered through organizational social responsibility to entice buyers (Cordeiro and Tewari, 2015; Liu & Lin, 2020). Empirical studies testing theoretical models that incorporate the interrelationships between the variables of the construct formed by the organizational green culture, organizational social responsibility, and healthy food safety shades lights on potential interactions between employees and customers.

Building organizational image is instrumental to organizations, enhance green competitive advantage and attains sustainable competitiveness. Determinants of green organizational image and competitive advantage attain competitiveness. Environmental green human resources management is a critical factor of organizations to achieve broader objectives in green organizational social responsibility practices, relevant to building green image, improving green brand reputation and stakeholder's engagement which determine a positive impact in growth, enhancing green competitiveness.

This study begins with an analysis of the green human resources as the basis to analyze the environmental social responsibility, green image, and green competitive advantage and finally some concluding remarks are presented.

## **GREEN HUMAN RESOURCES**

Green human resource management is an interdisciplinary field drawing from organizational, strategic management, performance management and organizational performance. (Aragón-Correa & Rubio-López, 2007; Boiral, 2009, Jabbour *et al.*, 2010; Schroeder, 2012; Clemens, 2006; Jabbour *et al.*, 2015; Lañsiluoto & Jarvenpää, 2010; Marcus & Fremeth, 2009; Ambec & Lanoie, 2008) Green human resource management also benefits from the subjects of training and development, engagement, and organizational culture (Govindarajulu & Daily, 2004; Jabbour 2013b; Rothenberg, 2003; Vaccaro & Echeverri, 2010).

Green human resource management is defined by Mampra (2013) as the policies to encourage organizational environmentally sustainable use of human resources and promote environmentalism to further boosts up member morale and satisfactions. Green human resources management consists of environment friendly human resources and knowledge capital practices (Mandip, 2012; Shoeb, 2015). Green human resources management is a set of policies, systems and practices aimed to stimulate the

organizational green behavior to create an environmentally sensitive, resource-efficient, and socially responsible organization.

Green human resource management is also conceptualized as the use of human resource philosophies, policies, and practices of environmentally sustainable use of natural resources and thwart any untoward harm that may arise from environmental sustainability concerns in organizations (Zoogah, 2011).

Green human resources management is the set of systems, policies, and practices of green organizations to benefit the individual, social, and natural environment (Opatha & Arulrajah, 2014, p. 104). Green human resources management system is the set of distinct and interrelated functions, activities, and processes aimed to attract, develop, and maintain green human resources consistent with their organizational culture and business strategy (Lado and Wilson, 1994; Boselie *et al.*, 2001). The green human resources management is more concerned to socioeconomic development for an environmental development (Renwick, Redman, & Maguire, 2013, p. 3).

The dimensions of green human resources benefit the organizational sustainability, in terms of employee retention and satisfaction (Holtom, Mitchell, Lee, and Eberly 2008). Green human resources management may create a participative environment at the workplace to put forward green concerns and issues by the employees that work on specific areas, are willing to collaborate and responsible to achieve green outcomes and the implementation of ethical organizational behavior (Collier & Esteban, 2007; Saifulina, Carballo-Penela and Ruzo-Sanmartón, 2020). Green human resources use the employees point interfaces to enhance awareness and commitment to promote sustainable practices (Mandip, 2012). Green human resources management concerns with a systematic and planned alignment of practices and organizational environmental goals (Jabbour 2013a, pp. 147–148).

Green human resources management has been studied in green organizational settings (Berrone & Gomez-Mejia, 2009; Jabbour, Santos, & Nagano, 2010; Massoud, Daily, & Bishop, 2008; Renwick, 2008; Stringer, 2009). The firm's environmental behavior is the focus of green human resources which can be continued consumption (Muster & Schrader, 2011). Green human resource management is dependent on patterns of green behaviors and decisions (Green signatures; Jackson, Renwick, Jabbour, & Muller-Camen, 2011).

Some factors that affect positively organizational pro-environmental green behaviors are organizational green human resources activities and practices (Saeed *et al.*, 2018; Luu, 2019), incentives and monetary rewards (Ezzine-de-Blas *et al.*, 2019; Nelson and Quick, 2013; Young *et al.*, 2015), training pro-environmental green behaviors (Jones *et al.*, 2012), organizational feedback about pro-environmental performance (Carrico and Riemer, 2011; Young *et al.*, 2015; Xu *et al.*, 2017), and collective green crafting (Luu, 2019).

The elements of green human resource management include the environmental human resources practices and knowledge capital (Dutta 2012;). Green human resources management practices have a direct link and positive impact on environmental strategy (Harris Crane, 2002; Shah, *et al.*, 2021). Green human resources initiatives and practices increases cost reductions, efficiencies and productivity, employee retention and other benefits. Green human resources management should be aligned between and with the other organizational functional areas.

Organizations must get the right green human resources functions with the right member green inputs with the specific functional green human resources management activities and right green performance to achieve sustainability and natural workplace environment (Opatha & Arulrajah, 2014, p. 107). Haddock-Millar, Sanyal, & Müller-Camen, (2016) explore multinational company approaches on

green human resource management to analyze similarities and differences on green behaviors and green policies, systems, practices, and activities.

Green human resource management integrates environmental performance into performance management systems safeguarding it against any potential damage. Green human resources management integrates environmental performance (Epstein and Roy 1997). Corporate image has a positive relationship with customer satisfaction, loyalty, and organizational performance (Nai and Cher, 2010, Minkiewicz *et.al.*, 2009; Amores-Salvado *et. al.*, 2014). Green human resources management is related to issues that implemented as green initiatives. Green human resources management is responsible in the practice of green initiatives, creating an organizational green workforce, achieving green objectives, and advancing green human capital (Mathapati, 2013, p. 2).

Environmental sustainability is implemented by the green human resources department of the organization to promote the corporate mission. There is ambiguity associated to the implementation of green human resource management policies in organizations leading to green corporate or organizational culture. The green human resource management plays a critical role in the creation of organizational sustainable culture (Harmon *et al.*, 2010) and translating green human resource policy into practice (Renwick, 2008).

The creation of a sustainable culture of the firm is an outcome of the green human resource department (Harmon, Fairfield, & Wirtenberg, 2010; Subramanian & Roscoe, 2019). Green human resources create a green workforce able to appreciate the organizational green culture initiatives to achieve green objectives aimed to advance the firm's human capital (Dutta, 2012). Green human resource management play a critical role in recruitment of more responsible employees toward green organizational practices. Also, green human resources management can lead the organizational green movement towards more green practices and green

Firms may design energy efficient processes and products implementing a system of incentives, green rewards and compensation aligned to green human resources management to enhance green organizational culture (Gupta 2008). Strategic compensation and rewards management in the context of green human resources management are tools to be used to support organizational environmental practices and activities aimed to enhance ecofriendly initiatives.

Facilitating green human resources management and sustainable policies, going green would be easier to implement in an organization. Green policies and processes implemented withing the green human resource space. Green human resource management formulate policies to promote the sustainable use of natural resources to promote the organizational environment sustainability (Marhatta & Adhikari, 2013, p. 2). Initiatives of corporations endorse the development of green human resources policies through the implementation of environment management programs.

Focusing on the strategic development of green human resources management considering the hierarchical influences has management implications in behaviors, policies, and practices on the operational functions. Environmental positioning and alignment with green human resources management is essential to achieve environmental performance and implement strategy. Organizational strategy must be aligned with green human resources management strategic priorities can be achieved (Jackson & Seo, 2010).

Green human resources management should create awareness among young working generations about the green movement, use and retaining of natural resources, maintaining proper environment and sustainable development for future generations (Mathapati, 2013, p. 2). The use of green teams in green human resources management foster the environmental learning and addresses the environmental issues (Hartman & Stafford, 1997; Jabbour, 2011).

## **METHODOLOGY**

This research collects and organizes information from scientific articles, journals specialized in green human resources, aimed at promoting corporate social responsibility based on sustainability reports. This through a comprehensive literature review process, with the aim of generating interpretations and conclusions from the reviewed information. This through the comprehensive literature review process of Williams (2018), the step by step describes how to select, record the resources, evaluate them, and synthesize them to generate interpretations and conclusions.

## **ENVIRONMENTAL ORGANIZATIONAL SOCIAL RESPONSIBILITY GREEN IMAGE AND GREEN COMPETITIVE ADVANTAGE**

The green economy shift towards environmental sustainability is creating new practices, occupations, and responsibilities at the core of performance (Dierdorff *et al.*, 2013). Green modern organizations build green organizational image enhance green competitive advantage supported by environmental organizational social responsibilities. Social responsibility of organizations improves economic, social, and environmental conditions in places no attended (Nouaimeh *et al.*, 2018).

The notion of green business innovation initiatives is related to the ecological dimensions of environmental social responsibility. Organizational green innovation exerts the organizational green image to the firm (Chen, 2010). Organizational green image from the perspective of brand equity is defined as the attitudes collection in the mindset of customers toward a specific brand that is hooked to ecological pledges and apprehensions (Chen 2010).

The ecological pledge of organizations to the society must be supported by management and marketing as instruments to tackle any trouble related to social and organizational activities to environmental issues and endeavors aimed to strengthening the green image and competitiveness (Feola, 2015). Organizational green image converts environmental opportunities to enhance competitiveness (Chang and Chen 2013).

### **Environmental Organizational Social Responsibility**

The concept of environmental organizational social responsibility is multidimensional related to sustainability, governance, and performance (Rahman and Post 2012). Environmental organizational social responsibility, building green organizational image and organizational green competitive advantage are tools aimed to enhance green competitive capacity (Ambec & Lanoie, 2008; Porter & van der Linde, 1995; Shafiul and Zahidul, 2021). Corporate social responsibility is a set of self-regulating organizational issues and affairs that facilitate and enhance the organizational reputational capital leading to social values to be accounted and trusted by all the stakeholders involved and to generate feedback for the organizational value.

Green organizational image is a term operationalized by the perceptions of the interplay among customer, organization, community, and personnel, all of them connected to the ecological pledges and concerns for environment (Chang and Fong 2010). Environmental community involvement is associated with green organizational image and green competitive advantage. Environmental community involvement is critical in bounding the different stakeholder's communication between the organization, society, and business conducive to building green organizational image and green competitive advantage (Lakin &

Scheubel, 2017). Creating and developing ecological communication among the different organizational stakeholders enhance green organizational image (Saha and Darnton 2005).

Organizations boost ecological, environmental, and social initiatives for building green image and reputation among customers in the market (Chen, 2008, 2010; Walker & Wan, 2012). Organizational green innovation practices establish the environmental image to generate positive organizational reputation aimed to increase or open new markets (Fraj-Andrés *et al.*, 2009). Societal concerns about ecological issues pressure to establish green organizational image and engage in environmental activities (Saran & Shokouhyar, 2021).

Perception of a positive organizational image is induced by the environmental commitment and engagement leading to repetitive actions (Lee, Lee, & Cho, 2018; Trang, Lee, & Han, 2019). Organizational social responsibility is stimulated with the green business movement and the sustainable development goals (Tang *et al.*, 2016). From the perspective of environmental movements, green organizational image is critical for the preservation of the environment.

Organizations are recognizing the strategic benefits of the integration of green concerns in corporate social responsibility practices and activities (Alam, Islam, 2021). Social responsibility of organizations publicizes the benefits to facilitate the goodwill to the community, to increase legitimacy, to receive support from non-governmental organizations and public endorsement. Organizations engage in community involvement to improve social and environmental settings contributing with all type of resources to achieve green image and competitiveness (LaFrance & Lehmann, 2005). Environmental community involvement is associated with green organizational image and green competitive advantage. The association between green organizational image and competitive advantage is related to green compliance (Moravcikova, Krizanova, Kliestikova, & Rypakova, 2017).

Environmental corporate social responsibility dimensions are holistically related to organizational green competitive advantage and green corporate image. Green corporate image imposes to take organizational green issues. Green corporate image initiative is a driving factor in the business setups. Corporate image has a positive relationship with customer satisfaction, loyalty, and organizational performance (Nai and Cher, 2010, Minkiewicz *et al.*, 2009; Amores-Salvado *et al.*, 2014).

Organizations invest on environmental issues to improve their corporate images and to increase their competitive advantages and to develop new markets (Chen 2008). Organizational green practices and activities are considered determinants of green organizational image and competitiveness (Schwaiger, 2004; Sellitto & Hermann, 2019). Green practices have a positive relationship with organizational image (Miles and Russell, 1997 and Chen, 2008). The enhancement of organizational green image has direct positive association with green practices (Lee, Kim, and Kim 2018). Building green organizational image aimed to enhance and achieve green competitiveness (Cronin, Smith, Gleim, Ramirez, & Martinez, 2011).

Organizational environmental green image is associated with green competitiveness and organizational green image enhances green competitiveness. Organizational green image has the capacity to improve the green competitiveness. Green image distinguishes a particular organization from others in providing green competitiveness and creating and preserving loyal customers (Widyastuti *et al.*, 2019; Chen, 2008; Widyastuti, 2019). Organizational green image is associated with green competitiveness (Chen 2008).

Environmental organizational social responsibility contributes to building green framework formed by the organizational image and competitive advantage constructs. Organizational social responsibility may be misunderstood. A framework of organizational social responsibility may support the management practices, producing and manufacturing processes, inventory, logistics and distribution, online presence, and so forth, to keep well informed the consumers.

Different categories of green behaviors based on a taxonomy vary in the workplace context and in other specific domains describing psychological factors that contribute to functional core of responsibilities related to environmental sustainability. Green human resources management as a green initiative is the organizational social responsibility. Green human resources management ascertain that green initiatives at the workplace is part of organizational social responsibility since human resource is a critical organizational asset.

Organizational environmental philanthropic activities distract social responsibility from adverse events (Koehn and Ueng 2010). Green organizational image is associated to green competitive advantage and environmental philanthropy. Environmental philanthropy is associated with green organizational image and green competitive advantage. Green human resources management initiatives are part of corporate social responsibility program of any organizations. The attributes of environmental philanthropy are crucial in building green organizational image and in association complementary to competitive advantage.

Environmental philanthropy builds green organizational image and green competitive advantage (Kim, Yin, & Lee 2020). Environmental philanthropy influences green organizational image and competitive advantage. Organizations engaged in environmental philanthropic initiatives for enhancing positive image, organizational reputation, and trust. Environmental philanthropy increases the ethical awareness and engagement aimed to contribute and achieve green competitiveness. Environmental green image is associated with green competitiveness

Social dimensions of sustainability are concerned with the organizational impacts on the social systems including the influence of green-lean practices on human rights, labor practices, social responsibility, etc. (Global Reporting Initiative, 2017). Environmental organizational social responsibility dimensions have effects in the interplay among green organizational image and green organizational competitive advantage creating new scenarios that require the formulation and implementation of green strategies to cope with environmental challenges (Kumar, 2014). Green organizational image is crucial catalyst for attaining organizational green competitive advantage (Sellitto, Camfield, & Buzuku, 2020).

## **Dimensions of Environmental Organizational Social Responsibility**

The dimensions of environmental organizational social responsibility are constructs that develop green organizational image and competitive advantage (Chuang & Huang, 2018). The dimensions of environmental organizational social responsibility upon building green organizational competitive advantage and image, are instrumental to develop ecological protection. Customer's perception regarding civil social responsibility contributes to green image (Lichtenstein, Drumwright, & Braig, 2004). The environmental civil social responsibility influences the dimensions of green organizational image and competitive advantage. The quality and strength of green organizational image have an impact on organizational green competitive advantage and attain sustainability (Widyastuti 2019)

The environmental organizational social responsibility is developed with activities ecologically compatible with adverse externalities (Lyon & Maxwell, 2008; Portney, 2008). Building positive green organizational image may compensate the adverse effects of ecological externalities (Russo & Fouts, 1997; Walker & Wan, 2012). The environmental organizational social responsibility dimensions influence the ecological management and the creation of a green competitive advantage. Environmental organizational social responsibility is integrated to ecological concerns in processes, operations, products, recycling, waste management and reduction of practices that may distress future generations (Mazurkiewicz, 2004).



The dimensions of environmental organizational social responsibility integrate a conceptual framework influencing the green organizational image and competitive advantage, with environmental community involvement (Ailawadi, Luan, Neslin, & Taylor, 2011; Rahman, 2011; Sen, Bhattacharya, & Korschun, 2006; Uddin, Tarique, & Hassan, 2008), philanthropy (Carroll, 1991; Liu & Zhou, 2009; Onlaor & Rotchanakitumnuai, 2010; Peloza & Shang, 2011) and environmental customer wellbeing (Carroll, 1991; Cochran, 2007; Mina Okada & Mais, 2010).

Organizational community involvement ensures green reputation, being environmentally and socially responsible with the customers, the community and society at large (Hong, Yang, & Rim, 2010). Environmental philanthropy is related with green organizational image and competitive advantage. Organizations identified as green by customers, they get committed to its products and services (Du *et al.*, 2007). Environmental customer wellbeing is associated with green organizational image and green competitive advantage. Customers become cordial and supportive of firms engaged in environmental organizational social responsibilities (Du, Bhattacharya, & Sen, 2007). Customers require more environmentally friendly goods and services that may enhance loyalty and build green image (Lin, Chen, & Huang, 2014).

### **Green Image and Green Competitive Advantage**

Green organizational image is related with environmental customer wellbeing and green competitive advantage. Environmental wellbeing contributes to build organizational green image and competitive advantages. Environmental customer wellbeing is associated to green image and competitive advantage. Organizations taking aggressive environmental efforts ensure the wellbeing and attracts customers to build green organizational image and competitive advantage (Han, Yu, & Kim, 2019).

Green business promotes more sustainable production, distribution and consumption practices responsibly managed that are more energy and resource efficient with low carbon and waste, safe and non-polluting. Organizations can conduct green processes as a responsibility to create and develop a green image to track organizational sustainability (Famiyeh, Adaku, Amoako-Gyampah, Asante-Darko, & Amoatey, 2018). Green image as a part of environmental organizational social responsibility is the perception held by people about the green concern of organizations (Widyastuti, 2019). Green organizational image innovation provides substantial green competitive advantage (Fernando, Jabbour, & Wah, 2019).

Green performance appraisals motivate and engages employees (Renwick *et al.*, 2013) covering environmental responsibilities and incidents, communication of environmental policies and management performance. Environmental organizational image with its customers is related to their behavioral characteristics and effective communication (Widyastuti, 2019). Organizational environmental communication is instrumental to consolidate the collective association between society and the organization for creating green image (Nair & Menon, 2008).

Green organizational image is measured (Walters 1978; and Chen 2008; Chang and Fong 2010). Measurement of environmental organizational social responsibility dimensions are adapted from Turker (2009). Employees are responsible of role performance including sustainability targets including green practices and tasks. Green performance appraisal must focus on environmental responsibilities and incidents and green information systems, aligning job descriptions with green activities. Sustainable organizational green performance is expected from green organizational image (Burnham, Frels, & Mahajan, 2003; Dick & Basu, 1994).

Green private and public organizations must be willing to join efforts to greenwash operations and involve forces to take environmental development responsibilities. The content analysis of greenwashing is evolving and contributing to the debate about the nature of corporate social responsibility (Seele, Lars, 2017).

The impact of other variables on green behaviors such as personality traits, environmental attitudes, organizational power, work values, etc. should consider measuring rather than relying on proxies as organizations move to commit environmental responsibility (Schmit *et al.*, 2012). Green shared values support the corporate social responsibility leading to the social and environmental reporting, green training, reduction of carbon emission, energy saving and adjustment of green supply chains (Song, Ren, Yu, 2019; Spence, 2019).

According to the studies conducted by Bag and Gupta (2020), green human capital is one of the main factors that influences the adoption of administrative strategies such as logistics as well as the performance of remanufacturing operations as well as management practices. of the green supply chain and operational performance, market, social and environmental performances, while it plays competitive partial mediating role between green human resource management and financial performance (Senyo, Agyabeng-Mensah & Afum, 2020).

Green human resources have been, Mishra (2017) considers that the practices of green human resources promote the pro-environmental behavior of organizations, considering senior management as one of the main supporting factors to facilitate ecological behavior among employees. In this sense, the green human resource turns out to be a competitive advantage that favors the development and growth of organizations, generating new green strategies that promote the sustainability of the same organization (Ali, Puah, Ali, Raza, & Ayob, 2021).

Likewise, Ali, Puah, Ali, Raza, and Ayob, (2021) determine the importance of green human resources in organizations because they play a key role in employee commitment and green ecological behavior as well as environmental performance in organizations (Senyo, Agyabeng-Mensah & Afum, 2020). The authors argue that it is extremely important that green human resources should consider the intellectual capital of organizations as well as the social identity of employees to generate and conduct environmentally friendly policies.

According to Pham, Hoang, and Phan, (2020), the main practices of green human resources are focused on Recruitment/selection, Training and development, Job description and analysis, Performance management/appraisal, Pay and reward system, Employee involvement and empowerment, Organizational culture, Role of unions in environmental management, Organizational learning, and Work-life balance green health and safety. Each of the green human resource practices is described below.

**Recruitment/ Selection:** The implementation of heat focused on environmental aspects in both recruitment and selection processes.

**Training and Development:** It focus on establishing the necessary policies to establish the environmental awareness of each of the employees, equipping them with environmental skills and increasing their capacity as well as the ecological experience of the employees in the organization.

**Job Description and Analysis:** Establish policies for monitoring and evaluating the performance of employees as well as compliance with environmental objectives

**Performance Management/Appraisal:** Establish a system of economic rewards for those employees who contribute to achieving the objectives of environmental management

**Pay and Reward System:** Establish a HRM system focused on providing opportunities for those employees who participate in environmental management initiatives and activities

**Employee Involvement and Empowerment:** Conduct the values, symbols of an organization that demonstrate its vision and need to pursue its sustainable environmental objectives

**Role of Unions in Environmental Management:** It refers to the encouragement of unions to senior management to create new jobs related to the environment and expand their sphere of influence in the workplace.

**Organizational Culture:** Development of managerial levels of knowledge acquisition related to the environment, as well as information exchange ideas

**Work-Life Balance:** Generating a balance between work and private life of an employee in relation to ecological values, attitudes, and behaviors

**Work-Life Balance Green Health and Safety:** Emphasizes ecological health and safety also emphasizes the lives of employees through health and safety procedures aligned with environmental management

Organizations give relevance to environmental reporting to show that takes green concerns and issues seriously to promote a green image (Hillestad *et al.*, 2010; Nair and Menon, 2008). Organizational social responsibility practices and activities must be communicated on social media to the community to reach consumers (Tang *et al.*, 2016). Environmental community is in positive relationship with green organizational image.

Environmental organizational social responsibility is instrumental to attain organizational green competitive advantages (Welford, 1995). The type of industry and work tasks must be considered in determining the levels of inclusion of green behaviors manifested in responsible intentions, gestures and behaviors directed toward the environment which are akin to the tasks of an organization green industry. A green industry develops and implement initiatives to promote the environment such as the production of renewable energy (Ones and Dilchert 2012a)

Organizational green culture linked to organizational social responsibility and healthy food safety. Environmental and green industry analyzes the relationships between green organizational culture, implementation of corporate social responsibility and food safety. Social responsibility of organizations is grounded on green organizational culture to gain favors and support in action from consumers caring about healthy food safety.

Consumers want to be more assure of healthy food safety from producing sources that have green organizational culture and leading to organizational social responsibility activities and practices. Green organizational culture is accountable for organizational social responsibility involving management of the economic, social, and environmental risks in decision making and policy issues (Firoz and Abinakad, 2016). Green culture is the collective belief and organizational social responsibility is the collective actions.

Organizational social responsibility of producers dedicated to supply foodstuff to consumers. The interactions between internal green organizational cultures and external green imperatives of organizational social responsibility concern green consumerism and green product quality in the food safety. Green product and services development benefit environmental protection supported by adopting green innovation organizational strategies to improve the added value meeting the consumers environmental demands in the environmental protection atmosphere, enhance the green organizational image and create sustainable competitive advantages by adding value (Chen, Chang, Lin, Lai, Wang, 2016; Zhang, Li, 2019).

Green culture, organizational social responsibility and food safety are all embedded in an organizational dynamic level involving a diverse set of stakeholders (Liu *et al.*, 2016). Internal environmental climate and green culture lead to environmental public health food safety through environmental organizational actions of social responsibility. Organizational internal green culture through social responsibility practices affects buying culture and purchasing behavior of consumers of healthy food safety (Han, Gao, and Matthews, 2017).

To elaborate on the collective attribute-action-value interrelations of green culture, organizational social responsibility and food safety, the integration is justified by the stakeholder theory (Freeman, 1984, 1999; Freeman *et al.*, 2010), relying on the integration of resources-based and market-based views (Phillips, 2003) on organization's attributes and behaviors interacting with internal and external entities and constituencies. Corporate image expresses salient business attributes driving customers (Namkung and Jang, 2013). Organizational green culture is the social and psychological climate among all the members. The intersection among green culture, organizational social responsibility and food safety creates dynamic interactions. Strong green culture in organizations supports the workforce for engaging in organizational social responsibilities.

Organizational social responsibility deals with the tensions among the economic costs and the good governance and food safety is related to personal and group motivation affected by ecological and psychological concerns. The consumers' choices for purchasing food depends on marketing features identified with the organizational culture and other tributes to stimulate stakeholder favorable behavior such as the organizational social responsibility and its impact on food safety as a collective value. The organizational green marketing image initiatives must respond to environmental regulations. Consumer's behavior and intention of buying food safety for their consumption are affected by the organizational social responsibilities. Consumers receives the commitment of organizational practices toward bearing social responsibility (Aliyu *et al.*, 2015). Consumer behavior determines the effects of organizational social responsibility on the purchase intention

Organizational social responsibility is a critical factor in strategic planning, more than involving supplementary practices and activities that do not affect its profits. Organizations are assessed on their social responsibility merits of responsible behaviors and actions in their activities. Implementation of environmental organizational social responsibility requires the formulation of appropriate strategies based on the interplay among the concepts of green organizational image and green competitive advantage considered crucial in the contextual environment. Formulation and implementation of green strategies relating environmental organizational social responsibility with organizational image and competitiveness (Walker & Wan, 2012).

Corporate social responsibility is a corporate growth strategy that ensures wellness and health of people and assures the production processes and food safety. Organizations incorporate strategic environmental philanthropy (Porter and Kramer 2002) for building social and economic image to respond to their stakeholders.

Corporate social responsibility is a factor for the consumer that plays a mediating role and resulting in increasing demand (Wei and Huang, 2017). Corporate social responsibility strategy ensures sustainable and ethical practices, attracts the best talent, build partnerships, make more organic products, manage risks of supply chains, minimize production costs, build transparency, traceability, and honesty, allows transparent conversations between investors and other stakeholders. Organizations are pressured by ethical concerns to adjust activities building green image and seeking green competitiveness.

## CONCLUSION

Local government, business, organizations, and citizens are responsible to develop green eco-friendly nanotechnology to enable sustainable processes and products. Employee engagement in green human resources management leads to develop and implement new environmental green initiatives and awareness of the organizational approach to environmental sustainability. Customer's ecological awareness of environmental principles aimed to create the organizational image implemented to satisfy the green marketing supported by marketing initiatives.

Green social responsibility is a critical factor of organizations that determines the growth and have a positive impact. Environmental organizational social responsibility builds green organizational image and competitiveness. Building green organizational image aimed to gain competitiveness and increase the market share. Green human resources management is relevant to achieve broader objectives in green organizational social responsibility practices, improving green brand reputation and stakeholder's engagement, and reducing costs of energy, raw materials, water, etc. In building green image, organizations enhance green competencies.

Organizational green practices and activities influence customer perceptions of green behavioral purchasing intentions and brand's green image (Namkung and Jang 2013). The green corporate image combines environment concerns as an effect of green and sustainable branding associated with the environment and sustainable organizational practices. Sustainable organizational green branding refers the green processes, practices, and products where organizational image derives from the stakeholder's green perception.

Green image of organizations is the outcome of green awareness and perception of society which contribute to enhance green competitiveness. Organizational green image balances the ecological well-being development with green innovation and competitiveness, sustainable upgradations, and compliance cost reduction. The organizational green innovation action improves the organizational legitimacy and image supporting organizations to obtain resources, stimulate customers, improve employee satisfaction, obtain willingness of stakeholders, enable green competitive advantages and organizational performance.

Organizations must pay attention to the needs and interests of the community to protect its environment responsibly and manufacture food products safety and healthy, linking organizational social responsibility with consumers that may have different attitudes to various sources. Organizational social responsibility is an instrument nurtured by green organizational culture influencing commitment and values in food safety. An organization that meets requirements of social responsibility offers green attributes in healthy products to its consumers and cares for their health and the environment.

The optimization of the environmental strategy creates a positive image of the company and develops competitiveness of green products. Environmental community involvement is related with green organizational image and green competitive advantage.

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## KEY TERMS AND DEFINITIONS

**Carbon Footprint:** Is a measure of the impact human activities have on the environment in terms of the amount of greenhouse gases produced, measured in tonnes of carbon dioxide (ETAP, 2007).

**Competitiveness:** The ability of companies, industries, regions, nations, or supra-national regions to generate, while being and remaining opened to international competition, high factor income and factor employment levels (OECD, 1995).

**Corporate Social Responsibility:** Is a management concept whereby companies integrate social and environmental concerns in their business operations and through which a company achieves a balance of economic, environmental, and social imperatives, while at the same time addressing the expectations of shareholders and stakeholders (UNIDO, 2021).

**Environmental Philanthropy:** Encompasses resources that individuals, communities, the business sector, and foundations commit to the preservation and conservation of nature and the promotion of activities related to nature conservation and the general health of the planet (Ramutsindela *et al.*, 2011).

**Green Business Innovation:** Companies that produce e.g., renewable energy such as wind and solar power, resource efficient products such as energy efficient pumps, environmental services and so on, to companies that implement more process-oriented initiatives in their business or value chain such as environmental ISO-standards, cradle- to cradle, Corporate Social Responsibility (CSR) or green reporting (Henriksen *et al.*, 2012).

**Green Industrial Policies:** Instruments that can support the transition to economic structures that balance environmental sustainability and wealth creation and help catalyze the needed change towards a sustainable future (PAGE, 2021).

**Green Organizational Image:** Is related to its attitude toward the environment by the organization's stakeholders, reflects the impressions of those involved in the dimension of “green reputation” and “green credibility,” a green marketing concept that organizations can use in product development to create a distinct advantage for the product.



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**Green Organizational Practices:** Companies that operate under this philosophy recognize, analyze, solve issue/ problems, and develop strategies that uniquely help the company to navigate through the environmental values (McCullough *et al.*, 2016).

**Knowledge Capital:** A firm's knowledge capital consists of organizational capital and individual capital.


**Sustainability:** Means meeting our own need without compromising the ability of future generations to meet their own needs.

**Sustainable Development:** Development that meets the need of the present without compromising the ability of future generations to meet their own needs.

## Chapter 21


# Implications Between the Green Product Consumption on Organizational Green Productivity and Organizational Performance Strategies

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### **ABSTRACT**

*This study has the aim to analyze the consumption of green products and their effects and implications on the organizational green productivity and organizational performance strategies. It is assumed that the consumption of green products has effects on the production and supply chains that have an impact on the organizational productivity and organizational performance strategies. The methods employed are the analytical-descriptive leading to the reflective inference based on the theoretical and empirical review of the literature. It is concluded that the organizational strategies of organizational green productivity and organizational performance must be based on the green products and services for the green consumption.*

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## **INTRODUCTION**

The purchase and consumption of ecological products and services promote the conservation of natural resources and energy, improve safety and health, reduce pollution, and stimulate the opening of new market segments, such as those for recycled materials. Consumers' green purchasing intention is based on their latent concern for the environment. Hence, consumers use eco-friendly products to reduce environmental damage, energy consumption, pollution, and eco-laundry behavior that affect the goodwill of the organization. Green consumption prevents unbalanced ecosystems, unsustainable degradation of land use, pressure from the consumption of water resources, food, bio-products, etc.; Likewise, green consumption prevents the reduction of fresh and underground water levels, loss of biodiversity, and an increase in global greenhouse effect emissions, among others.

Organizations to operate under ecological guidelines, seek the ecological innovation, this through a management that includes consumption behaviors related to the design of ecological products, the recycling of waste and the prevention of pollution (Chen, Lai, Wen, 2006; Dangelico, 2016). To achieve green organizational productivity, self-sufficient tools are necessary, linking humanity with occupation and the environment, all this supported by the ecological principles of sustainable use of natural resources, to maintain a socio-ecological balance between available resources. and the consumption and protection of ecological biodiversity.

Organizational ecological productivity is a new paradigm in sustainable environmental development, it constitutes a strategy to improve production while ensuring resource conservation and waste minimization to achieve organizational ecological performance.

The objective of this study is to provide information on the "green" consumption of products and services. Its academic contribution lies precisely in facilitating the understanding of this little-studied phenomenon, in addition to including the green supply chain as a continuation of the processes aimed at identifying and determining the benefits that lead to improving organizational productivity and organizational performance.

## **PURCHASE OF GREEN PRODUCTS AND SERVICES AND GREEN SUPPLY CHAIN**

### **Green Consumption**

In recent decades, green consumption has become a trend based on sustainable environmental behavior. Xiao and Hong (2018) point out that learning environmental knowledge has an impact on personal environmental behaviors related to green consumption activities. Thus, the exchange of ecological knowledge has an impact on the ecological culture and the organizational performance of the development of ecological products in the care of consumers. Consequently, organic consumers prefer organic products to traditional ones, even if that means spending more money (Kalafatis, Pollard, East, Tsogas, 1999; Paco, Raposo, 2009; Rashid, 2009; Chen, 2010; Ali, Ahmad, 2012; Choi, Kim, 2005).

Today the environment faces damaging effects, the same effects that producers, distributors, and consumers face, as a result these actors are becoming increasingly sensitive to producing and consuming ecological products and services. Regarding the above, authors such as Choi and Kim (2005) and Bang, Ellinger, Hadjimarcou and Traichal (2000) point out that those consumers concerned about the

environment tend to buy and consume more ecological products than those who care less. Consequently, green products attract some consumers and approach the market with a green approach.

For this reason, it is believed that the green organizational culture has impacts on socially and environmentally friendly organizational behaviors, green consumption, public health outcomes, and food safety. And while in theory green consumption should focus on internal green culture and influences, it is more concerned with external reach. While the organizational green culture seeks pure products and services using technology for energy conservation, minimal use of natural resources and preservation of the environment. Green culture encourages consumers to buy natural foods for the benefit of health (Bortolotti *et al.*, 2015). Although the organizational green culture tries to protect the welfare of the consumer, production, distribution,

To attract green consumers to achieve a sustainable consumption model, organizations are committed to shared green values to improve the organizational performance of green management, green organizational identity, green product, psychological property, and organizational civic behavior for the environment. To achieve a sustainable consumption model, Dougherty (1990) affirms that the members of the organization must have a green organizational identity, this with the aim of promoting the creation and development of meaningful thoughts based on innovations and creative forms of relationships between companies. new environmental technologies and the needs of consumers, all the above under a cognitive framework of environmental problems.

Clark *et al.*, (2019) agree that organizations that do not take ethical actions affect the attitude of consumers towards the brand. On the contrary, organizations where their members seek to improve the environment and have the objective of sustainable consumption and ecological organizational performance, manage to retain, or attract new customers with this same philosophy. On the other hand, it is important to consider that the political atmosphere of organizational environmental protection strengthens the psychological property of the green product of the members of the organization to satisfy the environmental protection needs of consumers, contributing to an active exchange of ecological knowledge.

And although organizations that do not take ethical actions affect the attitude of consumers towards the brand, still organizations face various barriers when implementing green purchases, such as higher production costs, lack of information, low availability of products, lack of commitment from staff, etc., (Giram, Gaikwad, Thonte, Rajurkar, Gholve, Bhusnure, 2005). From this it is necessary to say that, today, consumers demand that organizations be transparent about their sources of products, the ecological standards of inputs for growing, harvesting, packaging, distribution, and promotion of healthy products.

In short, consumer behavior is shifting from traditional consumption to organic products, which has a direct impact on the environment. That is, green products are produced and consumed with minimal environmental effects and impacts (Zhang and Li, 2019). Synthesizing, ecological products are those that are made with recyclable materials, saving energy and water, do not involve experimentation with animals, do not affect protected species, the use of packaging is avoided, and minimal waste is sought (Simon 1995; Nimse 2007).

Under the same logic, Elkington (1994) emphasizes that the green consumer is one who avoids the consumption of products and services that put health at risk and cause damage to the environment during the manufacturing, consumption, use and disposal process, uses materials of Endangered species and environments, implies the unnecessary and cruel use of animals, consumes a high amount of energy, and causes waste. Thus, green consumers prefer to buy from companies that care about environmental sustainability (Too and Bajracharya, 2013). Customers are likely to go to an organic restaurant and become more involved with green experiences (Namkung and Jang, 2013). The above, because food

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consumption is related to environmental concerns such as pollution., increased greenhouse gas emissions, water scarcity, energy savings, etc., (Kolk, 2016).

Therefore, consumers require information provided by producers about food sources, processing, manufacturing, supply chain, content, etc., thus the organization shows the quality and safety of food (Cordeiro and Tewari, 2015). For this reason, Sridhar-Acharya and Aithal (2015), Aithal and Prieti-Jeevan (2016) and Aithal and Preethi-Rao (2016) propose to use sustainable green technologies, since these, in addition to using and consuming less natural organic resources, support automation of processes to avoid human intervention, green gas production, entropy increase, environmental degradation and can be applied to make green nanotechnology.

### **Green Nanotechnology**

Why use green nanotechnology? This type of technology has a direct impact on consumer properties, being pioneers in solving social problems such as avoiding environmental degradation in agricultural processes and food packaging, elimination of poisonous food contents, production of renewable energy with zero emissions, reduction of green gas emissions, desalination of seawater. As well as promoting the use of natural energy sources, the production of consumer goods without secondary effects, the construction of smart buildings that are energy efficient and respectful with the environment, not ecological material, development of electronic components and recyclable waste, emission production processes of non-green gases, use of green hardware and processes in education and health services, etc.

Green nanotechnology processes and systems contribute to solving the Sustainable Development Goals (ODS) (OECD, 2013). Indeed, the use of nanotechnology helps the development of the agricultural industry, reduce poverty, reduce hunger, improve medical care, clean the environment (Prassad, Bhattacharyya and Nguyen (2017). It is also useful for the preservation and preparation of food in a way that promotes hunger reduction and environmental cleanliness. The implementation of green nanotechnology seeks equal opportunities, improve the industrial sectors of sanitation and clean water, generation and storage of renewable energy, job creation and skilled jobs, sustainable automation in industry, sustainable production and consumption of basic products, control of environmental degradation and climate change, cleaning, and conservation of marine and ocean resources, among others,

Given that most nations consider the Sustainable Development Goals in their national agendas and that organizations make up the productive base of each country, international and national guidelines encourage interested organizations and members to seek ecological approval, so that they enhance green creativity to develop a green product orientation that can meet the needs and expectations of stakeholders and consumers and thus achieve sustainable development (Chang, Chen, Luan, Chen, 2019; Chen, Chang, Lin, Lai, Wang, 2016; Chen, Chang, 2013). As shown, organizations must develop environmentally friendly products and services to satisfy environmentally conscious consumers (Chen and Chang, 2013).

Regarding energy consumption, the proposal to counteract those areas that consume large amounts of energy and lack vegetation are urban green areas of innovation. An example of the above, are green roofs with vegetation by reducing energy consumption, reducing air pollution, and mitigating the effects of urban heat islands, increasing water retention, and controlling the overflow of rainwater, while reduce the interior temperature and energy consumption (Berardi, GhaffaruabHoseini and GhaffarianHoseini 2014). Additionally, green roofs reduce CO<sub>2</sub> by insulating buildings and regulating energy consumption and organizational performance, temperature regulation, and urban heat island mitigation. It should be emphasized that compact cities have more control over urban energy consumption, more affordable

public transport, direct access to green areas and built environments, air quality becomes a potential threat, which increases the impact of the island effect. of heat.

And although there are potential risks due to the implementation of nanotechnology in production processes, it allows solving social problems and adding values to said processes and products of basic needs and desires, which is why it is believed that both government organizations and organizations non-governmental organizations should promote production based on nanotechnology, since the development of products and services with this type of technology supports sustainable development. In addition, green nanotechnology evaluations have implications for measuring the balance between benefits and limitations for the development of organizational performance standards for green nano-products.

## **Green Products and Services**

The green paradigm refers to the environment about end-of-life reuse and recycling, product use recovery, and supply chain assessment using a lean, green life cycle. An organization that develops green products and services integrates green thinking into green product activities (Chen, 2010). Developing such products requires green design, manufacturing, logistics, transportation, and recycling. It should be noted that the organizational performance of the development of green products has focused on research at the individual level (Chang, Chen, Luan, Chen, 2019; Chen, Chang, Lin, Lai, Wang, 2016; Chen, Lin, Lin, Hung, Chang, Huang, 2020).

## **Ecological Knowledge Exchange**

Green knowledge sharing has a mediating relationship between green product property development, green product development organizational performance, and green creativity. That is why environmental information must be collected on products and suppliers that focus on caring for the environment. Since the development of ecological products can contribute to obtain important income for the organizations (Chen, Chang, 2013).

The ecological knowledge exchange is an intermediate agent between the psychological ownership of ecological products, ecological culture, and the organizational performance of ecological development products (Baron, Kenny, 1986; Taylor, MacKinnon, Tein, 2008). The ecological knowledge exchange is a mediator between the members of the organization, the psychological ownership of the ecological products, their ecological culture, and the organizational performance of the ecological product development, which highlights the synergy between the ecological knowledge exchange for the culture. ecological performance and the organization's performance in product development.

The psychological ownership of green products has positive effects on green knowledge sharing, green culture, and organizational performance of green product development. The ecological knowledge exchange mediates the relationship between the psychological property of ecological products and ecological culture and the organization's performance in the development of ecological products. The cross-sectional framework of the psychological property of the organic product is related to the exchange of ecological knowledge between the members of the organization and the team effect of the ecological organizational identity (Chang, Chen, Luan, Chen, 2019). There is a relationship between green culture and the organizational performance of green product development (Chen, Chang, Lin, Lai, Wang, 2016). However, even though sustainable organizations promote a culture of sustainability by developing and supporting eco-intrapreneurs to add value to products and services, there is a gap

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between the green culture and the organizational performance of the development of green products in relation to the innovative behaviors.

This is where the organizational performance of product development comes in, this refers to the production of goods made from renewable materials in energy-saving conditions and with less influence on the environment, and less impact on human health (Chen, Chang, 2013). To obtain products and services such as those described above, it is necessary for organizations to operate under the premise of beliefs and collective actions focused on generating high-quality products. These collective beliefs and co-production style of the ecological environment shared by the members of the organization are known as “the green culture”, which has positive effects on the organizational performance of green product development.

Kumar and Christodoulou (2014) show that the leading brands are moving towards the introduction of ecological products, ecological attributes, and ecological operations. Regarding the same topic, Jabbour *et al.* (2015) emphasize that organizational dimensions, such as the size of the organization, the pressures and interest of interested parties, influence the development of green products and the organizational performance of the organization. In addition, Chuang, and Huang (2015) affirm that, organizations oriented to the environment achieve the ability to create ecological products with ecological competitiveness. Following the position of Müller (1998) about the importance of innovation for competitiveness, next, a brief description of the characteristics of organizational ecological innovation.

### **Organizational Ecological Innovation and Green Innovation**

Organizational green innovation includes behaviors such as (re) designing green products, recycling waste, and preventing pollution. It should be noted that traditionally there are five types of innovation accepted, product or service, market, improvements in the supply of production factors, production processes and industry structure (Schumpeter, 1978). While, for organizational green innovation, it is divided into only two types, green process innovation and green product innovation (Albort-Morant, Henseler, Cepeda-Carrión, Leal-Rodríguez, 2018).

- Innovation of green processes corresponds to the production and use of ecological goods, less harmful to the environment and the innovation of green products is related to products that are less harmful to the environment (Albort-Morant, Henseler, Cepeda-Carrión, Leal-Rodríguez, 2018; Chang, 2011; Utterback, Abernathy, 1975; Chen, 2011).
- The actions of organizational green innovation, concern the activities towards the protection of the environment and are carried out by the interest groups of the organization, examples of these actions are the use of renewable energies, the eco-design of products, implementation eco-efficiency processes and green supply chain management.

The results of innovators of green products in generating value without harming or being harmful to the environment (Dangelico, Pujari, 2010; Rubik, Frankl, Pietroni, Scheer, 2007), motivate organizations to focus on changing the innovation activities towards greener and more innovative processes, focused on environmental sustainability (Gao, Tsai, Xue, Ren, Du, Chen, Wang, 2018; Guo, Xia, Zhang, Zhang, 2018; Ma, Yin, Pan, Cui, Xin, Rao, 2018; Zhang, Wang, Xue, Yang, 2018; Triguero, Moreno-Mondéjar, Davia, 2013).

## **The Psychological Property of the Green Product**

The sense of forming an active attitude thinking and organizational performance corresponds to the psychological property of the product (Chang, 2020). Which is directly related to ecological creativity, ecological knowledge exchange and organizational performance of ecological product development. In turn, the psychological ownership of organic products and the exchange of ecological knowledge are linked to organizational identity.

Another fundamental element to improve the organizational performance of the development of green products and thus promote the psychological ownership of the product, is “green creativity”. This refers to the organizational strategic development aimed at improving behavior that integrates professional knowledge related to the environment, creative and specialized thinking applied to organizational processes, products, and services in the implementation of green innovation (Chen, Chang, 2013). Hence, the identification of the ecological team affects the psychological property of the members of the organization in terms of ecological knowledge.

The sense of ecological products as an object of psychological property is related to the exchange of ecological knowledge and ecological creativity that leads to forming an active attitude, thoughts, and organizational performance and in turn is linked to the organizational performance of developing ecological products. Thus, the sharing of ecological knowledge and learning opportunities about ecological concerns and problems become enhancers of ecological creativity and organizational performance of ecological products.

In short, knowledge management constitutes an intermediate and antecedent variable to integrate factors such as the ownership of ecological products and the exchange of ecological knowledge. As a result, organizational knowledge management fosters the exchange of ecological knowledge among the members of the organization, organizational performance, green creativity, and the development of ecological products (Chang, 2020; Chang, Yeh, Li, 2020).

If the psychological property of the products has a positive effect on the members, it is thought that this influences the exchange of ecological knowledge as an intermediary agent for the promotion of ecological creativity and the performance of the organization in the development of ecological products. Consequently, a strong sense of organizational psychological ownership generates an attitude in the members of the organization to protect, take risks and take care of the organizational performance of ecological products to obtain a competitive advantage.

In the words of Davenport and Prusak (1998), organizational ecological creativity maintains the competitive capacity with ecological knowledge to develop ecological products and services as an advantage. And the ecological team by impacting on ecological processes allows the creation of innovative environments for the development of green products. But only if the processes are supported by the capabilities of team members who participate in innovative green activities and spread the benefits over other green outcomes

(Robertson, Barling, 2013; Chen, Chang, Lin, 2014).

## **Characteristics of Green Products**

Sustainable green food trends include urban open and indoor farms, urban agroecology, aquaponics, organic produce, zero waste, slow food, farmers markets, etc. Likewise, green products imply a produc-



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tion, protection, and delivery of organic food, improving the taste of food, adding antibacterial for the potential damage of green nanomaterials and nanoparticles for food packaging.

Another characteristic is that green products, when considering the recovery of the good at the end of its useful life, is that they constitute a conscious purchase by preferring recycling points of sale, vegan products, and sustainable brands over other products. Thus, they reduce the frequency of replacement in the future, allow to reserve natural resources, pollute less, and contribute to saving energy and money in the long term.

In sum, the behavior of organizational citizenship for the environment can be analyzed from the perspectives of organizational identity, shared green values, and the psychological property of the green product.

- Organizational identity refers to the improvement of the exchange of ecological knowledge, the psychological property of green products and, consequently, the green culture and the organization's performance in the development of green products.
- Shared green values contribute to creating economic value and creating social value, so that the green organizational identity is influenced by these values as well as the psychological propriety of green products.
- As the members of the organization take measures to improve ecological management, they compose the psychological property of ecological products and that is where shared green values again come in, as they provide a strategic orientation for environmental protection initiatives and strengthen the psychological possession of green products by improving the behavior of organizational citizenship for the environment.

So, ecological behaviors in the workplace belong to the category of transformers and have a direct influence on improving the environmental sustainability of the organization's work processes and products (Wiernik *et al.*, 2016, p. 5). It is a space where awareness and knowledge of workers about quality and the use of ecological tools prevail and thus avoiding the risks that lead to a less ecological and poor organizational performance of SMEs, including a high variation of products, delivery times and standard methods.

Based on the need for sustainable growth, efficiency in ecological production has been incorporating ecological and lean tools in SMEs (Strzelczak 2017). For the green and lean paradigms are thought to have cause-effect relationships and overlapping factors. Thus, the lean and green principles are incorporated into industrial production and development systems, through the implementation of a production system that improves management techniques to preserve a more sustainable social, economic, and environmental environment for the needs future of humanity.

In the words of Sajan *et al.* (2017) the strategic approach to sustainability includes effective lean and green operations in SMEs. Since the most agile and green tools balance the principles of lean production and sustainability in production systems and minimize the emission of CO<sub>2</sub> from SMEs to be more competitive (Sajan *et al.*, 2017). As tools, the lean-green production system, green reduces CO<sub>2</sub> while lean reduces costs in the value chain and life cycle assessment (Dües *et al.*, 2013).

An example of the above is the development of possible non-agricultural economic and environmental activities as it is related to rural green tourism, the production of energy and renewable resources, the national cultural, artistic, and ethnic heritage, landscaping, the implementation of the provision of social services such as research, commerce, information, etc. (Zhybak, 2012; Mahiiovych Stan, 2021). This

becomes necessary when the specified quotas for land use vegetation do not ensure that production is consolidated as a more profitable and greener crop. For that reason, the conservation or transformation of green land use degradation must consider the political economy of production (Van Hecken, Kolinjivadi, Huybrechs, Bastiaensen and Merlet, 2021).

## **Green Supply Chain**

The green supply chain is a process that incorporates environmental concerns into long-term organizational purchasing decisions and supplier relationships (Gilbert, 2001). Green supply chain approaches are environment, logistics, and strategy. Studies on green sustainability strategies and financial organizational performance are reflected in social networks, corporate reputation and stakeholder management, addressing research on sustainability and stakeholders related to supply chain management (Lopez-Concepcion, Gil-Lacruz, Saz-Gil, 2021). Employee empowerment is positive for adopting a green supply chain (Namagembe *et al.*, 2016).

Sustainable green supply chain management and circular economy are related concepts (Gurtu *et al.*, 2015). Retailers can commit to circularity that incentivizes suppliers to deliver finished and semi-finished products in a circular orientation. Monetary incentives challenge the effectiveness of evaluating environmental behaviors and organizational performance (Fernández, Junquera & Ordiz, 2003). Incentives to suppliers and other upstream players and agents affect only a small part of the industry leading to the individual supply chain to optimize environmental sustainability (Schultz, Everding and Pies, 2021). The incentives do not depend on the climate Semaan & Pearce (2016) and the measure of economic health in the gross domestic product.

Green delivery of products and services uses green and alternative fuels and encourages green driving. In sum, the supply chain is supported by the organizational culture that moderates the relationship between the culture of sustainability and the organizational performance of the organization.

## **ORGANIZATIONAL GREEN PRODUCTIVITY AND PERFORMANCE STRATEGIES AS WAYS TO ACHIEVE SUSTAINABLE DEVELOPMENT**

Organizational green productivity constitutes a strategy aimed at improving production capacity aimed at sustainable development, at the same time, integrates development strategies and continuous improvement of productive capacity. Thus, organizational productivity is integrated by development strategies in search of protecting the environment in such a way that they serve as the basis for achieving sustainable development and continuous improvement. It should be noted that this type of productivity prioritizes socio-economic development based on the sustainable improvement of the quality of life with minimal or no damage to the environment.

Like development and continuous improvement strategies, the adoption of green innovations has positive effects on productivity (Aldieri *et al.* 2019). And for the establishment of a comprehensive organizational green productivity program, it is necessary to implement a management system to improve productivity and quality, environmental protection, and sustainable development. These types of management systems develop the necessary synergy between green procurement and productivity, serving as a market engine to improve the environment. It is relevant to note that the lack of integration in the

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public procurement process to maintain green spaces can create undesirable secondary effects because each managing organization makes different decisions in construction and maintenance.

Hence the importance of sustainable green governance, property, business, and organizational performance. As the management of organizational performance is ecological, the process to improve professional skills and achieve organizational objectives allows to measure the ecological results of the organizational capacity to meet environmental objectives and goals. So, organizations are focusing on developing green organizational initiatives and actions and environmental concerns to achieve green performance management of the organization. This through the organization's sustainable organizational performance, combining economic, social, and environmental measures leads to sustainable development (Elkington, 1998; Sebhatu, 2008). It is also relevant the building of an inclusive model of entrepreneurship for organizational performance focusing on innovation, knowledge management and intellectual capital aiming on organizational efficiency, productivity and performance (Popescu, 2020).

It should be noted that there are multiple factors to improve the organizational performance of green management depending on the green actions taken, such as innovation strategies (Kim, Park, 2017; Kim, Khan, Wood, Mahmood, 2016; Ulus, Hatipoglu, 2016; Graves, Sarkis, Zhu, 2013; Lülfs, Hahn, 2013; Daily, Bishop, Govindarajulu, 2009; Priyankara, Luo, Saeed, Nubuor, Jayasuriya, 2018), or vision. That is why organizations seek to promote organizational ecological shared value for ecological management since it is related to other elements such as ecological creativity, radical, incremental and reactive ecological innovation, pro-environmental behavior and organizational performance of ecological products (Chen, Chang, Yeh, Cheng, 2015; Chen, Chang, Lin, 2014; Chen, Chang, Lin, Lai, Wang, 2016; Afsar, Maqsoom, Shahjehan, Afridi, Nawaz, Fazliani, 2020; Chen, Lin, Lin, Hung, Chang, Huang, 2020; Chang, Chen, Luan, Chen, 2019).

Strategic human resource management processes such as training, rewards based on organizational performance, motivation, team development, etc., have impacts on green technology innovation (Shattouri *et al.* 2013, p. 71). Organizational ecological behavior, voluntary or on initiative, becomes crucial for organizational environmental organizational performance. Ecological behaviors are discretionary in nature and dimensions of organizational work performance (Campbell & Wiernik, 2015). The findings of a meta-analysis related to ecological behavior in all settings and the organizational performance domain are modest relationships between age and ecological behaviors (Ng and Feldman, 2008). Individual stereotypes suggest that older people are conceptually and empirically lagging in environmental performance of ecological behaviors in organizational performance.

Organizational green behavior can also be counterproductive and negative, not pro-environmental (Ones and Dilchert, 2012b, 2013), such as, for example, using natural raw materials from sources that are not sustainable, not turning off the lights after leaving the office, etc. For each of the identified categories, it is necessary to develop measurement scales (Ones and Dilchert 2012a). Deviant ecological behavior in the workplace provides a conceptual framework for a typology description of environmentally counterproductive ecological behaviors. Emerging from recent theoretical developments to construct and operationalize counterproductive green behaviors in the workplace (Ciocirlan, 2016; Ones & Dilchert, 2012a; Alt & Spitzbeck, 2016; Andersson *et al.*, 2005; Homburg & Stolberg, 2006; Manika *et al.*, 2015; Paillé *et al.*, 2019).

Individual and contextual factors explain employee engagement in counterproductive environmental behaviors, voluntarily or involuntarily. Counterproductive ecological behaviors of employees are related to the adaptation of a categorization of counterproductive work behaviors in the field of sustainability such as sabotage, diversion, etc. (Robinson and Bennett 1997) with the aim of identifying, classifying,

and describing ecological behaviors in the workplace that are harmful to the environment. Intentional behavior of employees to intentionally cause damage to the natural environment, counterproductive ecological behaviors are sometimes related to sloppy work (Belot & Schröder, 2013). The tools for measuring ecological behaviors in the workplace are based on sets of elements used in scales of ecological behaviors, counterproductive ecological behaviors, the emergence of new environmentally oriented behaviors and voluntary ecological behaviors (extra role).

Employees can contribute to creating more strategic sustainable organizational goals that are achieved to achieve high organizational performance, which can be motivated by monetary, non-monetary and recognition rewards to praise sustainability efforts. Collective action and the adoption of organizational resilience in the face of green challenges or stressors that have an impact on the organizational performance of the team and the general well-being. Social cognitive theory holds that collective efforts facilitate desirable behaviors, organizational performance, and team outcomes and encourages completion of their tasks (Bandura, 1986; Jung, Sosik, 2002).

The green team improves the organizational performance of sustainable development and labor productivity (Liu *et al.* 2014, Delmas and Pekovic 2013). Green teams affect both the organization's environmental performance and reputation (Dangelico 2015, p. 735). The effectiveness of green equipment contributes to the green process of the equipment and product innovation (Chen, Chang, Lin, 2014).

Recycling raw material waste using a system of green and lean tools on the production line helps assess the relevance of the project to increase organizational sustainability performance. Green nanotechnology, nano components, nanomaterials, and green nano systems increase the organizational performance of car components and use nano paints that lead to nicer and cleaner cars. The development of green roofs has environmental benefits, among others, the increase of open spaces, the improvement of the organizational performance of the building's energy, the mitigation of the heat island effect.

The green and lean paradigms overlap in different tools with differing functions to achieve sustainable organizational performance. Lean and green methods increase organizational sustainability performance (Dües *et al.* 2013). The relationships of synergistic lean-green manufacturing and sustainable organizational performance (Farias *et al.*, 2019; Thanki *et al.* 2016). Optimizing production systems incorporates lean and eco-friendly tools and techniques. Lean production is recommended in the long term, while green is recommended for SMEs (Belhadi, Touriki, *et al.*, 2018).

The fusion of lean and green production initiatives balances the interrelationships of overlapping paradigms, improving organizational sustainability performance, and reducing costs by considering waste as worthless activities. High costs and production processes are causes to develop a management commitment essential for green and efficient organizational performance. Green and lean tools improve production systems to achieve sustainable organizational performance, reducing production costs and achieving better quality. Tools and techniques to optimize lean and green production systems require training and motivation to increase production efficiency and enrich environmental, economic, and social perspectives (Belhadi, Touriki, *et al.*, 2018).

Companies deal with organizational performance management in terms of environmental organizational performance standards. The sustainable organizational performance of SMEs is supported by lean and green tools that focus on achieving sustainability to serve evergreen. The incorporation of lean and green in SMEs improves sustainable organizational performance, paving the way to new opportunities (Duarte & Cruz-Machado, 2019). The implementation of green and lean fundamentals, principles and tools improve the sustainable organizational performance and production efficiency of SMEs (Belhadi,

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Touriki, *et al.*, 2018). A production system of an SME implements lean and ecological tools to increase the result of the organizational performance of sustainability.

VSM's green and lean tool are used to increase production efficiency in places where opportunities for improvement are identified (Parthanadee and Buddhakulsomsiri, 2014). The implementation of green and lean tools in the production system varies between the framework of the companies with the participation of the top management and the employees to increase the organizational sustainability performance. Lean and green techniques and tools are needed for small businesses to increase organizational sustainability performance, such as the 5S framework to reduce waste, a clean work environment, increase efficiency, and use visual cues (Kandpal 2015). The lean and green company prioritizes 5S tools to improve organizational sustainability performance,

## **CONCLUSION**

The ecological organizational performance supports an adequate consumption model. Green organizational performance must meet the expectations of green consumers. Consumers identify more with organizations that have a strategy for a greener lifestyle. Sustainable human development and training should educate customers about the benefits of being greener and consuming green products.

The psychological property of organic products influences the exchange of ecological knowledge as an intermediate agent of ecological creativity and the organizational performance of the development of ecological products. Green knowledge sharing has a positive relationship with green culture and organizational performance of green product development. Green knowledge management is related to environmental behavior and organizational performance.

Organizations encourage green knowledge sharing behaviors among organization members to enhance green culture and organization performance in green product development with identification of property of green product psychology. The organizational green identity strategy aims for employees to identify with the organization by improving organizational citizenship behavior for the environment, organizational performance of green management and sustainable development goals, improving the green economy.

## **RECOMMENDATIONS**

Organizational strategies and actions for ecological innovation are proposed and designed, sharing the learning of environmental knowledge that leads to increasing ecological production and solving complex environmental problems and increasing profits. Awareness of lean and green concepts is incorporated into production systems. Lean is related to the state of production, increasing the frequency of replenishment. Awareness of lean and green organizational performance for SME production systems used for sustainability. Implement the foundations of green and lean tools, employees and senior management must participate as an input and a moderator adaptable to production and management preferences to achieve the result of organizational sustainability performance.

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## KEY TERMS AND DEFINITIONS

**Green Nanotechnology:** It refers to the use of nanotechnology to enhance the environmental sustainability of processes producing negative externalities.

**Green Supply Chain Management:** Alludes to the concept of integrating sustainable environmental processes into the traditional supply chain.

**Organizational Ecological Culture:** Defines the proper way to behave within the organization. This culture consists of shared beliefs and values established by leaders and then communicated and reinforced through various methods, ultimately shaping employee perceptions, behaviors and understanding.

**Sustainable Consumption:** Is the use of material, products, energy, and immaterial services in such a way that their use minimizes impacts on the environment, so that human needs can be met not only in the present but also for future generations.


**Sustainable Development Goals:** The UN's Sustainable Development Goals aim to end poverty, protect the planet, and ensure prosperity for everyone by 2030.

**Sustainable Management:** Is defined as the application of sustainable practices in commerce, agriculture, environment, production, and other fields by management in manner that is beneficial to present and future generations.

## Chapter 22

# Organizational Green Culture Implications in Organizational Resilience and Green Behaviors

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### **ABSTRACT**

*This study has the aim to analyze the implications between the green culture and creativity in organizational resilience and green behaviors. The analysis assumes that environmentally responsible assumptions, beliefs, values, and behaviors shared by the organizational members through green entrepreneurial and transformational leadership skills, give support to the organizational resilience, green culture, and creativity. The method employed centers around the theoretical and empirical review of the literature to infer some reflective deductions around the state of the art. It is concluded that the organizational green culture and creativity has a direct influence in the organizational green behaviors, entrepreneurship, and transformational skills.*

### **INTRODUCTION**

The cultural theory of the environment provides a holistic approach to the analysis of green culture including environmental awareness, knowledge, and behavior. Environmental sociology has a long-standing concern with nature and incorporating green culture very slowly to analyze the relationships between attitudes, behavior, and knowledge. The environmental cultural theory assumes green culture as a multifaceted construct formed by the green and culture components (Dunlap, 2002). Environmental studies are closely established with nature and sociology to give support to organizational green culture as the component of environmental awareness, attitudes, values, and so forth, simultaneously supported.

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Environmental research focusing on organizational green culture from the cultural theory perspective promotes behavioral cultural changes and provides valuable organizational knowledge and technology based on socially shared beliefs, attitudes, values, norms, and the products of their interactions. Organizational green is a multilevel phenomenon (Marquis, Jackson, Li, 2015; Robertson, Barling, 2013). The concept of green behaviors is a discrete construct related to one behavior that is determinant for another one despite those statements are distinct and do not overlap (Ones and Dilchert 2012b; and Ones et al. 2018). Green organizations are affected by the behavior of members toward the environment (Daily, Bishop, Govindarajulu, 2009; Ramus, Killmer, 2007; Ramus, 2001; Chang, Chen, Luan, Chen, 2019; Anderson, Bateman, 2000; Hanna, Rocky Newman, Johnson, 2000; Walley, Stubbs, 2000)

Green culture analysis incorporating various levels of socio-cultural analysis has been conducted by Ermolaeva, 2010; Dunlap and Jones 2002; Dunlap, 1993 Stern, 1995; Plumwood, 2002; Hoff, 1998; Nie, (1998), etc. Organizational green culture activities are leading to increase green performance and competitive advantage, considering the green environmental issues and concerns.

This study analyzes the implications that organizational culture and creativity has on organizational resilience and green behaviors, including entrepreneurship and transformational leadership.

## **GREEN CULTURE AND CREATIVITY**

Green culture is a complex socio-cultural phenomenon which can be approached from axiological and action-oriented perspectives. From the axiological perspective, is a methodological ground for green culture as environmental attitudes, values and norms related toward the environment to analyze the communication and manufacture of beliefs, attitudes, values, and norms. The action-oriented approach stresses the nature and human action relationship to analyze environmental behavior practices. The green culture dimensions are the environmental awareness, knowledge, and behavior. Organizational green culture dimensions generate more opportunities. Green culture is conceptualized as the collective concern of green environmental awareness (Mancha, Yoder, 2015). The analysis of individual and collective behavior of people is relevant to determine the relationship linking green culture and green environmental sustainability awareness.

The design of an environmental awareness strategy to enhance green culture. Green culture is a framework to design and implement organizational green strategies targeting the environmental awareness (Yang, Sun, Zhang, Wang, 2017; Fraj, Martínez, Matute, 2011. Organizational culture integrates environmental values into a green culture strategy to guide collective awareness and behaviors to have an impact on the organizational environmental performance (Sugita, Takahashi, 2015; Yang, Sun, Zhang, Wang 2017).

Environmental awareness leads to strong offers and stances (Barber, Taylor, and Deale, 2010). Organizational green culture affects the awareness of members and stakeholders in terms of green innovation committed to sustainability and ecology and reducing environmental damage (Yang, Sun, Zhang, Wang, 2017) Green organizational culture reflects the needs of organizations and people to have a cultural transformation for collective awareness and actions toward environments and stakeholders (Aliyu et al., 2015).

The action-oriented approach to green culture determines the fundamental human actions in relationship with nature. The action-oriented approach establishes the relationships between green culture and environmental attitudes and investigates the effect of environmental awareness and values practices. (Asafova, 2000; Ermolaeva, 2010; Chan and Lau 2000; Sreen, Purbey, Sadarangani, 2018). The axi-



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ological approach is a methodological fit for analyzing environmental attitudes and awareness of green values given the complexity of green culture (Baharov, 2000; Ermolaeva, 2010).

Environmental awareness influences individual attitudes towards green culture performance (Julina, 2013). Organizational green goals require to be supported by a green information system infrastructure aligned with ecological values nurtured by a green culture and environmental awareness and attitudes. The environmental attitude is a mediating construct between the green environmental awareness on green culture. The environmental attitudes are linked to the cultural stances on environmental awareness. Environmental attitude mediates the relationship between green culture and green environmental awareness (Sreen, Purbey, Sadarangani, 2018).

The environmental attitude is a mediating variable between the green culture as an endogenous variable and green environmental awareness and green product value as exogenous variables which results in that the environmental attitude mediates the relationship between green culture and green product value (Ogiemwonyi, Osarodion et al. 2020). The exogenous variables green environmental awareness and green product value are significantly related to green culture as an endogenous variable (Ermolaeva, 2010; Gurbuz, Ozkan, 2019; Yang, Sun, Zhang, and Wang, 2017; Chan and Lau, 2000; Kong, Harun, Sulong and Lily, 2014; Kaida, Kaida, 2016).

Knowledge on environmental culture is the standpoint for green movements in local communities to promote green culture. These factors have different green limitations for the research analysis to examine green culture in specific local communities and organizations. Individuals with a higher level of studies exhibit higher stand and advocacy of green culture because they are more knowledgeable of the environmental gains (Henion, 1972). Different types of green culture identify segments of people with similar attitudinal and behavior profiles and their relationships between environmental attitudes, behavioral and knowledge.

A study conducted by García-Machado, Martínez-Ávila, (2019) examine green innovation as a mediating effect between green culture and environmental performance in the Mexican automobile industry, modelled as a second-order composite. This study confirms empirically the mediating effect of green innovation adding knowledge for sustainability and environment development.

Cultural diversity as a moderator is not relevant on age-employee green behaviors and there are situational differences across the organizational contexts in terms of power, autonomy, social roles, etc. Green organizations are lacking diversity and not yielding the diversity (Labaye, 2012; Roberson & Park, 2007). Employee green behaviors are scalable behaviors and actions engaged and linked that contribute to environmental sustainability (Ones and Dilchert 2009; Ones and Dilchert, 2012a, p. 87). The situational differences may have effects on environmental green behaviors moderating the effects of other variables (Ones and Dilchert, 2012b). Organizational green culture has an influence on green creativity and entrepreneurial organizations operate under a green organizational culture to develop strategies to give support the organization through the environmental values (McCullough et al., 2016).

People and environment are concepts involved in green culture to promote ecological development and sustainable economic growth (Galpin et al., 2015). Green culture is an axiological attitude including elements, values and norms related to the environmental sustainability (Ogiemwonyi, et al (2020). The transformation toward greener organizational model is a multifaceted and multi-layered process (Anderson 1998). Organizations bearing green culture thrive in sustainability strategy to protect the environment and attracting talent in the process. Thus, it integrates culture with environment and people.

Organizational green culture predicts green performance and competitive advantage. Green innovation mediates organizational green culture and organizational green performance and in situations of envi-

ronmental pressure partially mediates between organizational green culture and competitive advantages and offers the theoretical background for the mediating effect of green innovation strategy (Wang, 2019).

Green creativity implementation and development leads to green innovation helping society and organizations to achieve sustainable environmental development responding to green trends and creating sustainable competitive advantages (Norton, Parker, Zacher, Ashkanasy, 2015; Chen, Chang, 2013; Chang, 2011). Research on green creativity (Song, Yu, 2018; Mittal, Dhar, 2016) have focused on individual-level

The consumer has the tendency towards a strong cultural stance on the environment with and impact on his attitude to adopt green culture and green product value. The study does not prove that the environmental attitude has a mediating effect on the relationship between green environmental awareness and green culture (Cai and Shannon, 2012; Baron and Kenny, 1986). The environmental awareness of consumers does not have an influence on their environmental attitude. The environmental attitude does not have an influence on the green culture

## **ORGANIZATIONAL RESILIENCE AND GREEN BEHAVIORS**

The concept of resilience is used in the organizational and management context as the ability to interact with adverse circumstances as the result of significant turmoil or the aggregation of negligible interferences (Sutcliffe & Vogus, 2003). Organizational resilience has a positive effect on environmental pressure and the outcomes of the organization in challenging work environment (Chen, McCabe, & Hyatt, 2017; Shatté et al., 2017) and considered as an outcome on wellbeing (Pangallo, Zibarras, & Patterson, 2016), work engagement (Malik & Garg, 2017) and duty performance (Ceschi, Demerouti, Sartori, & Weller, 2017).

Work environmental organizational activities have a positive association with satisfaction, recruitment, and retention (Wagner 2011, p. 157; Chia-Jung Chou 2014). The standards related to voluntary environmental improve the recruitment process of employees (Grolleau et al. 2012, p. 74). Absorption into green related activities is a component characterized by the attachment to green-related work (Schaufeli, Bakker, & Salanova, 2006). Environmental philanthropy promotes the wellbeing of society and organizations invest in projects for the wellbeing of future generation. Institutional pressure drives organizational green behavior (Delmas, 2002; Schaefer, 2007).

The conservation of resource theory proposed by Hobfoll, (1989, 2001) and the broaden-and-build theory (Frederickson 2001), it is inferred that green work engagement fosters green team resilience, and it is positively associated. Green work engagement reflects the green-related activities, mental pliability, the optimal level of energy, dedication, diligence, and involvement. The evaluation of cognitive involvement of employees in green-related activities leads to green work engagement affecting the green team resilience.

Green related activities are displayed by employees with dedication absorption leading to boost team resilience. Green team resilience emerges as a captivating topic introduced in the green oriented organization (Eys et al. 2019). Green teamwork results from individual solutions to complicate environmental problems (Daily et al. 2007). The green team represents the shared belief and confidence of working together to achieve green goals (Chen, Chang, Lin, 2014).

The shared values, norms, and beliefs of the team about green innovative activities constitutes the DNA among team members (Chen, Bliese, 2002; Epitropaki, Kark, Mainemelis, Lord, 2017). Focusing on the latent and explicit needs of the stakeholder's values in the ecosystem the development of green

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offerings rests upon the organizational values (Linnet al. 2012) such as collaboration, essential for developing the organizational green model (Roy and Whelan, 1992; Hart, 2005; Porter and Van der Linde, 1995). Organizations face a growing pressure to adopt green models and reduce environmental effects.

The team green efficacy, according to the social cognitive theory, represents the evaluation of the collective capacity to complete green initiatives exerting the efforts to become success full (Bandura, 1986; Riggs, Warka, Babasa, Betancourt, Hooker, 1994; Chen, Chang, Lin, 2014). Organizations should develop green team resilience to face economic hostility and adversity against green ethos, engaged towards green related activities. Green teamwork, recruitment, selection, and reward systems are activities oriented towards environmental activities that significant positive association with satisfaction and retention (Daily, Bishop, and Steiner, 2007; Grolleau et al. 2012; Wagner 2011; Jabbour, et al, 2013).

The system of green recruitment provides an opportunity to the employer to attract candidates to be employees focused on the organizational environment-friendly and green inducting sustainable processes and retain them after induction. The green recruitment is a process that must be aligned with organizational environment-friendly issues.

Organizational green team resilience is established via strategic interventions and training programs (Alliger, Cerasoli, Tannenbaum, & Vessey, 2015; Amaral et al., 2015; Centobelli, Cerchione, & Ertz, 2020). The evolution of new set of pro green competencies and skills among the employees of organizations. Green team resilience is strengthened by the vigor of the green resilient staff at the workplace supporting the social systems and is adaptive to cope to green-related challenges (Fredrickson, Tugade, Waugh, & Larkin, 2003).

The relationship between workplace behaviors and age determines the engagement of older people in green behaviors (Wiernik et al. 2016). Green organizational rewards include lifestyle and use of workplace benefits, recognitions of green agenda engagement of (Pillai & Sivathanu, 2014, p. 1). Compensation programs could be awarded bonuses based on appraisal ratings of behavioral and technical competencies in outstanding work of employees (Liebowitz, 2010, p. 53). An engagement strategy for employees leads towards effective organizational outcomes.

Performing sustainable work and duties may be in-role green behavior or extra-role green behavior. In-role green behaviors in an environmental sustainability context may provide sufficient perspective to challenge the porosity between the in-role and extra-role green behaviors (Bissing-Olson et al. 2013). The nature of green behaviors in organizational settings is subject to identify the causes and consequences of green behaviors to implement the right techniques and methods of intervention and operationalization of green behaviors at the workplace.

Organizational members with personality traits more focused on green issues help others to have environmental behavior (Brick and Lewis, 2016). The pro-environmental behaviors at the workplace from the perspectives of processes and environmental psychology (Ramus and Steger 2000; TUC Green Workplaces, 2007; Garling, Fujii, & Garling, 2003; Staats, Harland, & Wilke, 2004). Perceptions of organizational green psychological climate regarding pro-environmental behaviors such as conserving energy, recycling, and waste reduction overcome organizational threats to the natural environment. Psychological ownership has influence on the behavior of organizational members. Organizational green perception of stakeholders encourages growth.

Organizational psychology theory is useful to design strategic interventions for improving and enhancing green behaviors at work, without being concerned on individual differentials. Individual organizational perspective is being neglected (Garza-Reyes, 2015; Govindan et al., 2015). Green organizational psychological climate promotes green organizational behaviors and discretionary pro-social behaviors

(Norton et al., 2017). Pro-environmental behaviors in employee and personal green behaviors have situational differences withing working and non-working settings (Ones and Dilchert, 2013).

Personal environmental norms have moderated effects on employees' environmental Behavior. Individual green behaviors in the workplace setting examine the actions and the factors associated. Individual green behavioral should have the intentions to incentive, improve participation, and mutual aid to adopt green behaviors (Boiral and Paillé 2012). Motivation of individuals at the workplace have different effects in the type of behavior such as energy conservation, recycling, etc. (Steg & Vlek, 2009).

Human dimensions of employee motivation, training and rewarding contribute to the implementation of management principles (Cherian and Jacob 2012). Motivations of employees vary in accordance with the type of adopted green behavior (Ciocirlan, 2016; Manika et al., 2015; Ones & Dilchert, 2012b). Motivation of employees to become more involved and engaged in environmental behaviors (McDonald 2014).

Green organizational behavior can be exerted both directly and indirectly (Homburg and Stolberg 2006). Direct influence on the environment is related to an intermediate stage corresponding to the encouragement to adopt green organizational behaviors. To describe the different types of green organizational behavior have been developed different taxonomies (Zibarras, Judson, & Barnes, 2011) such as the environmental initiatives (Boiral & Paillé, 2012; Lamm et al., 2013), and green workplace behaviors (Ones and Dilchert 2012a).

Different types of green behavior may vary in response to psychological and demographic substantial differences such as age, although some studies argue that substantial differences in age for green behaviors are unlikely, and still more recent meta-analytic research of environmental behavior suggests that age differences in green behaviors are likely to be small (Wiernik et al., 2013). The age-related socio-psychological factors is a proxy for the variable of green behavior in environmental sustainability and other variables such as personality traits and environmental attitudes have a relevant impact on green behaviors (Kim et al., 2014; Scherbaum et al., 2008).

Green organizational behaviors can be categorized based on their type, degree of inclusion in tasks and level of influence. These parameters provide the basis for green behaviors at the workplace (Ciocirlan, 2016; Wiernik, Dilchert, & Ones, 2016). Society (Wiernik et al., 2016; Wiernik, Ones, & Dilchert, 2013), and the meta-analysis are used to classify green workplace behaviors with the advantage to combine results (Wiernik et al., 2013; Wiernik et al., 2016) of independent studies following a protocol (Hunter & Schmidt, 2004). There are green behaviors linked to job tasks and green behaviors linked to home (Norton et al., 2015). Green behaviors are voluntary to become more environmentally friendly (Ones and Dilchert 2012b).

Work psychology (Bissing-Olson et al. 2013, Fredrickson, 2003) helps to understand the relationship between the level of inclusion in the task and the intensity for adoption of green behaviors at the workplace. There has been longitudinal research to better understand workplace processes in green behaviors unfolding and changing over the course of individual lives (Baltes et al., 2012). Green behaviors at the workplace should incorporate collective measures instead of being tested at individual level (Kim, Kim, Han, Jackson, & Ployhart, 2014; Pinzone et al., 2016; Zibarras, et al. 2011). The level of task inclusions improves the green behaviors at the workplace (Boiral, 2009; Boiral & Paillé, 2012, Daily & Bishop, 2009).

Low and high intensity model green behaviors at the workplace is grouped in categories of sustainable daily work, environmental civic mindedness, and environmental voice behavior (Ciocirlan 2016). These emerging subcategories are included in the metacategories (Wiernik et al. 2016; Ones and Dilchert 2012a). Green organizational behaviors should be inclusive in tasks in which in-role behaviors are required in rewarded tasks, and extra role behaviors are discretionary. Green organizational behaviors

should be inclusive in tasks in which in-role behaviors are required in rewarded tasks, and extra role behaviors are discretionary (Ramus and Killmer 2007). To become more inclusive, green organizations need to advance retention and promotion of diversity (Zatzick, Elvira, & Cohen, 2003). Firms rewarding green behaviors with various types and financial incentives are effective in motivating eco-initiatives (Phillips, 2007, p. 9; Ramus, 2002).

The level of in-role behaviors and extra-role inclusion on environmental concerns, provides the conceptual tools for the nature of green behaviors in the workplace (Bissing-Olson et al., 2013). In-role and extra-role green behaviors can be integrated into tasks in green industries (Paillé et al. 2013). The green behavior at the workplace demonstrates a redundancy pattern, which requires to direct more effort to engage

An analytical approach driven by economy considers to be subcategories of the different types of green behaviors, closely related to organizational citizenship behavior environmental (Boiral and Paillé 2012; Organ, 1988). Organizational citizenship behavior for environment is referring to the organizational spontaneous behavior to enhance organizational green management (Boiral, 2009; Daily, Bishop, Govindarajulu, 2009; Chang, Chen, Luan, Chen, 2019; Paillé, Boiral, Chen, 2013). Organizational citizenship behavior for the environment enhances development of organizational green strategy aimed to achieve sustainable green organizations (Daily, Bishop, Govindarajulu, 2009; Priyankara, Luo, Saeed, Nubuor, Jayasuriya, 2018; Organ, 1997).

There is a trend toward more abstract subcategories of green behaviors (Boiral and Paillé in 2012). Some categories of green behaviors at the workplace require more risk taking and effort. The intensity required by adopting personal green behavior at the workplace, like turning off the computers is a low intensity that requires less effort and lower risk (Ciocirlan 2016). Different green behaviors at the workplace focus on different specific behaviors such as recycling garbage in the workplace.

The different categories of identified green organizational behavior overlap at operationalization levels of development making possible the combination of several scales to measure the green behaviors at the workplace bridging the gap between the interpretations and theoretical approaches. Measurement of green behaviors at the workplace can determine their frequency among employees (Robertson & Barling, 2017). Measurements are divided based on the individuals' actions and the conceptualization of the distinct types of green behavior taking specific actions (Homburg and Stolberg 2006). Recycling environmental behavior is measured by scales (Lamm et al., 2013; Lee & De Young, 1994; Manika, Wells, Gregory-Smith, & Gentry, 2015; Robertson & Barling, 2013).

Operationalization green organizational behaviors need methodological coherence (Robertson and Barling, 2013, 2017). Operationalization of green organizational behaviors gives rise to organizational citizenship environmental behaviors. Green behaviors are analyzed by (Inoue & Alfaro-Barrantes, 2015; Lo, Peters, & Kok, 2012; Norton, Parker, Zacher, & Ashkanasy, 2015; Young et al., 2015).

Operationalization of green behaviors and unification at the workplace raises the question of the possible effects. Sabotage behaviors adopt actions such as hiding data, environmental resources (Ciocirlan, 2016). Operationalization of green behaviors at the workplace determines the degree of maturity and the effects of unification.

The focus must be on measurement tools and tendencies of information on the nature of scale, redundancy, and types of employees (Inoue & Alfaro-Barrantes, 2015; Lo et al., 2012; Norton et al., 2015; Young et al., 2015).

The green reputation attracts some applicants, although the information about the firm environment on the website. Environmental reputation has a positive relationship with attraction to applicants, but

green reputation has no significant relationship with the information on the recruitment website of the firm (Guerci et al. 2016).

## **GREEN ENTREPRENEURSHIP AND TRANSFORMATIONAL LEADERSHIP**

Green culture can be developed by transformational leadership, entrepreneurship, and a managerial team capable to disseminate and share the beliefs and value systems leading to greening goals (Gao, 2017). Entrepreneurship, organizational green culture, and transformational leadership are organizational resources able to influence the shared beliefs and value systems shaping the environmental behaviors (Banerjee, 2002; Graves & Sarkis, 2012, 2018; Robertson & Barling, 2013, 2017; Wang, 2019).

Management studies assume the separation of nature and humans which may lead to the overexploitation of natural resources, prompting organizations to design and implement strategies based on green entrepreneurship and green transformational leadership and green human resource management relevant to achieve environmental performance. Transformational leadership as entrepreneurship have an influence on organizational green culture and the pro-environmental behavior (Azhar and Yang 2019) influenced by the organizational and contextual factors in workplace settings (Azhar, & Yang, 2021).

Entrepreneurship and transformational leadership and green culture considered as organizational resources stimulate the discretionary organizational pro environmental behavior (Brio et al., 2007; Egri & Herman, 2000; Fernández et al., 2006, Graves & Sarkis, 2012; Norton et al., 2012; Ramus & Steger, 2000; Robertson & Barling, 2013; Sanyal & Pal, 2017). Pro environmental behaviors are driven strongly by transformational leadership back up by an organization green culture. Individual and social pro environmental behaviors value action barriers moderate the effects between organization green culture and transformational leadership confirming the relevance of organizational culture in promoting and supporting pro environmental behaviors concerns in organizations (Ashikali & Groeneveld, 2015; Fernández et al., 2003).

Green transformational leadership promotes organizational green creativity considering resource commitment (Mittal, Dhar, 2016). Green culture has a mediating effect between green ability, motivation and opportunity and environmental performance, as well as green transformational leadership and environmental performance (Rizvi, and Garg 2021).

Business organizations must increase their green creativity by promoting resource commitment among their personnel. Implementing strategic green entrepreneurship is based on networking relationships of cooperation (Stadnyk, Krasovska, Pchelianska, and Holovchuk, 2021). The foundation of lean and green tools from the theory and uses are the optimal use of energy and reduction of waste (Siegel et al., 2019).

Green and lean management for SME is supported by awareness, long-term thinking, competitiveness, sustainability, flexibility, and multitasking (Harisekar, 2021). There is more efficiency when workers are aware of the green and lean tools and the 5S. Green and lean are not necessarily costly processes that requires much investment to sustain future challenges (Belhadi, Touriki, et al., 2018, a, b.; Dües, C. M., Tan, K. H., & Lim, M. 2013).

The strategies of green human resource management are related to green ability, motivation, and opportunity while the strategy of green entrepreneurship and transformational leadership is aimed to improve the organizational environmental performance (Rizvi, and Garg 2021).

## **PRACTICAL IMPLICATIONS**

Implementing green culture requires precision of the concept and its implications on the environmental awareness promoted by green movements and actors aimed to increase education, disseminate, and apply green cultures, behaviors, beliefs, and values aimed to enhance sustainability, environmental and organizational green performance.

Introducing new green practices in the facilities of the services sector related to the choice of customer, management play a relevant role in bringing the best of the local green culture through an appropriate training program (Ahmed, Mokhtar, Lim; Hooi; Lee, 2021). Anthropocentric and ecocentric green product values are associated to green cultural behaviors and environmental awareness concerns (Kaida and Kaida, 2016; Nordlund and Garvill, 2003; Ghazali, Soon, Mutum and Nguyen, 2017). The green consumer awareness on environmental concerns, issues and challenges is based on the cultural model (Franke, Hofstede, Bond, 1991).

Organizational green culture supporting green entrepreneurship and creativity calls for constructive transformations for managerial practices and procedures, or no such green culture can be conceived (Hermann, Bossle, 2020; Asiah, Cempaka, David, 2018). Green culture leadership and entrepreneurial oriented is essential for the promotion of green practices towards sustainable organizational development due to the contribution to reduce carbon emission, water resources management and safety food supply. Leadership and entrepreneurial skills and other institutional and individual capabilities at local level are necessary for sustainable development (Hermann, Bossle, 2020).

A practical implication for green entrepreneurship, leadership, decision-making, and management is focusing on aligning green behaviors and green creativity to achieve green innovation spatial infrastructure with innovative practices aimed to organizational resilience. Alignment of green culture with green innovation and green innovation spatial infrastructure contribute to organizational resilience and provide empirical evidence of alignment between green culture and green technology in any type of organization.

Another example of practical implication is the improvement of voluntary eco-behavior in the hospitality industry, for example, is the result of green leadership and entrepreneurship skills have implications for green management practices (Pham, Phan, Tučková, Vo, Nguyen, 2018).

Green human resource management practices enhance organizational green culture influencing green performance and competitiveness through enablers such as the entrepreneurship, leadership, message credibility, empowerment, and involvement. The study finds that green human resource management supports the development of the environmental green culture and the organizational green competitive advantage (Muisyo, Su, Ho, Julius, and Usmani (2021). Entrepreneurship as well as leadership are a vehicle to transform and changing culture of individuals and the organization to create, live and practice the green culture of innovation (Porter-O'Grady and Malloch, 2010).

## **CONCLUSION**

Organizational green culture has an influence on green creativity, organizational resilience and green behaviors that give support to entrepreneurial organizations with transformational leadership skills that enable to develop strategies to give support to the organization and operate through the environmental values. Green culture and transformational leadership have a positive influence on pro environmental behaviors moderated by the value-action barriers. Green culture and transformational leadership are

independent variables and distinctive constructs used to analyze the normative and social organizational elements influencing the green behaviors.

Organizations must create healthy ecosystems and economic value. Research has found some evidence on the mediating effects of environmental attitudes on green culture, green environmental awareness, and green product value. Organizations encouraging and promoting green culture as values and proposals based on green innovation and environmental performance, generate a commitment to environmental sustainability beneficial to human health and to society. Organizational members, actors and stakeholders are becoming aware of caring the environment for future generations.

Future research should include more exogeneous variables and mediating variables such as product value between environmental awareness and attitude with impact on green culture and consumer behavior to enable the design and implementation of green strategies

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