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LAGGING BEHIND THE SUSTAINABLE DEVELOPMENT GOALS: SCENARIOS FOR MEXICO BY 2030 BASED ON EXPERT OPINION

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por

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LIST OF ABBREVIATIONS

BAU – Business as Usual

CEMPE – Centro de Modelística y Pronósticos Económicos

COP26 – 26th Annual Summit of Conference of the Parties - United Nations Climate Change Conference

COP27 – 27th Annual Summit of Conference of the Parties - United Nations Climate Change Conference

DBI – Doing Business Index

DEM – Doughnut Economic Model

ECLAC – Economic Commission for Latin America and Caribbean

ECOSOC – Economic and Social Council

EIU – The Economist Intelligence Unit

FDI – Foreign Direct Investment

GCI – Global Competitiveness Index

GHG – Greenhouse Gases

GII – Gender Inequality Index

GSCI – Global Sustainable Competitiveness Index

GT – Grounded Theory

HDI – Human Development Index

HDR – Human Development Report

IHDI – Inequality- adjusted Human Development Index

IMCO – Instituto Mexicano para la Competitividad

IMD – Institute for Management Development (Switzerland)

IP – Industrial Policy

MDG – Millennium Development Project

MDI – Matrix of Direct Influences

MPI – Multidimensional Poverty Index

NEF – New Economics Foundation

PPHDI – Planetary pressures-adjusted Human Development Index

R&D – Research and Development

SDG – Sustainable Development Goals

SSI – SolAbility Sustainable Intelligence

TED – Technology, Entertainment, Design

UNDP – United Nations Development Programme

UNFCCC – United Nations Framework Convention on Climate Change

WCR – World Competitiveness Ranking

WEF – World Economic Forum

ZERI – Zero Emissions Research and Initiatives

ABSTRACT

Uncertainty has always accompanied humanity along with the desire to have foresight of what may come. Throughout history man developed different tools and methods to study the future. The reasons were obvious: trying to create a desirable future while avoiding undesirable outcomes. With major technological breakthroughs such as computers, the internet, and artificial intelligence, our ambition grew stronger to design and predict our future. However, major deviations from inertia or business as usual models can and do occur, as the pandemic did in 2020. This is especially important to keep in mind when humanity faces major global challenges that do not respect borders, such as organic and digital viruses, nuclear weapons, global warming, and rising sea levels. Hence, good coping strategies include global cooperation and preparedness for different scenarios. Development and progress of one country cannot be separated from that of other countries. This thesis explores the future of sustainable development in Mexico by 2030 through scenario planning. The research is based on expert opinion using qualitative foresight methods. For this reason, thirty experts with diverse backgrounds participated in three rounds of interviews. Results indicate a convergence in expert opinion concerning uncertainties ranging from heightened political risk, worsening public safety and sluggish economic growth. Using the cross-matrix methodology, four scenarios were developed that present different potential futures by 2030. These scenarios are validated with relevant literature, official documents, and recent reports. The most likely scenario suggests that Mexico is unlikely to meet the Sustainable Development Goals of the UN Agenda by 2030. The implication for the country is to develop strategic plans with stronger political commitment to the design and implementation of public policies that are conducive to sustainable development. At the same time, it is also critical to develop a proper preparedness plan to avert potential negative shocks and non-compliance with the international agreement of the UN. The present work contributes to the research and collective thinking about Mexico's development and what may come by 2030 in terms of sustainable development.

Keywords: Sustainable Development; Mexico; UN Agenda 2030, Scenario Planning; Qualitative Foresight Methods.

RESUMEN

La incertidumbre ha acompañado a la humanidad junto con el deseo de prever lo que puede acontecer. En respuesta a esto, el hombre ha desarrollado diferentes herramientas y métodos para anticiparse a escenarios y tratar de crear un futuro deseable, evitando resultados indeseables. Nuestra ambición de diseñar y predecir nuestro futuro se fortaleció con la llegada de los avances tecnológicos. Sin embargo, existe el riesgo de desviaciones importantes de la inercia o de los modelos habituales, como sucedió con la pandemia en 2020. Ante grandes desafíos globales, hasta cierto punto impredecibles – como dicha pandemia – es especialmente importante tener en cuenta estrategias para enfrentar, que incluyen la cooperación global y la preparación para diferentes escenarios. Esto principalmente porque el desarrollo y el progreso de un país no pueden separarse del de otros países independientemente de la situación. Esta tesis explora el futuro del desarrollo sustentable en México al 2030 a través de la planificación de escenarios. La investigación se basa en la opinión de expertos utilizando métodos cualitativos de prospectiva. Por ello, treinta expertos de diversa procedencia participaron en tres rondas de entrevistas. Los resultados indican una convergencia en la opinión de los expertos en temas como: un mayor riesgo político, el empeoramiento de la seguridad pública y el lento crecimiento económico. Usando la metodología de matriz cruzada, se desarrollaron cuatro escenarios que presentan diferentes futuros potenciales para 2030. Estos escenarios se validan con literatura relevante, documentos oficiales e informes recientes. El escenario más factible señala que es poco probable que México cumpla con los Objetivos de Desarrollo Sostenible de la Agenda de la ONU para 2030. Esto implicaría que el país debe desarrollar planes estratégicos con un mayor compromiso para el diseño e implementación de políticas públicas que conduzcan al desarrollo sostenible. Al mismo tiempo, los resultados sugieren que es fundamental desarrollar un plan de preparación adecuado para evitar posibles impactos negativos y el incumplimiento del acuerdo internacional de la ONU. El presente trabajo contribuye a la investigación y al pensamiento colectivo sobre el desarrollo de México hacia lo que puede venir al 2030 en materia de desarrollo sustentable.

Palabras clave: Desarrollo Sostenible; Planificación de Escenarios; México; Métodos Cualitativos.

DEDICATION

To my mother, Éva Álmos, from whom I received everything: life, love, roots, ambition, grit, guidance and help in every step of my life. I also owe thanks to my father, Csaba Lengyel, from whom in addition to receiving love, I picked up curiosity which led me to lifelong learning. I am dedicating this work to my daughters Helena and Uma, for whom I want to give everything: love, inspiration, ambition, perseverance, and assistance with whatever is needed and requested. Always.

"*When you have eliminated all which is impossible, then whatever remains, however improbable, must be the truth."*

Sir Arthur Conan Doyle

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CHAPTER 1. INTRODUCTION

By the third decade of the 21st century, humanity lives in a very globalized world. This world has been characterized by increasing interconnectedness, interdependence among markets, mobility of people and rising instability in international relations. Lately, however, the enthusiasm for globalization has been changing and references such as "slowbalization" or "de-globalization" are not uncommon terms seen in the media (Olivié and Gracia 2020). Several previously known structural uncertainties of the future, such as demographic change, economic and trade relations, environmental, social and political megatrends, became heightened during the COVID-19 pandemic of 2020, setting the stage for a world with a greater risk of instability in the upcoming decades (National Intelligence Council 2021). Tensions, among countries and within societies, have increased notably and threaten global cooperation on a wide range of issues, including climate change, migration, trade disputes, and political cooperation. For example, as a direct consequence of the pandemic, borders have been closed partially or totally in many countries for several weeks during 2020 and renewed economic protectionism limits the free flow of goods and services. The process of globalization has lost its appeal again, as during the 2007-2008 financial crisis, and a profound reconfiguration of political and economic relations is unfolding. At the onset of the new decade, deep uncertainties characterize the world. At the same time, there is no evidence that Covid-19 caused the collapse of global trade flows and led to a major shift to regionalization (Altman & Bastian, 2021). Further tensions emerged in early 2022, when Russian troops have invaded Ukraine resulting in global political and economic instability, along with the

threat of a nuclear attack and massive migration of the Ukrainian population. The conflict brought along price hikes of wheat and energy on global markets, worsening the inflationary trend that prevails in both developed and emerging countries in the era of post-pandemic recovery (Alvarez & Barrett, 2022).

The new circumstances prompted governments to rethink their previous development plans and force them to first attend to the imminent situations related to the pandemic and next, review the mid- and long-term plans for recovery and restructuring. Therefore, leaders must undertake the tasks of identifying the key driving forces that will shape the next decade and present a coherent strategic plan towards a desired future. In this quest for accommodating to the new challenges previously existing problems cannot be ignored either, as several of them – such as inequality, social polarization, and environmental sustainability – became more acute as a consequence of the 2020-2021 crisis (Altamirano et al. 2020). Hence, there is a need for proper diagnosis of megatrends and mapping the new critical uncertainties so that adequate public policies can be designed. Leaders at all levels of governance must be creative and innovative so that they can adequately respond to the voters' needs.

No doubt, every country has its own set of challenges which need to be considered within the international environment. For emerging countries, such as Mexico, overcoming the economic crisis may prove to be more strenuous, given that the availability of financing is more limited, compared to advanced economies. Although public debt financing is possible, it exposes emerging countries to additional sovereign debt-related risks on international markets and inflationary pressures within their countries (IMF 2020). For this reason, the timely implementation of adequate macroeconomic policies, both fiscal and monetary policies, are quintessential for a less

painful and fast economic recovery. At the same time, international commitments, for example, the Agenda of Sustainable Development by 2030 of the United Nations (United Nations General Assembly 2015) and the Paris Climate Agreement (United Nations Framework Convention on Climate Change Secretariat, 2015), are expected to be honored by the member states. Due to these limiting conditions internally and externally, strategic foresight and scenario planning may provide valuable insights to successfully navigate from the present situation to a desirable future scenario.

The present dissertation addresses the challenges that Mexico faces in the 2020s in finding a path for sustainable development while trying to improve its international competitiveness. The first concept, sustainable development, is examined through the concepts of the Doughnut Economic Model (DEM) (Raworth, 2017b), which is a newer adaptation of the Sustainable Development Objectives of the UN Agenda 2030 (United Nations General Assembly 2015). The second concept, international competitiveness, is studied and evaluated according to the Sustainable Global Competitiveness Index (SolAbility Sustainable Intelligence, 2013) as it represents a departure from the Global Competitiveness Index presented annually by the World Economic Forum (WEF, 2019). The first concept provides the theoretical framework to analyze whether Mexico will meet the UN Agenda by 2030. In addition, the research investigates whether sustainable development is compatible with the concept of international competitiveness. The study focuses on Mexico and its challenges ahead for the next 10 years. To this end, a qualitative study based on expert insight provides the foundation for scenario planning by 2030 to explore possible futures. Based on the scenarios it is possible to offer recommendations for public policies that may be needed to create the best outcome for the country.

Key findings of the present research include the following observations: first, Mexico faces important challenges that may make it difficult to meet the 17 SDGs of UN Agenda 2030. Second, sustainable development may not be compatible with the current form of capitalism as it undermines community and social development. Third, international competitiveness may not be compatible or relevant for sustainable development, as competitiveness based on the prevailing capitalistic economic structure does not properly take into account the impacts of economic activities on the environment and on the social fabric. Fourth, indicators such as the Global Sustainable Competitiveness Index (GSCI) (SolAbility Sustainable Intelligence 2013), the Happy Planet Index (Jeffrey et al., 2016) or the Better Life Index (OECD, 2020) and alternative economic models that focus on the principles of sustainability may be more conducive to the assessment of sustainable development. Fifth, current environmental policies and natural resource management may not secure that Mexico remains within the planetary boundaries by the end of the decade. Sixth, convergence to high income countries may be a misleading concept in a world that is becoming more limited by the planetary boundaries and most high-income countries exceed the limits (Rockström et al. 2009; Stockholm Resilience Center n.d.).

With respect to public policies, it is apparent from the investigation that experts hope to see a national consensus putting aside political and ideological differences in order to seek the progress of the country. Furthermore, if public policies are not inclusive, not supported by the majority, and are implemented in a legally contested way (in other words, not democratically), the intended results may not be attained in a sustainable manner, slowing down the country's development even further. To avoid another "lost decade" in Mexico in terms of economic development and inequality reduction that is coupled with an extremely stressing ecological situation, a clear transition needs to be

implemented towards a cleaner and sustainable economic model, based on major structural changes.

1.1. Background and Problem Description

There are different international evaluations for the progress of the economic development of a country. Several measures and indicators are widely used and provided by prestigious international organizations such as the United Nations, the World Bank, the World Economic Forum, and by national governmental agencies, for example, the *Instituto Nacional de Estadística y Geografía* (INEGI) in Mexico. However, the relationship between the indicators of international competitiveness and sustainable development are not clear, even if there are overlaps and similarities among the sub-components. Furthermore, it is unclear if international competitiveness as it is measured by the WEF promotes sustainable development and if the pursuit of higher competitiveness actually leads to greater economic growth in a sustained and beneficial way for an emerging country that aspires to approach high-income countries' living standards. From the point of view of sustainable development, which is the key objective of the UN 2030 Agenda, the 17 Sustainable Development Goals (SDGs) may not be difficult compatible with the concepts and ambitions measured with the metrics of international competitiveness. From these dilemmas arise the following central research question:

Is Mexico on a sustainable development path to achieve the UN Agenda 2030's SDGs?

Subsequent research questions that help to gain insight to the question above are:

1) Is international competitiveness conducive to sustainable economic development for Mexico?

2) What possible future scenarios lie ahead for Mexico's development by 2030, in terms of sustainable development?

3) What recommendations derive from the scenarios to that Mexico can develop with greater sustainability meeting the UN 2030 Agenda and become a more competitive country in the next decade?

To answer these research questions, the research design includes the application of qualitative research methods which are presented in Chapter IV, the methodology section of this document.

1.2. Justification of the Research

The justification for the present research arises from the missing link between international competitiveness and sustainable development for emerging countries. Further, by understanding the relationship among the key drivers of sustainability and international competitiveness, it is possible to explore possible future scenarios that take into account both perspectives and create a desirable development scenario for Mexico based on these concepts. Thus, as a next step, public policies can be designed that can foster greater economic growth, increasing the country's competitiveness and at the same time providing more favorable and inclusive social conditions for sustainable development.

There are several studies provided by different research centers that compute international competitiveness indexes (WEF, SolAbility, a Korean think-tank and

management consultant) and sustainable development indicators at national level (UN, INEGI, for example); however, there are few studies on the relationship between the social as well as environmental factors of sustainable development and of international competitiveness.

There are also several studies related to sectorial competitiveness for small and medium enterprises (SMEs). Sustainable development has also been studied; however, most studies focus on a particular sector (for example, sustainable tourism) and the environment. With respect to issues of international competitiveness that are related to sustainable development, there are fewer studies. In Europe some authors conducted research on "Sustainable Competitiveness" (Balkyte et. al, 2010) for a comprehensive and successful European development, proposing public policies for the European Union. Another measure, the Global Sustainable Competitiveness Index (GSCI) has been put forth by SolAbility, publishing annual reports since 2013 (SolAbility Sustainable Intelligence 2015). SolAbility's approach incorporates both concepts of sustainability and competitiveness on a national level and their approach is not limited to industry analysis and firm strategy formulation for corporations. In their mission statement the think-tank states:

"Sustainable development and sustained economic development are not mutually exclusive, but essential and complementary elements of sustained development and business success" (SolAbility, 2021.p. 1).

In addition, the think tank challenges the approach of the "Davos-Man", referring to the WEF competitiveness assessment, which from their point view focuses on the momentary capacity to financial-economic wealth generation within an "airtight space

independent of its physical environment" (SolAbility Sustainable Intelligence, 2013, p. 3). Nonetheless, in spite of its integrated and holistic approach, the GSCI is not widely used and referred to as of 2021. #12 The WEF assessment is a more common reference, and although it does include some of the elements of sustainability in the latest reports (WEF, 2019) and much more in 2020 (WEF, 2020), its perspective is still very different from that of SolAbility.

Due to the aforementioned reasons, it is pertinent to carry out a study that analyzes sustainable development and sustainable international competitiveness, that takes into account the economic, social and environmental conditions of Mexico.

Mexico is a large emerging country, in terms of size and population, with significant economic potential on a global scale: the country ranks as number 10 for its population and number 12 for its annual GDP according to the World Bank list based on 2019 data (World Bank 2021). However, Mexico has several challenges and lags in several international assessments related to economic performance.

Considering GDP per capita measured in current international dollar at purchasing power parity (PPP) as a proxy for living standards of a country, Mexico's GDP per capita was USD 20,944 in 2019 (World Bank 2021), below the OECD average of USD 47,209 and behind other emerging countries such as Turkey (USD 28,133) or Argentina (USD 23,040), a regional peer.

In terms of sustainable development, as of 2021 Mexico is ranked at 69th place among 193 countries (United Nations, 2020b), behind several of its regional peers, such as Colombia (68th), Peru (61st), Brazil (51st), Ecuador (46th) and Uruguay (45th) on the global ranking (United Nations, 2020c). This result indicates that there are 68 countries that manage sustainable development better than Mexico, representing an important

opportunity for improvement. In 2020, the country has shown improvement only on one SDG (No. 11, Sustainable cities and communities) being on track to meet the 2030 objectives, moderate advancements were found on 9 of the 17 SDGs, stagnation on 5 SDGs and no data was available on SDG 12, Responsible consumption, and production. In a summary, Mexico is behind in meeting the targets set by 2030 according to these metrics.

In the area of international competitiveness as measured by the WEF, Mexico's competitiveness ranking has fluctuated over a period of 12 years according to the WEF 2019 Report: Mexico's was ranked as 53rd in 2007 on the WEF GCI ranking, worsening significantly during and following the economic crisis of 2008-2009, recovering to the 51st place by 2016; in 2017 it ranked as 44th while by 2019 the country was ranked at the 48th place among 141 countries. In the meantime, other emerging countries, for example Poland advanced more than 10 places (from 51st place in 2007 to 37th), Colombia (from place 69th to 57th place) (WEF, 2019). As competitiveness is a very complex measure and fluctuates over time, it is difficult to draw clear conclusions based on the overall ranking. Value scores are better metrics to assess change in a country's performance, nonetheless, even these must be examined more carefully and in greater detail to draw conclusions from it.

The challenge for Mexico lies in the preparation and implementation of adequate public policies so that country can advance and make considerable progress in terms of higher living standards given its economic potential, by meeting the UN's SDG targets by 2030 and being more competitive internationally.

1.3. Relevance, Feasibility and Viability

The research is relevant for Mexico as it seeks alternative strategies and mechanisms that would allow the country to prepare for possible future scenarios and design ways to achieve the best scenario, including recovery from the 2020 economic crisis and giving a way to greater economic growth. This latter goal would be an improvement, given that in recent years prior to the 2020 recession the annual GDP growth had been mediocre (the annual average from 2001 to 2019 was 2% according to the data of INEGI (INEGI, 2021). Measures of international competitiveness and several factors of sustainable development such as the reduction of inequality have improved little. The GINI coefficient, a measure of income distribution in a country, decreased from 0.50 in 2002 to 0.45 by 2018; according to the World Bank (2018). In his TED (Technology, Entertainment, Design) conference the British economist Richard Wilkinson argued that persistent inequality causes several serious personal phenomena within society, including underestimating oneself, depression, isolation, social resentment, increasing crimes, among other problems, undermining social cohesion (Wilkinson, 2011). This present research could contribute to new insights by analyzing the relationship between the factors of sustainable development and international competitiveness. Identifying the key relationships for sustainable development could design better public policies for the country. It is also relevant to assess in Mexico's case if sustainable economic growth is possible without detrimental damage to the environment and within the boundaries of available resources, given that several scholars have questioned the theory of "green growth" (Hickel & Kallis, 2020).

There are open databases available that provide the necessary and comparable data to conduct research (INEGI, OECD, SolAbility, World Bank, WEF, United Nations

Development Programme (UNDP), UN, among other official sources). Global sources have homogenized data for several countries of the world, making international macroeconomic comparisons possible.

Another observation is that software programs mentioned in the methodology are either available on the internet (the cloud version) free of charge or this author has already acquired a license (for example, Minitab and Atlas.ti).

Given free access to the main sources of open-source databases with time series, data is available from use of secondary resources and provided background information for the research. The qualitative investigation can be executed as it is possible to conduct in-depth interviews with a selected group of experts and thus obtain valuable information from primary sources. With the previous consent of a targeted number of 30 experts from the public, private and academic sectors who are knowledgeable about the Mexican economy, the interviews can be completed either in a presential form or by using an online platform recorded and transcribed after the interviews.

1.4. Theoretical Value, Contribution and Methodological Utility

The research seeks to find links among different theoretical approaches regarding economic development: sustainable development and international competitiveness from the perspective of emerging countries, specifically that of Mexico. Furthermore, the study intends to contribute to the discussion on convergence, considering the criteria of the 17 SDGs set by UN and sustainable global competitiveness.

The present study applies qualitative research methods. It begins with a quantitative analysis and continues with the qualitative research based on the Delphi method and

concludes with the application of strategic foresight research methods, such as the Cross-Matrix Scenario Planning method. Thus, it offers a study with a step-by-step methodology that leads to a well-founded and comprehensive proposal.

1.5. Research Propositions

As this present research is based on qualitative research methods, propositions are important elements of the research design. The following propositions derive from the research questions and provide the basis for the field research. The first and central proposition of the research is defined as follows:

Based on expert opinion and with the use of other foresight methods, it is possible to gain insight whether Mexico will meet the UN Agenda 2030, developing in a sustainable way by 2030. The proposition is that Mexico may not meet the 17 SDGs of the UN by 2030.

Considering the subsequent three research questions, the following propositions are formulated:

1) Fostering international competitiveness may not be conducive for sustainable development for Mexico.

2) It is possible to explore the future with foresight methods and draft four plausible scenarios for the future of Mexico, in terms of sustainable development and identify which one is the best-case scenario and the worst-case scenario.

3) Strategic recommendations can be developed and presented to foster sustainable development which could lead to the desirable scenario by 2030, meeting the UN Agenda.

1.6. Research Objectives

The main objective of this research is to explore the future of Mexican economic development, whether the country will meet the UN Agenda 2030 by the targeted time. As key theoretical frameworks the Doughnut Economic Model (DEM) for sustainable development and Global Sustainable Competitiveness Index (GSCI) for competitiveness are considered. With the development of four future scenarios, this research intends to signal what steps may be necessary for achieving the best-case scenario for Mexico by 2030, which would enable the country to meet the UN Agenda as a consequence.

Research Subobjectives include the followings:

1) Review and analyze current evaluations whether international sustainable competitiveness ranking using Solability's assessment has any relationship to the ranking of sustainable development as presented by the UN dashboard of SDGs.

2) Develop four possible scenarios for Mexico by 2030, in terms of sustainable development, based on qualitative foresight methods.

3) Develop strategic recommendations that could be instrumental to achieve the best-case scenario for Mexico, which would also lead to meeting the Agenda 2030 of the UN.

1.7. Expected Outcomes

The outcome of the present research will include the following elements: 1) a qualitative analysis based on interviews of 30 experts following the Delphi method, analyzed with the software Atlas.ti; 2) four scenarios developed with the use of cross-matrix scenario planning and cross-impact analysis; 3) proposal for critical steps that need to be taken as a strategic plan for the best scenario by 2030.

1.8. Limitations of the Research

Key limitations include data availability for emerging countries, therefore only those countries will be included in the sample who have data for the same number of years as the rest of the sample are included. With respect to the qualitative analysis, experts will be selected based on their experience, however, participation is limited to those experts who are available during the field research phase. The same applies to focus group participation, when five experts will be invited and a minimum of four are expected to participate in order to carry out the focus group session.

Finally, even though this dissertation puts forth the proposal of public policies, their implementation ultimately lies within the faculties of corresponding government entities.

1.9. Ethical Considerations

The author of the present research respects the anonymity of every participant during and following the Delphi interviews, the follow-up round of expert feedback, and the final focus group session. No names, institutional affiliations and other personal data will be revealed in this study. Only the content and comments will be analyzed.

1.10. The Layout of this Thesis

The previous introduction described the main contributions and principal lines of research of this thesis. Chapter 2 presents the literature review that is most relevant to this study and related to the topics of economic development, sustainable development, national competitiveness, and Mexican national planning. Chapter 3 explains the theoretical framework that is used as the basis for the analysis for sustainable

development. Chapter 4 describes the methodology of qualitative research in four phases, described step by step. Next, Chapter 5 presents the results and discussion that derive from the literature and investigation. Finally, Chapter 6 offers the conclusions of the thesis discussing the limitations and further areas of research.

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CHAPTER 2. LITERATURE REVIEW

2.1. From Economic Growth to Sustainable Development

This first part of the literature review outlines the most important steps of how economic growth as a concept evolved in the twentieth century and how it expanded towards economic development. As a consequence of climate changes from 1970s on, the concept of sustainable development emerges and becomes more and more ubiquitous in public discussions and in academic research. By 2015, when the UN announced and accepted the Agenda 2030, the term sustainable development became mainstream and the standard term to use when assessing development in any country. In the following section first economic growth, then economic development is presented, closing with an overview of the evaluation of sustainable development. For a schematic overview of the terms and different schools of thought that are discussed here below a mental map can be found in Annex A.

2.1.1. Concepts of Economic Growth and Development

To assess the progress of a country, first the concept of economic development must be clarified. The meaning and scope of economic development have been changing over time. In the literature there are four major threads that have been identified during the XX century (Todaro & Smith, 2015).

The first, the linear-stages growth model that evolved around the middle of the century and is often referred to as the Harrod-Domar growth model (or AK model, as a simple reference to the linear growth model), that understands economic growth as a function of the national capital formation and the savings to the national output; in other words, endogenous growth in which the ratio of capital output and savings is considered constant (Solow 1956a, 1994). As a key addition to this model, Walt Rostow's Five-Stage Development Model (Rostow 1959) explained the transformation from a traditional agrarian society to a modern urban society with high consumption in five steps: 1) agrarian society, 2) preconditions to take off, 3) take-off, 4) drive to maturity, 5) age of high mass consumption. This model, however, has several limitations, most importantly that it relies on a steady capital formation and savings for several years as a precondition to take off which often proved to be difficult to attain for many developing countries. In addition, nowadays its linear nature can be questioned, as experts have argued that the 5 stages do not necessarily need to be followed one after another. For example, the industrializing stage may be passed by, as a case study about Ethiopia's development pointed out to this phenomenon (World Bank, 2015).

The second important school of thought focused on the theories describing structural and pattern of change in development. In the 1950s Arthur Lewis put forth the Two Sector Model (Lewis, 1954) stating that societies develop from a traditional agrarian society into an industrial society due to the transfer of excess labor from the rural areas into urban centers where the salaries and productivity is much higher. Around the same time Simon Kuznets provided another influential contribution to development theories, pointing to a new framework for the patterns of development (Kuznets, 1955). According to this model, an inverse relationship can be predicted between urbanization and income

inequality. As a country develops and the rural population moves to the urban areas earning higher wages, inequality rises. However, over time, as the level of income rises, this trend can be expected to reverse (Kuznets, 1955).

The third major school of thought with respect to economic development emerged from the 1950s through the 1970s in Latin America. Two major branches that have been distinguished include economic structuralism and dependency theory (Taffet & Cohen, 2014). The structuralist thinkers, such as the Argentinian Raúl Prebish who became the executive director of the Economic Commission for Latin America and Caribbean (ECLAC) of the UN in 1950, focused on structural changes in the economy as a result of international trade. Prebish (1950) described the impacts of specialization as a consequence of comparative advantages on physical and human capital formation and changes in economic output, trade, and utilization of the factors of production. As a result, Latin American countries' terms of trade – a ratio of at which the exports of a country are exchanged for those of one of its trading partners – deteriorated and this situation resulted in a dependent relationship with the industrialized countries, as was the case during colonial times. His observations lead to the concepts of center and periphery countries (industrialized and non-industrialized countries), giving the framework for what later became known as the Dependence Theory, the other branch of development studies of the era, dating from the 1960s (Todaro & Smith, 2015).

Continuing Prebish's line of thought, another scholar, Immanuel Wallerstein refined Prebish's dependency theory and described the model of World Systems (Wallerstein, 1974), including long-term historical analysis of the world economy and adding the category of semi-periphery countries within the dependency framework. This latter term referred to countries with abundant resources, large-size markets and close

proximity to core countries that were "needed to make the capitalist world-economy run smoothly" (Wallerstein, 1974, p. 403). According to the author, the addition of this third, middle-stratum category enables the system to be stable over a long period of time, avoiding a very polarized world of the rich countries versus underdeveloped countries that might lead to conflicts. Countries in this condition, such as Mexico or Brazil, constantly seek to join and graduate to become a more developed and affluent core country (Gereffi & Evans, 1981).

Adding to Wallerstein's analysis, the Brazilian economist Theotonio Dos Santos (1970) identified three types of dependence that Latin American countries have undergone: 1) colonial dependence; 2) financial-industrial dependence; and 3) dependence of multinational corporations, calling this latter one the most recent – "new" in the 1970s – dependence that was observed and increasing in the region thorough the second part of the XX century.

The common feature among these schools of thought was that they studied the international political and economic relations of countries from the Marxian approach of historical and dialectical materialism, as it is noted by several authors (de Rivero, 2018; Taffet & Cohen, 2014; Todaro & Smith, 2015) and provided an alternative explanation to the prevailing mainstream development model advocated by the developed countries.

The fourth approach to economic development is the Neoliberal (or Neoclassical) counterrevolution, that originates from the late 1980s and 1990s, as a flagship policy of the Washington Consensus (Williamson, 1993). The Washington Consensus was a set of economic policy recommendations for developing countries, and Latin America in particular, that became popular during the 1980s (Williamson, 2016). In its approach it emphasized open-market fundamentalism, including free trade, property rights,

privatization, and openness in countries with the ambition of convergence to high income countries. Even though the name of the Washington Consensus refers to the convergence in the policies recommended by institutions based in Washington, D.C, including as the World Bank, the International Monetary Fund and the US Department of Treasury, one of its key proponent in the 1980s was the Peruvian economist Hernando de Soto and his policy recommendations that targeted developing countries around the world, most notably in Latin America and the ex-communist countries of Eastern-Europe (Stiglitz, 2002; Williamson, 2004). The policy set was considered originally as a way for developing countries to converge and join the global economy. It has been associated with American foreign economy policy that exported a neoliberalist ideology to less developed countries. Hence, since the late 1990s, it became the nemesis of anti-globalist movements around the world (Yergin & Stanislaw, 2002). In addition, according to one its critics, the Nobel-laurate Joseph Stiglitz (2008), these policies did not produce the expected results in terms of economic growth and created a resentment in many regions of the world, including Latin America.

With respect to economic growth, by the 1990s new proposals emerged. According to the neoclassical economic models, growth is expressed in material terms, typically measured by the annual GDP increase as proposed by Solow (1956b, 1994).

According to Solow's model, growth can come from adding new capital, which is a result of saving and this can lead to temporary growth. However, due to the law of diminishing returns, growth eventually slows down, except if an exogenous factor, namely new technologies is applied. Solow's approach, which marked the pattern of economic growth during the second part of the twentieth century but proved incomplete and insufficient for some time. An important contribution to the growth theories came

from the Arrow (1962) who proposed the theory of learning-by-doing, pointing out that in addition to the availability of technology, the impact of technology absorption translates to growth over time.

Later, in the late 1980s and early 1990s the research continued on economic growth and added new discoveries related to previous insights. Grossman and Helpman (1991) presented a new approach to growth theories, the quality-ladder theory, which states that there is a continuous improvement when a product is produced repeatedly and thus the quality improves over time. This quality improvement leads to the development of new products, and diversification which ultimately result in economic growth at the aggregate level. Therefore, incentives to Research and Development (R&D) are crucial in fomenting horizontal diversification to produce more sophisticated goods. This insight later led to new discoveries on the importance of economic diversification.

Around the same time, other economists, such as Mankiw, Romer and Weil (1992), revisited Solow's model of economic growth and extended it by including human and physical capital to make the model more robust and complete. Therefore, endogenous factors, such as savings, investment, policy decisions and a growing population can lead to sustained economic growth, according to economists Romer (1994) and Lucas (2009).

Lucas, continuing earlier research in the area of human capital development and learning-by-doing (1988), argued that growth stems from knowledge in the economy, intellectual capacities and a sustained flow of new ideas that can generate growth (Lucas, 2009). His proposal emphasizes the importance of investment into human capital, including education, training, research, and exchange of ideas in diverse labor contexts. Apparently, countries that have the greater capacity to invest in human capital can attain

greater growth as they generate more value-added goods and services through constant innovation.

Taking this idea further, the economists Haussman, Hwang and Rodrik argued in their seminal article "What You Export Matters" that a country's export capacity and specialization can foment economic growth and make convergence possible for emerging countries (Hausmann et al., 2006). This proposal suggests that for emerging countries the stairways to heaven may lead through export-oriented industrial and targeted trade policy.

The Korean economist Ha-Joon Chang developed upon previous theories to show that if an emerging country's government intervenes with strategic trade policies to promote its exporters and protect its producers from import competition at the onset of development, the country can attain greater growth that can make convergence with richer counties possible. South Korea' case, outstanding among its emerging peers, offers a proof for this observation (Chang, 2007). In his book titled "Bad Samaritans: Rich Nations, Poor Policies and the Threat to the Developing World", Chang presented a compelling case through several examples from the history of rich countries that illustrate how now highly industrialized advanced countries have also protected their own markets during the early phases of industrialization and development. Hence, the expectation that rich countries have of emerging countries opening up their markets to free trade without any protecting mechanism is hypocritical, self-serving, and damaging for the developing world.

Chang is not alone with strong criticism of Western development policies directed towards the countries of the Global South. The North American economist William Easterly agrees that unsolicited advice from the "development experts" of rich countries often has been misleading and harmful for developing countries for several decades

(Easterly, 2015). As the author argues, development does not need to come from the top-down and from North to South, from so-called experts to newcomers in the world markets. Countries have their own way of finding the right path towards their own development and growth. A case in point described by Easterly is China's development during the past two hundred years.

Much like unsolicited external expert advice, seemingly altruistic financial help can also result in adverse outcomes. The Zambian economist, Dambisa Moyo presented ample evidence that foreign aid provided by rich countries to developing countries in Africa had not delivered the promise of economic growth over 50 years. In fact, aid may keep those countries in a state of constant dependence, making poverty worse and inhibiting the emergence of endogenous forces of growth and self-discovery (Moyo, 2010). In her recent work, "Edge of Chaos: Why Democracy is Failing to Deliver Economic Growth – and How to Fix it" (2019), Moyo argues that democracy has not delivered on the hopes for development either, but rather has polarized societies and has given a way to political extremism, and thus does not result in better outcomes.

Over the past 10 years new insights into development have also been put forth. Among them are those of Abhijit Banerjee and Esther Duflo, two Nobel laurate economists, who have conducted field research in several parts of the developing world to understand how the poorer segments of society live and behave on a daily basis. Based on these observations, they have argued that better policies can be designed to alleviate poverty (Banerjee & Duflo, 2011). Their empirical work shows that by paying attention to specific local details within a community in extreme poverty, the community members themselves can help improve their lives. Examples include motivating mothers to vaccinate their children and using the malaria nets properly to avoid unnecessary diseases.

Macro-perspective research has also contributed to new ideas for better development strategies. One of the most influential works of the past decade comes from the scholars Daron Acemoglu and James Robinson. Their seminal book titled "Why Nations Fail: The Origins of Power, Prosperity and Poverty" (Acemoglu & Robinson, 2012) set out to search for clues about why through the centuries some nations have become affluent countries with high living standards and others did not. The authors give several historical examples from many countries of the world, that indicates that nations with extractive political and economic systems do not provide favorable conditions for prosperity and growth in the long term. Rather, in these systems one social group exploits the others for their own benefit, resulting in dictatorships, market distortions, plunder, and poverty. On the other hand, if a country's political and economic systems are inclusive and based on strong institutions, the rule of law and shared opportunities, then there is a chance for growth and prosperity for society. The arguments that the scholars present are compelling, although they recognize that U-turns are also possible as development is not a linear process. Nonetheless, it still remains to be seen how a country can graduate from an extractive system to a more inclusive one in a peaceful and successful manner in emerging countries with very diverse social norms and cultural-historical legacies.

Another important insight comes from two economists of Latin American origin, Ricardo Haussman and César Hidalgo, who suggest that there may be a network view of development (Hausmann & Hidalgo, 2010). This perspective builds on previous research (Hidalgo et al., 2007) related to product space and specialization in a country that may make a major difference in the development process. As in Grossman-Helpman's findings (1991), higher level of sophistication in product specialization in exports may lead to

greater economic growth. As specialization increases, more connections are formed among the export products within a country. Based on this concept, a group of researchers led by Hausmann created an Atlas of Economic Complexity at Harvard University (Harvard Growth Lab. Harvard University, 2021). The Atlas visually illustrates industrial capacities and know-how of a country that can generate growth and prosperity. As the Economic Complexity map of a country becomes more complex, it indicates a higher level of interdependence for and diversification of production and as a result, for export capacity. Given that building diversification and export capacity takes time, the Atlas allows the users to make inferences and projections for future growth, based on the existing economic structure. The analysis of product connections offers valuable insights into the complexity of the economic system, supply chains, and connections within and among industry sectors. It does not, however, guarantee that there is a spillover effect from high-productivity sectors towards less productive ones (Hartmann et al., 2017).

Related to the export-driven development, a recent study by researchers Li et al. (2021) examines how changing export patterns and trade policies impact growth and economic development of developing countries, compared to advanced ones. Their econometric model examines the impact of several factors of economic geography, such as export location (distance from core import markets), product space and proximity, product type with respect to technology intensity – machinery, chemical products, raw materials – export volume, foreign direct investment (FDI) received, education and skill level of the labor force on GDP growth. The authors' findings show that export evolution depends on many factors and the export patterns are different among high-income, middle-income, and low-income countries. Advanced countries tend to be at the core of the product space, concentrating on machinery and chemical products. Moreover, export

location can be influenced by R&D investment in every country irrespective of their income level. On the other hand, education makes a bigger difference for developed countries, while for developing countries the impacts and spillover effects of FDI are more significant. A disappointing insight is that developing countries cannot reap the benefits of knowledge spillover of internal elements of growth catalysts, such as education, training, and R&D to generate innovation. Instead, in developing countries innovation tends to come from outside, via FDI spillover. Therefore, trade policies have great influence on development.

The interdependence of trade among the developed and emerging countries also poses questions about the nature of the prevailing economic system, capitalism. Several authors argue that capitalism is in crisis (Arkonada, 2013; Case & Deaton, 2020; Collier, 2020; Han, 2022; Neuwirth et al., 2022; Shaw & Waterstone, 2019; Zuboff, 2019), bringing new anxieties and despair to the working classes while maintaining the status quo of extractive economic and political institutions for the benefit of the small selected economic elite. As Collier (2020) puts it,

"Economic man is utterly selfish and infinitely greedy, caring about nobody but himself. He became the bedrock of the economic theory of human behaviour. But for the purpose of public policy, economics needed a measure of aggregating the well-being, or 'utility', of each of these psychopathic individuals. In fairness, for many questions public policy is indeed good enough; whether the deficiencies are devastating depends on the policy. For modest questions, such as 'should a road be built here?' it is the best technique available. But for many larger issues it is hopelessly inappropriate. "(Collier, 2020, p. 9).

The author argues that the Utilitarian calculus infiltrated public policy and thus all moral obligations to administer 'the most good for the highest number of people' were delegated to the state. Citizens became consumers, instead of responsible rational actors. The state, in social democracies, is a provider of social paternalism: on one hand, it tries to redistribute income through tax collection via social programs to reduce inequality, on the other hand, intents to increase the size of the pie that it is be shared among its citizens (Collier, 2020). Nonetheless, the result has been disappointing in the past decades, as in many countries the gap between poor and rich is not reducing, instead of convergence persistent divergence has been observed.

Other peculiarities with respect to the current version of capitalism are highlighted by Haskel & Westlake in their seminal book titled "Capitalism without capital: The rise of the intangible economy" (2017). The authors pointed out that the present form of capitalism is very different from the classic capital accumulation, as nowadays physical capital such as plants, machinery, physical goods have become less important in several industry sectors while the share of intangible capital has grown significantly in the past three decades. The current "knowledge economy" is based on R&D and other intangible factors of business such as the business model itself, client portfolio and specialized knowhow. These intangible assets are lately more important to value generation than the traditional physical assets. As a consequence, this new intangible business model allows more mobility across borders at a remarkably fast pace. Additionally, the valuation and the regulation of the new firms are often very challenging as these models are quite different from the traditional company valuations. Furthermore, intangible investments generate spillovers from one firm and sector to another one by creating complementary supplying firms, and the combination of these increase the value of each one as well.

Often intangible services can be scaled up much more easily, rapidly and almost indefinitely, such as Amazon or Facebook, offering higher returns on investment. Considering labor and market structure regulations, the challenges are also multiple and often not understood until negative externalities emerge and need to be addressed (e.g., Airbnb's impact on neighborhoods and on rental prices was not foreseen). Another feature of this new interconnected knowledge economy is that it is technology-driven and requires specialized knowledge which makes the digital divide even more marked in societies. Although theoretically the chance is there to participate for everyone, in reality the first mover and most competitive winner takes it all, creating market concentrations and leaving the less educated, unconnected, and traditional economic sectors' workers such as agriculture in a disadvantageous and precarious situation. In these new sectors labor unions barely exist, making it difficult for workers to demand better wages and working conditions. For example, Uber refuses to consider it drivers as employees and has faced government pushback in several countries. In these contexts, it is hard to foresee how the principles of sustainability can be adapted, mostly due to the social impacts. Further structural problems of capitalism include the fact that capitalism subverts community (Neuwirth et al., 2022), praises the individual and individualistic actions, and therefore often leads to the tragedy of commons. This is worrisome from both social and environmental points of view.

Similarly to Collier's take on the role of the state, Haskel & Westlake (2017) see the government's role as critical in setting the necessary rules for the new intangible capitalist model.

Taking this concern to a more extreme level, Zuboff (Zuboff, 2019) analyzes the impacts of the network and technology-based economic model which, according to the

author, drives us to the age of 'surveillance capitalism'. For this term the following eight definitions are offered:

"1. A new economic order that claims human experience as free raw material for hidden commercial practices of extraction, prediction, and sales; 2. A parasitic economic logic in which the production of goods and services is subordinated to a new global architecture of behavioral modifications; 3. A rouge mutation of capitalism marked by concentration of wealth, knowledge, and power unprecedented in human history; 4. A foundational framework of a surveillance economy; 5. A significant threat to human nature in the twenty-first century as industrial capitalism was to the natural world in the nineteenth and twentieth century; 6. The origin of a new intrumentarian power that asserts dominance over society and presents startling challenges to market democracy; 7. A movement that aims to impose a new collective order based on total certainty; 8. An expropriation of critical human rights that is best understood as a coup from above: an overthrow of the people's sovereignty." (Zuboff, 2019)

These definitions set the stage for the author's dystopian view of the contemporary form of capitalism, arguing that now everything is being digitalized and monetized, from toothbrushes to refrigerators, turning households and businesses into a constant flow of behavioral data that corporations mine and sell back in the form of new products and services to the unsuspecting consumers. In addition, big tech firms' capacity to lobby legislation for favorable or minimal regulation leaves consumers at the mercy of the owners of new technologies that emerge at an exponential pace. The author considers that the lobbying techniques applied by corporations in the US are ruthless as they camouflage

and conceal the real capacity of the data extraction of these tech solutions and hence allows the manipulation of consumers. From Zuboff's point of view the state is complacent and uses data for its own purposes, for the citizens' own safety as it is often stated, using national security as a pretext since 9/11 (in the United States). This attitude of government actors ushers in the emergence of a new totalitarian state, even if the origins derive from the corporate world. The author is more concerned by the unfettered surveillance of firms, this new form of capitalism, than the overreaching capacity of the state in the digital age. Zuboff sums up that surveillance capitalism may bring about more certainty with all the predictive power of AI about human behaviour, but this new world may come at a price of having to give up some of our humanist ideals, such as democracy and free will.

Similarly, the role of state in the current neoliberalist economic system, the Korean philosopher Han (2022) also argues that democracy is in danger as the new ruling form is characterized by the dominance of information, 'infocracy' as it is labelled by the author. The current form of capitalism and state rule are both based on information in which citizens and consumers are not conscious actors but subjects of exploitation and control. National elections are often interfered with by chatbots and trolls from both right and left, manipulating the outcome for the benefit of the most agile user group of the collected information. For Han (2022) democracy has been degenerated to infocracy, a new system, where masses are controlled and surveilled by the ubiquitous applications using state of the art technology and punished if they do not follow the centrally prescribed guidelines. Not an appealing world and system that Han describes.

Nonetheless, these Orwellian views of present-day societies put forth by Zuboff and Han apply more to developed countries than emerging Latin American societies. In these

latter countries many citizens either do not have access to digital services as the digital divide is much wider, or do not follow state orders for two reasons: one, for the mistrust in their governments; second, for the size and importance of the informal economy which to a great extent runs beyond the reach of the state regulation. These factors differentiate Latin American societies from Asian and developed countries where civic obedience and state control tend be more prevalent and efficient. How the health and economic crisis unfolded in different parts of the world during the Covid-19 pandemic was illustrative of these regional differences. The global trend however is clear: digitalization and the use of AI by both the private and public sectors are becoming more common around the world, even if the pace of its application is different from country to country.

As of 2022, following a surge of protectionist policies during the late 2010s and the recovery from the COVID-19 pandemic-induced economic crisis, emerging countries continue to search for the right macroeconomic policies to first accelerate their own recovery. Next, the following priority is to direct their countries towards sustained growth and foster sustainable development to meet the UN 2030 Agenda to which most countries made the formal commitment. Juggling these pressures amidst inflationary processes and a potential recession that may be under way in the developed economies (Roubini, 2022) which could affect negatively emerging countries and make it even more difficult to meet the Agenda for many countries.

2.1.2. Sustainable Development

The Brundtland Report (Brundtland et al., 1987) was one of the first written documents to include the concept of sustainable development as a result of a research commissioned by the UN General Assembly, who created the World Commission on Environment and Development in 1983. This document presented the results of an investigation into the global impacts of economic growth and development in the year 2000. One of its most important messages still serves as a blueprint for the definition of sustainable development, emphasizing that our current development cannot undermine the growth capacity of future generations:

"[t]he Commission's hope for the future is conditional on decisive political action now to begin managing environmental resources to ensure both sustainable human progress and human survival. We are not forecasting a future; we are serving a notice - an urgent notice based on the latest and best scientific evidence - that the time has come to take the decisions needed to secure the resources to sustain this and coming generations." (Brundtland et al., 1987, p. 11).

Based on the spirit of the Brundtland Report, in 1992 the United Nations Conference on the Environment and Development held the first Earth Summit in Rio de Janeiro, Brazil, marking the 20th anniversary of the first Conference on the Human Environment of 1972, held in Stockholm, Sweden (United Nations, 1992b). In addition to bringing world leaders, experts, and NGOs together, the Rio Summit produced the Agenda 21, an ambitious program to call for action to invest in the future through

sustainable development. Moreover, it produced legally binding international agreements ready to be signed such as the United Nations Framework Convention on Climate Change (UNFCCC), Convention on Biological Diversity and Convention to Combat Desertification (United Nations, 1992a).

Since 1992, several other Earth Summits were held (Rio +10 in Johannesburg in 2002, and Rio+20 in Rio de Janeiro), promoting the commitment of international cooperation. However, these agreements often remained intentions for an international framework as some countries have not ratified them at the national level. For example, one of the proposed agreements is the Kyoto Protocol in 1997 (UNFCCC, 2021) that set out clear targets to reduce six greenhouse gases was signed by 84 countries, but it was not ratified by 29 states; among them, the United States. As of December 2020, 144 states have accepted the Protocol and 37 states made binding commitments, of which 34 have already ratified it.

In terms of the social aspects of development, there were new insights and major improvements in assessing human development during the 1990s. At the onset of the last decade of the XX century, the Human Development Report (HDR) was presented by two economists, the Pakistani Mahbub ul Haq and the Indian Amartya Sen (United Nations Development Programme (UNDP, 1990). With a new methodology and a human-centered approach, it presented the Human Development Index (HDI) which has been measured and published by the UNDP since then. The authors introduced the report and the new index with the following lines:

"The purpose of development is to offer people more options. One of their options is access to income – not as an end in itself but as a means to acquiring human well-being.

But there are other options as well, including long life, knowledge, political freedom, personal security, community participation and guaranteed human rights. People cannot be reduced to a single dimension as economic creatures" (UNDP, 1990, p. iii).

Not only was the approach of the HDR novel, but its purpose: it aimed to provide a practical tool for policymakers to develop public policies that look beyond the improvement of GDP figures. Furthermore, the report clearly stated that it did not intend to preach or advocate for any specific type of economic model as better than any other. Rather, it offered an overview of the experiences of different countries. The report is published almost every year - for the years of 2007 and 2008 in one edition and it was not published in 2012 and 2017 - and it has been very influential worldwide. Since 2010 three additional indexes have been computed and included in the HDR: 1) the Inequality-adjusted Human Development Index (IHDI); 2) the Gender Inequality Index (GDI); and 3) the Multidimensional Poverty Index (MPI). These indexes measure other facets of human life, adding new assessments of different social dimensions for deeper analysis and more specific policy development.

In 2020, another innovative measure, the Planetary pressures-adjusted Human Development Index, was introduced for the first time in the annual report titled "The Next Frontier: Human Development and the Anthropocene" (UNDP, 2020). This adjustment in the HDI indicates that the environmental aspects of development affect human development as well.

In the early 2000s, the Millennium Development Project (United Nations, 2002) was born as an coordinated effort to focus on 8 key areas of development, called the Millennium Development Goals (MDGs), that include: 1) eradicate of extreme poverty

and hunger; 2) achieve of universal primary education; 3) promote gender equality and empower women; 4) reduce child mortality; 5) improve maternal health; 6) combat HIV/AIDS, malaria and other diseases; 7) ensure environmental stability; 8) global partnership for development.

When the UN MDGs were defined, the primary focus was on social development primarily, as 6 of the 8 MDGs were related to social issues. MDG No. 7, to ensure environmental stability, indicated the global objective to consider the natural environment. MDG No. 7 referred to increased CO2 emissions, loss of biodiversity, deforestation all of which disproportionately affects the poor. Some of the achievements of MDG 7 include 1) the virtual elimination of ozone-depleting substances, and with that, making the recovery of the ozone layer possible in a few decades; 2) substantial increase in protected natural areas on sea and land; 3) the increase of the share of people with access to clean drinking water from 76% in 1990 to 91% in 2015; and 4) the reduction of population living in urban slums from 39.4 % in 2000 to 29% in 2014 (Millennium Development Project, 2016). However, there were many challenges that have not improved or worsened, notably deforestation which has increased globally, CO2 emissions which continued to rise, and the accelerated exploitation of fisheries. Among the main virtues of this project was that it aimed to improve the lives of the world's poorest people and it set clear measurable targets to achieve within 15 years (MDG Achievement Fund, n.d.).

Considering the environmental impacts of human activities, from the early 2000s the search was on for a better assessment. By 2006 two institutions presented different measures that intended to gauge the changes in the environment. In 2006 the Environmental Performance Index (EPI) was presented by the Center for International

Earth Science Information Network Earth Institute, Columbia University and Yale Center for Environmental Law & Policy in 2006 (Yale University, 2020). This composite index focuses on assessing two major areas of the natural habitat: 1) environmental vitality; 2) environmental health. Within these two major areas there are several subcomponents, organizing 32 indicators into 11 issue categories. In 2020, Mexico is ranked 51, with a score of 52.6 of a possible 100, while Denmark, ranked on the top of the EPI list, achieved a score 82.5 in 2020 (Wendling et al., 2020). The EPI does not make any assessment of the economy or the social performance of a country, as it focuses solely on the environment.

Another assessment that came into light around 2006 was the Happy Planet Index (HPI) published by the New Economics Foundation (NEF), a British organization (New Economics Foundation, 2021). This assessment evaluates economic performance in relation to the environment and social well-being. As the authors summarize it "It tells us how well nations are doing at achieving long, happy, sustainable lives" (Jeffrey et al., 2016, p. 1). The HPI takes into account individual well-being or life satisfaction based on a Gallup World Poll, life expectancy, inequality, and the ecological footprint of a country. Therefore, the HPI differs from the classic approach of measuring progress only in terms of GDP per capita increase. NEF considers this latter perspective as short-sighted and improves often at the cost of deteriorating social fabric and climate conditions. Due to this approach the HPI is holistic and reflects on how people feel and how satisfied they are overall with their lives. Interestingly, on the global HPI ranking countries from Latin America and Asia often score better than high income countries of Europe and North America. According to the latest 2016 report Costa Rica ranked as No. 1, Mexico as No.

2, Colombia as No. 3. and Vietnam No. 5. Highly developed European countries such as Norway ranked No. 12, and Denmark No. 32 on this assessment.

This ranking shows a very different picture of the world. On this ranking economic well-being does not enjoy priority, given that it is measured against the social and environmental cost of a country achieving its well-being. Therefore, it is not so surprising that El Salvador (17th) scored higher than the Netherlands (18th), Germany (49th) and the United States (108th). These latter three countries are much wealthier; however, their people are less happy, and their environmental impact is much greater than that of the people of El Salvador. Unfortunately, as this report is not published annually, no time series data are available for longitudinal statistical analysis. Taking into consideration this limitation, other assessments have to be considered for statistical analysis.

The best candidates to offer the most reliable and comprehensive dataset are the UN entities given that these collect the most complete statistics regularly from every country. In addition, when the Millennium Development Project came to completion by 2015, a new set of goals was developed and presented, with a broader, more ambitious vision: the Sustainable Development Goals, set in the UN Agenda 2030 (United Nations, 2020a). From the onset, the overarching goals were set to all countries of the world, not only for low income developing countries as their predecessor, the MDGs. Furthermore, the 17 SDGs include several specific goals with a high number of indicators regarding the natural environment, broadening the vision from social and economic progress to all three pillars of sustainability as it was set out since 2015, under the auspices of the Economic and Social Council (ECOSOC) of the UN (Economic and Social Council. United Nations., 2015). The UN Agenda 2030, as it is commonly referred to, will be

described in the next chapter in greater detail, given that the present research considers it as the guiding framework for analysis towards sustainable development.

2.2. Assessing Competitiveness

There is no clear single definition for competitiveness in the economic literature. Competitiveness, an elusive term in economics, can be interpreted differently, depending on the level of economic analysis. From the micro-level (competition among firms) to macro-level competition in which countries are considered as a unit of analysis, there are different contexts where competitiveness is often assessed: competition within a sector (sectors competitiveness), competition among regions (within a country or across country borders); at national level among entities within a country (national competition, as the Instituto Mexicano para la Competitividad (IMCO) assesses the competitiveness of the 32 Mexican states) (IMCO, 2021).

Other more specific categorization may include the following levels of analysis for competitiveness: 1) firm or company level; 2) sectorial level (when firms of the same industry form clusters); 3) regional level (by geographical proximity); 4) national (within a country, typically analyzing by greater administrative entities, such as states); 5) by economic blocks (for example, European Union); 6) and at international or global level (among countries) (Balkyte & Tvaronavičiene, 2011). Figure 2.1 below displays the six levels of competitiveness that have been identified by the authors Balkyte & Tvaronavičiene (2011) from smaller units to broader entities and level of analysis.

Figure 2.1 Levels of Competitiveness

Source: Adapted from (Balkyte & Tvaronavičiene, 2010)

However, scholars have very diverse approaches, considering different factors and models of competitiveness. As a result, analysts offer different definitions and assessments of competitiveness. Before discussing international competitiveness, it is important to mention that at subnational level competitiveness is often discussed as productivity in a sector or industry.

Moreover, the references may get confusing as the term 'national competitiveness' often actually refers to 'international competitiveness' (Aiginger & Vogel, 2015; Krugman, 1994; Porter, 1990). Therefore, one needs to verify first what each author means by the term competitiveness.

Given that the focus and unit of analysis of the present study is at country-level, this research document will use the term 'international competitiveness', adapting the categorization of Balkyte & Tvaronavičiene (2011). The following section offers a brief overview of the literature on the key concepts and assessments related to international competitiveness.

2.2.1. International Competitiveness

Classical models, starting from Adam Smith, with the Wealth of Nations (Smith, 1776) and his theory of absolute advantages and later David Ricardo with the theory of comparative advantages established the basic concepts of international trade, which at that time was used as a proxy for comparing countries' success at an international level (Todaro and Smith, 2015). Later, in the XX century neoclassical models offered new insights for comparing country's performance, such as the Heckscher-Ohlin Theory of Comparative Advantages and factor endowments (Leamer, 1995) and Porter (1990) with his Diamond-Model of the competitiveness of nations. What these models have in common is their focus on the capacity of a country to produce material goods and services most efficiently. Porter summed up his definition of competitiveness as: "The only meaningful concept of competitiveness of a nation is national productivity." (Porter, 1990, p. 6).

Other non-material factors were not considered, often due to the difficulty of quantifying them. Often these are considered narrow interpretations of competitiveness, such as cost efficiency and productivity (Aiginger & Vogel, 2015; Chikán, 2008).

Regarding the competitiveness of nations, the Austrian scholar Aiginger (2006) agrees that productivity plays a key role in driving national prosperity. However, the author also points out that when analyzing resource driven economies, there is a distinction in the economic literature between human resource driven or natural resource-driven prosperity (Aiginger, 2015).

Other authors, for example, Peña-Vinces et al. (2014), also offered extensive review of the literature on international competitiveness which focuses mainly on the impact of

enterprises (mostly national companies in Latin America and multinational firms in developed countries) have on the capacity building of a country, hence contributing to the improvement of the country's competitiveness.

The Korean scholars Cho and Moon (1998, 2009) developed the dual double diamond model (DDD) for the assessment of competitiveness of nations, an adapted and modified Porter Diamond model, with new elements, such as taking into account the international environment. In the Nine Factor Model the authors included human factors, such as education, as well. Their amplification of the term therefore is an important step to make the term competitiveness more useful for country-level analysis.

Paul Krugman's position on international competitiveness is very different from focusing on corporations. Krugman indicates it a "dangerous obsession" to talk about national competitiveness as countries cannot go bankrupt like business can. Countries do not have a "bottom line" (Krugman, 1994, 1996). In his view, the term of firm level competitiveness is different from international competitiveness as they have different objectives and understanding. He argues that the debate on competitiveness is misleading, and the overuse of the term national competitiveness is incorrect as it may prompt erroneous public policies, pushing industrial policy in the name of competitiveness (Krugman, 1994). Thus, Krugman suggests that competitiveness, if at all used, should refer to productivity only (1996).

As two Greek academics Psofogiorgos and Metaxas (2016) observed, Krugman has an opposing view of competitiveness to that of Porter, however, they both suggest the need to consider a new theory of economic geography and regional economy.

Attila Chikán (2008), a Hungarian scholar and influential economist in his homeland defines national competitiveness in terms of sustainable welfare for a nation:

"National competitiveness is the capability of a national economy to operate ensuring an increasing welfare of its citizens at its factor productivity sustainably growing. This capability is realized through maintaining an environment for its companies and other institutions to create, utilize and sell goods and services meeting the requirements of global competition and changing social norms." (Chikán, 2008, p. 7).

With this definition Chikán creates a link between microeconomic and national competitiveness; in fact, he proposed a model based on Porter Diamond including firm level elements (such as macroeconomic policy, social norms, public institutions, double value creation for consumers, as well as Porter Diamond elements, such as factor conditions, demand conditions, firm strategy which are key factors in the global competition of firms). He argues that with this extended model that connects macro and micro competitiveness a close circle can be created and better explained how the wealth of the citizens can be incremented (Chikán, 2008). This vision is broader than that of Porter, as sustainability is also considered, not only economic factors, such as productivity and output capacity. In addition, it is closer to the spirit of the Brundtland Report (1987) which provided the vision of intergenerational considerations.

One of the driving forces of competitiveness at national – and firm and industry level as well – is productivity. Productivity is often understood as the value of output produced per worker, in other words, a ratio between output and input (OECD, 1994). Increasing productivity can drive economic growth and contributes to rising living standards. Greater multi-factor productivity is the result of better capital utilization, higher skill levels and in addition to factor utilization, technical and organizational

innovation. IMCO (2021) also includes productivity in the assessment of innovation, one of its subindexes in the measure of competitiveness at subnational level. Additional components include the number of patents, the number of research centers and economic complexity of a state. Innovation is closely linked to technological advancement, which can be observed through the rise of productivity. However, it usually brings results in the medium and long term as technological innovation is often not detectable in the short run in national statistics (Brynjolfsson et al., 2018; Brynjolfsson & Collis, 2019; Solow, 1994). Although the economist Gordon (2014) expressed skepticism if productivity can still be improved in the US, due to ageing population, lags in education and persistent inequality, later the author noted that new technologies can indeed drive productivity to higher levels (Feler & Gordon, 2021). Latest advances in automation, machine learning, artificial intelligence, and many other computer-driven technologies, are indeed driving the rise in productivity in the digital and increasingly intangible economy (Brynjolfsson et al., 2018; Brynjolfsson & Collis, 2019; Haskel & Westlake, 2017). This phenomenon has important implications for the labor force, salaries, and inequality in society (McKinsey & Company, 2018).

Another important discussion that is related to competitiveness at subnational and national level is the debate on specialization vs. diversification. This topic is also relevant for regional and sectorial competitiveness that ultimately can influence national competitiveness (Aiginger & Firgo, 2015, 2017; Fagerberg & Srholec, 2017). The idea is that economic diversity and complexity can lead to greater and sustained economic growth, according to several authors (Bahar et al., 2014; Gao et al., 2021; Gómez Zaldívar et al., 2019; Hausmann, 2016; Hausmann & Hidalgo, 2010; Hidalgo et al., 2007). In addition, *specialization* may result in greater vulnerability and less resilience in the face

of economic shocks and interruption in supply chains (Li et al., 2021; Xiao & Drucker, 2013). In a study about competitiveness and specialization in Mexico in the aftermath of the pandemic, it was shown that diversified states were overall more resilient, but the type of specialization mattered how the specialized states were affected by the economic lockdown of 2020. States such as Sinaloa specialized in agriculture and food production did well while Quintana Roo specialized in tourism, was affected very negatively, and took more time to recover (Lengyel-Almos & Kato-Vidal, 2022). With respect to specialization, another research demonstrated that the interplay between government and the industry sector, specifically in the medical supply sector, assistance from the state can contribute and increase the resilience and robustness of a certain industry sector (Gereffi et al., 2022). Additionally, cooperation among the stakeholders can result in increased competitiveness and national security. These findings suggest that targeted industrial policy can not only help a certain sector but also can benefit the region and country at an international level as well, ultimately raising national competitiveness.

Having reviewed several scholars' perspective on competitiveness, the next section summarizes and describes the most known international organizations that study and assess countries' competitiveness.

2.2.2. Organizations Measuring Competitiveness At International Level

Different international organizations and private research institutions have been tracking international competitiveness since the late 1980s. In the present research five are studied that produce reports and ranking on national competitiveness: IMD (World Competitiveness Ranking**)**, World Economic Forum (Global Competitiveness Index), the

European Union (focusing on EU countries), the OECD (for its member countries), and SolAbility Sustainable Intelligence (Sustainable Global Competitive Index). The first four, often mentioned by other authors as well (Aiginger, 2006; Aiginger & Vogel, 2015; Chikán, 2008) have very different approaches and objectives. One of the most recent, SolAbility's composite index, is less known and studied yet. In spite of its relative novelty - published since 2013 -, there are academic articles examining this particular ranking and evaluation (Balkyte & Tvaronavičiene, 2014; Janković-Milić & Jovanović, 2019).

To have a better overview, Table 2.1 offers an overview of the most known and widely used assessments of international competitiveness, including some of their key characteristics, such as their perspective on competitiveness, the number of countries studied, the quantity and grouping of indicators that form the index, the year of the first publication, the scope and ownership of each organization.

Table 2.1 Selected Assessments of International Competitiveness by Organization

Organization (abbreviation)	Indicator	Key Focus of Assessing Competitiveness	No. of Countries Included	Subindexes: major groups (subcomponents)	Time Series (1st year)	Scope (Owner ship)
European Union (EU)	Regional Competitiveness Index (RCI)	Regional competitiveness on how attractive and sustainable environment is a region for firms and residents to live and work.	28	4 thematic objectives (11 subobjectives, 70+ indicators)	2010 *	Regional Block (public)
IMD World Competitiveness Centre (IMD)	World Competitiveness Ranking (WCR)	Benchmarking for countries; how nations and enterprises compete for laying foundations for future prosperity.	63	4 factors (337 criteria)	2006	Global Foundation (private)
Organization for Economic Cooperation and Development (OECD)	Better Life Index	Overall well-being of the population, in terms of economic outcomes, inequalities and resources for future well-being.	37	11 dimensions (80 indicators)	2010	Economic Block (public)

SolAbility Sustainable Intelligence (SSI)	Global Sustainable Competitiveness Index (GSCI)	The ability to generate and sustain inclusive wealth compromising the same conditions for future generations.	180	5 pillars (127 indicators)	2013	Global Foundation (private)
World Bank (WB)	Doing Business Index (DBI)	Ease of doing business in a country (business friendliness).	190	11 indicators	2002	Global (public)
World Economic Forum (WEF)	Global Competitiveness Index (GCI)	Improving living standards, shared prosperity, and environmental sustainability. Stakeholder capitalistic approach.	141	12 pillars (103 indicators)	2004	Global Foundation (private)

* The European Union did not publish the RCI reports annually until 2020, only in 2010, 2016, 2016 and 2019. *Sources*: The author's compilation based on reports from Annoni & Kozovska, 2010; IMD, 2020; OECD, 2020; SolAbility Sustainable Intelligence, 2020; World Bank, 2020; World Economic Forum (WEF), 2019b.

Common features among them that each generates indexes to compare concepts that are difficult to quantify (such as life satisfaction by the OECD or the labor market flexibility by the WEF) and for this end the reports use hard data as well as surveys and other methods of investigation (such as interviews) to compute indicators which later can be ranked, mapped, and compared. In addition to the qualitative data collection, several sub-indicator data come from other institutions' data reporting, from example, from the World Bank or from national data collecting entities, such as INEGI in Mexico.

There are differences in their approach. Some focuses on the business sector's health and competitiveness (such the World Bank's Doing Business Index and the IMD's World Competitiveness Ranking) while other organizations' approach is more holistic, considering not only the business environment but other non-material conditions of well-being (for example, the OECD's Better Life Index). The concepts of sustainability are now incorporated in at least two of these assessments: The World Economic Forum's

GCI since 2014 and SolAbility's SGCI since its inception in 2013. Below is a brief overview of the approaches of each organization's competitiveness assessment.

The European Union. At international regional level the European Union provides an assessment of competitiveness, and the European Commission publishes its annual competitiveness report in which it defines competitiveness as follows:

"Regional competitiveness is the ability of a region to offer an attractive and sustainable environment for firms and residents to live and work." (Annoni & Kozovska, 2010, p. 2).

From this definition it is clear that the European Commission's approach focuses on the capacities of material production of a country and being competitive refers to the cost efficiency side of the competitiveness debate. Due to its business focus and limited regional coverage this report does not appear to be adequate for research on a global scale.

IMD. The World Competitiveness Ranking (WCR) was developed by IMD World Competitiveness Center, a private research center in Switzerland. IMD published its first World Competitiveness Yearbook in 1989, and tracks the data of 63 countries, based on 337 competitiveness criteria using hard statistical data (163 elements) as well as data obtained from expert surveys (92 elements) (Rosselet-McCauley, 2007). In addition, IMD tracks other measures that are relevant for businesses, for example, the Key Attractiveness Indicator (which comprises of 15 indicators), Digital Competitiveness Ranking, and Talent Ranking (IMD, 2020). The perspective of competitiveness in IMD's eyes is defined in its methodology:

"An economy's competitiveness cannot be reduced only to GDP and productivity because enterprises also have to cope with political, social and cultural dimensions. Governments therefore need to provide an environment characterized by efficient infrastructures, institutions and policies that encourage sustainable value creation by the enterprises." (Rosselet-McCauley, 2007).

This statement indicates a focus on the business environment, thus national competitiveness can be seen from the perspective of firms, not primarily from a macro perspective. For this reason, the IMD report appears to be limited for further research on competitiveness and sustainability on a national level.

Organization for Economic Cooperation and Development (OECD). Since 2011 the organization publishes the Better Life Index which has a different focus. It aims to compare material and non-material conditions of well-being in each country, based on 11 topics identified as essentials for human life (OECD, 2020). As it is defined by the OECD:

"What makes for a good life? While the richness of human experience cannot be captured in numbers alone, it is important that the statistics shaping public policy reflect both people's material living conditions, and the quality of their lives. This includes how life is changing over time, how lives differ across different population groups, and whether today's well-being is achieved at the cost of depleting resources for the future." (OECD, 2017).

In its approach this index appears to be most holistic, taking into account key concepts of sustainability such as economic, social and environmental conditions. The shortcoming of this index is that it evaluates only the OECD countries are evaluated (38 countries as of 2021), and other countries in the world cannot be compared.

SolAbility Sustainable Intelligence (SSI). Published first in 2013 by the South Korean think-tank SolAbility, this index aims to evaluate international competitiveness with the perspective of sustainability. Its definition of competitiveness is the following:

"Sustainable competitiveness is the ability to generate and sustain inclusive wealth without diminishing future capability of achieving and sustaining current wealth levels." (SolAbility Sustainable Intelligence, 2016, p. 7).

The index proposed by SolAbility, the Sustainable Global Competitiveness Index (SGCI), is constructed by 127 indicators, organized into five major pillars: 1) natural capital, 2) intellectual capital, 3) social capital and cohesion, 4) resource efficiency and intensity, 5) government efficiency (SolAbility Sustainable Intelligence, 2020). Given the composition of these categories, it is notable that this index takes into consideration not only productive efficiencies but resources usage and the impacts on the environment. An additional benefit is that it contemplates social cohesion among the key drivers. A further advantage of this assessment that is computes the SGCI index for 180 countries since 2013, making trend analysis possible for most of the world's countries. This index will be described in more detail in the next chapter of this document.

World Economic Forum (WEF). The Global Competitiveness Report is published annually since 2006 by the World Economic Forum, another international organization

located in Switzerland with the focus of fomenting international public and private cooperation. This report published the Global Competitiveness Index (GCI) which aims to evaluate and rank country's competitiveness defined as follows:

"The ability of countries to provide high levels of prosperity to their citizens. This in turn depends on how productively a country uses available resources. Therefore, the Global Competitiveness Index measures the set of institutions, policies, and factors that set the sustainable current and medium-term levels of economic prosperity." (WEF, 2019a, p. V).

This composite index is comprised of 12 pillars, organized into three major groups: basic requirements, efficiency enhancers, and innovation and sophistication factors, with several sub-indexes. It is worth mentioning that the 2019 World Competitiveness Report makes an adjustment to their previous focus on prosperity and returns on investment. In an era where sustainability must be considered as well, the organization's shift in perspective can be noted in the following paragraph:

"[w]hile economic growth, as measured by GDP, is not an end in itself, it remains a precondition for enhancing human welfare. It provides the resources necessary for improving health, education, and security. It is therefore important for countries to monitor closely the factors that determine competitiveness, while keeping an eye on the wider societal goals and related trade-offs…The goal of human-centric economic progress is the increase in sustainable and equitable welfare for a country's population" (WEF, 2019, p. V)

This declaration reflects a macro view, including economic, social and environmental factors. In its latest "Davos Manifesto 2020", the organization declares the need for a "stakeholder capitalism" in order to sustain value creation for all stakeholders, including firms, employees, communities, and all levels of government (World Economic Forum (WEF), 2020a)

Another positive feature of the report is that it evaluates countries from all over the world, a total of 141 countries as of the 2019 Global Competitiveness Report.

The World Bank. Doing Business Index (DBI). This index has the longest trajectory, as it is published annually since 2002 by the World Bank. However, it focuses on the business environment in a country, as its name suggests. The DBI is based on regulatory reforms and other metrics that help assess how easy it is to do business in a country. Because of its nature, this index and assessment appear to be very different in its scope and objective from the previously discussed ones. Hence, DBI will not be used for comparison in this study.

In summary, the term competitiveness always needs to be clarified in what context and what level of analysis we want to use it. Since the original meaning of the term comes from microeconomic firm-level analysis, the distinction must be made if the research's focus is different. When analyzing competitiveness at an international level, the purpose of research has to be defined further so that the correct evaluation can be applied and countries' competitiveness compared in that particular context, whether the focus is on the business environment or the population living standards in a broader sense. For a more sustainable approach the OECD's Better Life index offers more insights and appears to provide a more adequate assessment of a country's performance compared to other evaluations. Due to the limited number of countries that are in the OECD, this dataset

would leave out many of the emerging countries of the world. As complete datasets are available from the UN World Bank, the WEF Global Competitiveness Reports and SolAbility's Sustainable Global Competitiveness Reports, these make it possible that the majority of the world's countries can be compared on the metrics that this study will examine.

CHAPTER 3. THEORETICAL FRAMEWORK & CONTEXT

By the second decade of the XXI century, it has become obvious that ignoring the underbellies of globalization, inequality, migration, and environmental degradation, can no longer go on without serious systemic dangers for humanity (Goldin & Reinert, 2012). The 2007-2008 global financial crisis further highlighted these phenomena and the interdependence of all systems on Planet Earth, not just international finances. The importance of the environment and social issues are now incorporated into composite indexes. In fact, by 2021 not considering the social as well as the environmental dimensions of development does not seem to be an option.

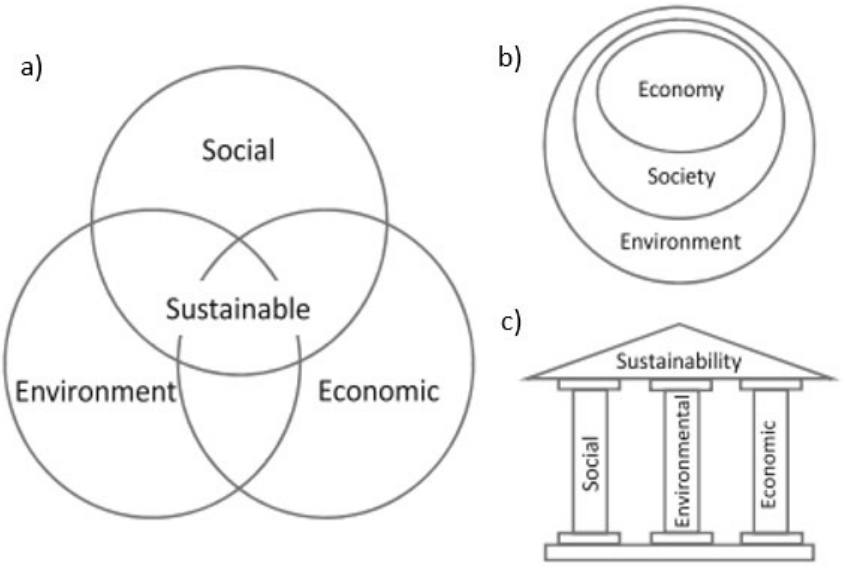
As was illustrated in the previous chapter, there are indeed several assessments that include the abovementioned dimensions.

However, the most comprehensive report up to date is the UN Sustainable Development Report encompassing all metrics that help to assess development in a broad sense for every country with available data. For this reason, the present study will use the data provided by the UN entities.

The conceptualization of the economic, social, and environmental pillars of sustainable development were ingrained in one of the UN's documents (UN, 2012), prior to the inception of the SDGs. There have been several illustrations that offered insights on how these three pillars may relate to each other, as Figure 3.1 shows. Panel a) in Figure 3.1 is the Venn-diagram visualization, illustrating the intercepting nature of the three pillars, often referred to as dimensions. In panel b) the concentric circles approach can be seen, indicating which is a broader enclosing dimension (environment), within which this society is encapsulated, and within society, the economy. In panel c) the three pillars are

shown literally, separated from each other, but together holding up sustainability. Perhaps this latter illustration is the least useful, as removing the middle pillar – the environment – the structure may still stand, which would be detached from reality.

Figure 3.1. Illustrations of Sustainability



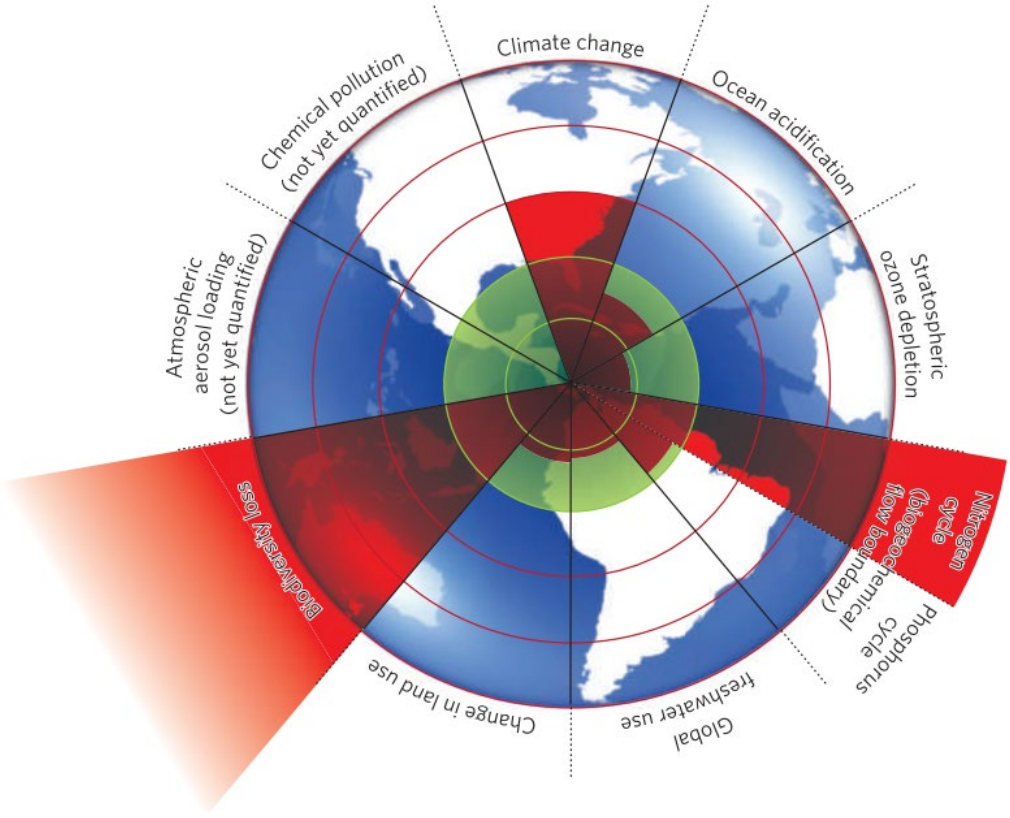
Source: Purvis, Mao, and Robinson, 2019, p.2.

As the Millennium Development Project concluded in 2015 (United Nations, 2002), a new agenda was formulated by the UN with a broader perspective, encompassing the principles of sustainability as it was defined decades earlier (Brundtland et al., 1987). The SGDs of the UN Agenda 2030, in addition to the social and economic dimensions of development, include the principles of environmental sustainability as well, as four of the 17 objectives focus on issues such as climate change, fresh water, life under water, life on land. By adding these objectives, the "three-pillar" model became more explicit and complete.

Conceptually, the importance of considering the natural environmental as a more fundamental context that from the proposal of several researchers at the Stockholm Resilience Center with a seminal article published in the influential Nature magazine in 2009 titled "A Safe Operation Space for Humanity" (Rockström et al., 2009). This article presented the nine planetary boundaries with clear descriptions and several indicators to measure human impact on the environment.

Below Figure 3.2 shows the image that summarizes the nine boundaries that according to the authors humanity must respect for its own survival.

Figure 3.2. The Nine Planetary Boundaries



Source: Rockström et al. 2009, p. 472.

As the authors describe, a threshold can be established by finding critical values for each aspect of human impact on the environment. Some of these critical values have already been defined, such as for the depletion of the ozone layer, ocean acidification, and biodiversity loss. There are, however, areas where scientists are still looking for adequate models to establish the critical values, for example, chemical pollution or atmospheric aerosol loading (Rockström et al., 2009). The red-shaded areas in Figure 3.2 indicate the boundaries which are already beyond those established threshold values. In 2009, the authors identified three of the nine boundaries where the threshold has already transgressed: 1) the rate of biodiversity loss, 2) climate change, 3) interference of the nitrogen cycle (Rockström et al., 2009). Hence, if humanity continues as business as usual (BAU) with the current trends in extraction, production, consumption and contamination, irreversible processes may unfold in the not-so-distant future.

These concepts of the environmental boundaries were considered to some extent and incorporated in a different way into the new framework for sustainable development published by the UN in 2015 (UN General Assembly & United Nations General Assembly, 2015). As mentioned before, of the 17 SDGs, four are clearly related to the environment: No. 6 - Clean water and sanitation, No. 13 - Climate action, No. 14 - Life below water, and No. 15 - Life on land. Although links among the 17 SDGs were identified and mapped, a year after of its launch a very insightful visual illustration was presented by two scientists from the Stockholm Resilience Centre, Rockström and Sukhdev, in a conference on how food connects all of the 17 SDGs (Stockholm Resilience Centre, 2016). As it is visible in Figure 3.3, the base of the 17 SDGs - the lower ring of the three-layer model - are comprised of the four SGDs related to the environment,

illustrating that the natural environment is really the basis for all our other activities, including all human interactions in society and the economy.

Figure 3.3 A New View of the Sustainable Development Goals (SDGs)

Source: Azote Images for Stockholm Resilience Centre, 2016

Moreover, it is important to consider that of the three dimensions of sustainability - social, economic, and environmental - only the first two have agency on their own, considering that humans are the main actors in society and in the economy. With respect to the environment, however, humans are only one of the species and actors among many others on Planet Earth and can exist without humans. Therefore, the environment is an exogenous element for humans, which we are part of and dependent on. Our impacts on the natural environment, however, can have profound and irreversible effects, threatening several species' survival, including our own.

Another noteworthy element of the illustration in Figure 3.3 is the vertical representation of SDG17, Global Partnership, indicating that we need global cooperation for all systems to work and solve these challenges. Considering the natural environment, no borders really exist, provided that those are human-made artificial creations of political-administrative separating lines. Neither rivers, seas, animals stop at national borders, nor do other climatic phenomena, such as hurricanes, floods, drought, and contamination. For these reasons, the illustration offers a useful basis to develop new economic models.

3.1. The Doughnut Economic Model

By the early 2020s, it appears increasingly clear that the existing capitalistic model that functions based on the extraction of natural resources and converts those into commodities is not sustainable at the current level of population growth. The UN 2030 Agenda provides a complete set of goals and indicators on how to measure our progress and the impact of our economic activities on the planet, but it does not offer a practical guide how to reach them. Therefore, new models are needed that can offer us guidance on how to transit from the linear extract-transform-consume-discard model to a sustainable model.

There are several new approaches and proposals that have been put forth in the past two decades, such as the Circular Economic Model (Stahel, 2016; The Ellen MacArthur Foundation, 2017) and the Blue Economy (G. Pauli, 2010; G. A. Pauli, 2016). Both reports were originally written for the Club of Rome in search of sustainable economic

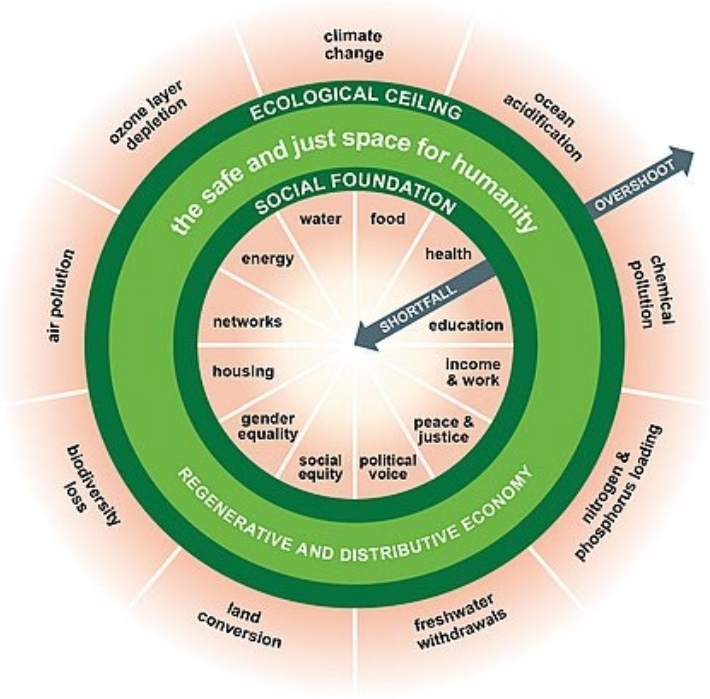
models. Common in these reports that they focus on business models at a microeconomic level and indicate how production and consumption cycles can be reinvented by entrepreneurial innovation, with regenerative and cradle to cradle designs, without waste or emissions. Numerous successful case studies have been documented and presented by the NGO led by Gunter Pauli, Zero Emissions Research and Initiatives (ZERI) since 2010 (Pauli, 2016, 2017), mapping businesses, innovation, research and training sites around the world (ZERI Foundation, 2021). These models also share that they have a bottom-up or grassroot approach, which makes it possible for anyone and any organization to apply them. This way it is possible to move away from the mainstream business model of rent seeking without considering how the inputs have been produced and what impact the output may have on the environment.

However, these models assume that individuals and businesses make the right choices towards sustainability by their own will and convictions. Governments can provide incentives to businesses who follow these models but their impact on the macro-level economy is still not far-reaching. In fact, most countries' economic models are still based on extraction, capital accumulation and transformation, each of which requires a lot of energy, resources and generates externalities, such as waste and pollution. One exception is Bhutan, a small landlocked country at the foothills of the Himalayas, that manages to be not only carbon-neutral but carbon negative (Climate Council Australia, 2017). In other places in the world market failures are ubiquitous. We are informed regularly by the media about the depletion of fisheries, overuse of soil for agriculture, deforestation for planting high-yielding crops, and it appears that without government regulation and proper incentives no significant change will occur.

Due to the aforementioned reasons, new economic models need to be considered that offer alternatives to the existing economic structure. One of the interesting new proposals of recent years comes from a British economist, Kate Raworth, who developed the Doughnut Economic Model (DEM) during the 2010s (Raworth, 2017a).

The DEM model unites the key concepts of the previously described UN Agenda 2030 and the Nine Planetary Boundaries from the Stockholm Resilience Centre. By combining these two frameworks, Raworth created a new one, offering new insights. Her visual presentation (see Figure 3.4 below) illustrates with more clarity the planetary boundaries as upper limits that every community and country need to respect (Raworth, 2017b). Once a country overshoots these planetary boundaries, it indicates that the country uses more natural resources or its impacts on the environment is not sustainable for the next generations; hence its progress contradicts with the principles of sustainability. The inner core of the doughnut represents the basic foundations for human life, such as food, water, health, education, social equity, which need to be met at a minimum threshold for a dignified human life. These twelve dimensions of the inner core are based on the social SGDs of the UN 2030 model and use the same metrics.

Figure 3.4 The Doughnut Economic Model (DEM)



Source: Raworth, 2017a, p. 4.

By 2021 the author provides a dynamic interactive illustration on her website which allows the visitor to observe the current status of each indicator, inside and outside the doughnut (Raworth, 2020).

Based on the objectives of the present document and the literature review, the following research is going to use the concepts of this simple integrated model as a framework for further analysis of sustainable development. Although the DEM is relatively new, it has been proposed as a model for development in a handful of cities in advanced countries, such as Amsterdam in the Netherlands, Copenhagen in Denmark and Portland in the U.S. (Doughnut Economic Action Lab, 2021). On a macroeconomic scale, however, it has not been considered to be implemented by any country as of this writing.

It is yet to be seen whether it can be scaled up to a national level, beyond the size of a city.

Another dilemma that the DEM model poses is how it can be applied to advanced and emerging countries where the conditions are very different. High income countries are overshooting on several metrics of the planetary boundaries, while middle income countries are falling short in many indicators of the social dimensions, the inner core of the doughnut, and possibly overshoot in some indicators of the planetary boundaries. This situation also presents a moral dilemma as humanity has only one planet and if rich countries are using natural resources in excess and contaminate relatively more than lower income countries, the development of this latter group may be limited, unless new discoveries and innovations make low- or zero-carbon emission development possible. In other words, the concepts of convergence of emerging countries to advanced ones could be questioned. Even the aspiration to "catch-up" and follow the path of the advanced countries appears to be misplaced and misleading.

Further debate can unfold about what happens within the 'safe zone' of the doughnut, which is illustrated by the green area in Figure 3.4. Given the competitive nature of humans, in any group size, currently it appears difficult that progress and economic development can be limited. For this to happen, genuine global agreement and cooperation are needed with binding upper limits for each country. Although it is not impossible, nonetheless without the coercive force of a major systemic crisis it seems unlikely that more than 200 countries of the world can arrive at such an agreement in the near future. As a support for this argument, current ongoing tensions in geopolitics, trade, and cybersecurity-related issues are factors to consider (Goldin, 2020). Not even the

COVID-19 pandemic has nudged the countries to reach overarching binding global agreements on vaccines.

Consequently, it can be useful to revisit the concept of competitiveness, specifically sustainable international competitiveness, and attempt to reconcile it with the DEM model as described above.

3.2. Sustainable Global Competitiveness

Considering international competitiveness as presented in Chapter II, the model developed by SolAbility Sustainable Intelligence (SSI), the Global Sustainable Competitiveness Index (GSCI) offers a different approach from that of the most famous and commonly used WEF Global Competitiveness Index. In an analytical paper from 2013 titled the "Sustainable Competitiveness vs. Davos Man" SSI points out two major differences and shortcomings in WEF's perspective (SolAbility Sustainable Intelligence, 2013, p. 3):

1) it focuses on financial-economic wealth creation assuming that the economy is detached from the natural environment.

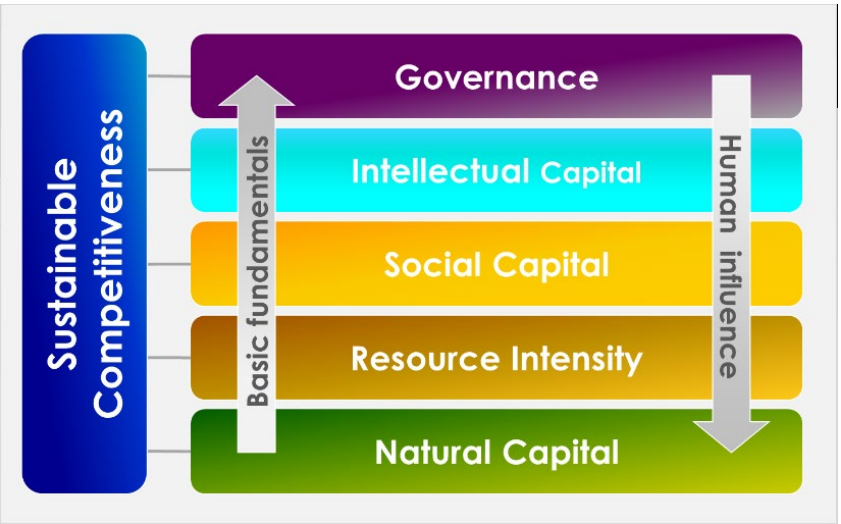
2) it ignores the impacts of current economic activities on future capacity of wealth creation, thus not meeting the criteria of sustainability as defined by the original Brundtland Report (1987).

These are valid arguments, even considering that WEF has been trying to incorporate the concepts of sustainability in its index for several years. In 2014, the organization published the Global Risk Report (WEF, 2014) which have included three risk factors of stemming from the environment, such as water crises (on the top 10 Global

Risks, it is No. 3), failure of climate change mitigation and adaptation (No. 5), greater incidence of extreme weather events (e.g. floods, storms, fires; No. 6). However, their approach suggests that the environment represents a risk to humanity, and not that we are inseparable part of it using it for our own survival and benefit. Also, many of the WEF indicators are based on executive opinion, not empirical data, which may signal the perceptions of those business leaders who participated in the surveys (WEF, 2018).

On the other hand, SSI builds its assessment and composite index mostly from data (90% of its indicators come from data; SSI, 2013) and it takes the environmental dimension just as important as other pillars. The GSCI is constructed of five major pillars, which can be seen in Figure 3.5.

Figure 3.5. Pillars of Sustainable Global Competitiveness



Source: From SolAbility Sustainable Intelligence (2020, p. 47)

A brief description of the 5 pillars (SolAbility Sustainable Intelligence, 2013)

1) **Natural Capital** refers to the availability of natural resources and how they change due to depletion over time;

2) **Resource Efficiency** refers to the efficiency of using available scarce resources for economic activities;

3) **Social Capital** refers to health, security, freedom, equality of life;

4) **Intellectual Capital** refers to the capability to generate jobs and wealth via innovations in globalized markets**;**

5) **Government** refers to the results of core areas of state investments, such as infrastructure, market, and employment, with the provision of a sustainable future.

In Table 3.1 examining the latest rankings of these two indexes, the SGCI and GCI, it is apparent that there are differences in these lists. Mostly less populous advanced countries appear (United Kingdom and France are the outliers for being the most populous) on the GSCI, Scandinavian countries leading the list; while on the GCI several advanced countries with large population are listed (such as the United States, Japan, Germany, and the United Kingdom). It is also noteworthy that no emerging country appears on either of these two lists. For a more specific explanation, further analysis is required to understand the differences between the assessments and the countries' characteristics.

Table 3.1 Ranking of the top 20 countries on Sustainable Global Competitiveness (SGCI) and Global Competitiveness Index (GCI) (2020, 2019)

Sustainable Competitiveness (GSCI), 2020			Global Competitiveness Index (GCI), 2019		
Country	**Rank**	**Score**	**Country**	**Rank**	**Score**
Sweden	**1**	**62.1**	Singapore	**1**	**84.8**
Denmark	**2**	**61.0**	United States	**2**	**83.7**
Iceland	**3**	**60.7**	Hong Kong SAR	**3**	**83.1**
Finland	**4**	**60.4**	Netherlands	**4**	**82.4**
Switzerland	**5**	**59.4**	Switzerland	**5**	**82.3**
Estonia	**6**	**59.4**	Japan	**6**	**82.3**
Latvia	**7**	**58.2**	Germany	**7**	**81.8**
Luxembourg	**8**	**58.0**	Sweden	**8**	**81.2**
Norway	**9**	**57.7**	United Kingdom	**9**	**81.2**
Croatia	**10**	**57.2**	Denmark	**10**	**81.2**
New Zealand	**11**	**57.2**	Finland	**11**	**80.2**
Liechtenstein	**12**	**57.1**	Taiwan, China	**12**	**80.2**
Ireland	**13**	**56.8**	Korea, Rep.	**13**	**79.6**
Austria	**14**	**56.7**	Canada	**14**	**79.6**
United Kingdom	**15**	**56.1**	France	**15**	**78.8**
Slovenia	**16**	**55.9**	Australia	**16**	**78.7**
Lithuania	**17**	**55.9**	Norway	**17**	**78.1**
France	**18**	**55.5**	Luxembourg	**18**	**77**
Czech Republic	**19**	**55.2**	New Zealand	**19**	**76.7**
Portugal	**20**	**55.0**	Israel	**20**	**76.7**

Source: Author's compilation from (SolAbility Sustainable Intelligence 2020; WEF, 2019b). Note: 2019 is the latest ranking of GCI from WEF as of the writing.

Given the differences in their approaches, the SGCI by SSI appears to be a better measure to assess competitive sustainability than GCI by WEF. Nonetheless, in the methodology chapter this comparison will be examined with statistical methods.

3.3. Brief Review of Mexico's Recent Economic Progress

Mexico, similar to other emerging countries, is in the process of economic development to provide better living standards for its population. During its history in the 20th century

the country had experience with the producing goods for the US market based on a unskilled labor force with low salary, developing a maquiladora industry since 1930s, first in the Northern part of Mexico, later in the central regions as well. Later, import-substituting industrialization was implemented, developing its own industrial base (Calva, 2020a). In the 1970s exporting oil provided cash income for the country but the high profits earned from the extractive industries created distortions in the economic structure as other industries become less productive and profitable compared to oil extraction and sales. By the 1980s when the oil prices on the world market plummeted, the extractive model coupled with a not very productive industrial base resulted in accumulated debt, hyperinflation, and a lost decade for Mexico. By the late 1980s and early 1990s a new model economic model was promoted by the US foreign policy makers and become popular in Latin America as an alternative, the neoliberalist model. As mentioned in Chapter 2, it was based on free trade, open markets, exports that relies on cheap labor force, privatization, and macroeconomic stability. The ratification and implementation of the North American Free Trade Agreement (NAFTA) in 1994 provided a new framework for the export-driven economic development. Although NAFTA resulted in important growth in terms of exports within the region, in terms of economic growth the results were modest as the annual growth rate was around 3.5%. The growth expectation as a result of trade openness was greater since the policy expected to create greater wealth faster for most of society. Another consequence of the NAFTA was the reliance and increasing dependence on the terms of trade towards the North American market. With the intensification of globalization and the appearance of China and other trading relations in the world, the conditions for inserting into the global trading system have changed since 2000.

The following section reviews four selected indicators that are one of many variables for assessing the three pillars of sustainability. As a first assessment for economic progress, the annual change of the GDP and annual GDP per capita growth are selected. For social progress the Gini index is an indicator of income inequality. Finally, for environmental impact of economic activities the CO2 emissions per capita are chosen to examine the change over the last 40 years.

Figure 3.6 shows the annual GDP growth in three selected emerging countries, Mexico, Chile, and South Korea between 1980 and 2020.

Figure 3.6. Annual GDP growth of Mexico, South Korea, and Chile in percentage from previous year, in current USD, 1980-2020.

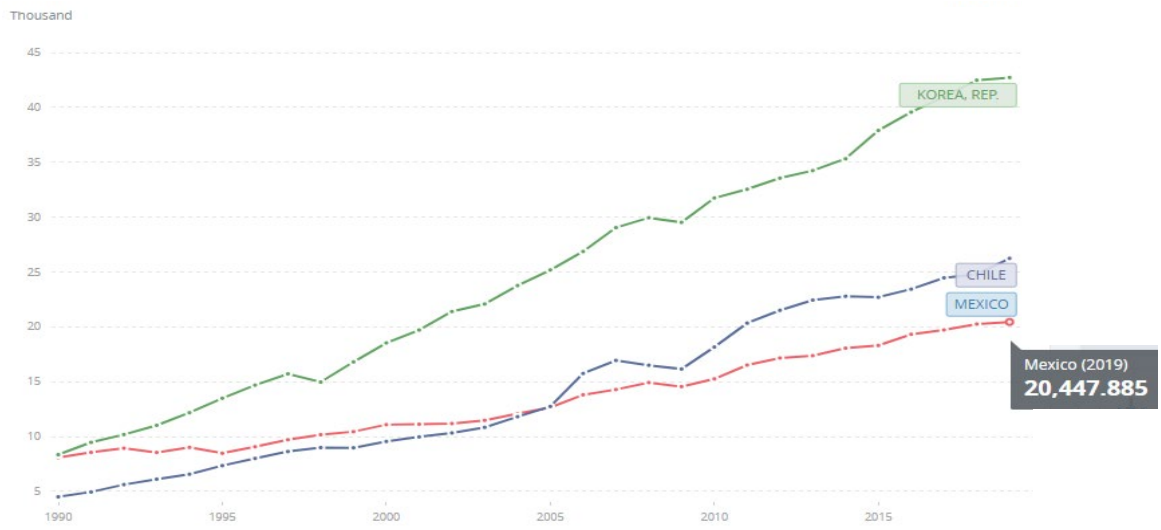
Source: Data from World Bank dataset (World Bank, 2021c)

As it can be observed the annual growth has fluctuated in all three countries through the four decades. However, in South Korea it has been almost constantly above both Chile and Mexico. Korea's average annual growth was 6.1%, while in Chile 4.3% and in

Mexico 2.5%. These trends indicate faster economic growth in South Korea and Chile on average than in Mexico during the past 40 years.

Now observing the GDP per capita increase between 1990 and 2018 (see in Figure 3.7), the data reveals that Mexico and South Korea had about the same income per person in 1990 (8,082 USD and 8,353 USD respectively) while Chile had much less (4,511 USD) (World Bank, 2021d). As an observation, the first year that data is available for this indicator in the World Bank dataset is 1990 and the latest data was published for 2018.

Figure 3.7. Annual GDP per capita growth of Mexico, South Korea, and Chile in USD from previous year, in current USD, 1980-2020.



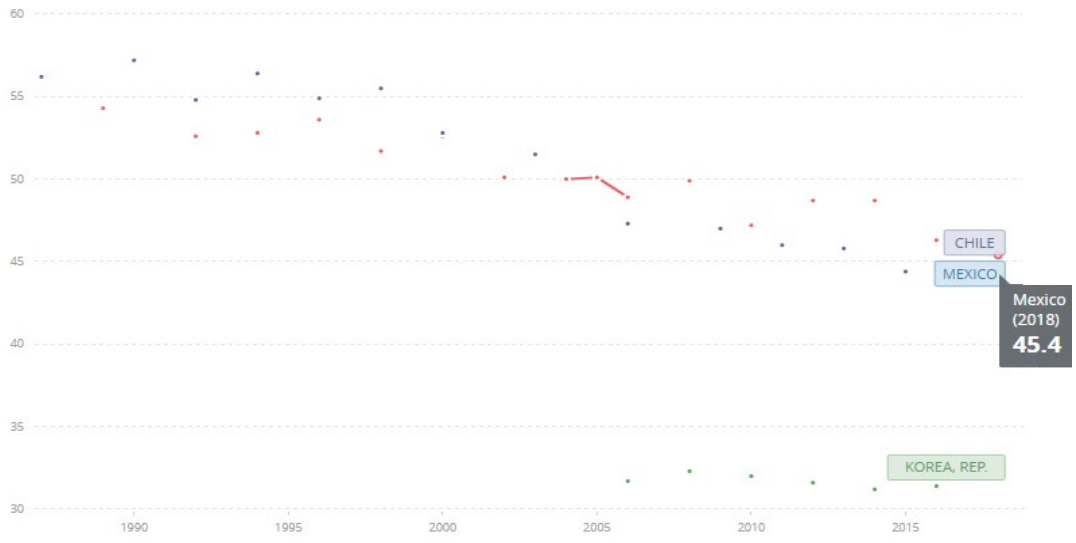
Source: Data from World Bank dataset (World Bank, 2021d).

By 2018, however, a South Korean citizen's GDP per capita income was 42,728 USD, more than double as much as an average Mexican citizen's income, 20,448 USD. Chile reached a higher GDP per capita income than its regional peer, Mexico, earning 26,247 USD.

Due to this impressive economic growth South Korea is now considered as an advanced country, while the two Latin American countries have not managed to improve the living standards of their people at such an accelerated pace.

On the measure of income inequality, the Gini index (see in Figure 3.8), a common measure of social well-being, indicated that both Latin American countries had a very high score in the late 1980s according to the World Bank's estimation (Chile 56.3 in 1987, Mexico 54.3 in 1989) reflecting varying inequality in these societies. In 2006 South Korea reported this data for the first time, when its Gini index was estimated at 31.7, signaling a less unequal society. Since 2006 there has been notable improvement in Mexico and Chile. By the late 2010s, the Chilean Gini score was 44.4 and Mexico's was 45.4. These figures are still considered high, revealing high income inequality and they are well above South Korea's score of 31.4 (World Bank, 2021e).

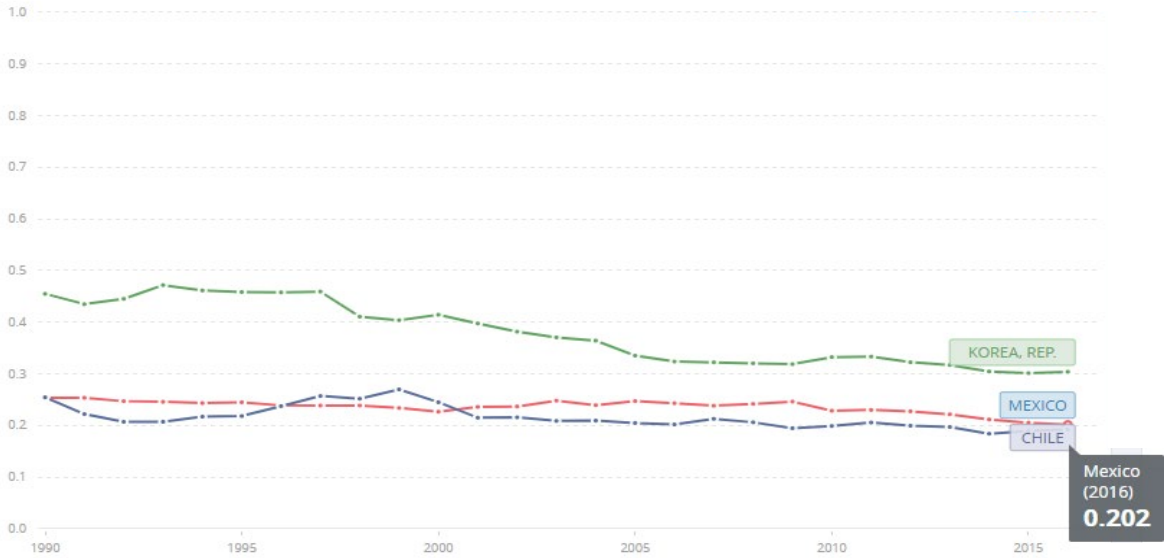
Figure 3.8. GINI index (World Bank estimate)-Mexico, South Korea, Chile, 1987-2018



Source: Data from World Bank dataset (World Bank, 2021e). Note: The values of the GINI index are published in 2016 for South Korea, in 2017 for Chile, and in 2018 for Mexico in the World Bank dataset

During the phases of industrialization and modernization, it may be expected that emerging countries' CO2 emissions increase, while later, at an advanced level of economic development, the country may apply new technologies and as a result decrease its carbon emissions (Stern, 2004, 2017). Observing the CO2 emissions for the three countries in Figure 3.9, it is noticeable that South Korea's CO2 emissions were significantly higher in 1990 than the Latin American countries, but it has been reducing gradually between 1996 and 2016, while in Mexico and Chile it has changed very little during the same time. These trends confirm Stern's findings (2017) that significant decline in CO2 emissions can only be expected at very high-income levels.

Figure 3.9. CO_2 emissions (kg per 2017 PPP of GDP) – Mexico, Korea, Rep., Chile, 1990-2016.



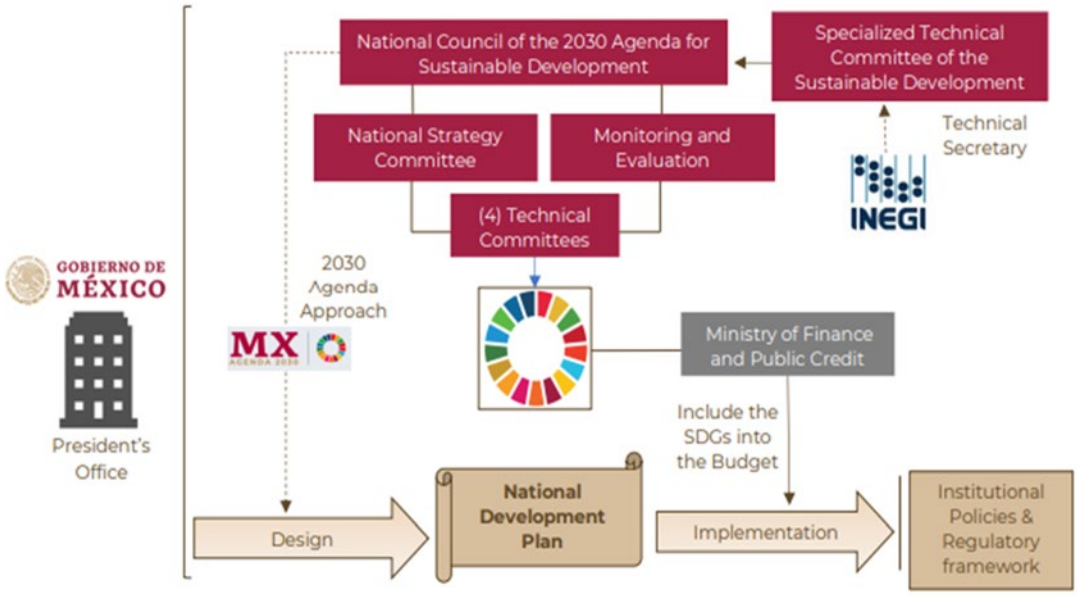
Source: Data from World Bank dataset (World Bank, 2021a)

The indicators above signal important trends in the selected three countries, but they do not describe the fundamental economic and social changes that took place in these countries from 1980 to the late 2010s. To gain more insight into economic and human progress, one must examine other indicators of development, such as productivity, education, competitiveness, and well-being indicators and review specific economic policies and national development strategies.

3.4. Current status of the implementation of the UN Agenda 2030 in Mexico

Mexico, as most countries of the world, has signed up the UN Agenda 2030 of the SDGs in 2015. For the implementation and fulfillment of the program, Mexico has developed several initiatives, from the formulation of the Specialized Technical Committee of the Sustainable Development Goals (Comité Técnico Especializado de los Objetivos de Desarrollo Sostenible, CTEODS) within the framework of the National System of Statistical Information and Geography (Sistema Nacional de Información Estadística y Geográfica, SNIEG), the body in charge of coordinate the tasks of generating, monitoring and updating the data and indicators to monitor progress in compliance with the 2030 Agenda at the national level. The following image illustrates the current structure at national level in Figure 3.10:

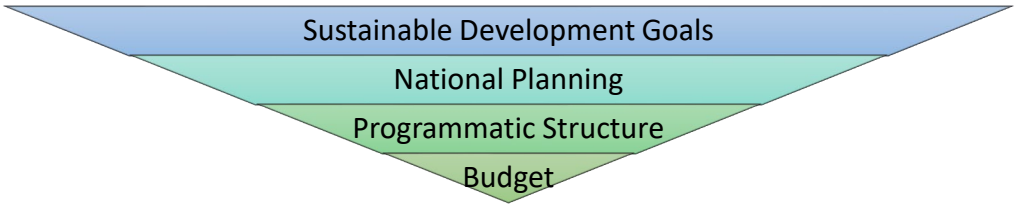
Figure 3.10. Schematic overview of the architecture for the implementation and monitoring of the 2030 Agenda



Source: Secretaría de Hacienda y Crédito Público (2020, p. 6)

From the Mexican government's documents the intention is apparent to comply and fulfill the SDGs of 2030 Agenda, given the high-level commitment and the organizational basis and mechanisms that were laid out for the implementation. Considering the financial resource assignation, the budgetary process was also defined by the SHCP according to the following process as in Figure 3.11, from parting the SDGs through National Planning and Programmatic Structure to the definition of the actual Budget:

Figure 3.11. Mexico' yearly budgetary approval process



Source: Adapted from Secretaría de Hacienda y Crédito Público (2020, p. 9)

In addition, in September 2016, Mexico ratified the Paris Agreement and its Intended Nationally Determined Contribution (INDC) from 2020 clearly confirmed its commitment to the environmental improvements in the form of unconditional and conditional contributions (SEMARNAT, 2020):

1) Unconditional contributions: Consist of, alternatively: Reduction of 22% of greenhouse gas emissions (GHG) and 51% of black carbon emissions by 2030 as compared to the baseline business-as-usual scenario (BAU);
2) Conditional contributions: A reduction of up to 36% of GHG emissions and 70% of black carbon emissions by 2030 compared to the BAU scenario.

Concerning the social issues, the 100 commitments of the President (López Obrador, 2019) included several points that intended to attend the situation of the Mexican population in poverty and inequality, giving preference to the most vulnerable and marginalized segments of society by providing scholarships to students and young people, increasing pensions to the elderly, creating new institutions such as the new Welfare Bank (*Banco del Bienestar*) to attend the financial needs of the unbanked, cutting out middle men from public tenders, reducing salaries of high level public servants and announcing a general austerity plan in public finances. Other points include further elements of transformation, the Fourth Transformation as the President named it, including the hallmark infrastructure projects of the current 2019-2024 administration (such as the Maya Train in the Yucatán Peninsula, the Commercial and Transportation Project of the Trans-Isthmus, the Santa Lucía Airport, and the Dos Bocas Refinery), among many other programs that aim to change the previous governments' social and

economic policies and programs. On the government's website these points, and their actual status are updated regularly. According to the site, by the third quarter of 2022, 78 of the 100 commitments were completed. This focus on the previously unattended segments of society may explain the high approval rating of Andrés Manuel López Obrador (AMLO) four years after his election: on August, 2022, it was 61% (it stood exactly at the same level as a year earlier, in August 2021), according to polls (COA, 2022).

With respect to the assessment of UN SDGs on the UN SDG Dashboard site which tracks each country's performance and progress on the 17 SDGS, the result was less comforting in 2021 as it can be seen in Figure 3.12.

Figure 3.12. Sustainable Development Report 2021 - Mexico

Source: Sustainable Development Report 2021 (UN, 2021).

The dashboard indicates that the overall index ranking of the country stands at 80th place of 165 countries, with a score of 69. Looking at the 17 SDGs, progress can be seen on SDG1, eradication of poverty, while 7 SDGs (SDGs 3,4,5,6,7,11,13) show modest improvements with a long way to go to achieve fulfillment, on other 7 SDGs (2,8,9,10,14,16,17) stagnation is indicated and on SDG15 (Life on land) decline is signaled amidst major challenges remain. On SDG12 (Responsible consumption and production) no assessment was reported at the time of this writing, possibly due to missing data. Clearly, the Covid-19 pandemic has caused a serios setback on several fronts and the subsequent economic crisis resulted in a decline or stagnation on several indicators (Esquivel, 2020) that affect the SDGs, including inequality reduction (SDG#10) and zero hunger (SDG2).

By the 2022 Sustainable Development Report (Figure 3.13), the ranking of the country has improved, as it is at the 74th place, moving ahead six places. Its status nonetheless is reason for concern as the country tries to recover from the deepest economic crisis in the past hundred years and make progress on all these social and environmental challenges.

Figure 3.13. Sustainable Development Report 2022 - Mexico

Source: Sustainable Development Report 2022 (UN).

As with every crisis, the post-covid economic recovery offers an opportunity to take new approaches to address social, economic, and environmental issues, with the potential to execute deep structural reforms that are needed. Mexico has been trying to find a new economic development model since the results of the past three decades of economic policies have not delivered the promise of economic growth as it was described in the previous section comparing Mexico's growth to other countries such as Chile or South Korea.

There is a need to reinvent the existing capitalistic model in Mexico as several scholars have pointed out (Arkonada, 2013, 2019a, 2019b; Calva, 2019, 2020a; Moreno-Brid et al., 2009; Téllez Ramírez, 2020) by departing or diversifying the policies of previous administrations. In fact, this transformation seems long overdue, given the poor

socio-economic results, such as the poverty rate, income inequality and lack of social mobility previously mentioned. Moreover, when analyzing the current status of economic order in Latin America, including Mexico, as Bartra (2014) argues that the current state of capitalism can be characterized as not only dispossession of the lower socioeconomic segments of society but as a degradation of human life. Valencia Triana (2016) goes even further as she describes the afflictions of the narco-culture on people in Mexico and the socio-economic distortions that derive from violence. The social impacts cannot be understated as the diverse manifestations of violence are confirmed by the homicide, feminicide, kidnapping, extortion, and other violence-related statistics of the past two decades. So far, no effective policies have been implemented by the past three administrations in Mexico that delivered sustained reduction in violence and crime rates. As the authors Caciabue and Arkonada (2019a) put it, the old capitalistic model isn't dead yet and the new one has not been born yet, therefore the present times are turbulent, undefined and uncertain how they will evolve. It is possible that change may not come from top-down development models but rather from bottom up or in a mixed form, with a partnership between the private and public sectors, including the community level initiatives.

With respect to the Mexican reality, other aspects of economic structure need to be considered. There are several features of the current economic system, namely capitalism, that have made development and progress especially difficult. Starting with intrinsic features of capitalism, the permission of non-competitive market structures that enable monopolies to emerge and dominate economic sectors has prevented the development of small and medium-size enterprises (SMEs) for decades. In fact, according to a recent analysis by Ríos (2021), it is not normal that the top 500 list of most important companies

published annually by the magazine *Expansión* has not changed significantly in the past 20 years: 70% of the companies of 2000 in the ranking of the top 10 companies were also in the top 10 in 2022. This indicates that the big firms of Mexico are hard to be overtaken by newcomers, even in the era of fast-paced technological change and emergence of new business models, such as Amazon or Facebook, which were unknown 20 years ago. The author attributes this immobility in company ranking to the tremendous advantages that big firms have accumulated over time, including by obtaining special permissions and favors from the government, not paying their fair share of taxes by tax evasion and avoidance, exerting influence on Mexican politicians to prevent passing unfavorable laws, among other strategies (Ríos, 2021). These influences make it very difficult for the SMEs to compete with the big established firms which additionally have the financial means to employ the best consulting and law firms that are unaffordable for the smaller companies. Furthermore, big firms have access to financing while the cost of financing from the banking sector for SMEs is very high, limiting their growth and capacity to overcome financial downtimes.

Other sectorial inequalities have also been identified by Ríos (2021), for example the excess fees and abusive practices in the banking sector, the public notaries, the practice of selling expensively by retailers, all charging extra prices to the Mexican consumers. Levy and López-Calva (2016) pointed out that the average workers' earnings have been stagnated for two decades and earnings for workers with more schooling have declined which results in reducing the return on education. The authors argue that the persistent misallocation of resources towards lower-productivity firms impedes Mexico from taking advantage of investments in the human capital. These phenomena all indicate structural problems that government regulations could address.

Adding further to this uncertainty, humanity faces increasingly more challenges that derive from climate change. Even in this respect there are authors who are concerned with the developments of environmental protection and prevention of ecological degradation in Mexico (Hernández-López, 2020; Ribeiro, 2004, 2019), in the context of multinational companies operating in oligopolistic markets where the government does not intervene to sufficiently mitigate the negative externalities that arise from harmful agricultural and industrial practices.

Considering the latest global summit on the environment in Glasgow in late 2021, the COP26, Mexico presented a commitment towards more conscious use of natural resources, invest in sustainable development, new investments, and innovations in the area of clean industries, as it is now moral imperative to act responsibly. This includes forming more alliances between the public and the private sectors to create new opportunities and eliminating barriers among these sectors (UN Global Impact - Pacto Global Red Mexico Red, 2021). The intentions are there, the results need to be seen in the upcoming years.

Even though Mexico has the mechanisms in place for achieving the Agenda 2030, the current results are not satisfactory, while future is uncertain and not written. Therefore, it is pertinent to investigate the possible outcomes with foresight methods. The next chapters will investigate these topics with different research methods.

CHAPTER 4. METHODOLOGY

4.1. Introduction and General Description of Methodology

4.1.1. Research Objective

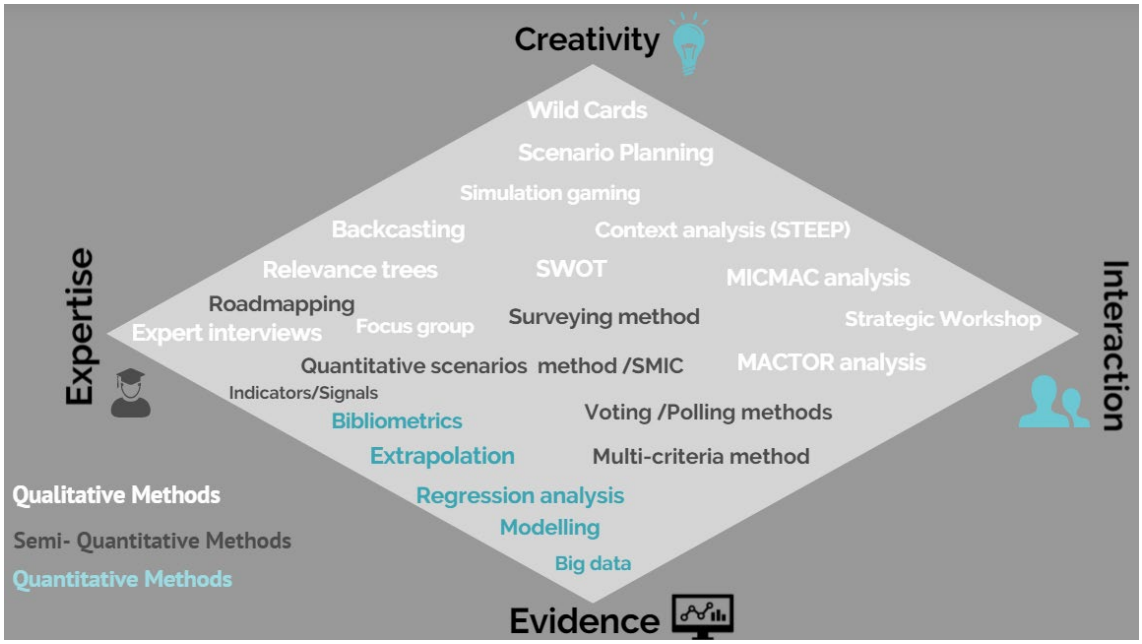
As the objective of this investigation is to develop possible and plausible scenarios by 2030 in Mexico, scenario planning method is used as the main research method. Therefore, the present investigation applies primarily qualitative research methods. With this method it is possible to identify the best-case, the worst-case and most likely scenarios that may unfold by 2030. In order to obtain well-founded research and results, three complementary qualitative research methods are going to be applied as it is suggested by authors of foresight methods (J. C. Glenn & Gordon, 2009; Godet, 2000; Lum, 2016; Popper, 2008b; Wade, 2012).

4.1.2. Type And Phases Of The Research

The reason for selecting this type of research is that developing scenarios requires nuanced insights that can be better investigated by qualitative research methods. A further advantage of qualitative methods is that these rely on observing reality, describing, and interpreting systematically the phenomenon which is the subject of the study. In this research type meaning is extracted from the collected information through rigorous scientific methods in order to analyze subjective reality (Creswell & Creswell, 2018). As the objective is explore future scenarios with respect to sustainable and competitive development in Mexico, foresight methods offer multiple tools to substantiate the findings. The complementary research methods for foresight studies have been widely recommended and used by several authors (Godet, 2012; Hines, 2015; Lum, 2016;

Popper, 2008a; Saari et al., 2017; Voros, 2003) and international organizations, including the UNDP since it published a complete Foresight Manual with respect to the Agenda 2030 (UNDP Global Centre for Public Service Excellence, 2018). Furthermore, for the selection of methods Popper's recommendations (2008b) were considered that suggests using methods based on the intrinsic attributes and according to their capabilities, i.e. according to their ability to gather and process information depending on whether these derive from evidence, expertise, interaction of creativity. Based on these criteria, the author suggests selecting research methods according to the research objective and expected outcome from the following Foresight Diamond in Figure 4.1:

Figure 4.1. Popper's Foresight Diamond



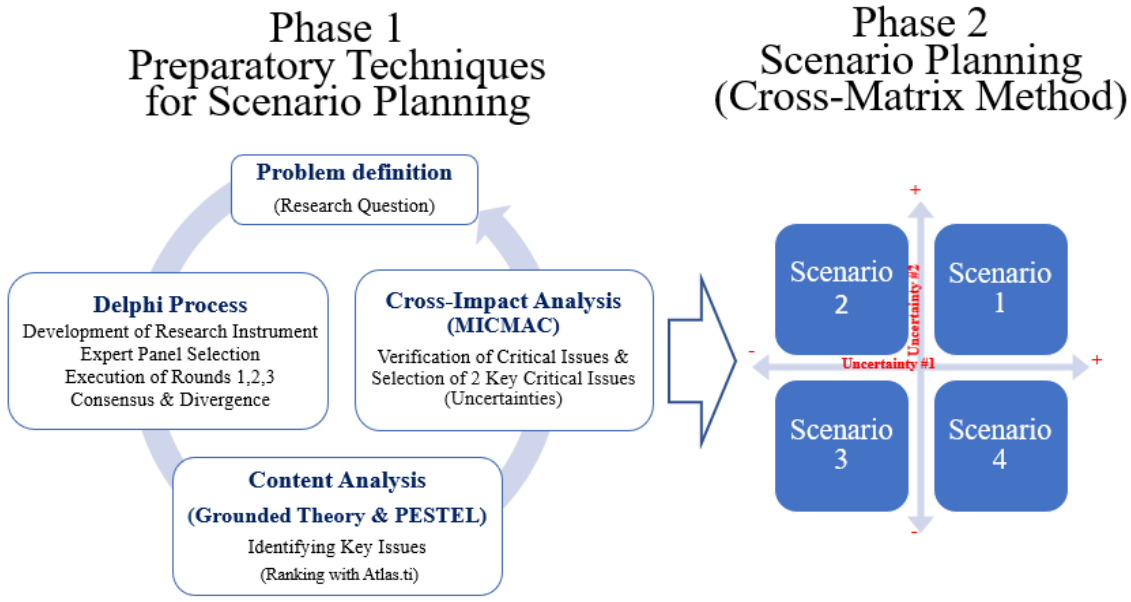
Source: Author's adaptation based on (Popper, 2008a).

Based on the above cited studies, the present research was conducted in two major phases: in Phase 1 preliminary research methods are included that create the basis for Phase 2, which focuses on the development of scenario. The first part of this chapter, Phase 1,

starts with the introduction of the Delphi method and its application in the present research project, describing the three rounds of field research that included in-depth interviews and focus group sessions. After collecting the information, content analysis was conducted in the next phase with the use of the software Atlas.ti. The content analysis will help to ground two key uncertainties that are the basis for the four expected scenarios. Following this analytical part of the investigation, the findings of were further assessed with cross-impact analysis with the use of the software MICMAC, concluding the preparatory phase of the research.

In Phase 2, scenario planning method was applied, therefore in Chapter IV, the method itself is introduced as to how it is used in diverse contexts, highlighting the validity and usefulness of this prospective method for the present research. Figure 4.2 below illustrates the steps of Phase 1 and Phase 2. Both phases are described in greater details later in this chapter, hereby the schematic overview summarizes the flow of the investigation.

Figure 4.2. Research phases



Source: Author's work and adaptation based on Taylor (2020) and Wade (2012).

4.1.3. RESEARCH METHODS

The research methodology was designed and built to create plausible and consistent scenarios for the next 10 years. Therefore, the first key concepts of the Delphi method are summarized briefly as a starting point for the research. Second, the process of conducting field research using the Delphi method is described for this present study. The obtained information through this process is analyzed by using the software Atlas.ti and applying the key concepts of grounded theory (GT). Next, after identifying the key drivers for the future, the third phase, scenario planning can be initiated and executed with great detail. Once described the four proposed scenarios, the best and worst scenarios can be identified. As a final step, recommendations will be presented on what critical steps and policies may need to be implemented to achieve the best-case scenario while averting the worst-case scenario.

4.2. Phase 1 – Preparatory Research Methods

4.2.1. The Delphi Method: Consensus Seeking Through Expert Interviews

The Delphi Method is a qualitative and quantitative research method that aims to find a consensus among an expert panel on a specific topic through iterative data collection and analysis. Its principal objective is to provide insights from experts in areas of high uncertainty in order to help the decision-making process and to formulate policies with respect to the research topic (J. C. Glenn & Gordon, 2009). By its purpose, the method can serve as an exploratory or a normative research tool, depending on the intention of the research (Glenn, 1994, Popper, 2008). The present research uses it as an exploratory tool that precedes the next steps of foresight methods, as many authors suggest (Gándara

& Osorio Vera, 2017; Godet, 2012; UNDP Global Centre for Public Service Excellence, 2018).

The Delphi Method was first introduced by the RAND Corporations, a think-tank in the US, in the late 1950s, in a military technology and national security context for complex and high-stake issues (Gibson & Miller, 1990). Later, the method was adopted by researchers and decision makers in diverse fields, from academic research to public and private sectors' future-oriented investigations as well (Gordon, 2009).

The need for the Delphi research method arises from several methodological obstacles with respect to investigating future systems and events. For one, since the future does not exist yet, no hard data can be collected. Second, the key factors that influence the topic are in constant change, hence their relationships and impacts cannot be fully studied. These create structural uncertainties with regard to the future while there is a need to create desirable future outcomes. The strategic prospective methods are used precisely for these reasons; among them the Delphi Methods helps to obtain insight into expert judgement concerning the research topic (Gándara & Osorio Vera, 2017; Godet, 2012; Loo, 2002; Mozuni & Jonas, 2017; Voros, 2003).

There have been several versions of the Delphi Method, the original procedure is summarized by Gordon (2009). His proposed method is used as a blueprint for current research. First, the preparatory phase started with the formulation of the problem, in which the first step was to accurately define the field of investigation, so that the experts could be selected accordingly and have a common understanding. In the present investigation the problem was defined previously by research objective that aims to find out whether the current development process of Mexico is conducive to sustainable development to meet the Agenda 2030.

Next, still in the preparatory phase, the selection of experts took place. The selection and sampling method of experts should be clear and explicit and should be established prior to the study according to Gordon (2009). The research question of the study defines the profile of the experts, focusing on professional expertise related to the topic. It is also noted that not titles, nor positions should matter in the selection but rather their knowledge and experience regarding the topic and the capacity to envisage the future. Glenn (2009) also provided a detailed mapping for the selection process to ensure rigor and diversity necessary for a valid study. In the current study the snowball method was applied after the initial expert selection as experts recommended other experts before or after the interviews. If the recommended experts fit the description and added to the diversity criteria of the sample, they were approached and included depending on their availability.

An additional condition is that the experts should not confer with each other and should be separated for an unbiased opinion. With the use of online surveying methods or an individual interview session geographically dispersed experts could also be invited to participate. In this respect, the next section explains how the experts were selected for the current research project. As a final preparatory step, the selected research instrument – the semi-structured interview guide – was tested with the collaboration of three experts who had the expertise and were available. After the suggested adjustments, the interview guide was used during the interviews with the selected experts. The final number of collected interviews should not be less than 25 (J. C. Glenn & Gordon, 2009). This condition is met with the present research as there were 30 interviews completed. Considering the present research, the abovementioned procedure of the Delphi method was applied in order to gain insight into expert opinion on the topic of sustainable

development in Mexico by 2030. The Delphi research method therefore included the following three rounds after the preparatory phase:

1st round: In- depth interviews with a panel of 30 experts

2nd round: Feedback and additional comments from experts via email

3rd round: Focus group session with five experts

Below Figure 4.3 gives a more detailed overview of how the Delphi method was applied in each round to obtain primary data for the research.

Figure 4.3. The Delphi process of consulting expert opinion

Source: Author's work based on the steps of Delphi method.

First, as Figure 4.3 illustrates, the problem was formulated and with related questions a semi-structured interview guide was developed. Given that the objective of the current

research is develop scenarios for sustainable development in Mexico by 2030, the interview questions cover different aspect of this topic, following the STEEP methodology (Schwartz, 1991). The interview guide (in Annex B) was tested with three selected experts to calibrate the questions and adjust to the main research questions. This way the questions were aligned with the research objectives and congruency is assured for adequate data collection that is critical for the next steps of the research. The three mentioned experts were selected based on their expertise in the field and their availability: for example, one participant is in expert scholar in economic development while another person was from the private sector with extensive overview of economic and fiscal issues, and a third participant was invited to test content and language clarity of the interview questions.

Once the results are collected, a summary is drafted by the researcher and sent out to the experts, expressing the group consensus, and noting issues on which divergent opinions are presented. In the second round, the experts are invited to provide further responses with respect to the consensus and to justify their opinions if they feel that their position is divergent from the consensus. This, and the third subsequent round, aim to reduce the spread of opinions among the experts to obtain a consensus on most questions. This enables to find the mean opinion and the deviations within the expert panel (Godet & Roubelat, 1996). For reaching consensus usually three subsequent rounds are satisfactory, as Loo (2002) pointed out. Based on these observations, the present research meets the criteria of the Delphi method.

Regarding the usefulness and limitations of the Delphi Method, one major advantage of this method is that it allows us to obtain consensus through successive questionnaires or interviews. During the process, high quality information and insights

can be gained about events, processes, trends, important changes which formulate the future outcome of the research topic (J. C. Glenn & Gordon, 2009; Hsu & Sandford, 2007). The validity and the reliability of the method derive from following the required steps and the rigorous selection of experts. Nonetheless, convergence does not always mean coherence among the ideas presented in the consensus. Another advantage is that the method can be used in different disciplines, such as social sciences, business management, economics, and technology development.

As a final point to this qualitative research method, Tapio et al. (2011) showed that quantitative and qualitative information can be obtained from the Delphi method when the two aspects are combined in the research design holistically and offer great insights. The scholars' main recommendation based on more than ten years' experience is to balance the quantitative and qualitative questions in the questionnaire. Their conclusion is that "integrating qualitative and quantitative material by using mixed methods to form coherent scenarios is at the same time desirable, possible and difficult – making the 'unholy marriage' a worthy adventure" (Tapio et al., 2011, p. 1616).

Sample Composition & Data Collection

Following the pilot round of testing the interview guide, a group of 35 experts was assembled with experience and knowledge of the subject. To assure diversity and heterogeneity, experts were invited from the academic, public, and private sectors, considering that several scholars are also active in the public sector while one works in the private sector as well. Of the originally complied list of 35 potential experts, 30 were able to collaborate with the interviews during the time of the research. The interviews were conducted during an 8-week period from September through November 2020 via

the Zoom online meeting platform and had an average duration of one hour. With the explicit permission of the interviewees, the conversations were recorded for further analysis. Several of the experts are professors of economics or researchers specialized in economic development and work at renowned Mexican public and private universities or research centers. Public sector experts include those from the federal, state, and municipal government, with expertise in the energy, water management, education, and public policy sectors. The private sector is represented by experts in the legal, accounting-consulting, strategic prospective, media, construction, and mining sectors, among other areas. Several experts were personal contacts of the author while many others were recommended by contacts who considered those people knowledgeable about the topic. The balance among experts from private & public sectors, academic and professional background, gender, nationality, and expertise were all considered for the selection. In Annex C the composition of the expert group can be observed according to several of these mentioned categories. As it often is the case, experts may be active academics having two affiliations or may work in the private or public sector as well. The affiliation of the participants is listed in Table 4.1 below.

Table 4.1. Affiliation of participants in Round 2 of interviews

AFFILIATION BY SECTOR	Count	%
academic	**5**	**17%**
Instituto de Investigaciones Dr. José María Luis Mora	1	3%
ITESM	1	3%
La Casa de la Universidad de California en Mexico, A.C.	1	3%
UAQ / ITESM	1	3%
UNAM, Department of Economics	1	3%
academic/private	**1**	**3%**
Independent Consultant /ITESM	1	3%
academic/public	**9**	**30%**
Centro de Investigación y Docencia Económicas (CIDE)	2	7%
Centro de Pensamiento desde la Amazonia	1	3%
Centro Estudios Espinosa Yglesias/CIDE	1	3%
Freelance writer and journalist/ The News	1	3%
ITESM/UAQ/Municipio de Qro.	1	3%
ITESM/Universidad Adolfo Ibañez (Chile)	1	3%
Trascendencia Social AC / ITESM	1	3%
World Resources Institute Ross Center for Sustainable Cities	1	3%
private	**9**	**30%**
Business Owner (PYME, Sector TI/Comercio)	1	3%
Carrera Alvarez Cue y Asociados SC	1	3%
Chufani Construcciones	1	3%
Compañía Minera Cuzcatlán	1	3%
Ernst & Young Latin America	2	7%
Mexico Business News	1	3%
Pinnacle Advisory Group International	1	3%
Ríos Cortés Abogados	1	3%
public	**6**	**20%**
CFE	1	3%
Environmental Activism in Qro.	1	3%
Gobierno de Edo. De Quintana Roo	1	3%
Miami-Dade County Board of County	1	3%
Municipio de Querétaro, Statistics Office	1	3%
Secretary of Planning and Budget of the State of Yucatan	1	3%
Grand Total	**30**	**100%**

Source: author's summary based on the sample of experts.

4.2.2. Content Analysis with Atlas.ti

In the next step content analysis was conducted of the transcribed interviews with the software Atlas.ti that is often used for this sort of qualitive analysis. For coding and later for the content analysis the principles of Grounded Theory (GT) were applied. The justification to use this qualitative method of analysis lies in its usefulness and constructivist approach that allows to build bottom-up from raw data to create categories

and concepts (Charmaz, 2006). Several studies that aim to understand and analyze content use GT as a common methodology given its systematic approach of constructing theory based on empirical evidence and its flexibility to coding, formulating concepts and ultimately theories (Charmaz, 2014; Charmaz & Belgrave, 2012, 2019; Lester et al., 2020; Urquhart, 2017). The authors Stark and Brown (2007) argue that GT is an adequate methodology to develop explanatory theories of basic social processes in a certain context. As Charmaz (2012) points out in her summary of using GT for interview analysis, "the power of grounded theory lies in piecing together a theoretical narrative that has interpretive power" (p.35). Coding is an important element of GT, as coding is the organizing tool that allows us to interpret the data which comes from the interviews. Coding is often conducted in a two steps process: after the initial open coding the second round of axial coding helps the researcher to focus on the key topics (Charmaz & Belgrave, 2012). This process can be repeated until saturation has been reached and no new insight emerges from additional data. With the progress of the analysis, the original codes may be adjusted, corrected, or merged and new ones may be added, to refine the research and focus on the topic.

As an analytical tool the software Atlas.ti was applied, given that several scholars use this software for interview content analysis (Abdi & Khodadad Hosseini, 2019; Friese, 2011; Friese et al., 2018; Vila-Henninger, 2019) in diverse contexts, such as perceptions on a country's economic development, voters 'perception, health care and financial crisis data. These studies illustrate the versatility and usefulness of the software, which led to selecting and applying it for the present research.

Following the above-described procedure, during the first phase of the analysis, the open coding technique was applied for the full text of every transcript. Open coding picks

up on the most frequently repeated topics and expressions, for example, sustainable development or federal government. The full list of open codes includes 80 codes that were established based on the interviews and can be found in Annex C. Several codes correspond to the questions as they were raised during the interview (for example, question 15 asks about the two most critical uncertainties, therefore there are codes for uncertainty#1 and uncertainty#2) which allow ranking and summarizing the issues mentioned. In fact, the original coding was conducted in Spanish, provided that the interviews were conducted in Spanish but later these were translated into English in order to have consistency with the result reporting and generating semantic maps.

In the next step axial coding was conducted. Axial coding is a research technique which helps create linkages and relations among the collected data. This type of coding provides the basis for creating categories, concepts and theory based on data. Axial coding is most often used precisely within constructing grounded theory (Allen, 2017).

As an outcome of axial coding, the 80 open codes were organized into 10 major groups including six dimensions (political, economic, social, international, environmental, and legal dimensions – these abbreviated as PESTEL), and four other categories that group certain perceptions (personal experiences; uncertainties; references to time, such as past and future; and personal assessments, if something was considered as positive or negative from a person's perspective). These major concepts follow the logic of PESTEL analysis; hence it is a directed content analysis that focuses on these key dimensions. The advantage of applying directed content analysis is that the categories arise from the literature – in this case from the elements as sustainable development is described by the UN Agenda 2030 – and therefore these dimensions can be easily related to those concepts (Humble, 2009), making the triangulation and validation more

transparent. The list of these ten code groups along with their description can be seen in Annex D. Both the codes and code groups were adjusted several times to synthetize better the information and to keep them as simple as possible without losing the richness of the information provided by the participant. The description of the groups helped to narrow down the diverse topics into bigger concepts and based on that, it is possible to conduct frequency analysis at which each topic was mentioned.

In the following steps connections were established among the code groups, organized, and ranked by their importance (such as uncertainties), built networks with the concept groups and generated specific reports, particularly concerning the two extreme scenarios.

Following the completion of the first summary report, in the second round the participating experts have received a copy of the report via email and were invited to comment on it. Specifically, it was asked in the email explicitly if they agreed or disagreed with the key findings. Out of the 30 participating experts ten people have responded and gave feedback. This information was also transferred and processed in Atlas.ti.

In the third round a small focus group of five people was selected from the previous 30 experts who participated in a focus group conversation which targeted to clarify critical issues from their point of view and discuss advances since the first interviews were conducted. The selection was based on their availability and diversity (two participants were from the public sector, two from the private sector and one academic were the ones who could participate). The focus group discussion took place on February 22, 2021, via Zoom and five experts have participated in the conversation that took two hours. In Annex C the agenda of this focus group conversation can be examined. Following the event, the recording was transcribed, coded, and processed in Atlas.ti.

The results of the content analysis will be included in Chapter 5. The execution of the Delphi method and the collected information's analysis were necessary steps to identify uncertainties based on expert opinion. In the next section, prior to the scenario planning process, the cross-impact analysis is explained which helps to verify and select the two most important critical issues.

4.2.3. Cross-Impact Analysis with Micmac

As a first step one has to identify the two most critical issues (in other words, key uncertainties), and then imagine their opposite extremes, it is possible to develop the four scenarios which are the combination of the two uncertainties' extremes. The selection of the two key uncertainties comes from first a ranking of all issues mentioned by the experts with the content analysis with Atlas.ti, obtaining a list of 11 variables.

The relationship among these variables is further analyzed with a cross-impact analysis using of MICMAC software (Godet, n.d.). The method allows us to analyze any problem in a systematic way and enables us to cluster the issues and group the themes into critical ones through a rigorous evaluation. This analytical method was developed in France by Michel Godet in 1971 and it was applied to key factor analysis in the development of nuclear energy in 1974 by the French Atomic Energy Council (Godet, n.d.). The cross-impact analysis "allows analysts to work through a large number of variables and scenarios, and to be explicit about the interrelationships of particular events and conditions" (Kippenberger, 1999, p. 8), as is it summarized by this author.

The method has been widely used in the field of strategic prospective for (Arango Morales & Cuevas Pérez, 2014; Godet, 2012; Pérez-Uribe & Vargas, 2016) in diverse

context in management at any level, from food policy development (Barati et al., 2019), energy sector's future analysis (Saxena & Vrat, 1990), economic development of a country (Toumache & Rouaski, 2016), the Internet of Things (IoT) adaptation in smart cities (Janssen et al., 2019), drivers to reduce student dropout from academic program (Narváez-Ferrín & Cervantes Muñoz, 2021), among many other topics. Its success is attributed to the ease of use, its efficiency and that the results can be easily validated by reviewing the matrix input information (Arango Morales & Cuevas Pérez, 2014; Godet, 2006).

The steps of the MICMAC method includes 1) listing the variables; 2) description of the relationships between variables; 3) identification of the key variables with MICMAC (Godet, n.d.). A schematic presentation of the matrix of direct influences (MDI) of MICMAC software can be seen in Figure 4.4 which shows how the variables are organized into a table and assessed qualitatively first and then with the numerical value according to nomenclature below the table. For each pair of variables, the following questions are asked: is there a relationship of direct influence between variable *i* and variable *j*? If there is no relationship, one puts 0. If there is, then according to how strong this relationship is, the direct influence can be low (1), medium (2) high (3) or potential (P).

Figure 4.4. Cross-impact analysis with MICMAC – Matrix of Direct Influences (MDI)

cross-impact →

	Variable 1	**Variable 2**	**Variable 3**	**Variable *n***
Variable 1		1	3	P
Variable 2	2		2	1
Variable 3	0	3		2
Variable *n*	P	1	2	

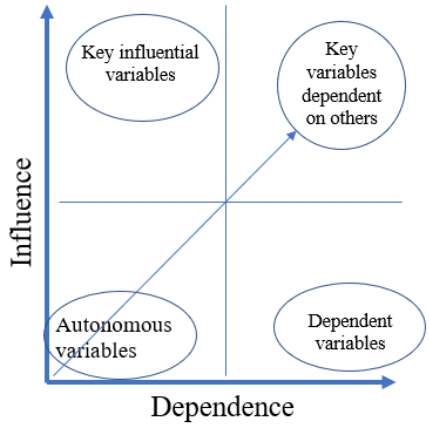
Nomenclature:

0: means no influence, inexistent relationship between the variables *i* and *j*.
1: weak influence
2: medium influence
3: strong influence
P: potential influence

Source: Author's adaptation based on Godet (n.d.) and Godet & Durance (2011). Note: The numbers in the table are only indicative of the possibilities that can be captured within the software.

Based on the above-described numerical assessment of the cross-impact of each variable the MICMAC software generates a Cartesian plan on which the same variables are located according to their influence versus dependence on each other. The variable coordinates correspond to the sum of the influences and dependencies calculated in the matrix of direct influences. This spatial display helps the researcher to assess the most influential variables and identify clusters of variables that may have similar influence. The list of themes and variables can be found in Annex F while the values in Annex G. Using the matrix view that is generated by the software, one can identify key influential drivers as well as less critical, dependent variables. Figure 4.5 illustrated better how the variables can be interpreted according to their location in Cartesian matrix view.

Figure 4.5. Interpretation of Variable Location in MICMAC



Source: Author's work based on the work of Arango & Cuevas (2014).

The visual display helps to determine the groups of variables that are highly influential on the others and direct the focus on them, filtering out the dependent variables which are less influential. Additionally, the MICMAC software allows to quantify and rank the variable according to their influence, assisting better to decision-making. Moreover, further matrix views can be generated from software, such as the Matrix of Potential Influences and Matrix of Indirect Influences, refining more the assessment of the topic. The value of this analysis is gaining insight into which variables to pay more attention to as they are more influential and consider them for further analysis. This way, a complex problem can be simplified, mapped, and then synthetized based on qualitative assessment.

The results of the MICMAC analysis are used for the second major phase of the research for the scenario planning process. As a continuation, the steps of scenario planning are presented and described.

4.3. Phase 2 – Scenario Planning as Prospective Method

As the objective of the present investigation is to develop scenarios with the use of the cross-matrix method, this section introduces this method in greater detail.

In general, foresight methodologies seek to gather data and make sense of it so that people can think in different and new ways about the future (Popper, 2008b). Among the foresight methods, scenario planning aims to explore possible futures in a systematic way (Cornish, 2000; Godet, 2006; UNDP Global Centre for Public Service Excellence, 2018; Voros, 2003; Wack, 1985a, 1985b). The key objective of scenario planning is imagining and exploring what the future may hold and thus better prepare for all possible outcomes with adequate strategic planning. With respect to the present investigation, foresight methods are relevant as the UN Agenda 2030 is an ambitious future goal promising to eradicate poverty and put human and economic development on a path that can be sustained for the next generations. To achieve this ideal requires constant analysis and evaluation of how countries are progressing in order to make the necessary adjustments along the way. The first step however is to conceive the ideal scenario where the world and each country would like to find itself by 2030. Evidently, the future cannot be predicted, only possibilities can be considered, and preferred futures identified. That is the reason why diverse foresight methods need to be applied to explore the possible and plausible futures and for this task there are several manuals, including the UNDP's Foresight Manual (2018) that aims to promote dialogue, create new strategies and identify new opportunities for innovation to achieve the 2030 Agenda.

The scenario planning method has been used in different context since the 1950s. One of its first users comes from the RAND Corporation, a US think tank that was a

pioneer in using the Delphi method as an important input for scenario building in political and military modelling and simulation game exercises, providing valuable intelligence reports US government agencies (DeLeon, 1973; Kahn & Wiener, 1967). As DeLeon observed (1973), it is important to consider that scenarios do not have predictive ability but rather they stimulate the process of exploring future possibilities and prompting strategy designs to either promote or avert the scenario to unfold in the future.

Since the 1960s scenario planning has been used in the corporate world, helping companies navigate the " turbulent uncertain future" and often consider "uncharted waters", as the Pierre Wack referred to possible scenarios (Wack, 1985b). One of the most notable companies where Wack applied this method successfully was Royal Dutch Shell since the early 1970s (Schoemaker, 1995; Wack, 1985a), assisting the firm to prepare for a potential oil price hike. This hypothetical event took place a few years as a consequence of the 1973 OPEC oil embargo and found Shell better prepared than its competitors. Another Shell associate and futurist Peter Schwartz (Schwartz, 1991) resumed the key concepts and steps of the scenario planning and strategic thinking in his seminal book *The Art of the Long View*: *Planning for the Future in an Uncertain World*. Since then, there have been several approaches and techniques put forth for scenarios planning. Most methods have a systems approach and integrate the external impacts by considering the economic, political, social, environmental and technological dimensions (often abbreviated as STEEP or PESTEL forces if the legal dimension is also added), as Schwartz (Schwartz, 1991) proposed it. As a common denominator, scenario planning includes three major phases: first, a diagnostic analysis of the past and present with different tools aiming to recognize patterns, cycles, trends and changes; second, understating the current events and trends that characterize the present; and third, future

visioning, which includes the exploration of future possibilities and defining the preferred options where we would like find ourselves (Hines, 2015; Lum, 2016; UNDP Global Centre for Public Service Excellence, 2018; Voros, 2003).

In a more specific way, there are different descriptions in the literature on foresight methods. One of the first authors was Schwartz (Schwartz, 1991) whose description is often used as a guideline by other authors, adjusting or grouping the steps into major phases. Wade (2012), on the other hand, has added two more steps – gathering information in the preparative phase and monitoring & updating scenarios in the final post-development phase, although the essence of the previous list does not change substantially. Table 4.2 below offers an overview of the similarities and differences among the two types of scenario planning method:

Table 4.2. Comparing the steps of two scenario planning methods

Schwartz's method	**Wade's method**
1) Identify focal issue or decision	1) Framing the Challenge
2) Identify key factors in the local environment which influence the decision	2) Gathering Information
3) Identify driving forces that influence key factors in the local environment	3) Identifying Driving Forces (select 2 critical)
4) Rank by importance and uncertainty	4) Either/or->future's critical uncertainties
5) Select scenario logics	5) Generating Scenarios
6) Flesh out scenarios	6) Creating Story Lines
	7) Validation & identify further research
7) Consider implications	8) Assessing implication
8) Selection of leading indicators and signposts	9) Identifying Signposts
	10) Monitoring & updating scenarios

Source: Based on Schwartz (Schwartz, 1991) and Wade (2012).

As it is visible from Table 4.2, essentially the ten steps of Wade cover the eight steps of Schwartz, adding validation of scenarios and monitoring and updating the scenarios as

future tasks. Other approaches, such as the French *La Prospective* school's Michel Godet recommends a similar process, including different studies, such as stakeholder analysis, actor's game (using the MACTOR software), mega-trend analysis, competence tree assessment, among other complementary techniques that may be relevant and helpful to define the scenarios correctly (Godet, 2006).

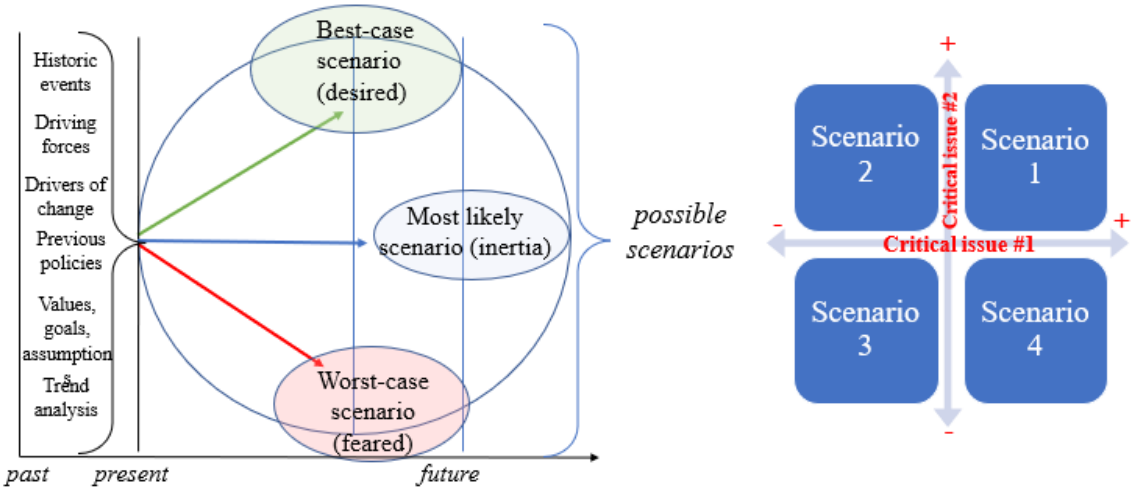
In summary, there is no one and clear definition and approach to scenario planning. The different approaches depend on the organization, context, and final user's preference and request (e.g., for national security and military, corporate organizational, government, among others) (Godet, 2006; Schoemaker, 1995; Schwartz, 1991; Shell International BV, 2008; Van Der Heijden, 1996). Even definitions differ and offer different insights and focus:

"Scenarios are stories about the future, but their purpose is to make better decisions in the present." (Shell International BV, 2008, p. 98).

"Scenarios enable new ideas about the future to take root and spread across an organization—helping to overcome the inertia and denial that can so easily make the future a dangerous place." Kelly, CEO of GBN (Scearce & Fulton, 2004, p. 14).

According to the basic types of scenarios planning methods, there are two major types of scenarios: 1) the 3-scenario method; 2) 2x2-scenario or cross-matrix method (Godet, 2006; Rhydderch, 2017; Schwartz, 1991; Van Der Heijden, 1996; Voros, 2003; Wack, 1985b). The first, the 3-scenario method typically includes best-case, worst-case, and most-likely (or inertia) scenarios as in Figure 4.6 panel a) shows.

Figure 4.6. Two major scenario types



Source: Author's work based on Godet (2006); Wade (2012); van der Heijden (1996).

The virtue of the 3-scenario method lies in its simplicity, as it can be easier to imagine a very optimistic scenario (best-case) and a pessimistic (worst-case) scenario, and then contrast these with the baseline inertia scenario which is commonly the extension or extrapolation of the present trend (Cornish, 2000; Van Der Heijden, 1996). This latter one is the most likely scenario while the other two extreme ones are called contrast scenarios. The second type of scenario planning method, displayed in panel b), refers to the 2x2 matrix or cross-matrix method which is constructed by selecting two key variables (or drivers as they are often referred to) and using them as axes in a Cartesian plan and considering the extremes of each axis, four scenarios can be developed. In case of the cross-matrix one has to review carefully which of the scenarios is the best-case scenario (as there is always one that is the most desirable) and worst-case scenario, given that this scenario planning method offers more subtle assessment, considering key driving forces. The complexity of the cross-matrix method allows a more nuanced insight than the 3-

scenario method; however, often this type of scenario is more challenging to define properly.

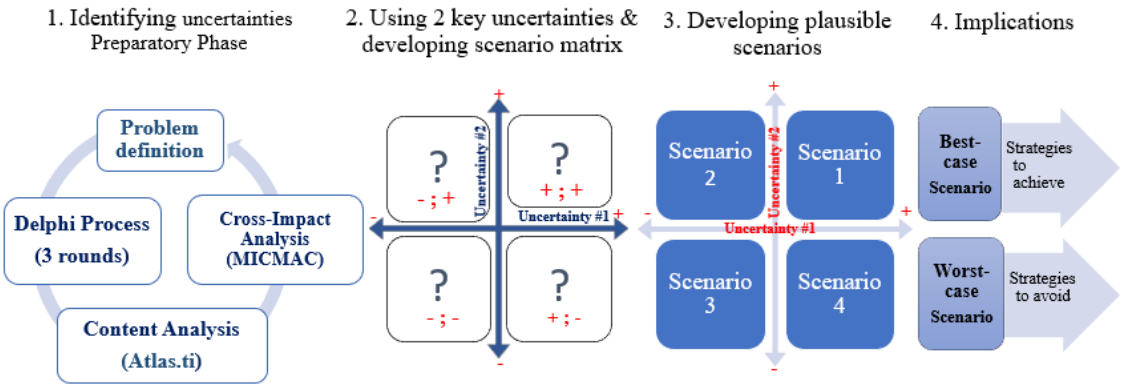
That is why most authors recommend to conduct prior investigation for this type of scenario planning, such as Delphi surveying or interviewing method, key driver analysis, actor's game analysis, among others (Godet, 2012; UNDP Global Centre for Public Service Excellence, 2018; Voros, 2003).

For the present research the cross-matrix method is going to be used, given that it is a very useful tool to explore four alternative scenarios that may occur in the future. In addition, it is widely applied in social sciences in many contexts, such as geopolitics (Scoblic & Tetlock, 2020); work and technology on a global scale (J. C. and M. P. T. Glenn & Millenium Project Team, 2019); cognition and organizational change in the oil industry (Cornelius et al., 2005; Vecchiato, 2019); in the tourism industry (Wade, 2012); ecosystems services in coastal regions (Sandhu et al., 2018); COVID-19 scenarios for global human development (Acaps, 2020); national defense planning (Johansen, 2018), national preparedness plan (de Klerk et al., 2021), among many others. Considering the topic of the present project, one of the relevant and recent research focused on future scenarios for the value of ecosystem services in the Latin American countries by 2050 (Hernández-Blanco et al., 2020), using scenario planning and presenting four possible scenarios for the region.

After the two key uncertainties have been selected and verified through the cross-impact analysis with MICMAC software, the research focus turns to the construction of four possible future scenarios. The process and schematic design of scenarios with cross-matrix method is illustrated in Figure 4.7, from the preparatory phase previously

presented to the development of scenarios, identifying the most preferred or desirable scenario as well as the worst scenario that ought to be avoided.

Figure 4.7. The Scenario Development Process



Source: Author's adaptation based on Taylor (2020) and Wade (2012).

In step 2 as the process indicates, it is possible to specify the extreme possibilities of each selected uncertainty or critical issue (e.g., uncertainty #1 is democratic or non-democratic governance, and uncertainty #2 is a cohesive united or individualistic non-cooperative society). Based on the extremes, one can define all four combinations and construct possible scenarios as step 3 indicates. Among the well-described scenarios, it is possible to identify which one is the best-case scenario and which one is the worst-case scenario with proper calibration of nuances. Lastly, in step 4, concrete strategies can be proposed to achieve the best-case scenario while avoiding the worst-case scenario for Mexico by 2030.

In the following Chapter 5, the research findings and results are presented, in the same order as they were executed during the research phases: first, the results of the analysis that derives from the interviews obtained with the Delphi method and then analyzed with Atlas.ti; second the MICMAC analysis which complements and defines

the key uncertainties and lastly the four scenarios developed with the methodologies above presented.

CHAPTER 5. RESULTS AND DISCUSSION

This chapter presents the key findings of the qualitative study. The results of the expert interviews are summarized and analyzed with the software Atlas.ti, that allows different analyses of the transcribed interviews. To begin the analysis, ten main uncertainties were identified and ranked as the participants mentioned them. Using MICMAC software the results were subsequently verified through cross-impact analysis. Second, the interview responses were evaluated to determine if each expert expressed a positive or negative perception on a selected issue. This serves as a "thermometer" on the participants' subjective opinions during the last quarter of 2020. Third, different semantic maps were generated from the coded material, depending on how each topic related to others, from different angles. These maps contributed with other visual insights to the topics.

Following the analyses of Atlas.ti and later the cross-impact analysis with MICMAC which validated the two critical issues, scenario planning was the next step. Using the two most critical issues as axes in the cross-scenario method, four scenarios were developed and presented in greater detail. To substantiate the scenarios selected excerpts from the expert interviews are presented following the scenarios. To validate the findings of the four scenarios, scenario details were triangulated with excerpts from the interviews, the literature presented in Chapter 2 and recent reports and official documents that contain references to the phenomena mentioned in the scenarios. In the subsequent discussion, the findings are assessed and lastly recommendations are presented.

The results of the first analysis are presented in Table 5.1 below containing the list and ranking of critical uncertainties Mexico faces in the upcoming years. In Table 5.1 Key Uncertainties #1 (in panel a) ranks the top 10 uncertainties that were mentioned first

by the participants while Key Uncertainties #1 (in panel b) rates the ones which were mentioned as second. The darker red indicates higher frequency or intensity of each topic's occurrence, offering a quick visual illustration. It is noteworthy that if uncertainty regarding the Political Environment and Parties, then it was ranked as second, indicating its overall importance. Moreover, uncertainty linked to Public Safety also appeared as second among to the first top-ten list and as first as a critical issue on the secondly mentioned uncertainties.

Table 5.1. Ranking of Key Uncertainties

a) Key Uncertainty #1

a)	Frequency Uncertainty #1	Intensity (U1xGr)
● **Political Environment and Parties** Gr=37	9	333
● **Public Safety** Gr=17	4	68
● **Government at federal level** Gr=91	3	273
● **Institutions/Institutional Environment** Gr=15	3	45
● **Environment** Gr=71	2	142
● **Natural Resources** Gr=39	2	78
● **Social Tension & Polarization** Gr=23	2	46
● **Economic growth** Gr=17	2	34
● **Private/Business Sector / SMEs** Gr=69	1	69
● **Government at state-local level** Gr=37	1	37

b) Key Uncertainty #2

	Frequency Uncertainty #2	Intensity (U2xGr)
● **Public Safety** Gr=17	**4**	**68**
● **Political Environment and Parties** Gr=37	**3**	**111**
● **Environment** Gr=71	**2**	**142**
● **Social Tension and Polarization** Gr=23	**2**	**46**
● **Economic growth** Gr=17	**2**	**34**
● **Government at federal level** Gr=91	**1**	**91**
● **Private/Business Sector/SMEs** Gr=69	**1**	**69**
● **Government at state-local level** Gr=37	**1**	**37**
● **Investment** Gr=34	**1**	**34**
● **Institutions** Gr=15	**1**	**15**

Source: Authors' work based on the data with the use of Atlas.ti.

Rankings in panel a) and in panel b) were calculated according to how often these topics and codes were mentioned (Frequency Uncertainty #1) and their associated intensity calculation (Intensity=U1xGr, referring to U1=number of times the topic was selected as

key uncertainty, Gr=how grounded the topic is, i.e., the number of times the topic was mentioned in all 30 interviews).

Among these the following critical issues stand out: political environment and political parties, federal government and public institutions, issues related to the environment and natural resource management, and economic issues linked to economic growth and the business environment. As noted, experts mentioned the political environment as the most critical uncertainty for Mexico, adding a worrying tendency around the concentration of political power. Furthermore, considering political parties and politicians, participants noted that Mexican politicians often follow their self-interests instead of the common good and lack the capacity to compromise and think in long-term goals. Another commonly mentioned challenge is the lack of continuity in public policies. If there is a change in the governing party at the end of a sexennial, the new party and its leadership do not continue projects started by the previous government. Instead, it cancels infrastructure projects and institutions that were initiated by the preceding administration, e.g., the new airport in Mexico City.

In relation to governability and the rule of law, legal conditions also ranked high among the uncertainties. Experts commented that they observed serious challenges to the application of the rule of law at the federal and, to a lesser extent, at the state levels of governance. In addition, federal government inefficiency was also highlighted as a notorious problem that represents an obstacle for progress.

With respect to environmental issues, commonly mentioned concerns included the lack of coherent and progressive policies by the present administration, the U-turn on alternative energy projects that were launched by previous administrations, cancellation of several investment projects to generate energy from renewable sources (solar and wind

energy), the push for oil-based projects (such as the construction of the Dos Bocas Oil Refinery), and the lack of adherence to international agreements related to climate change, e.g., the current administration reneging on previously set climate targets. In addition, experts expressed their concern about the country's natural resource management, mentioning the following issues: too much extraction is taking place by private companies; improper management of forested areas; the lack of water resulting in possible future water shortages; environmental degradation due to infrastructure projects such as the construction of the Maya Train through the tropical forest in the Yucatán peninsula; and the threat of biodiversity loss due to urbanization and real estate developments.

Public insecurity appears also high on the list of uncertainties. In recent years public security has not improved in Mexico, as drug-related violence, extortions, homicides, feminicides, and robbery continue to rise. Participants indicated that the federal government has not presented coherent public policies to address this issue; the National Development Plan (PND) (Presidencia de la República, 2019) did not cover several critical areas, even though insecurity has a clear negative impact on social well-being, domestic migration, and the business environment and investors' trust.

Another key uncertainty is high inequality and unequal opportunities for disadvantaged and marginalized groups that result in social tensions within Mexican society. Strong discord and hostility among political parties and their voter base create an environment which is unfavorable for achieving unity and accord for setting and reaching national goals and initiating important development projects. Communication is politized and polarized, not only along party preferences and affiliations but within a regional context as well. Participants expressed their concerns over a potential standoff between

the economically prosperous central-northern regions and southern Mexico which lags in development and economic performance. Experts also pointed out that the southeastern regions of Mexico, which are very rich in natural resources, such as oil and water, are the least developed, have the highest indigenous population, are more vulnerable to climate-related natural disasters from hurricanes and floods to earthquakes, and face greater challenges in democratic processes.

With respect to economic issues, the most notable risk and uncertainty is related to slow and insufficient economic growth and an unfavorable business environment as the business sector perceives hostility and a lack of cooperation and support from the current administration. All experts considered the role of the private sector as fundamental for economic development and the progress of the country given its key role in generating employment and wealth. However, several participants pointed out that the federal government's unfriendly attitude towards the business sector negatively impacts entrepreneurs, workers and ultimately the country. For Mexico to advance, more competitive jobs are needed, and these are typically generated by the private sector, not by state-owned companies.

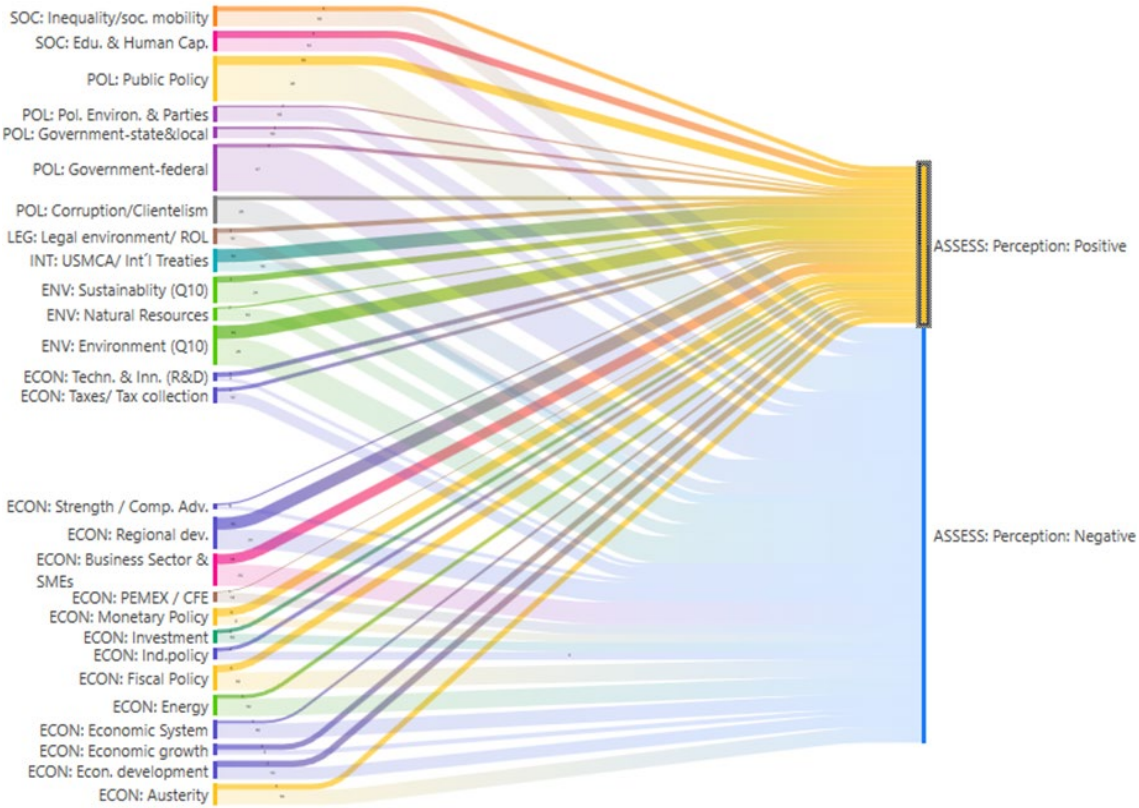
Although the topic of education and human capital development did not appear among the top 10 critical issues, it was mentioned by almost every participant as a very important issue that the country needs to improve in the next decade.

Positive vs. Negative Perceptions of Selected Topics

To analyze the participant perceptions–positive or negative–with respect to each mentioned topic, whenever the speaker's perception was clear, it was considered as well.

Although the sample is an availability sample, not a representative one, these positive or negative perceptions are indicative of the tendencies in expert opinion in late 2020. For example, if an expert commented that the policies towards improving public education were insufficient and inadequate for increasing the skill level of young people by 2030, this observation was assessed as a negative perception of current educational policies. Similarly, clearly identifiable perceptions of certain policies or phenomena were also coded according to each topic allowing to visualize the perceptions in a Sankey graph view of code co-occurrence. Figure 5.1 shows an overwhelming number of negative perceptions of participants.

Figure 5.1. Table of Co-Occurrence of Selected Codes and Positive vs. Negative Perceptions of Each Code



Source: Author's work based on the data with the use of Atlas.ti

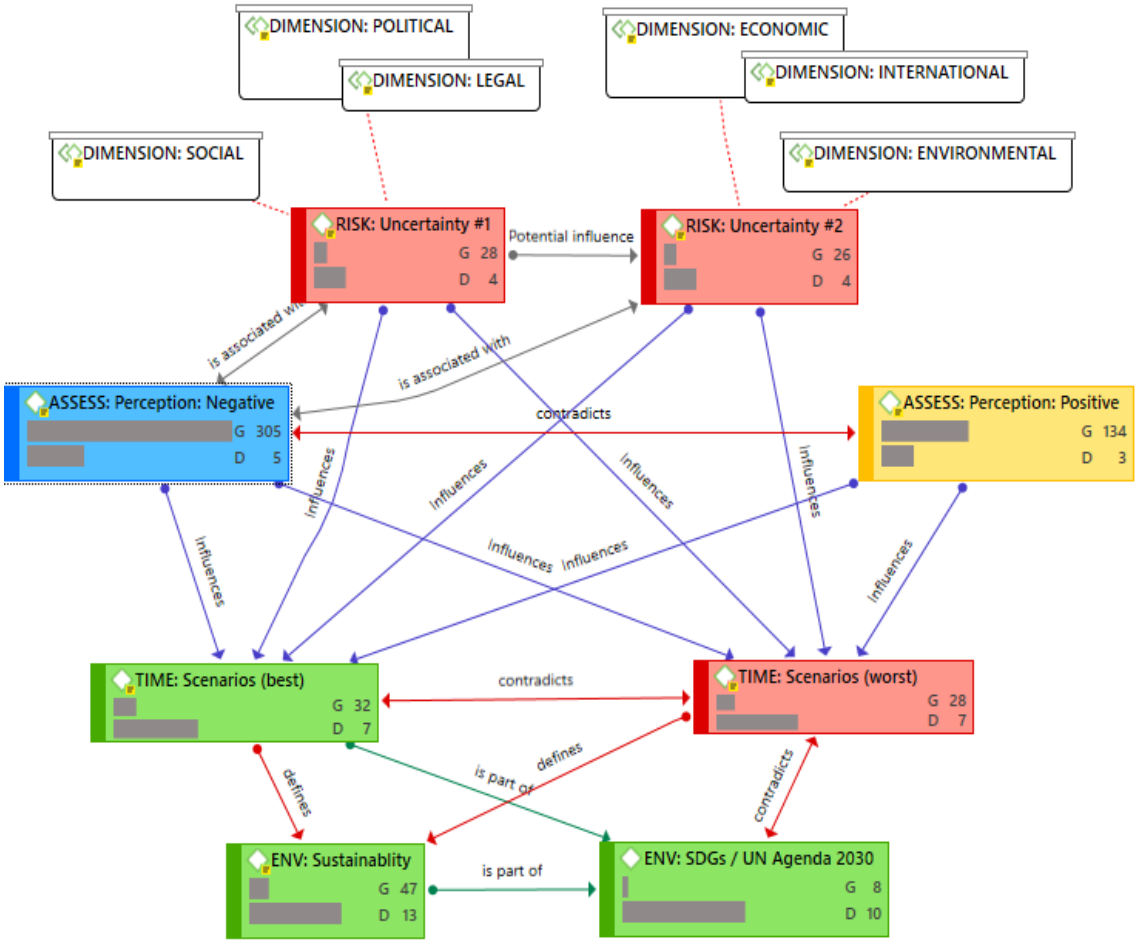
The dark shaded colors signal the positive perceptions while the light-colored areas indicate the quantity of negative comments expressed about a certain topic. It is noteworthy that the experts made more than double as many negative comments as positive (305 vs. 134 quotes) and several co-occurrences appear with other codes. More specifically, it can be observed that many experts highlighted the negative aspects of current federal government, public policies, environmental and sustainable policies and most topics and codes related to economic issues. Only a handful of questions or topics received more positive comments than negative. As for example, the code and topics related to the USMCA free trade agreement and regional development. One topic, monetary policy, received mixed comments and shows almost evenly split perception among the experts.

Networks Created to Visualize Relationships Among Categories and Codes

Following the perception assessment, different semantic maps were developed in order to visualize the network connections among key concepts, categories, and perceptions. Figure 5.2 below displays the relationships among the following categories: Dimensions, Uncertainties, Perceptions and Scenarios. The letter "G" refers to how grounded each code was, in other words, how many times these phrases were mentioned in all the interviews. The letter "D", on the hand, refers to density, indicating how many connections the phrase or concept has with other concepts. Clearly, the higher these values are, the more frequent and more connected a particular concept is. The connectors among the colored codes and concepts – such as "defines", "influences", "potential influence", "is associated with", or "contradicts" – indicate semantic linkages among

them. With their help, the network in Figure 5.2 shows how key uncertainties are related with the six dimensions.

Figure 5.2. Network #1: Relationships among Six Dimensions, Key Uncertainties, Perceptions and Extreme Scenarios



Source: Author's work based on the data with the use of Atlas.ti

Key Uncertainty #1 was mostly related to the political, legal, and social dimensions. As the political dimension is very closely related to the legal dimension, These two dimensions visually overlap each other. For example, codes such as bureaucracy and corruption belong to both dimensions. Similarly, codes of the international dimension

overlap with three codes in the economic dimension, e.g., FDI, USMCA trade agreement, and foreign trade. Consequently, this overlap is visible as well. The two key uncertainties were grouped as Uncertainty #1: socio-political critical issues; Uncertainty #2: economic and environmental issues. These two categories will define the future scenarios, depending on the perceptions of each respondent. The perceptions were coded and grouped as either positive or negative with respect to any issue mentioned during the interview. These categories and concepts were instrumental to the formulation of the scenarios, best and worst, as these two extremes were asked of each participant. Ultimately, the definition of the scenarios help indicate whether Mexico can meet the objectives of the UN Agenda by 2030. As an additional observation, this semantic map was modeled according to the logic of UN model of 17 SDGs as these were constructed in a three-layered pie shape, the environmental SDGs forming the base layer on which society and the economy are built (shown in Figure 3.3).

Another grouping provided other useful insights. Network #2 in Figure 5.3 clearly shows that our future is built on the foundations of social and natural environment (rectangle concepts on orange and green, respectively). This map is constructed differently from the previous one. The elements at the lower level of the current map include the social foundations of society, in other words people, who need sufficient natural resources and economic conditions to have decent living standards - located at the middle segment of the map - which could lead to sustainability and ultimately meeting the 17 SDGs at the highest level, assuming the best-case scenario, green box on the upper left segment of the map. If the worst-case scenario becomes reality, in red box on the upper right, then this situation would contradict the principles of sustainability and therefore it would jeopardize the fulfilment of the UN Agenda 2030.

Figure 5.3. Network #2: Relationships among Social, Environmental and Economic Foundations of Sustainable Development, Extreme Scenarios, and the UN Agenda 2030

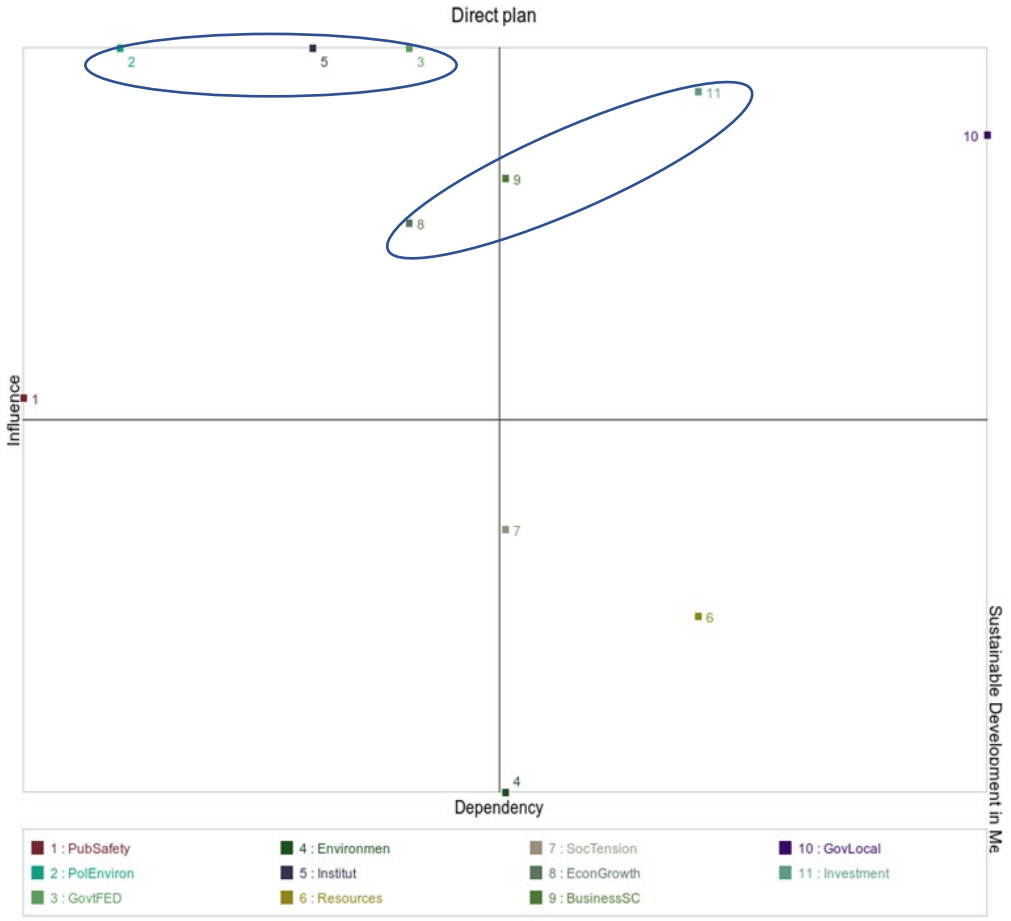
Source: Author's work based on the data with the use of Atlas.ti

These network maps were instrumental and confirmed the key drivers that emerged from the interviews as well. In the following cross-impact analysis these drivers are used and studied further.

Cross-Impact Analysis

Key variables and drivers obtained from the interviews and from the above presented network maps offer the list of variables for the MICMAC software (complete list in Annex F) used for cross-impact analysis as explained in the methodology section. After capturing the variables and assigning the values in the cross-impact matrix (in Annex G), the software used the data to generate the image in Figure 5.4. It provides a visual tool to select the most influential drivers and identify clusters that emerge in the upper quadrants.

Figure 5.4. Matrix of Direct Influences - Variables and Values



Source: Author's work based on the data with the use of Atlas.ti. The eleven variables include: 1 Public Safety, 2 Political Environment & Parties, 3 Federal Government, 4 Environment, 5 Institutions, 6 Natural Resources, 7 Social Tension & Polarization, 8 Economic growth, 9 Business Sector, 10 Local Government, 11 Investment. The two blue encircled areas indicate the clusters that can be identified.

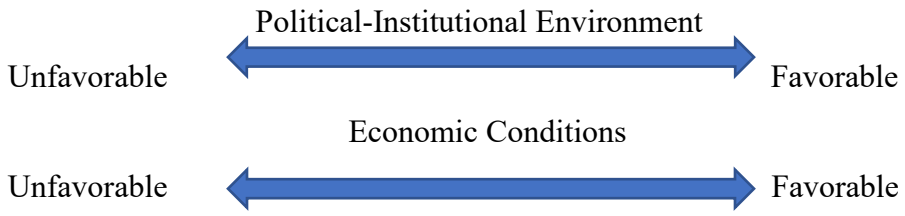
The matrix view above marks the two main clusters that can be identified as some variables that are located close to each other on the Cartesian plan. Three highly influential variables 2,3,5 (political parties, federal government, and institutions) form Cluster 1, while variables 8,9, and 11 (economic growth, business environment, and investment) form Cluster 2. The common theme of these two clusters can be defined as Political-Institutional Environment for Cluster 1 and Economic Conditions for Cluster 2.

These two themes uniting the two clusters serve as axes to formulate the four scenarios in the next scenario planning phase.

5.1. Results of Scenario Planning

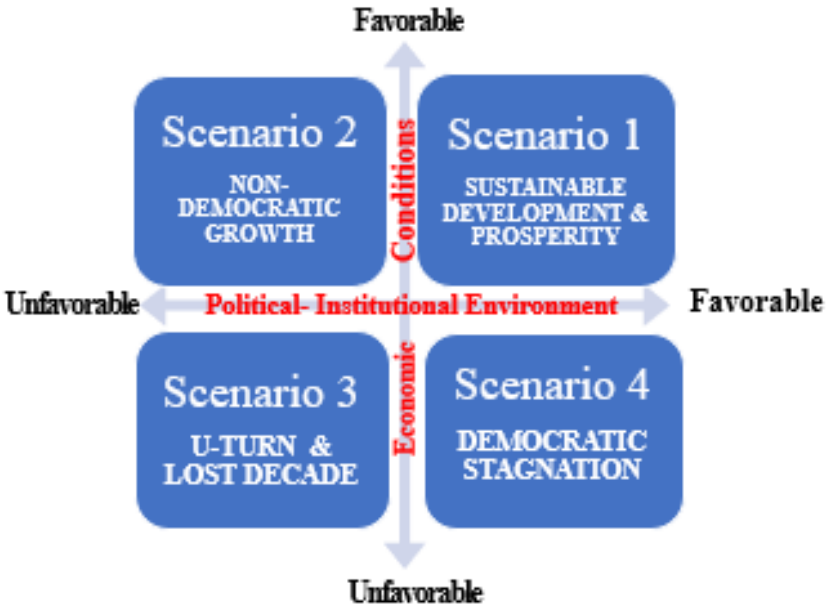
There are different types of scenario planning methods as mentioned before. Among the commonly used methods we can mention the three-scenario method and the cross-matrix method. The first type usually includes a best-case scenario, a worst-case scenario and a most likely or inertia scenario (Chermack et al., 2001; Durance & Godet, 2010; Hines, 2015). The cross-matrix method takes a different approach: it uses the two most relevant critical issues of the topic and considers their extreme opposing meaning (Rhydderch, 2017; Wade, 2012). As Schoemaker (1995) also pointed out, scenarios explore a joint impact of two uncertainties which stand side-by-side and tries to understand their interaction.

In this case, the two critical issues that emerged from the cross-impact analysis are Political-Institutional Environment and Economic Conditions, which can unfold the following way:



Using these two critical topics as axes, four future scenarios can be developed, by considering the opposites of each topic, whether the conditions are favorable or unfavorable towards achieving the UN Agenda 2030, as it is visible in Figure 5.5 below.

Figure 5.5. Cross-Matrix Scenario Planning



Source: Author's work.

The names of each scenario derive from the combination of the two conditions on each axis. Once the general conditions of a scenario are identified, each one can be developed in greater detail, following the internal logic and coherence of each scenario. For example, Scenario 1 both political and economic conditions are favorable. This combination would indicate economic prosperity in a democratic environment, hence the best-case scenario of the four, advancing on the economic and social dimensions of sustainability. Scenario 2 develops as a combination of unfavorable political-institutional environment and favorable economic conditions. This means that on one hand the unfavorable political-institutional environment is likely to bring along processes that indicate a departure from a democratic approach resulting in a more authoritarian state. On the other hand, favorable economic conditions would refer to greater economic growth that provides more prosperity, assuming a more sustainable development in addition to growth. In Next, Scenario 3 develops in a context in which both political and economic conditions are

unfavorable. This mixture would mean little or no progress by 2030 and therefore would be the worst scenario, potentially a lost decade, and a missed opportunity for the country. In Scenario 4, due to favorable political-institutional environment, democratic processes would advance but unfavorable economic conditions would suggest little growth or even stagnation. Detailed descriptions of the four scenarios can be seen below in Table 5.2.

Table 5.2. Four Possible Scenarios for Sustainable Development in Mexico by 2030

			Political- Institutional Environment	
			Unfavorable	**Favorable**
Economic Conditions	Favorable		**SCENARIO 2: NON-DEMOCRATIC GROWTH**	**SCENARIO 1: PROSPERITY AND SUSTAINABLE DEVELOPMENT**
		Real GDP (%, estimated 2022-2030)	Low growth (2-3%)	Growth (2.5-4%)
		Unemployment rate (%, estimated average 2022-2030)	Similar to current level (3-4%)	Similar to current level (3-4%)
		Change in GINI index (inequality)	minor improvement	significant improvement
		Energy sources & nature care	traditional oil-based energy	shift to greener energy source, nature preservation
		Improvement on SDGs	SDG 8 (potentially 10)	SDG 1-17
		Stagnation or decline on SDGs	SDG 7,13,15,16	Almost none on the 17 SDGs
		UN Agenda 2030 / DEM	***Partial fulfilment / not within the Doughnut***	***Fulfilment and Potentially within the Doughnut***
	Unfavorable		**SCENARIO 3: U-TURN AND LOST DECADE**	**SCENARIO 4: DEMOCRATIC STAGNATION**
		Real GDP (%, estimated 2022-2030)	Very low growth (1-1.7%)	Very low growth (1.2-2%)
		Unemployment rate (%, estimated average 2022-2030)	Above to current level (6-7%)	Above to current level (5-6%)
		Change in GINI index (inequality)	no improvement /decline	minor improvement
		Energy sources & nature care	traditional oil-based energy, no land care	potential for shift to greener energy source, nature preservation
		Improvement on SDGs	Almost none	SDG 16 (potentially 10,13,15)
		Stagnation or decline on SDGs	SDG 7,8,10,13,15,16	SDG 7,8
		UN Agenda 2030	***Potentially not meeting any of SDGs / not within the Doughnut***	***Partial fulfilment / not within the Doughnut***

Source: Author's work. Annex I describes each scenario and phenomena with more details.

When discussing the potential impacts of the above-mentioned scenarios on objectives of the UN Agenda 2030, Table 5.3 below indicates which two SDGs were selected from each dimension and discussed in more detail instead of all 17 SDGs. The selection considered the critical issues that were frequently mentioned by the expert panel and have been important to the progress of the country. In terms of social wellbeing, the lack of security and weak institutions were often noted, therefore SDG16 (peace, justice, and strong institutions) was selected, in addition to the inequality (SDG10) which is another notoriously pressing issue in Mexico. Considering economic issues, sluggish economic growth, lack of decent jobs and fossil fuel-based energy generation were mentioned frequently, hence SDGs 7 (affordable clean energy) and 8 (decent jobs/econ. growth) were selected. Finally, with respect to environmental issues, SDGs 13 (climate actions) and 15 (land care) were chosen as highly important goals to sustainability.

Table 5.3. Selection of Two SDGs per Dimensions of Sustainability

Dimensions	**Corresponding SDGs**	**Selected SDGs**
Social Well-being/Governance	1,2,3,4,5,6,10,16,17	10 (reduced inequality) 16 (peace/justice/institutions)
Economic issues	7,8,9,11,12	7 (affordable clean energy) 8 (decent jobs/econ. growth)
Environmental issues	13,14,15	13 (climate actions) 15 (land care)

Source: Author´s selection based on the UN Agenda 2030.

When considering the impacts on the above selected SDGs, the four scenarios may unfold according to the logic of the matrix generated.

Scenario 1: Prosperity with Sustainable Development in the upper right quadrant shows a scenario in which both political-institutional and economic environment favor sustainable growth and development, investment both public and private increase and generate prosperity while managing natural resources with care and focus on alternative energy sources instead of fossil fuels. This scenario, which is the best-case scenario of the four, could lead to the achievement of the 17 SGDs of the UN Agenda 2030 and compliance with Mexico's commitment to this international agreement.

Scenario 2: Non-Democratic Growth shows a future scenario in the upper left quadrant in which the country halts democratic processes and becomes increasingly authoritarian but pushes forward on key targeted public investment projects that may generate growth and have a positive spillover effect for job creation. These processes could result in making progress on SGDs 8 but falling behind on other social issues, such as SDG 10,16.

Scenario 3: U-Turn and Lost Decade scenario in the lower left quadrant describes a combination of unfavorable political-institutional and economic conditions. This situation would be the worst-case and most disappointing scenario, as both external and internal factors would present obstacles to progress. If there is no political commitment nor financial resources available for growth and structural changes in the economy, social and environmental outcomes will be unsatisfactory for the country. Under these circumstances there would be little or no improvement on most of the SGDs; therefore, it would be difficult to meet the UN Agenda 2030.

Scenario 4: Democratic Stagnation in the lower right quadrant presents a future in which democratic processes advance giving rise to improvements on several SDGs, such as SDG16 (Peace, Justice, and Strong Institutions). However, the economic

dimension stagnates and very low to almost no growth may be experienced for several years. This situation could be a consequence of external conditions, e.g., a worldwide economic recession in the mid-2020s or internal economic conditions that may derive from low level of investment and limited business opportunities in the private sector. If companies, especially SMEs, do not prosper and entrepreneurship is not encouraged, low job creation could result in rising unemployment and a possible increase in the informal sector. Socially, there may be some developments on several SDGs such as gender issues, but on others, such as education and inequality reduction, improvements are likely to be constrained due to budgetary limitations as a consequence of lower tax revenue if growth is hampered. Furthermore, the lack of funds would impede technological progress that is promoted by the state, leading to greater inefficiencies and minimal progress in productivity. Under such conditions the shift to renewable energy sources could possibly be inhibited, leading to continued reliance on fossil fuels as the main energy source. Consequently, advancement toward environmental targets (SDGs 13,14,15) would also be restricted.

Among the four potential scenarios, the most likely scenario may unfold paradoxically between Non-Democratic Growth and Democratic Stagnation scenarios, as there are indicators that support either or both scenarios. An example of this is the sluggish growth expected for the upcoming years, as the country still has not recovered from the economic post pandemic economic crisis (IMF, 2021). Other unforeseen events such as a global economic downturn, may have a high negative impact on economic growth, holding back Mexico's economic progress (Gourinchas, 2022). To validate the presented four scenarios the next section examines them considering other recent

documents and official reports along with previously discussed development theories and phenomena observed in the Mexican economy prior to the pandemic.

In the following section comments from experts are selected and organized into groups which show consensus and support the best-case and the worst-case scenarios separately. Next, diverging comments are also represented, again, organized according to which extreme scenario they support. These comments offer support for the above generated scenarios.

5.2. Observations related to the Best-Case Scenario

First, observations were collected that describe the desired or best-case scenario, imagined as **Sustainable Development and Prosperity**. For one, experts noted that it is desirable that Mexico be a country with a vision and a "national pact" to push for development, investment in education and innovation, with a more inclusive and conscientious society that is united to strive toward a common goal. Table 5.4 shows selected and organized experts' comments by the STEEP dimensions which support the ideas of Scenario 1.

Table 5.4. Excerpts Related to the Best-Case Scenario (Scenario 1)

Comments Related to Political-Legal Issues
1. "My best scenario would include **more conscious citizens**, not only in an economic sense, but also in a political sense; in the sense of beginning to have **greater citizen participation**, beyond mere electoral processes, because as long as we have more involved citizens, **more participation in community** issues and in political issues, it will be much easier for them to demand that their governments really carry out and advance projects that are **for the benefit of the citizens themselves and not for the benefit of a few**".

2. “Mexico is a **more transparent country** that has consistency **between governments**, **continuity and a more even distribution of wealth**.”
3. “There are **agreements among all actors, among the governors**, and CONAGUA, …and that there is a **great pact for setting public policies**, and if there are, these agreements … give stability [to the country].
4. “A country that really **manages to control corruption**. I believe that this is the main problem in this country, and it is closely linked to the **issue of security and drug trafficking.** Unfortunately, I think that this is one of the most degenerative problems that this country is having. And hopefully we can achieve that with **strong institutions**, whoever is the president, with a president who respects the institutions; to **invest in education, to invest in the country’s infrastructure**.”
5. “My best scenario would be that changes could take place in 2021 and 2024, that some of the **international commitments could be resumed to comply with the UN agreement**, that we could start or resume actions that really allow us to **reduce these enormous inequalities, bring services to people, bring better living conditions, more opportunities for personal, human, professional development** that allow us to get many rural and indigenous populations in Mexico out of abandonment.”
6. “…and a society that has **more legal certainty**.”
7. “[I’d like to see the] **consolidation of our institutions that guarantee us democracy**, which has cost so much for us throughout history…to revise and adjust them to the realities...that we have them in a better shape so **that these can guarantee us the freedoms** that we cherish so much. ”
Comments Related to Economic Issues
7. “The best thing would be for us to have **a true industrial policy** that focuses on our strengths and strengthens them; try to make policies to encourage industry. This would **promote employment, improve education**, give more **resources to innovation and development, improving health issues**.”
8. “I would like to see companies in **Mexico provide jobs** and above all that we have **strong and independent institutions**.”
9. “A country that is much **more integrated with our regional partners**, in a good measure **with the United States**. A more intense commercial exchange, which could allow us to have a **greater advancement in technology**, also in education, to have **greater opportunities for our young people** to have better preparation for the future.”
10. “In ten years, we will begin to see **Mexicans being competitive worldwide**, generating effects”.
11. “The industries... well, I would also like to see how we can... **have a better exchange,** at various levels... **with China**, for example.”
12. “The best scenario is to **have economic growth**.”
Comments Related to Social-Economic Issues
13. “In the best scenario, I would like to see a Mexico logically with **less inequality**, but with a **higher growth rate and where there are Mexican “star” products that play a strong role at the international level**. That would be my best scenario. And, logically, a **better public primary education**; that is, that it would permeate the public, in a summary, **better education for all**.”

14. “For me, the best scenario would be that by 2030 **we have an agreed vision as a society of what we want to do in the future** and start working on that vision and fight to achieve that goal.”
15. “…start working on that **vision and fight to achieve that goal**, for me that would be the ideal, and in that case, I am assuming that there is **a better distribution of income**, there would be **more equality in the collection of taxes**.”
16. “Me gustaría, por supuesto que tuviéramos **una sociedad sin las diferencias de ingresos**”
Comments Related to Environmental Issues
17. “My best scenario would be a country in which the implementation of innovative environmental policies could be encouraged much more, that begin **to encourage and invest much more in the development of new technologies** that generate necessary **energy**.”
18. “…[T]hat we have **clean energy production, we have water sanitation**, and we have a fiscal policy. Less complicated than the one we have today and competitive.”
19. “A **self-sufficient Mexico in energy, preferably renewable energy**, and in the production of its **own food, emphasizing organic production**, and with a decrease in animal products. ”
20. “I would like to see, in **all aspects of renewable energies...more developed**. Going back to the **energy policy**, seeing it with a positive eye...critical of course of everything that has to do with **wind energy**, the **replacement of PEMEX**, I believe that an energy institute should be developed, which could encompass energies or **privilege renewable energies and try to include PEMEX**, of course... in a more appropriate development framework, of a minor...not a minor but if it were a minor exploitation. pressure that it be the flagship company of the state for the energy issue.”

Source: author’s compilation based on the interviews from Anonymous (2020) participants.

These segments above indicate that experts envision that Mexico continues to be a democratic country where the rule of law and electoral processes are respected but with more transparency and accountability. The federal, state, and municipal levels have made progress, and it is readily apparent to their citizens. Regarding pressing social issues, experts hope to see Mexico significantly reduce its notoriously high inequality. Furthermore, participants highlighted the importance of making progress on racial and gender inequality. Improvements on these issues would create better and equal opportunities for Mexicans. Additionally, marginalized groups would require more help and proper attention from the public and private sectors.

With respect to the environment, under a best-case scenario experts would expect to see a conscious citizenry and all three levels government–federal, state, and local level–committed to better environmental stewardship by reducing pollution, environmental degradation, and biodiversity loss. These observations support Scenario 1, Sustainable Development with Prosperity.

5.3. Observations Related to the Worst-Case Scenario

When asked about the worst-case scenario, experts generally saw the continuation of the current governance and ideological direction in terms of political, economic, social, environmental policies as detrimental to the country's progress and leading to a stagnating economy with a polarized society and deteriorating environmental conditions, e.g., serious water shortages, increased pollution, and energy derived from fossil fuels. Observations in Table 5.5 underpin these ideas. Interestingly, several comments may refer to other scenarios as well, as they are marked in the columns next to the excerpts, indicating when a statement supports or potentially supports a scenario:

Table 5.5. Excerpts Related to the Worst-Case Scenario (Scenario 3)

Comments Related to Political Issues
1. "The worst scenario is that the **democratic institutions**, which guarantee us democracy and liberties the state takes control of them, that **the current government passes over the INE** [National Institution of Elections**], passes over the Central Bank**, passes over everything that has to happen, **to have a central and political control**. So, that would lead to a continuity of a political vision, an ideology that is not shared by all Mexicans. "
2. "In the worst case, we **continue with a political system that simply cannot be specified**, where the incentives for politicians are too **far from the needs of the population** and where we continue with a system of unsustainable differences."

3. “The worst-[case] would be to have **this horrible combination of political polarization** continuing, and also **that policies around sustainable development are scaled back** and thus making it more difficult to correct. I mention these two elements because they are complementary. In my opinion, the 2030 Agenda offers elements to be at the center. … the **extreme would be to continue with this polarization that puts aside that reasonable and scientific knowledge**, which places emphasis above all on ideological definitions, above common agreements.”
4. “It would be a **typical scenario Venezuela** (...) The worst scenario would be to be in a **civil war**, although I don't think that is a realistic scenario (...) In that case it would be **a country that does not have self-confidence**, where there are still many deaths, the “**narco” has more power, lack of legal certainty** would make the bad people have more confidence, more power, more weight in what is happening in the country, forgoing the idea of legal certainty, and economically it would be disastrous. That for me would be the worst scenario, it would be a situation where Mexicans would be leaving Mexico, like Venezuelans, there would be a migration abroad, very strong.”
5. “I think that my worst scenario, in a political sense, would **undoubtedly imply a federal government that seeks to perpetuate itself in power** and a citizenry that initially does not take the necessary measures to prevent this from happening, and that subsequently ends up in **greater political instability** such as what It happened, for example, in Brazil.”
6. “**A polarization that occurs, or a much more pronounced political fragmentation** than we have, with a **negative growth** that reaches close to -20% and at a given moment, a growth of, well, **unemployment, violence,** etc... at the end of the six-year term, that these would be conditions, if those agreements are not reached.
Comments Related to Socio-Political Issues
6. “… [There are] policies that **are not strategic, that are not visionary, that do not increase the growth of the country**, … what is the unstable part of the country, once again going back to the system that they continue like this, with **high level of violence**, with **lack of transparency, lack of security for the people**, who do not have confidence in their government. And that they **continue to think that developing the oil sector is the only way forward**, if that is the focus for the next ten years, it will definitely not good for Mexico.”
7. “And well, I also believe that, in ten years**, Mexico's contribution to the SDGs, well, it will simply be minimal**; and therefore, that it ends up being **quite chaotic economically, and therefore socially**.
8. “that **insecurity spreads even more, reaching all states** of Mexico.”
9. “The worst scenario is that **polarization deepens in society**. Because that would not allow us to create the conditions to advance in terms of sustainable development. That is to say, it would not allow us a more pronounced social polarization, which would go deeper, it **would not allow us to achieve or even think about projects, to work together, to have a common vision**.”
Comments Related to Economic Issues
10. “The worst scenario is that we have **an economic collapse, that takes us back several decades,** and that **drives away entrepreneurs from this country** as well as other countries, leaving Mexico mired in a hole from which it will take many decades to get out again.”

11. “The worst scenario is that the current government, or the group that is currently in government, **leads us to try to show that socialism is a very great possibility** and that it can be lived very well within our **social doctrine**. And that, for this, institutions must be destroyed, and private initiative must be destroyed, because in socialism, I understand, the government or the people together do everything.”
12. “My worst-case scenario is that **we continue exactly the way we’re going**. Where all industries begin to be attacked, a system begins to become more paternalistic than it already is, more clientelist and we arrive at a neo-patrimonial state.”
13. “The worst scenario is where the idea that Mexico can be a developed country with all that that implies is abandoned. Where already at the level of society, of the state, of the people there is **an abandonment of that idea that the country can be a developed country**, and therefore the policies that should be pursued are not pursued.”
14. “the worst scenario is that in ten years **our private sector does not exist and if it exists**, it is nothing more than to maintain what they have had and that it does not fall.”
15. “A continuation of policies that have created uncertainty. **Uncertainty to invest** because contracts are not respected. It undoes investments that have already begun and seeks to return to state control of certain areas such as electricity, which for years has shown it is inefficiency.”
Comments Related to Environmental Issues
16. “There is going to be a **lot of pressure with the issue of water**, …it is very worrying and so is climate change. It is very likely that many of our freshwater deposits in the north on the coasts will become saline, that they will become no longer drinkable.”
17. “**Greater conflict over water**, yes or if it will come if we don't change. I mean, because right now there are like these sacrifice zones. These excluded places, you begin to see many diseases, and there are many communities that right now are marginal but later we must not forget the environmental resources.”
18. “**Deforestation** also worries me, I think it will continue advancing at very fast rates and **we will lose most of the forests** and the other, well it seems to me that there is still an incipient [situation], but a tendency to separate the country into regions, advancing at different speed and the situations are different among the north, the center and the south.”
19. “… [a government that is] **encouraging investment in refineries, in trains** that can harm much more than they can benefit, in a development model that really ends up being anachronistic.”
20. “I believe that my worst scenario also includes **public policies which will continue to be developed without considering international recommendations**, and without considering as a fundamental basis the goals that are set out in the SDGs.”

Source: Author’s compilation based on the interviews from Anonymous (2020) participants.

With respect to economic policies, experts envision a worst-case scenario that includes a prolonged post-pandemic economic crisis and misguided economic policies beyond 2022, causing long term stagnation where economic growth is well below the country’s capacity and potential. In this scenario the government does not cooperate with

the private sector and makes entrepreneurship more difficult. Employment is at a suboptimal level – with significant unemployment and underemployment – and many people find jobs only in the informal sector. There is a low level of investment and FDI, further worsening even further job and wealth creation. Instead of future-oriented sustainable infrastructure projects, e.g., better public transportation system, water, and energy generation facilities, etc., non-productive, and non-renewable energy generation is still prevalent in Mexico. Due to low investment, the country's infrastructure, including health care system, public schools, and the highway network, deteriorates greatly.

Interestingly, several of the above cited comments support ideas that are presented in the two other scenarios. Participants expressed fears that the country will become less democratic (Scenario 2, Non-Democratic Growth) and feared the continuation of current policies that do not encourage economic growth (Scenario 4, Democratic Stagnation). Although these two scenarios seem like opposites, they may not need to be. The former emphasizes the lack of democratic political processes which are not favorable for SD, while the latter highlights the foregone economic growth.

After studying these possible future outcomes, the most likely scenario may be Democratic Stagnation, based on the developments as of this writing. The reason for this is the expectation of slow growth for upcoming years and the shared belief that Mexico will continue to be a democratic country, in spite of worrisome signals that may indicate otherwise. For example, by early 2022 some institutional checks and balances had been severed, among them some independent public agencies such as the National Electoral Institute (INE), the National Commission on Human Rights (CNDH), Freedom of Information Agency (INAI) (O'Neil, 2022). In the economic arena, private investment has not increased, thus curtailing growth in employment and production. Investments

related to energy generation continue to focus on fossil fuels instead of incentivizing green energy development. Social programs, albeit well-intentioned, do not offer a significant change in inequality as informality prospers and well-paying job opportunities are scarce. Considering these points, it would require substantial change in current policies in such key areas as strengthening institutions and the rule of law (SDG16), economic growth and job opportunities (SDG8), decreasing inequality (SDG10), attending to pressing environmental issues (SDGs13,14,15,11) to achieve the UN Agenda 2030. Meeting all the established goals by the end of the decade does not appear realistic given the current policies. However, even with the existing policies, progress on sub-indicators may be achieved against such goals as SDG2 (zero hunger), SDG3 (good health and well-being), SDG5 (gender equality). Only substantial negative change to existing public policies could reverse positive trends on these SDGs, which then could lead to the worst-case scenario (U-Turn & Lost Decade). Currently there are no signs of such regression on the abovementioned topics, signaling that the inertia or most likely scenario will probably unfold as described by the Democratic Stagnation scenario.

5.4. Minority Report: Diverging Opinions

Several participants described different positive scenarios which create a “minority report” including all the outlying opinions (Mead & Moseley, 2001). Some of these extreme views are cited below in Table 5.6:

Table 5.6. Excerpts Related to Diverging Views on the Best-Case Scenarios

Comments Related to Political Issues
1. "The best-case scenario is that the **current conditions do not get worse**, and they continue as the current trend indicates."
Comments Related to Economic Issues
2. "Mexico changes its perception of development and considers alternative economic models for the future, such as **circular economy and de-growth models**, replacing the current economic model that is **based on economic growth, production**, and consumption."
3. "Mexico **has a clear industrial policy to further develop the country's strengths and comparative advantages**. The federal administration consults with academics and research centers to implement the best plan for the nation."
4. "Mexico emits its own crypto-currency and may have several local currencies as complementary currencies, fomenting commerce within communities."
5. "Mexico **develops a comprehensive plan for regional development**, that considers certain centers of expansion and industrial growth generation, such as the northern or central region of the country (Bajío-region). Some Mexican products would have worldwide impact."
Comments Related to Socio-Economic Issues
6. "Mexico provides **universal health care and pension for all**, as well as **unemployment benefits** for the unemployed. People without skills and jobs receive a universal basic income."
7. "I would like to see a **more open Mexico with foreigners**. And that is also a sign of a country that has a lot of confidence in itself."
Comments Related to Environmental Issues
8. "By 2030 Mexico has **intelligent cities, which are car-free** and offer efficient public transportation that is **powered by clean energy sources**. The use of **bicycles is widespread** in the cities."

Source: author's compilation based on the interviews from Anonymous (2020) participants.

These comments support the best-case scenario from a different perspective, adding richness to the detailed scenario.

5.5. Divergence in Worst-Case scenario (minority opinion)

In a similar way, numerous experts described extreme negative scenarios as alterative future that could happen in the next decade. Some of the key ideas are cited in Table 5.7:

Table 5.7. Diverging Views on the Worst-Case Scenarios

Comments Related to Political-Social Issues
1. "**We are already living the worst-case scenario**: going through the worst pandemic in 100 years, **with no adequate governance and measures to mitigate the health** care crisis and **the economic crisis**. "
2. "Assuming that the COVID-19 pandemic is not controlled within a year or two with either effective treatment or vaccine and different mutant viruses surface, **the impact on the loss of human life and economic shock may prolong all through the decade in Mexico**, extending more the negative effects in every aspect of life. It may be a lost **decade for the country** and the population may even shrink. "
3. "According to two-three experts **the Mexican federation may fall apart in an extreme situation**. The northern states forming a new union, based on the argument that they contribute more to the federal budget and due to the differences in economic, social, and cultural aspect. "
4. "In an even more extreme scenario, a **Mexico may descend into civil war**. Military order may be introduced to control disorder, not excluding the intervention of US military forces."
5. "If a **socialist ideology-driven governance continues to seize control over key resources, institutions, and the military beyond 2024**, Mexico may experience a scenario like that of Venezuela by 2030. **This scenario would result in mass exodus of young Mexicans, primarily to U.S.**, which would be a major loss for the country."
Comments Related to Socio-Economic Issues
6. "My worst-case scenario is that **we continue exactly the way we're going**. Where all industries begin to be attacked, a system begins to become more paternalistic than it already is, more clientelist and we arrive at a neo-patrimonial state."
7. "The **poorer, marginalized, unskilled people will be left to their fortune**, **many will die** of the consequences of the pandemic, due to less or no access to health care, and other services, or simply for not having the basic needs covered for survival (food and water). **Only the strongest and luckiest will survive**. **The luckier, well-off part of society will not care and will not take action to solve the situation**."
8. "[t]hat **this pandemic will last longer than we think it will**. Because no one thought of a second wave, although there was talk of it, but never thought of, and what about a third wave, imagine a third wave. Come on, it is the last straw that **would kill millions of companies**, millions…and no new companies will be established, we are talking about **informal small family run business**, etc., this would be a very serious problem."
9. "My worst scenario...well, it would be **no growth**. It would be closely linked to the previous one, since I do not see a very future panorama, very encouraging, I see it as there is **not going to be any growth**, there are not going to be companies that... there are going to be **a number of diminished companies, dead**, then the worst scenario would be that we continue with the same policies, that there would be **no evolution of the companies**."

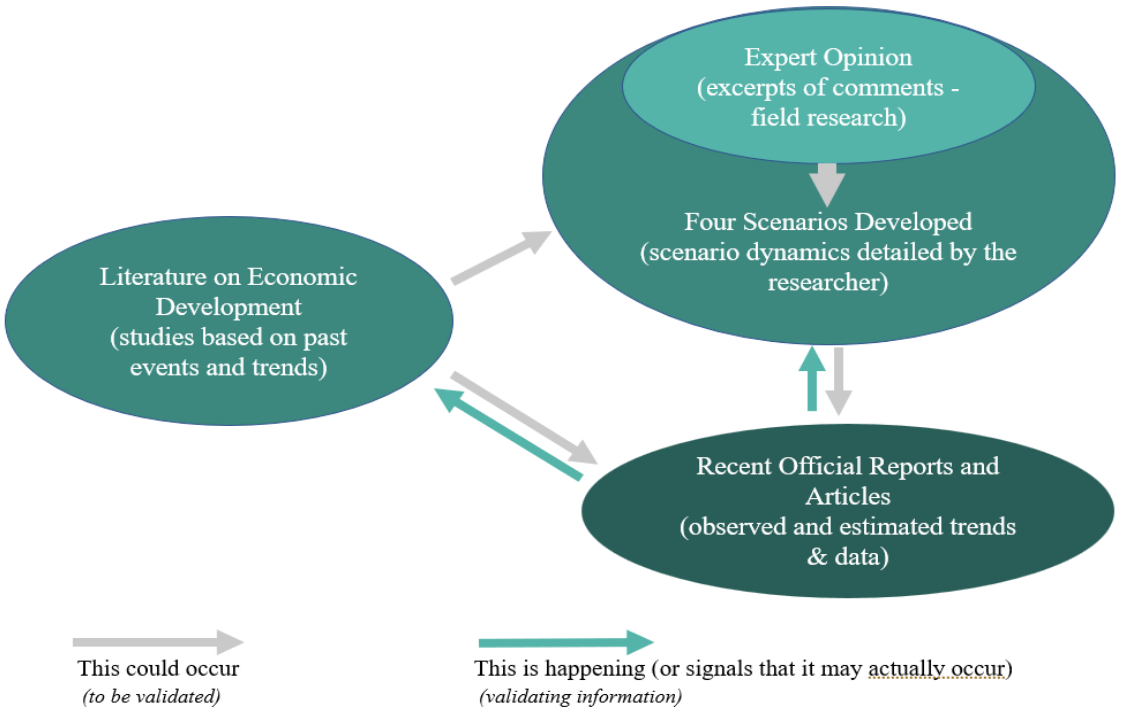
Source: author's compilation based on the interviews from Anonymous (2020) participants.

These minority opinions indicate the diversity of views that the panelist expressed during the interviews. Each one separately may seem an anecdotic extreme view, however these may support one of the four scenarios described previously. Events, such as a prolonged or renewed wave of Covid-19 pandemic don't seem impossible in late 2022, when China again closed one-third of Beijing's population due to new wave of contagion. Other wild card events, such as a global conflict, were not mentioned, although the risk of a bigger scale armed conflict between Russia and Ukraine or China and Taiwan are not out of the realm of possibilities in 2023.

5.6. Validation of Scenarios

The validation process was carried out by triangulating information from different sources. The concepts and observations discussed in the literature chapter of this document provided a framework for analyzing the scenarios and comments made by the expert panel. Most recent information derived from official reports and documents as of late 2022 gives some insights into trends that may unfold in the upcoming years. Triangulating this information allows a more balanced assessment of the phenomenon described in a scenario (da Silva Santos et al., 2020; Noble & Heale, 2019).

Figure 5.6. Illustration of the Validation Process for the Scenarios



Source: Author's own work

Figure 5.6 demonstrates that the first element of the comparison is the relevant literature, in which the theoretical framework has a fundamental role. The qualitative research of expert opinion provided the basis and the core ideas for the scenarios that were developed as potential futures. Recent official reports and documents offer insights as to what trends are developing currently, and there are projections in the literature on how certain tendencies may play out in the future. The gray arrows indicate what may occur based on the literature and the scenarios, while the green arrows show feedback based on the actual observed information that is currently available, two years after the interviews were conducted.

Following this scheme, the next section reviews the most important and relevant topics mentioned by the experts in the following PESTEL groupings: 1) political 2) economic; 3) social; 4) technological; 5) environmental; 6) legal dimension. Note that

these are similar to the dimensions used in interview coding. The author adjusted this PESTEL segmentation by uniting the political and legal dimensions under one main topic, a Political-Institutional Dimension as these two topics are very intertwined and the legal conditions sets the framework for the functioning of the institutions. Furthermore, these topics were often mentioned together by the experts. Additionally, this is the name of one of the critical issues that is used as an axis in the scenarios planning. The other critical issue identified was the economic environment. These two dimensions are discussed in greater detail in the following pages while the analysis of the other dimensions such as the technological, social, and environmental dimensions can be found in the Annex K.

Validating the Political – Institutional Dimension

In Table 5.8 the first column summarizes the topics most often mentioned by the experts. The second column indicates from the used literature which document, journal article, book, international report, and index is relevant to the topic. In the third column gives the number of experts who mentioned this topic. Column four provides the summary of these observations based on the excerpts from the interviews presented in the previous section. In column five the recently observed trend that can be inferred from the official report is indicated. Next to it, column six shows the selected recent documents that served as a basis to identify the trends. Finally, in column seven the reader can find the number of scenarios that are validated with the currently unfolding trend.

Table 5.8. Validation for Topics related to Political – Institutional Issues

Topics	Literature	No. comments	Summary comments related	Trend observed (2022)	Based on reports as of 2022 (Source, year)	Scenarios supported by recent trend
National policies for development PND, 4th Transformation Nation state	PND (2019), Chang (2010) Easterly (2015) Chimhowu et al. (2019)	5	National pact is desirable, continuation of federal policies, revision of policies of 4th Transformation	continuity with PND, mixed unity	Coneval, Diagnóstico II (2021)	1,4
Governance at federal and state level: efficiency & transparency, strength of institutions	UN Agenda 2030 (2015) SolAbility, (2019)	6	Increasingly **authoritarian gov't** power. Potential signals: limiting INE's or Banco de Mexico's autonomy	mixed: concerning (INE), improved tax collection (positive)	SolAbility, (2021b) World Justice Project, (2022) Social Progress Index 2022 (Green et al., 2022)	2
Political unity for development (among parties)	Andrade Gabiño (2020) Loser (2012) - Mexico 2042, Otero (2018)	5	**Fragmentation along party line**s and the **lack of political unity** impedes progress.	mixed - political polarization	Freedom House (2022)	3
Militarization and greater control of civil life	Latinobarómetro (2021), Zuboff (2019)	2	Democracy should prosper without militarization. Signal: National Guards' protagonist role	deterioration	World Justice Project (2022), Global Peace Index (2022), Latinobarómetro (2021), Global Militarization Index (2021)	2

Topics	Literature	No. comments	Summary comments related	Trend observed (2022)	Based on reports as of 2022	Scenarios supported by recent trend
Rule of Law, Impunity, Transparency	Loser et al. (2012), World Rule of Law Index (2018) (2017), SolAbility (2019), UN Agenda 2030 (2015)	6	**Deteriorating Rule of Law**, Continuing impunity, privileges to a small elite	worsening trend	World Rule of Law Index (2022b), World Justice Project (2022), Freedom House (2022), EIU (2022)	2,3
Corruption	Corruption Perception Index (2018) – MX#138/180 Social Progress Index (2017), Ríos (2021)	8	**Persistent and rampant corruption** is a major obstacle of progress	some improvement	Corruption Perception Index (2022): 124/180 Social Progress Index (2022)	2,3

Source: the author's compilation based on interviews from the experts (Anonymous, 2020) and the documents cited in the table.

As Table 5.8 above indicates, one of the central topics mentioned was the need for a national pact, a development plan that is executed for the benefit of society. The PND (2019) encompasses this aspiration of the current Mexican government. Other authors (Loser et al., 2012) also argued in favor of a clear national plan. In fact, Mexico is one of the many and an increasing number of countries where a national development plan is prepared by any incoming government (Chimhowu et al., 2019). Moreover, it is required by law. Easterly (2015) and Chang (2007) argued that each developing country needs to find its own path to development instead of listening to outside experts or following other countries' economic development models. The experts interviewed also confirmed that it is very important to have a national plan as well as the political willingness and unity to execute it for the country's progress. Without a plan a country may not have a direction

indicating the areas it wants to develop and where it wants to make important structural changes. As column 7 indicates, in two of the four scenarios it is likely that the use of national planning would remain in effect. In fact, as the Covid-19 pandemic revealed, strategic economic, political, health care decisions require a stronger nation-state approach to governance. Additional developments, such as the Russian-Ukrainian war, created shortages of numerous basic goods including energy, food, fertilizers, the consequences affect almost every country in the world. Another widespread phenomenon, accelerated inflation unseen for decades in many countries including Mexico, demands the government's attention and policies that can mitigate these negative impacts on society. Hence, only under extremely unfavorable political and economic circumstances should a national plan be abandoned; under less unusual circumstances it would likely remain the most important strategic document of any incoming federal administration.

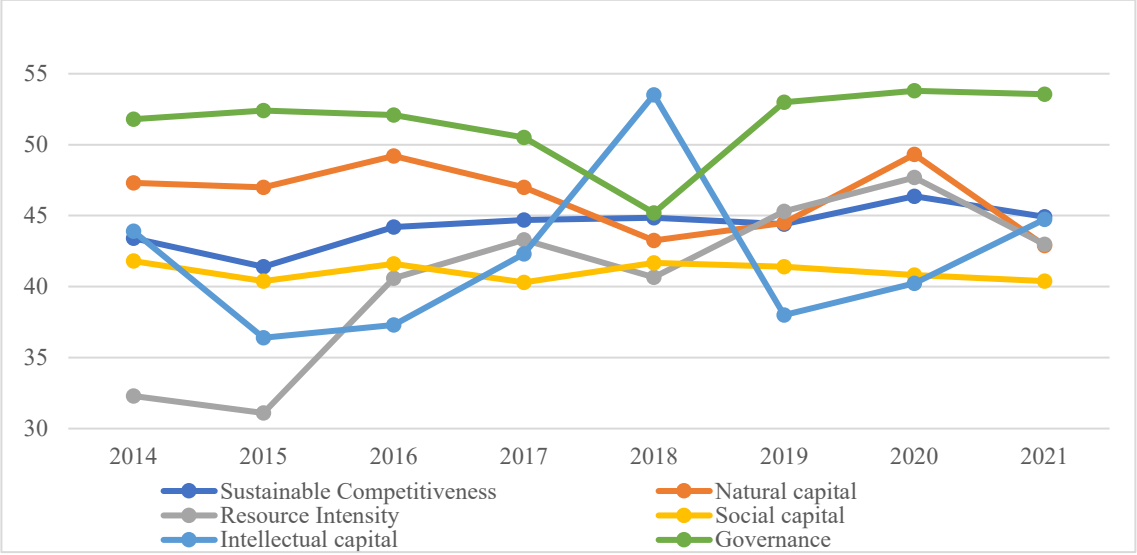
According to the *Consejo Nacional de Evaluación de la Política de Desarrollo Social* (Coneval) (2021) evaluations of the National Plan of Development (NPD), there was both progress and shortcomings related to NPD. The first observations in 2021, two years after its publication, noted that many of the subsequent documents which were supposed to include specific objectives and numerical targets were published late or not at all, although according to the National Planning Law (*Ley de Planeación*, 1983), these must be published six months after the publication of the NDP. This makes the assessment difficult, especially when 62% of the 21 programs were not published by 2021(Coneval, 2021). Another issue identified in the document cited is that 45% of the objectives lack clear indicators. Hence, it is hard to assess the success of these objectives. Thirdly, there is no previously established numerical target on 12% of the indicators, again, making assessment less precise. One good example is the Sustainable Rural Development special

program that has clearly defined all the necessary indicators. Another interesting detail is that of 110 indicators only 38 measure phenomena related to three high priority areas, such as situation of women, children and adolescents and people in extreme poverty. Among the priority objectives, ten social issues were identified, including sustainability and environment, income and poverty, productivity and competitiveness, social well-being, and water security. These areas are associated with 65% of result-oriented objectives and indicators. The remaining 35% of the objectives include management or coordination processes. Considering the results, of the assessed program indicators 47% achieved an excellent level (above 83% on the relevant scale or metrics), while 31% of the indicators received "area of opportunity" qualification which indicates little to no progress. Programs obtaining excellent evaluation include Pro-equality (*Proigualdad*) and the special Program for Sustainable Rural Development as all related indicators achieved adequate or outstanding evaluation. On the other hand, the program called National Comprehensive Child Development made the least progress as 88% of its indicators fell below the adequate level. The greatest challenge identified by Coneval is the tardiness of rolling out the programs as of 2021 and the lack of precise measures of the indicators to properly assess the progress of the NDP.

Considering governance at federal, state, and municipal levels, efficient governance has been a challenge for Mexico, as well as many other countries. Several authors observed that the legal framework for democratic processes is well established. However, the application of the law, transparency, accountability and impunity are the major areas for improvement (Andrade Gabiño, 2020; Loser et al., 2012; Ríos, 2021). When compared internationally, Mexico's score on Governance Efficiency Competitiveness

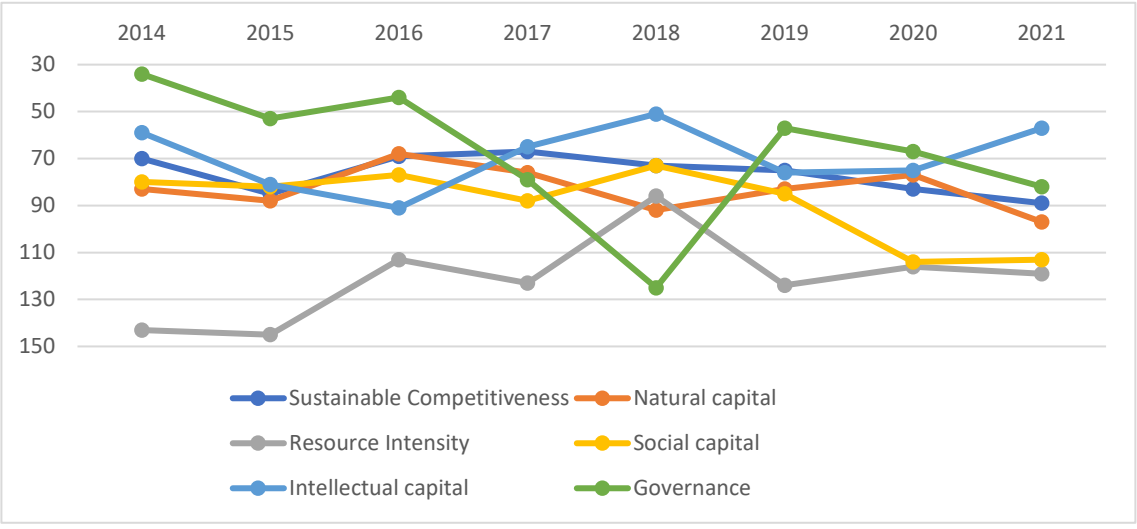
Index has seen a significant improvement from 2018 by 2019 according to the assessment of SolAbility (2021b). However, there has been stagnation since then (Figure 5.7).

Figure 5.7. Mexico's Sustainable Competitiveness Index and its Five Subcomponents' Scores between 2014 and 2021



Source: the author's compilation based on SolAbility's Global Competitiveness Index Reports from 2014 to 2021. Note: The higher the score, the better is the outcome.

Figure 5.8 Mexico's Sustainable Competitiveness and its Five Subcomponents' Ranking between 2014 and 2021



Source: the author's compilation based on SolAbility's Global Competitiveness Index Reports from 2014 to 2021. Note: Ranking goes from 1 being the best to 180 being the worst performing country.

The country's global GSCI ranking among 180 countries fell from the 44th place in 2016 to the 125th place in 2018, the lowest ranking since 2014, then rose to the 57th place in 2019 and subsequently fell to the 82nd place by 2021 as it is seen in Figure 5.8. The composition of each subcomponent, including the Governance subindex, can be found in Annex J. The evaluation above shows a stagnating trend based on the score from 2019 to 2021 (Figure 5.7). While such a trend can occur in any of the scenarios, if it continues, it could indicate that a Non-democratic Growth (Scenario 2) or the worst-case scenario (Scenario 3) would be unfolding in the coming years. Considering other aspects of governance, Freedom House (2022) in its 2022 annual Report of Freedom in the World entitled "The Global Expansion of Authoritarian Rule" noted that an increasing number of national governments became more controlling, overriding the rule of law, not respecting free elections, basic human rights, civil organizations, NGOs, cracking down on media, and rounding up people from the political opposition. For example, Afghanistan, Russia, Myanmar, Nicaragua, among many others, saw serious setbacks by 2021. According to this report, Mexico is considered a partly free country ranking in 60th place globally, similar to 80% of the global population that lives either partly free or not free countries. Considering this status as an unfavorable political-institutional condition, this ranking supports scenarios 2 and 3, as the other two scenarios would assume a more democratic environment.

Issues related to the rule of law, its weakness in Mexico's case, are among the commonly mentioned challenges cited in many evaluations and they were noted by many experts during the interviews. According to the World Justice Project, the rule of law is defined as follows:

"Effective rule of law reduces corruption, combats poverty and disease, and protects people from injustices large and small. It is the foundation for communities of justice, opportunity, and peace—underpinning development, accountable government, and respect for fundamental rights. "(World Justice Project, 2022b, p. 13).

The World Justice Report 2022 that is constructed with primary data obtained through general polling using a representative sample of 1000 people and qualified respondents' questionnaire from each country, Mexico ranked a115th of 140 countries, behind countries such Angola, Mali, and Guatemala (World Justice Project, 2022b). This disappointing result reflected a decline between 2015 when Mexico's score was 0.47 to 0.42 by 2022, well below the global average of 0.55. Among the regional peers of 32 countries where the average is score is 0.52, Mexico is in 27th place. The overall score contains eight factors for assessing the general status of rule of law, including constraints on government (below global and regional average), absence of corruption (scoring 0.26, again, well below both averages, ranking 134 of 140 countries), government openness (on this metrics Mexico is above both averages), fundamental rights (below both averages), order and security (Mexico: 0.52, world average: 0.72, regional average: 0.66), regulatory enforcement (below both averages), civil justice (well below both averages), criminal justice (also well below both averages) (World Justice Project, 2022a). This result and trend support scenarios related to unfavorable political conditions, scenarios 2 and 3.

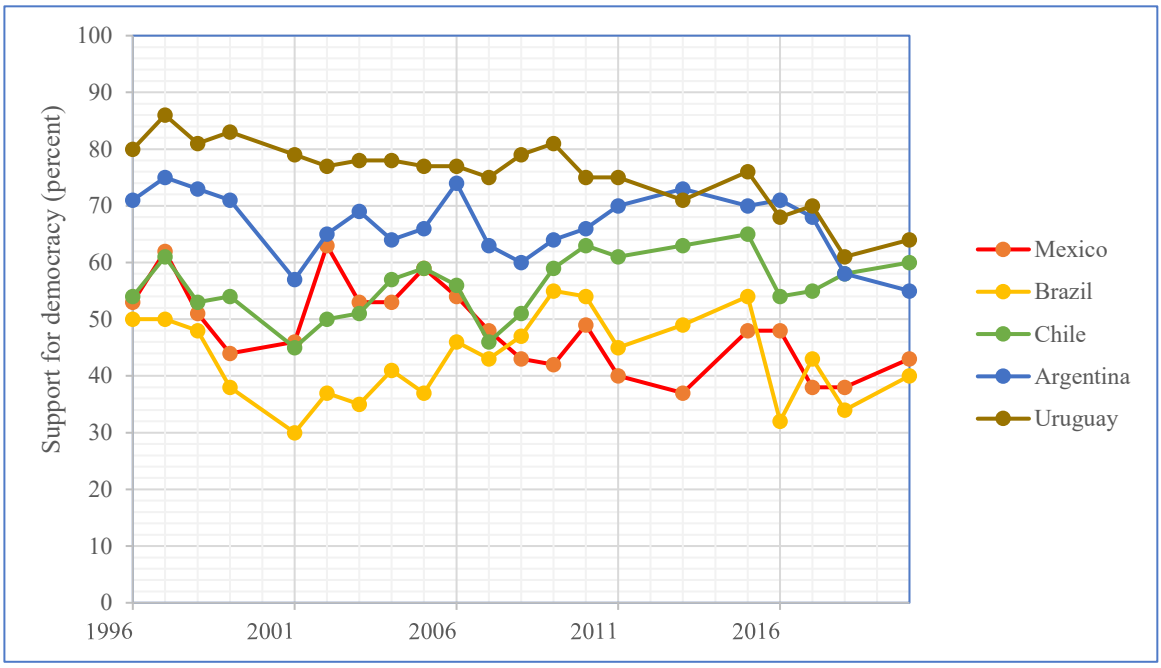
With respect to corruption, other reports based on respondents' answers from each country, such as Transparency International's Corruption Perception Index ranked

Mexico at 124th place of 180 countries, with a score of 31, 100 being the best and "clean country", zero being the lowest and most corrupt country. There is a moderately improving tendency from 2018 when it ranked at 138 place scoring 28 (Transparency International, 2022). This organization uses three data sources including reputable local and international institutions such as the World Bank and the World Economic Forum and several surveys from each country to compute the aggregate score and ranking.

Other organizations such as the Chilean Latinobarómetro (2021) relies on interviews of approximately 20,000 people of the 600 million Latin Americans. Similarly, the Barometer of Americas from Vanderbilt University in the US, uses surveying methods for getting firsthand information from the continent's countries. Both of these reports found similar results with respect to several questions related to democracy, rule of law and corruption (Parás et al., 2022).

Belief and support for democracy has been fluctuating in the Latin American region, including in Mexico. Only in 2020 when the support for democracy fell below 50% (49%) in the region, in Mexico it was 43% in the same year (Corporación Latinobarómetro, 2021). It is interesting and notable that since 1996 when the organization started collecting this information, 2002 was the year when democracy enjoyed the highest support (63%) in Mexico while 2013 was when it was the lowest (37%), and the lowest among its regional peers (Figure 5.9). Since 2018 the trend for Mexico however indicates improvement by 2020.

Figure 5.9. Support for democracy in selected countries of Latin America (in percent of the population, 1996-2020)



Source: Author's compilation based data published in Informe 2021 (Corporación Latinobarómetro, 2021), p. 21.

Less enthusiasm for democracy from 2015 may be indicative of lack of support for the ruling governments of these countries in those years. Interestingly, according to the data above, the pandemic did not result in less trust in democratic governments in 2020, on the contrary, support has increased in the selected countries, except Argentina. The reduced esteem for democracy does not suggest that people would prefer strong leadership that would override the rules of democratic governance. In the expert panel interviewees expressed their concern about any signal that may curtail democratic processes. In fact, it was one of the greatest concerns. In the special report on Latin America titled "Who Desires Authoritarian Leadership in the Latin America and Caribbean Region?" (Paul, 2022), a publication of Vanderbilt University, respondents were asked about their support for strong and unbound leadership, 25% of the Mexicans

responded affirmatively (the regional support ranges from 17% in Costa Rica to 57% in Guyana). Curiously, in Canada 38% of the respondents responded that they would support a strong leadership. Other findings showed that higher levels of education are strong predictor of opposition to strong and unbounded leadership while economically secure respondents and those who feel safer in their neighborhoods are more likely to support it. As this report indicates, Mexicans do not show desire or preference for powerful leaders who would override democratic processes in order to deliver on their promises or for their personal gain.

Recent developments in fact indicated that Mexicans are concerned about the President's electoral reform initiative to curtail the budget of the National Election Institute (abbreviated as INE in Spanish), the Mexico's highest national authority of democratic electoral processes (Enrique et al., 2016; Instituto Nacional Electoral et al., 2020). In late November 2022, considerable crowds marched in several parts of Mexico opposing the electoral reform and in favor of maintaining INE's autonomy, scope of activities and the allocated budget (Soriano & Viña, 2022). As of this writing, it is not known if the proposed reforms are going to be approved by favorable votes.

Another issue mentioned by the expert panel is Mexico's increasing militarization under the present administration. Since 2019 several analysts expressed their concern about the creation and deployment of the National Guards in civil activities and the potential for increased militarization in Mexico (Hernández & Romero-Arias, 2019; Serrano, 2019), noting that increasing military presence on the streets may not lead to a rise in public safety and to diminish the activities of criminal cartels. Mexico is not a country where the level of militarization is considered high in terms of public military spending, military personnel and armament compared to other countries; Mexico held a

145th ranking on the Global Militarization Index in 2017.However by 2021 it had risen to 137th place, signaling that militarization had indeed increased according to this evaluation (Bonn Institute of Conflict Studies (BICC), 2017, 2021). From another perspective, the Global Peace Index, a composite index measuring the peacefulness and safety within a country based on 23 quantitative and qualitative indicators, Mexico's ranking has not changed significantly since the change of government in 2018. In 2017 Mexico was in 138th place, and by 2022 it was in the 137th place among 163 counties (Institute for Economics and Peace, 2022), behind nations such as Haiti, South Africa, Palestine, Israel and India. This result is unsettling and concerning, given that Mexico is not a country in conflict with other nations nor is it in the midst of a civil war. The score reflects the generally high level of insecurity that many Mexicans perceive and experience in their everyday lives, due to drug violence, feminicide, and many other violent crimes that are barely reported to the official institutions, owing to the lack of confidence in the criminal justice process (Mexico Evalúa, 2022a; World Justice Project, 2022b). In summary, Mexico's political-institutional situation does show unfavorable and unsatisfying conditions for development and progress. The ruling Morena party is likely to retain its power beyond 2024, considering the President's popularity and the lack of unity among the opposition parties. As the Economist Intelligence Unit's brief summary states, the country is likely to continue follow the Morena policy initiatives until 2030, without a national pact. Not having regulatory predictability, the failure to advance the rule of law and the lack of trust from the private sector in contract rights may be major impediments to economic growth and investment in the upcoming years.

Validating the Economic Dimension

The key issues related to the economic dimension, listed in Table 5.9 below, include economic growth, job creation, the business environment, industrial plan, dilemmas concerning economic development path, international trade relations and the UMCA, the post-pandemic economic recovery, and sustainable development. Experts commented that economic growth is critical, coinciding with previous reports from the several national studies including *Centro de Modelística y Pronósticos Económicos* (CEMPE), a think tank of the UNAM, and international organizations such as the IMF, the World Bank, the OECD, and the Economist Intelligence Unit. The key message in all cited reports is that economic growth had been sluggish prior to the pandemic and that the recovery has been gradual since 2021. The outlook for growth, considering a potential economic slowdown in 2023 in the world and in the US, Mexico's main trading partner, does not promise the higher levels that would be desirable for expansion--around 4% annually. In fact, as it was previously cited, Calva (2020b) argued that a minimum of 6% annual GDP growth would be desirable to cope such challenges as combating poverty, increasing real salaries, and reducing inequality. Nonetheless, estimates suggest a 1-2% growth in the upcoming years as a more likely scenario (CEMPE, 2022; EIU, 2022; World Bank, 2022).

Table 5.9. Validation for Topics related to Economic Issues

Topics	Literature	No. of comments	Summary comments related	Trend observed (2022)	Based on reports as of 2022 (source/study, year)	Scenarios supported by recent trend
Economic growth	IMF (2020), World Bank (2019), OECD (2020)	8	Low growth is expected for the upcoming years (2022-2027)	stagnation /slow recovery	Economist Intelligence Unit (2022), CEMPE (2022), World Bank LAC (2022), IMF (2022)	3,4
Jobs /Employment /Skills in population	Calva (2020), Ríos (2021), World Bank (2019)	4	Unemployment could rise, if there is no growth, people lack skills	stagnation / post-pandemic adjustments	IMCO (2022a), Social Progress Index (2022)	3,4
Business environment /Investment / FDI	IMF (2019), World Bank (2019), Doing Business Index (2020b)	6	Unfavorable environment, **low investment,** unfriendly approach to private sector.	deterioration	Banco de Mexico (2022), EUI (2022), Doing Business Index (2021b)	3,4
Industrial plan (National Plan) / National resilience	Machado et al. (2020) Gereffi et al. (2022)	3	Strategic **industrial plan** needed	improve-ment	SE Industrial Policy (2022)	1,2
Development paths: Export-oriented growth / network view of development regional development	Calva (2004), De la Garza Toledo (2018), Gereffi & Evans (1981), Quintana et al. (2013), Hausmann (2007, 2016), Hidalgo (2017)	3	Strategic industry sectorial & **regional focus** needed	improve-ment	SE Plan Industrial (2022)	1,2
Free Trade/ State-driven commercial relations /USMCA	Calva (2004, 2019), Chang (2010)	5	Concern about USMCA, dependency on US trade, international trade flows have not recovered	mixed (USMCA - concerns)	UNAM Boletín (2022), DHL Connectedness Index (2021)	1,2

Sustainable Development	Raworth (2017) UN Agenda 2030 (2015)	4	**Not enough is being done** on sustainability, especially on energy generation, land & water management	stagnating, minor improvement in 2022	UN SDG Dashboard (2022), Climate Action Tracker (2022)	3,4
Covid-19 recovery	IMF (2020), Esquivel (2020), Baldwin y Weder di Mauro (2020a, 2020b), Reinhart (2020)	5	Big impact on Mexico, very **slow economic recovery** expected	stagnation	Banco de Mexico (2022), Economist Intelligence Unit (2022), IMF (2022)	3,4

Source: Author's compilation based on interviews Anonymous (2020) and the documents cited in the table.

An important positive development is the announcement of a new industrial policy (IP) in September 2022. This plan has four key areas that the Mexican government wants to prioritize: 1) innovation and technological-scientific advancement; 2) human capital development for the new technological innovations; 3) promotion of regional development and value chains for SMEs; and 4) sustainable industries. Several of these elements including focus and mechanisms to improve productivity, regional cooperation and development, increasing the skill level of the Mexican labor force, were previously mentioned in the literature and official reports about Mexico, i.e., before the publication of the IP (IMF, 2021; World Bank, 2020b). Not only international organizations, but the experts also noted these issues as important elements that were missing from the present administration policy set. The implementation of the new IP could set the stage for higher productivity and competitiveness, more sustainable development. This would create a favorable economic environment and set the stage for scenarios 1 and 2, depending on how political-institutional conditions unfold in the coming years. During the interviews the experts also argued in favor of a coherent IP which could not only help improve

productivity, competitiveness, labor skills, but also reduce rural poverty and regional inequalities.

Other authors such as Gereffi et al. (2022) demonstrated that strategic industrial policies which emerged during the pandemic can be successful not only for the local industries but can also increase the country's resilience in the face of adverse circumstances. The authors argued that government support for key sectors to develop vaccines, produce rubber gloves, facemasks, and ventilators, all of which were suddenly in high demand created new opportunities and sources of income when global value chains (GVC) were severed. Countries, such as Malaysia, China, and the US among others, that could mobilize their resources and assist their local industries, did better at a firm level and also contributed to increased national security of strategic healthcare items. Thus, the involvement of the nation state in the private sector by assisting firms and the collaboration among firms, GVC and the state, created greater resilience not only at firm level but also at GVC and at national level. The authors mention that nation states can tap into the power of GVCs as "weapons" to push home industry interests, using them to a nation's benefit at a cost to foreign competitors (Gereffi et al., 2022).

This analysis of the critical relationship among three actors--firms, industry and nation state--in the aftermath of the pandemic supply chain shocks adds a new perspective to the previously examined concepts of the network view of development (Hausmann & Hidalgo, 2010; Hidalgo & Hausmann, 2008) and regional development (Ocegueda et al., 2009; Quintana Romero et al., 2013). The increased state support for local industries to mitigate the impact of and depart from dependence on MNC's is not a new idea, as it has been present in the development literature for some time (Dos Santos, 1970; Gereffi & Evans, 1981; Wallerstein, 1974). In fact, this renewed enthusiasm for state promoted

industrial development which gained momentum during the pandemic, may offer a viable alternative to the neoliberalist model that has been prevalent since the late 1980s (Calva, 2019; De la Garza Toledo, 2018; Otero, 2018). This alternative does not contradict the export-driven growth models either (Calva, 2020a; De la Garza Toledo, 2018; Li et al., 2021). Table 5.10 below shows estimates for key economic data from a recent study published by Economist which also indicate an expectation of a slow economic growth for Mexico until 2027.

Table 5.10. Estimation and Forecast of the Economist Intelligence Unit, Mexico, Q3 2022

	2022[a]	**2023[b]**	**2024[b]**	**2025[b]**	**2026[b]**	**2027[b]**
Real GDP growth (5%)	2.6	0.8	1.7	2.1	2.1	2.2
GDP per head (US$ at market exchange rates)	11,000	11,650	11,890	12,110	12,360	12,560
GDP per head (US$ at PPP	22,300	23,110	23,710	24,530	25,430	26,370
Consumer Price Inflation (ave)	8.0	8.3	4.0	3.7	3.5	3.0
Short term interest rate (ave, %)	7.9	10.6	9.8	7.7	5.4	4.5
Unemployment rate (%)	3.5	3.8	3.7	3.6	3.5	3.5
Government balance (%of GDP)	-2.4	-3.6	-3.1	-2.9	-2.7	-2.5

Source: Author's compilation based on the Mexico - One-Click Report (Economist Intelligence Unit, 2022). Notes: [a] – Estimate, [b] – Forecast.

In the face of these recent developments, there are authors who argue that Mexico should prioritize the development of its agricultural sector as it could contribute to the post-covid recovery and also provide greater resilience and robustness in case of shocks (Sánchez et al., 2022). More public investment into the sector could increase productivity, reduce informality and rural inequality.

As discussed previously, during the interviews experts were asked specifically about the best- and worst-case scenarios in two separate questions. Many opinions coincided, some differed. Based on the 30 interviews with experts, several patterns emerged including a generally pessimistic perception of the current state of affairs and

the direction the country took in 2020-2021. Furthermore, converging ideas can be detected when analyzing the best and worst-case scenarios. A desirable future as described in the best-case scenario, presents a situation in which Mexico creates a "national pact" and the political leadership develops the appropriate strategies to achieve its goals, considering the specific cultural characteristics of the country. In the best-case scenario, there is improved, more transparent natural resource management which remains mostly in public ownership with active participation by the private sector. The government provides a proper, efficient legal framework that promotes investment and business efficiency. The cooperation between the private and public sectors allows the country to achieve energy self-sufficiency based primarily on renewable resources, rather than fossil fuels. Water will be a critical issue; several experts are deeply worried about the availability and access to fresh water in several parts of Mexico. It will be imperative to have a clear legal framework that can balance the need for water access by both business and the public.

In contrast, the worst-case scenario describes a very dark future by 2030, a lost decade for Mexico with severed democratic processes. This scenario could be averted with targeted policies and programs. However, out-of-the box programs and development plans can only work if Mexico's natural and cultural heritage is respected and considered. The most likely scenario suggests that the country will face disappointing economic growth coupled with strong state intervention and a reduction in democratic processes in the coming years.

Furthermore, as many experts pointed out, only radical and fundamental changes can put the country on a path to meeting the 17 SDGs of the UN 2030 Agenda by 2030. Without strategic and ambitious policies, it is unlikely that Mexico will achieve these

goals. These comments and observations point to Scenario 4, Demographic Stagnation as the most likely scenario by 2030. This conclusion coincides with the risk analysis conducted by the Economist Intelligence Unit in late 2022, in terms of critical issues Mexico faces and their potential for unfolding (Table 5.11). Other events considered by only two experts in the interviews in 2020, such as a new variant of the Omicron-variant of the corona virus, appears as a risk with moderate probability but very high impact if it happens.

Table 5.11. Major Risk Areas and Scenarios, according to the EIU, Q3/2022

Major Risk Areas and Scenarios, Q3/2022	**Probability**	**Impact**	**Intensity**
Dealing with organized crime activity becomes costlier for businesses	Very high	High	20
The government introduces reforms that foster monopolistic practices in favor of state-owned companies, dealing a blow to private firms	High	Very high	20
The Omicron variant of covid-19 (or one of its successors) sends the global economy back into recession	Moderate	Very high	15
Political polarization increases, undermining stability and increasing unrest	High	Moderate	12
An energy policy dispute leads to a trade and investment row with the US	Moderate	High	12

Source: Economic Intelligence Unit, 2023. Notes from the report: Scenarios and scores are taken from the Risk Briefing product of EIU. Risk scenarios are potential developments that might substantially change the business operating environment over the coming two years. Risk intensity is a product of probability and impact, on a 25-point scale.

Another topic not previously mentioned relates to the US-Mexico trade agreement, and potential disputes about Mexico's energy policy. This issue did not come up during the interviews as the policy was just being formulated around the time of the interviews. According to this report, the situation may pose a moderately probable but high impact situation for the country in the near future. As an observation, this analysis of the Economist does not specify a time horizon for these scenarios.

5.7. Discussion: What can be learned from Scenario Planning

The objective of the present investigation was exploring the future of what may lie ahead for Mexico in terms of sustainable development by 2030. The primary data collected through the in-depth interviews enabled the identification of key variables of uncertainties with respect to the future. After examining more closely the dynamics of these variables through the cross-impact analysis, two themes were selected and used for developing four scenarios describing potential futures in Mexico. To assess the validity of each scenario, the descriptions and observations of the expert panel were compared with the available literature. For the assessment of the current status and potential trends for coming years, recent reports and news articles provided additional insights and clues as to how the future may unfold. The results of the research suggest that it will be difficult for Mexico to meet the objectives of the UN Agenda 2030, making the most desirable scenario–Sustainable Development and Prosperity (Scenario 1) –challenging to execute, giving a low probability of it happening. The most likely scenario is the Democratic Stagnation (Scenario 4), with very high probability, given that Mexico is expected to continue as a democracy with the expectation of low economic growth in the next eight years. This observation coincides with other estimates (Centro de Modelística y Pronósticos Económicos (CEMPE), 2022; International Monetary Fund, 2022; The Economist Intelligence Unit, 2022). The probability of Scenario 2 titled Non-Democratic Growth is low, based on the comments of the experts, and considering that growth e is not expected to exceed 2.2% annually and that the country is not likely to face a totalitarian political regime. It is not impossible, however, that either a left right-leaning concentration of

power happens in Mexico under very unfavorable social, political, and economic circumstances, e.g., another major economic crisis, pandemic, or extreme violence spreads so much that the martial law is implemented, and power is concentrated in the hand of small elite group with support of the military. Finally, Scenario 3 titled U-Turn and Lost Decade, which is the worst-case scenario, may also unfold with a moderate probability. This assessment is based on the comments of the experts on the extreme scenario which were summarized in the Minority Report. It is also notable that at least three experts considered the situation Mexico was going through in late 2020 and early 2021–the worst pandemic in history, coupled with the deepest economic crisis and a government whose response to these events was considered inadequate–already the worst possible scenario. The details described in scenarios were obtained from the expert interviews as they were related to the logic of each scenario. Consequently, the response to the initial research question whether Mexico is on a sustainable development path to achieve the UN Agenda 2030's SDGs is that the country is lagging and probably will be lagging behind most of the SDGs of the UN Agenda 2030 by the time 2030. Considering the second research questions whether international competitiveness can be conducive to sustainable development, there is no clear evidence based on a literature review. Countries that rank high on the GSCI achieved their development in a way that was not sustainable. In fact, except for a few smaller countries such as Finland and Switzerland, most wealthy countries are not living within the UN's planetary boundaries. A better example of sustainable economic development is Costa Rica. While it is in the upper middle-income group, its population is much closer to living within the planetary boundaries. This means that competitiveness may come at the cost of sustainability and push for greater international competitiveness may be counterproductive from a

sustainable point of view as it results in negative externalities such as pollution, inequality, and over-consumption which is the driving force of the capitalist economic models expecting endless economic growth. Living within the planetary boundaries appears to contradict the current trend of economic growth. However, no-growth models may not be appropriate for countries which have growing populations, as more people may need more goods and services or a better and more equal wealth distribution within the country.

The third research question regarding what may lie ahead for Mexico by 2030, has been answered with the description and the discussion of the four scenarios. And finally, with respect to recommendations, there are several points that derive from the results and outcome of this investigation. First of all, all policies should focus on paving the road for the best-case scenario, which would be creating a society that is safe and serves all Mexicans, providing decent work and living conditions, opportunities through sustainable development within the planetary boundaries. For this it is important to achieve political unity to make a national pact for sustainable development and growth from all contenders at the 2024 elections. If the current ruling party, Morena, is reelected, it is desirable to have support from the opposition parties so that there is overwhelming political will to design and execute policies for inclusive political and economic institutions. If policies are coordinated and supported independently from party affiliation, there is a greater chance to succeed and meet more of the SGDs by 2030. Second, addressing other critical social issues, such as better public safety, reduction of violence and persistent inequality is highly desirable so that the risk of political and social polarization dissipates. A safer and more just environment is necessary for people to prosper in society. Issues related to another pivotal theme, the legal-institutional framework, were also mentioned by several

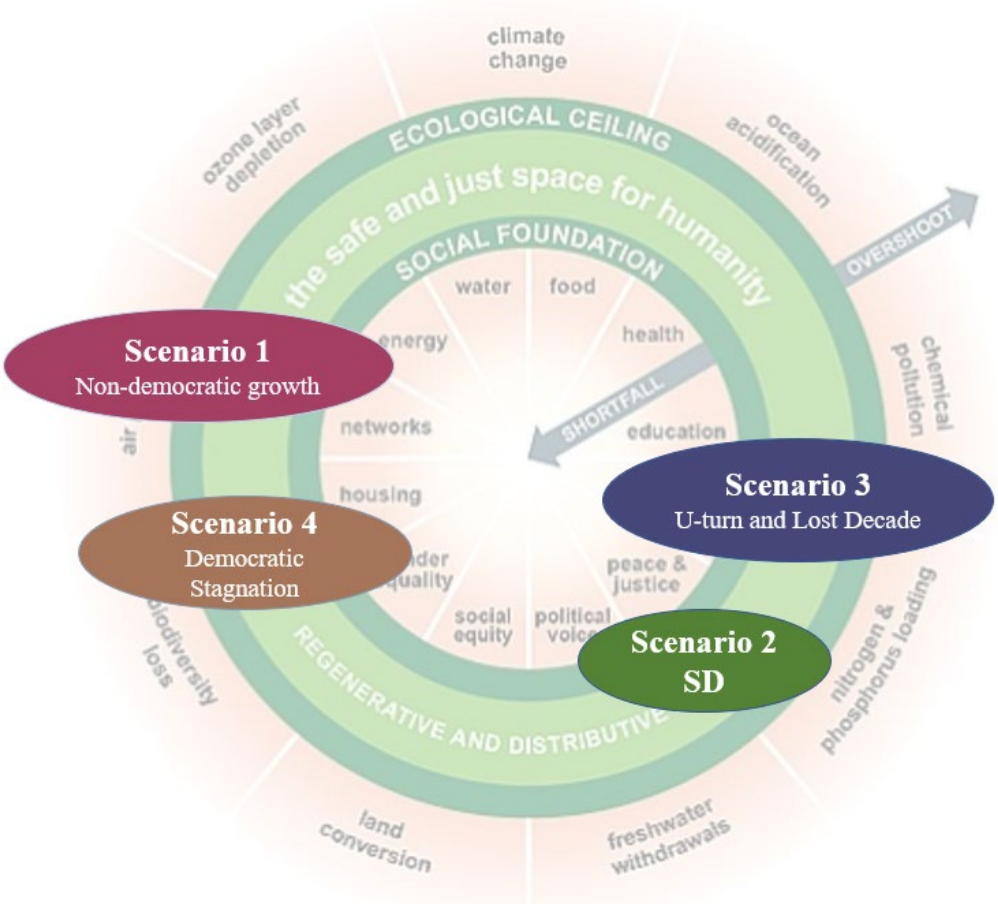
interview subjects and is noted by all official reports (Corporación Latinobarómetro, 2021; Mexico Evalúa, 2022b; Parás et al., 2022; World Justice Project, 2022a), including the improvement the rule of law, the trust in the criminal justice, and reduction of corruption in public life. Next, in terms of economic development, growth was mentioned as necessary for the country's progress. For greater economic growth experts, similar to official reports, noted that a coherent and comprehensive industrial plan is needed. By the third quarter of 2022, the Ministry of Economics roiled out the new industrial plan, marking a road towards more sustainable industrial development that promotes innovation, the development of human capital, regional development, and sustainable industries. A good initiative and first step, public policies enabling its execution should follow in the coming years. Continuity of these policies should be expected if the current ruling party wins again in 2024. With respect to environmental policies, some progress was made by late 2022 when the country increased its commitment towards the zero net target, without making more ambitious commitments. What is not seen is the investment, promotion, and incentives for cleaner energy generation. These are needed if Mexico is to reach the SDG7 (clean energy) targets by 2030. All these are critical issues that are required if the country wants to meet most of the targets of 17 SDGs.

In summary, the data obtained through qualitative foresight methods were adequate for carrying out the research and responding to the research question. Possibly other methods could have worked as well, for example, surveying instead of in-depth interviews. However, surveys are more limited given their nature, providing less qualitative information, and losing the richness of comments and personal observations which were shared during the interviews. Additionally, a much bigger sample would have been needed for surveying. The benefit would have been the collection of primary

quantitative information which could have been analyzed with different statistical methods (from correlation analysis to linear regression analysis). Due to the time limitation, the author opted for the in-depth interviews instead of surveying and the application of quantitative analysis.

Next, with respect to the theoretical framework, using the Doughnut Economic Model the following visual representation in Figure 5.9 can be derived from the research and the presented four scenarios.

Figure 5.9. Four Scenarios in the context of Doughnut Economic Model



Source: Author's work using the framework of Raworth (2017).

The image created by Raworth (2017b) suggests that for SD the best case scenario (no. 2) should fall within the doughnut, meaning that all the social foundations are met yet the country's development does not overshoots the planetary boundaries. The worst-case scenario (no. 3) would fall below the socially safe and just level, not providing equal opportunities and living conditions for all Mexicans while exceeding the environmentally sustainable levels of water usage, land conservation, pollution, and climate change indicators. In case of Scenario 2., by achieving growth the social indicators may be met but the environmental targets would not be met, especially if the current and new government post-2024 keeps focusing on fossil fuel driven the energy production and not investing in clean, environment-friendly sustainable energy alternatives. Scenario 4, the slow-growth stagnation with democratic governance would make progress on many of the SDGs, but due to lack of economic means, not all the social needs would be met. It is possible that inequality would be reduced, however, without growth there would be limited tax collection, limiting the necessary investments in public education, public health care, among other pressing needs that a growing and ageing population would require by 2030. Other potential consequences would include constrained investment into public housing, not having financial means to upgrade the infrastructure, make public transportation more efficient hence reducing CO_2 emissions, and thus would result in falling behind the environmental targets. In other words, there would be modest progress, but disappointing for many Mexicans. The country would follow the path of what Rios (2021) has described in her book "*No es normal*" that it is not normal that Mexicans are not living better.

In a summary, based on the literature and theoretical framework which focus on the search of new economic models and proposes the Doughnut Economic Model as an

alternative, the results of the investigation confirm that the current capitalistic model prevalent in Mexico will not be conducive for sustainable development. In fact, the inertia scenario 4 – Democratic Stagnation – would clearly not lead to significantly better living standards, more job opportunities with better pay, reduction of inequality, or higher tax collection that would be critical for better redistributive social programs. Nor would it lead to the transition to renewable energy sources necessarily, provided that the current administration's hallmark infrastructure project includes the construction of the Dos Bocas Oil Refinery while not promoting actively the shift to renewable energy sources.

Hopefully, the present and next government does everything in its power to pave the road for creating the conditions so that the best-case scenario can unfold.

Based on the research and the current trends documented in the official documents and reports, it is unlikely that Mexico will achieve the objectives of UN Agenda 2030. Only with strategic and very ambitious policies could it be possible, for which there may not be enough political unity and will in the next six-year administration, even if the same ruling party remains in power. On the positive side the new industrial policy may increase economic growth and push for better quality education, greater investment in innovation, new technologies and more research in Mexico. If these policies are accompanied with favorable developments in terms of the rule of law and better conditions for investment from the private sector, the government could create a virtuous cycle for growth and progress. More adequate redistributive policies are important, however job creation that offer more dignified salaries is even more critical.

With respect to the structural problems of capitalism in Mexico as highlighted by several authors (Arkonada, 2019b; Calva, 2018, 2019, 2020b; Raphael, 2015; Ríos, 2021) and presented in Chapter 2, it is apparent that rules of game need to be changed radically

in Mexico in order to have a more leveled playing field for all actors in society; especially for SMEs in the world of big monopolistic firms, for the unbanked people, for marginalized groups, for the less educated and digitally left behind, and for everyone in the informal sector who lives in precarious situations and has a hard to time to rise in the social ladder into the middle class. For example, getting cheaper commercial loans under more favorable terms is critical for fostering small and medium-size businesses. Without fundamental social transformation it will be hard to meet the social SDGs of the 2030 Agenda.

Considering the underlying challenges of the current capitalist system as discussed in the literature review, Mexico is facing similar challenges of the increasingly digitalized and monetized economy, with some limitations as many people do not have access to digital services, for example, banks and internet services. Access to the internet may even reduce inequality in education as well.

CHAPTER 6. CONCLUSIONS

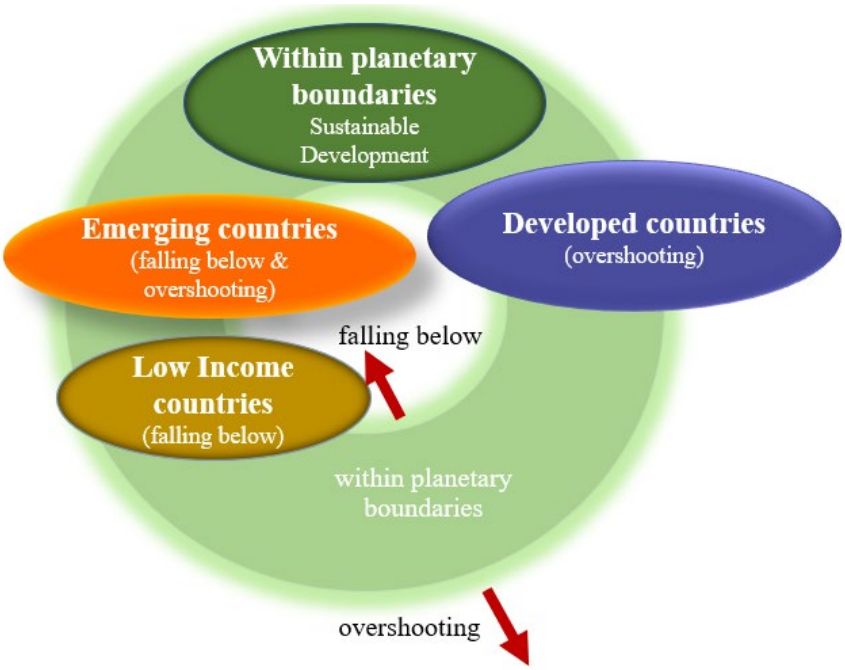
This investigation started with the main research question whether Mexico is on a sustainable development path which could pave the road to the fulfillment of the objectives of the UN Agenda 2030. Other subsequent questions were the revision of relevant literature and theory regarding sustainable development. Considering the initial material and the latest available data on the status of sustainability that was revised, it was unclear whether the country could meet the objectives of UN Agenda 2030. To assess how the future might unfold by the target date first available and relevant literature was reviewed, including several documents on Mexico's national planning strategies and results, considering the economic crisis of 2020-2021. Next, a specific field research was conducted in which experts were consulted about the topic. The in-depth interviews allowed to identify key variables of uncertainties in terms of sustainable development in Mexico by 2030. Then these variables were further studied and ranked using cross-impact analysis. This analysis then led to the scenario development of four potential futures for Mexico. To assess each scenario, validation was carried out with the observations of the expert panel. For further assessment of the current status and potential trends for the upcoming years recent news articles were used. To this end the assessments of national and international organizations were revised, such as from the Bank of Mexico, IMCO, EIU, IMF, and World Bank, providing useful insights and data that confirms several of the research findings. The results of the research suggest that the most likely scenario is unlikely to lead to meeting the objectives of the UN Agenda 2030, only partial fulfilment can be expected. This observation derives from the content analysis of the interviews with the expert panel. Recent developments and official reports that were available until late

2022 point towards scenarios 2, 4 or in the worst case, towards scenario 3, U-turn and Lost Decade. If the latter scenario were to unfold, it would not be allusion to Lost Decade of the 1980s which was characterized by large external debt of several Latin American countries, including Mexico. Rather, it would describe a decade which offered hope and opportunity for changing the development course of the country but did not happen. This certainly would be the least desirable scenario for Mexico.

Further implications

The implication of the findings of the current investigation is that if the DEM framework can be used for analyzing the different scenarios of Mexico's possible future development, then this model could be used for other countries as well, depending on their characteristics and level of development. Using the categorization of the World Bank according to the income levels of each country, the four groups of countries – high income, upper middle, lower middle, and low income – countries, it is possible to place them within this visual model, applying the same logic for their potential development. The image below in Figure 6.1 intends to illustrate how countries at different levels of development according to their income level might fare within this model.

Figure 6.1. Potential unfolding of Doughnut Economic Model in countries at different level of development by 2030



Source: Author's own work using the framework of Raworth (2017).

This simplified illustration is based on current trends that derive from studies and tracking reports such as UN Dashboard or the Climate Action Tracking site. The abstraction indicates that high income countries – in the blue ellipse - are likely to still overshoot the climate-related SDGs in 2030 while the social foundations of a dignified human life will be mostly covered, reaching the minimum level established by the indicators. As of 2022, there is not enough commitment from large and developed countries to limit GHG emissions. Low-income countries, on the country, are likely to still fall short of social foundations and potentially these countries may not exceed on the climate-related indicators. Emerging countries, including large countries such as China, Mexico, Brazil, Indonesia, on the other hand, are still likely to have challenges on both fronts: still not being able to provide the minimum social foundations for all of its citizens

and reduce inequality significantly while overshooting on the climate targets, due to deforestation, overfishing, insufficient land care and natural resource management. Most likely, only a handful of counties are likely to meet the UN Agenda by the target year. By late 2022, the countries that rank highest on the SDG dashboard include Finland, Denmark, Sweden, Slovenia, all EU countries. Considering the spillover effect of unsustainable consumption to other countries, however, there are still considerable areas for improvement even for these mentioned countries. Clearly, this is a preliminary estimation without solid evidence and lacks details and special considerations for big countries such as India and China. However, it might provide new insights and further areas for investigation.

Limitations of the Research

The limitation of the present research lies in the selection of documents as not all available documents could be reviewed due to time limitation. Furthermore, as the expert panel was selected based on access to people and their availability, the sample would be different at each subsequent selection. Subgroups from the full sample of thirty participants could also have been selected for validation of the scenario results.

Further Areas of Research

Further research could include more and different documents, offering even broader insights. Also, a subsequent surveying could provide data for quantitative analysis. A lineal polynomial regression analysis of the time series data available from SolAbility's

Global Sustainable Competitive Index could shed light on which of the five subcomponents of the aggregate index explains better the outcome over time. Different subgroups of countries, such as regional peers or countries with similar characteristics could be compared if there is any pattern or model that could explain the outcome of sustainable competitiveness. Another quantitative method, such as principal component analysis may offer a different insight compared to regression analysis.

The conclusion of the present dissertation is that strong political will and the implementation of ambition public policies are required if Mexico wants to achieve the best-case scenario, sustainable development, by 2030 and thus meeting the UN Agenda as a consequence. Maybe the metrics of the UN Agenda 2030 are not the best suited for all countries with different set of characteristics and priorities. Development is an uneven and non-lineal process with incremental advances and occasional regressions often alternatingly. Additionally, a country is never really "done", not even the richest and most sustainable countries. Challenges always remain for the next generation, however, it's the population's responsibility to elect leaders who are committed to the progress of a country and then incumbent political leadership's task to execute to their best capacity given the circumstances.

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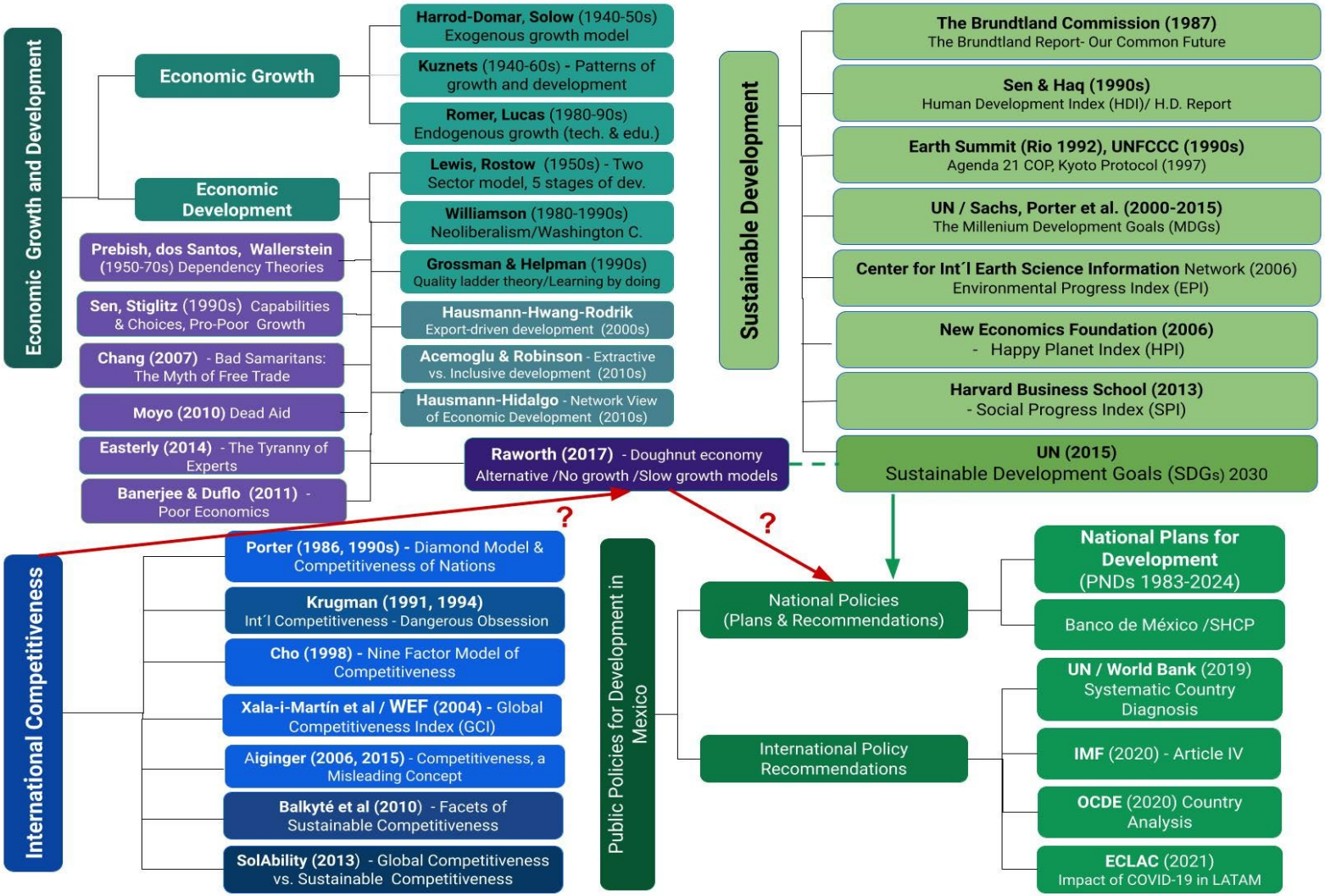
APPENDIX
ANNEX A. Literature Review



ANNEX B. Research Instrument – Semi-structured Interview Guide

Instrumento de investigación cualitativa - Entrevista semiestructurada

Políticas y escenarios para el desarrollo sostenible de Mexico hacia el 2030

Entrevista# ___
Entrevistada/o: _____
Organización & puesto: _____
Realizada por: Krisztina Lengyel
Fecha: _____
Formato: _____ (entrevista en vivo /vía zoom)
(presentarme & pedir permiso para la grabación y toma de notas)

Introducción breve

Esta entrevista tiene como objetivo explorar escenarios futuros del desarrollo económico de México, con el fin de diseñar políticas públicas que conduzcan al desarrollo sostenible para el 2030.
Se toma como base la definición de la Comisión Brundtland (1987) que dice "aquel desarrollo que satisface las necesidades de la presente generación sin disminuir la capacidad de las siguientes generaciones de satisfacer las suyas".

Las políticas para el desarrollo sostenible tienen como objetivo garantizar la coherencia entre las políticas industrial, social, medioambiental, climática y energética para crear un entorno inclusivo y empresarial óptimo para el crecimiento sostenible, la creación de empleo y la innovación.

La presente investigación es parte de un proyecto de tesis doctoral en economía en la Universidad Autónoma de Querétaro. Usted fue seleccionado para participar debido a su experiencia y conocimiento sobre el tema. Si está de acuerdo, pido su permiso para grabar la conversación para el análisis posterior. Le agradezco de antemano tu cooperación.

Q1. ¿Cuál es el área o sector en el que tiene mayor experiencia profesional?

Q2. ¿Qué conocimiento tiene sobre las políticas públicas relacionadas al desarrollo económico de Mexico?

Q3. ¿Cómo ve la aportación del sector privado para el desarrollo económico del país?

Q4. ¿Qué política industrial considera más propicia para un desarrollo económico más rápido?

Q5. ¿El T-MEX que apenas entró en vigor en julio pasado ha ayudado al sector privado y para fomentar la competitividad del país?

Q6. Considerando el desarrollo de las regiones en Mexico, ¿cómo ve las políticas el desarrollo regional del gobierno federal actual?

Q7. Hablemos ahora de los aspectos sociales de desarrollo de Mexico. ¿Qué opina sobre la desigualdad en Mexico, cómo se podría bajar de su punto de vista?

Q8. Le comento que existen diferentes soluciones en el mundo para la redistribución de la riqueza: por ejemplo, en Suecia los profesionistas ganan mucho más dinero que los obreros, sin embargo, después de los impuestos – que tienen tasas bastante altas, cerca de 50% - logran reducir la brecha entre los dos grupos de la sociedad; en Japón, en cambio, no hay una diferencia muy alta entre los salarios antes de impuestos, por lo que las tasas de impuestos son más bajas. ¿Usted opinas de esto?

Q9. Cómo podríamos construir un sistema económico mejor y más justa en Mexico, ¿qué se requiere de tu punto de vista?

Q10. ¿Qué opina de las políticas ambientales del gobierno actual, las consideras adecuadas y benéficas para un desarrollo sostenible?

Q11. ¿El gobierno federal qué otras políticas podrían considerar, viendo las experiencias de los países emergentes, por ejemplo, Corea del Sur?

Q12. Considerando las políticas económicas, ¿cómo ve la política fiscal actual, la austeridad, es benéfica para el país?

(OPCIONAL: Q13. Ahora considerando la política monetaria, ¿qué expectativas tiene en los próximos años, tendremos una presión inflacionaria o deflacionaria en Mexico?)

(OPCIONAL: Q14. Hablando de nuestro estado, ¿cómo ve las políticas públicas para el desarrollo sostenible en el estado de Querétaro?)

Q15. Cómo ve, ¿cuáles serían los principales factores de incertidumbre en los próximos 10 años? Por favor piensa en dos factores:

Q16. ¿Cuál sería su mejor es escenario para Mexico para 2030, en términos de desarrollo sostenible?

Q17. ¿Cuál sería su peor es escenario para Mexico para 2030, en términos de desarrollo sostenible?

Q18. ¿Tiene otros comentarios?

KL: Muchas gracias por su tiempo y ayuda con esta entrevista, su aporte en muy importante para la investigación.

ANNEX C. Expert Panel

a) Nationality of Experts

NATIONALITY	Count	% of Total
American	2	7%
Colombian	2	7%
Mexican	21	70%
Mexican/ American	4	13%
Argentine /Mexican	1	3%
Grand Total	**30**	**100%**

b) Residence of Experts

Country of Residence	Count	% of Total
Chile/MX	1	3%
COL/MX	1	3%
MX	24	80%
MX/US	1	3%
US	3	10%
Grand Total	**30**	**100%**

c) Gender Distribution of Experts

GENDER	Count	% of Total
female	12	40%
male	18	60%
Grand Total	**30**	**100%**

d) Highest Education of Experts

EDUCATION	Count	%
Bachelors	9	30%
Masters	8	27%
Masters/PhD c.	3	10%
PhD	10	33%
Grand Total	**30**	**100%**

e) Field of Expertise

ACCORDING TO EXPERTISE	Count	%
Economics /development	6	20%
Economics/ Finance	3	10%
Legal	3	10%
Accounting	3	10%
Int. Rel.	3	10%
Pol. Science	2	7%
Environmental	1	3%
Public Affairs	1	3%
History	1	3%
NGOs	1	3%
Business	1	3%
Prospective	1	3%
Journalism	1	3%
Engineering	1	3%
Energy	1	3%
Library/research	1	3%
Grand Total	**30**	**100%**

f) Distribution According to Key Sectors

ACCORDING TO KEY SECTOR	Count	Count	% of Sector
academic	5		
academic/private	1		
academic/public	***9***	***15***	***50%***
private	7		
private/legal	1		
private /media	***1***	***9***	***30%***
public	***6***	***6***	***20%***
Grand Total	**30**	30	100%

ANNEX D. Code Book with 80 open codes and explanatory comments

	Code	Comment
1	ASSESS: Perception: Negative	Actitudes o percepciones negativas de algún acto o política.
2	ASSESS: Perception: Positive	Actitudes o percepciones positivas de algún acto o política.
3	ASSESS: Trust /Distrust	Confianza hacia el gobierno actual, confianza hacia el futuro, que las políticas actuales serán propicias para un desarrollo sostenible.
4	ECON: Austerity (Q12)	Política fiscal que se enfoca a la austeridad, principalmente en el control/reducción del gasto público.
5	ECON: Automotive Industry	
6	ECON: Budget (federal/state/mun.)	Se refiere al presupuesto gubernamental (puede ser nivel federal, estatal o local/municipal).
7	ECON: Business environment	Comportamiento y entorno empresarial en Mexico.
8	ECON: Competitiveness /Productivity	Competitividad a nivel nacional (macro), sectorial (meso) y empresarial (micro).
9	ECON: Consumers/Consumerism	
10	ECON: Economic crisis 2020	La crisis económica de 2020 (la caída de la oferta, demanda agregada, aumento de desempleo, perturbaciones en la cadena de valor, disminución en las exportaciones, inversión y consumo, entre otras).
11	ECON: Economic development (Q2)	
12	ECON: Economic growth	Economic growth that is expected, hoped for to provide wellbeing to Mexican society, presently and for future generations.
13	ECON: Economic System (Q9)	Se refiere al sistema económico en nivel macroeconómico en general, sea capitalista, socialista o comunista.
14	ECON: Energy	Fuentes de energía (renovable o no renovable) y la gestión energética del país.
15	ECON: FDI	Inversión extranjera directa en Mexico.
16	ECON: Financial Markets (money flows/remittances)	Se refiere a los flujos de dinero (que Mexico recibe o lo que sale del país), incluyendo las remesas.
17	ECON: Fiscal Policy / Gov't Spending (Q12)	Se refiere al manejo de presupuesto federal (ingresos y egresos de la nación), pol. relacionados al gasto público, recaudación de impuestos, la pol. de austeridad, la deuda soberana y temas relacionados.
18	ECON: Foreign Trade	
19	ECON: Incentives/ gov't help (direct)	Apoyos e incentivos de gobierno hacia las diferentes áreas del sector privado (por ej. automotriz) con políticas favorables y con subsidios (por ej. sector agropecuario).
20	ECON: Industrial policy (Q4)	Política Industrial incluye políticas específicas para el desarrollo de algún sector industrial, de algún programa específico, por ejemplo, ZEE (Zonas Económicas Especiales) y programas federales como PROMEXICO/INADEM (de gob. anteriores).
21	ECON: Informal economy	Se refiere a la economía informal que no está fiscalizada ni regulada en Mexico.
22	ECON: Infrastructure	
23	ECON: Investment	Investment of all kinds and origin: it can be private, public, national and foreign.Inversión de todo tipo e origen: puede ser privada, pública, nacional e extranjera.
24	ECON: Labor Market/ Employment	
25	ECON: Market structure / regulation /monopolies	Se refiere a la estructura de mercado, por ej. monopolístico, y la regulación del mercado y los sindicatos de algún sector.
26	ECON: Monetary Policy (Q13)	Pol. monetaria incluyendo pol. inflacionaria, cambiaria, de tasa objetivo, de reservas.

27	ECON: PEMEX / CFE	Referencias a las empresas PEMEX y CFE.
28	ECON: Private/Business Sector (Q3)/ SMEs	Se refiere al sector privado, incluso varios sectores industriales, como el sector de automotriz, aeroespacial, agropecuario, etc. y el comportamiento de estos sectores. También se incluye las referencias a los PYMES y las actitudes hacia este sector de parte de gobierno. Relacionada Q3, Q4, Q5.
29	ECON: Real Estate Market	
30	ECON: Regional development (Q6)	Se refiere a las políticas específicas dirigidas a ciertas regiones con el fin de apoyar el crecimiento de esta zona.
31	ECON: Self-sufficiency /Sovereignty	autosuficiencia en energía renovable
32	ECON: Strength / Comparative Advantages	Se refiere a las fortalezas del país que pueden ofrecer ciertas ventajas competitivas.
33	ECON: Taxes/ Tax collection	Se refiere a los impuestos cobrados (ISR, IEPS, IVA) y la recaudación total, como ingreso presupuestal.
34	ECON: Technology & Innovation (R&D)	Se incluye todo lo que se refiere a la tecnología, la innovación, adopción de nuevos procesos y herramientas de TIC.
35	ECON: Tourism & Tourism industry	
36	ENV: Environment (Q10)	Medioambiente - todos los temas relacionados: cuidado del agua, de la biodiversidad, contaminación, manejo forestal & marítimo, etc.)
37	ENV: Natural Resources	Natural resources - refers to the wealth or lack of some strategic resource (water, oil, minerals, trees, etc.) and the management of these resources.Recursos naturales - se refiere la riqueza o falta de algún recurso estratégico (agua, petróleo, minerales, árboles, etc.) y la gestión de estos recursos.
38	ENV: SDGs / UN Agenda 2030	
39	ENV: Sustainability (Q10)	Se toma como base la definición de la Comisión Brundtland (1987) que dice “aquel desarrollo que satisface las necesidades de la presente generación sin disminuir la capacidad de las siguientes generaciones de satisfacer las suyas”.
40	EXP: Anecdote / Example	Referencia anecdótica o ejemplo que ilustra algo.
41	EXP: Example of other countries (Q11)	Se refiere a los ejemplos de otros países mencionados por los entrevistados; pueden ser positivos o negativos.
42	EXP: Expertise (Q1)	El expertise se refiere a la experiencia laboral y el conocimiento principal de cada entrevistado.
43	INT: International environment	Justicia social en materia económica y legal.
44	INT: Organizations & cooperation (nat’l & int’l.)	Cualquier tipo, primordialmente económicas: FMI, BM, OCDE, OMC, BID, ONU, CEPAL, etc. y la cooperación con estas organizaciones o con otros países.
45	INT: USMCA /NAFTA/ International Treaties (Q5)	Todo relacionado al Tratado de Libre Comercio entre Mexico-EE. UU.-Canadá (T-MEX) o TLCAN como antecesor. Otros tratados internacionales también están incluidos en este código (por ej. en materia ambiental, no solo en materia comercial).
46	LEGAL: Legal environment/ Rule of Law	El entorno legal, se refiere a la formulación y la aplicación de las leyes, la transparencia y la rendición de cuentas.
47	POL: Corruption/Clientelism	Mal manejo de fondos públicos, clientelismo.
48	POL: Democracy	Entorno democrático, libertad de expresión, se respetan los procesos democráticos, por ej. elecciones.
49	POL: Gov’t Planning / National Development Plan (PND)	Se refiere a la planeación central gubernamental, incluyendo al Plan Nacional de Desarrollo (PND) que es presentado por cada gobierno al iniciar su sexenio.
50	POL: Government /federal level	Government/Federal level refers to the decision-making process, decisions and results executed by the Mexican federal government entities.

51	POL: Government/state-local level	Government/State-local level refers to the decision-making process, decisions and results executed by the state and local levels of government entities.
52	POL: Institutions / Institutional Environment	Institutions and Institutional environment refer to the legal aspects such as transparency, accountability and the rule of law that are provided by Mexican local institutions to society. As state and municipal level and institutions are creation of political entities, they do reflect on the political aspirations and policy making of the ruling political power of each entity.
53	POL: Political Environment & Parties	Political parties, their actions and Mexican political life. /Partidos políticos, sus acciones y la vida política mexicana.
54	POL: Public Policy (Q2)	Todas las políticas públicas: político, jurídico, ambiental, económico, demográfico, etc.), primordialmente a nivel federal, pero puede ser nivel estatal o municipal.
55	POL: Public Private Partnership (PPP)	Se refiere a la alianza entre el sector público y privado; puede ser a nivel federal, estatal o local.
56	POL: States /Querétaro /Mexico City	Temas como políticas, eventos, desarrollos relacionados al estado de Querétaro, o otro estado federativo.
57	RISK: Uncertainty #1 (Q15)	Incertidumbre clave #1 (seleccionada por los expertos) de cualquier tipo (político, legal, económico, social, ambiental, tecnológico, seguridad, etc.) and cualquier nivel: federal, estatal, local, personal.
58	RISK: Uncertainty #2 (Q15)	Incertidumbre clave #2 (seleccionada por los expertos) de cualquier tipo (político, legal, económico, social, ambiental, tecnológico, seguridad, etc.) and cualquier nivel: federal, estatal, local, personal.
59	RISK: Uncertainty / Risk	Incertidumbre de cualquier tipo (político, legal, económico, social, ambiental, tecnológico, seguridad, etc.) and cualquier nivel: federal, estatal, local, personal.
60	SOC: Characteristics of Mexicans	Características socioculturales, idiosincrasias, descripciones de comportamiento y actitudes.
61	SOC: COVID-19/ Pandemic	Se refiere a la pandemia y la enfermedad de COVID-19.
62	SOC: Education & Human Capital	Educación en Mexico: se refiere a la disponibilidad y la calidad de la educación pública principalmente; no excluyendo la educación privada. También incluye el Capital humano y la capacitación técnica y vocacional.
63	SOC: Health/ Healthcare System	Se refiere al sistema de salud mexicano.
64	SOC: Indigenous Communities /Marginalized groups	Se refiere a las comunidades indígenas y/o marginalizadas en Mexico.
65	SOC: Inequality/poverty /social mobility (Q7)	Se refiere a la desigualdad social, medida por el nivel de ingreso usando el índice GINI y por la diferencia entre el decil con mayor ingreso y el decil con menor ingreso. Además, referencias sobre pobreza y movilidad social (intergeneracional) están incluidos.
66	SOC: Mexican Society & Civil engagement	Ciudadanía consciente, activa y participativa en los procesos políticos.
67	SOC: Migration	Migración - movimientos de mexicanos que salen de Mexico y Centroamericanos que están en tránsito en Mexico hacia a EEUU.
68	SOC: Opportunities	Se refiere a las oportunidades laborales y sociales que son cruciales para la movilidad social y la reducción de la pobreza y desigualdad.
69	SOC: Population & demographic changes	
70	SOC: Public Safety	Public Safety as society experiences and the information and data that are published about the status of public safety (homicides, assaults, crime rate, etc.) by the government.
71	SOC: Social Programs & Policies	Programas sociales: asistencialismo (a grupos sociales específicos) o programas estructurales a largo plazo.

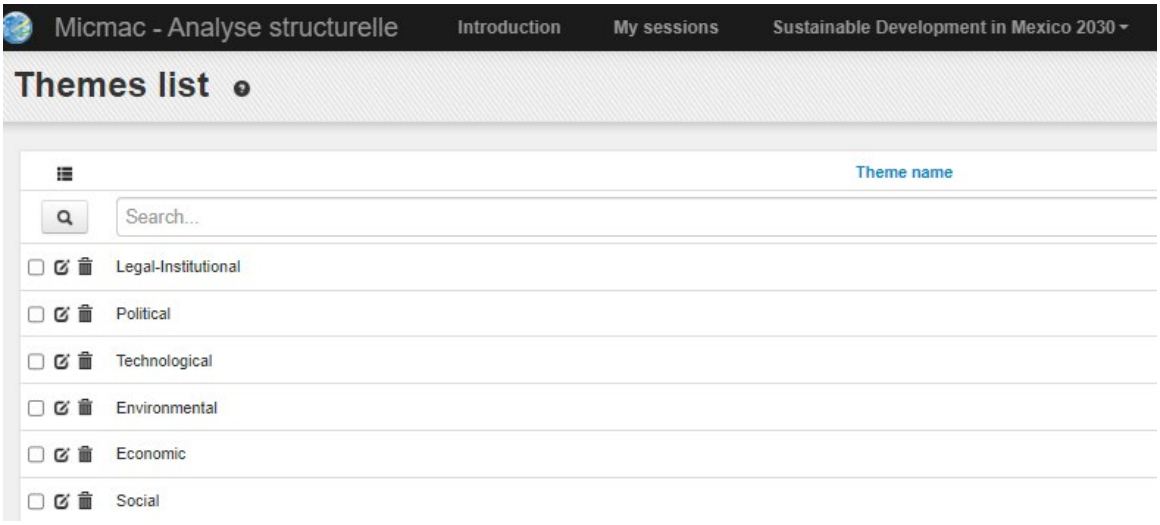
72	SOC: Social Tension & Polarization	Social issues that express or refer to social tensions in Mexican society (discontent, frustration) be it latent, perceived, or explicit, including violence or social confrontation. Temas sociales que expresan o refieren a las tensiones sociales en la sociedad mexicana (descontento, frustración) sea latente, percibida o explicita, incluyendo violencia o enfrentamiento social.
73	SOC: Social well-being / Social inclusiveness	
74	SOC: Transportation & Mobility	
75	SOC: Urbanism & Urban Planning	Desarrollo y planeación urbana, incluyendo el concepto de "smart/intelligent cities"
76	SOC: Wealth Redistribution (Q8)	Maneras de redistribución de riqueza en la sociedad, vía medios fiscales (impuestos) otras formas.
77	TIME: Future / Visions of the Future	Todos los comentarios que se refieren al futuro: expectativas y visiones.
78	TIME: Past	Todos los comentarios y observaciones sobre eventos, hechos, políticas o personajes importantes del pasado, típicamente de la vida pública e historia mexicana.
79	TIME: Scenarios (best) Q16	Escenarios en el futuro que pueden desenvolverse, algo que puede ocurrir. Puede ser imaginativo o realista. Escenarios del futuro, que en según la metodología de 3 escenarios pueden ser el mejor, el peor y de inercia. Se pide la descripción de las primeras dos tipos durante la entrevista (Q16-Q17).
80	TIME: Scenarios (worst) Q17	Escenarios en el futuro que pueden desenvolverse, algo que puede ocurrir. Puede ser imaginativo o realista.Escenarios del futuro, que en según la metodología de 3 escenarios pueden ser el mejor, el peor y de inercia. Se pide la descripción de las primeras dos tipos durante la entrevista (Q16-Q17).

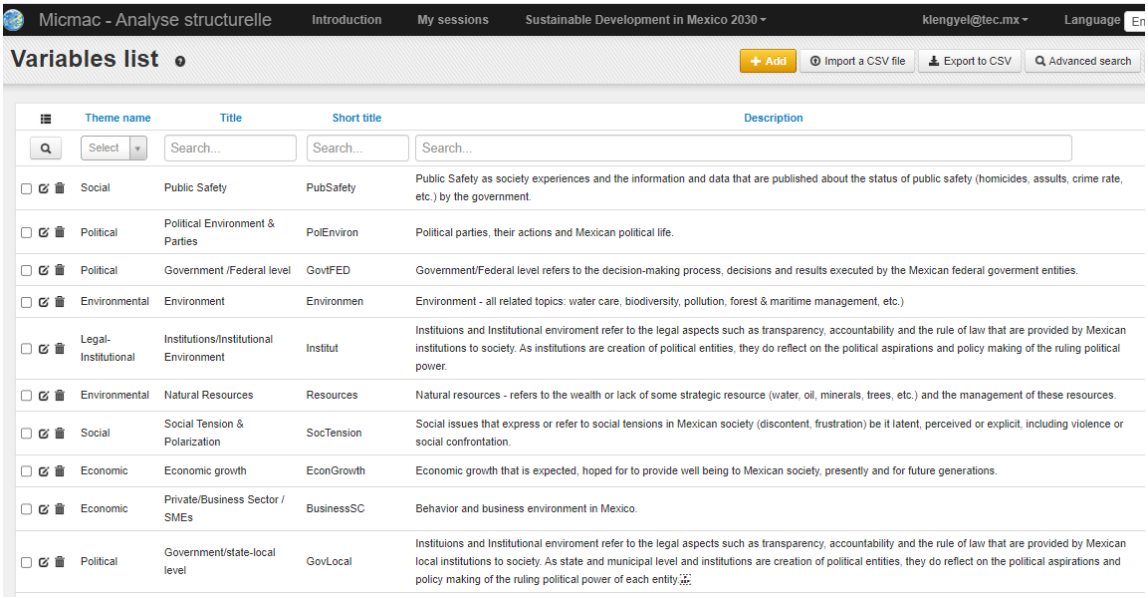
ANNEX E. Code groups in which the 80 open codes and explanatory comments

	Document Group	Comments (description)
1	PERCEPTIONS: ASSESSMENT	This dimension refers to the subjective assessment of the interviewee who may perceive an issue or event as positive or negative. This group includes 3 codes.
2	DIMENSION: ECONOMIC	The economic dimension covers all topics and codes related to economic issues (such as economic growth, economic system), economic policies (e.g., fiscal and monetary policies), the business environment, industry sectors, firms, market structures, the economic crisis of 2020, competitiveness, productivity, and international commerce. This category includes 39 codes.
3	DIMENSION: LEGAL	The legal dimension includes topics and codes that are related to the legal framework of the country, the rule of law, application of the law, the lack of proper law enforcement (e.g., impunity and corruption). This category includes 6 codes.
4	DIMENSION: SOCIAL	This dimension covers the aspects and codes related to social well-being, such as social cohesion, health care, education & human capital, civil engagement, health care services, public safety, opportunities, social programs, etc. This category includes 16 codes.
5	DIMENSION: ENVIRONMENTAL	The environmental dimension includes topics and codes that are related to the environment, climate change, sustainable management of natural resources and the connection to the UN 2030 Agenda. This category includes 5 codes.
6	DIMENSION: INTERNATIONAL	The international dimension includes topics and codes related to international relations of Mexico, diplomatic and commercial, including references to international organizations, treaties and trade agreements. It also includes references to the UN 2030 Agenda. This category includes 6 codes.
7	DIMENSION: POLITICAL	The political dimension includes topics and codes that are related to political issues, political parties, 3 levels of government (federal and state & local), institutions and public policies. Bureaucracy and corruption are also included in this category. This category includes 12 codes.
8	PERCEPTIONS: TIME	It refers to time references, past and future as well as the future scenarios (best and worst). This group includes 4 codes.
9	PERCEPTIONS: UNCERTAINTIES	Uncertainty refers to situations that generate concern for not having clarity how an issue will evolve in the future, yet it may have significant impact. The uncertainty can be structural, sectoral, it can be broken down with the PESTEL method.
10	PERCEPTIONS: EXPERIENCES	This dimension refers to experiences narrated by the participants, for example anecdotes and examples. This group includes 3 codes.

Source: Author's own work with the software Atlas.ti

ANNEX F. MICMAC – List of Themes and Variables

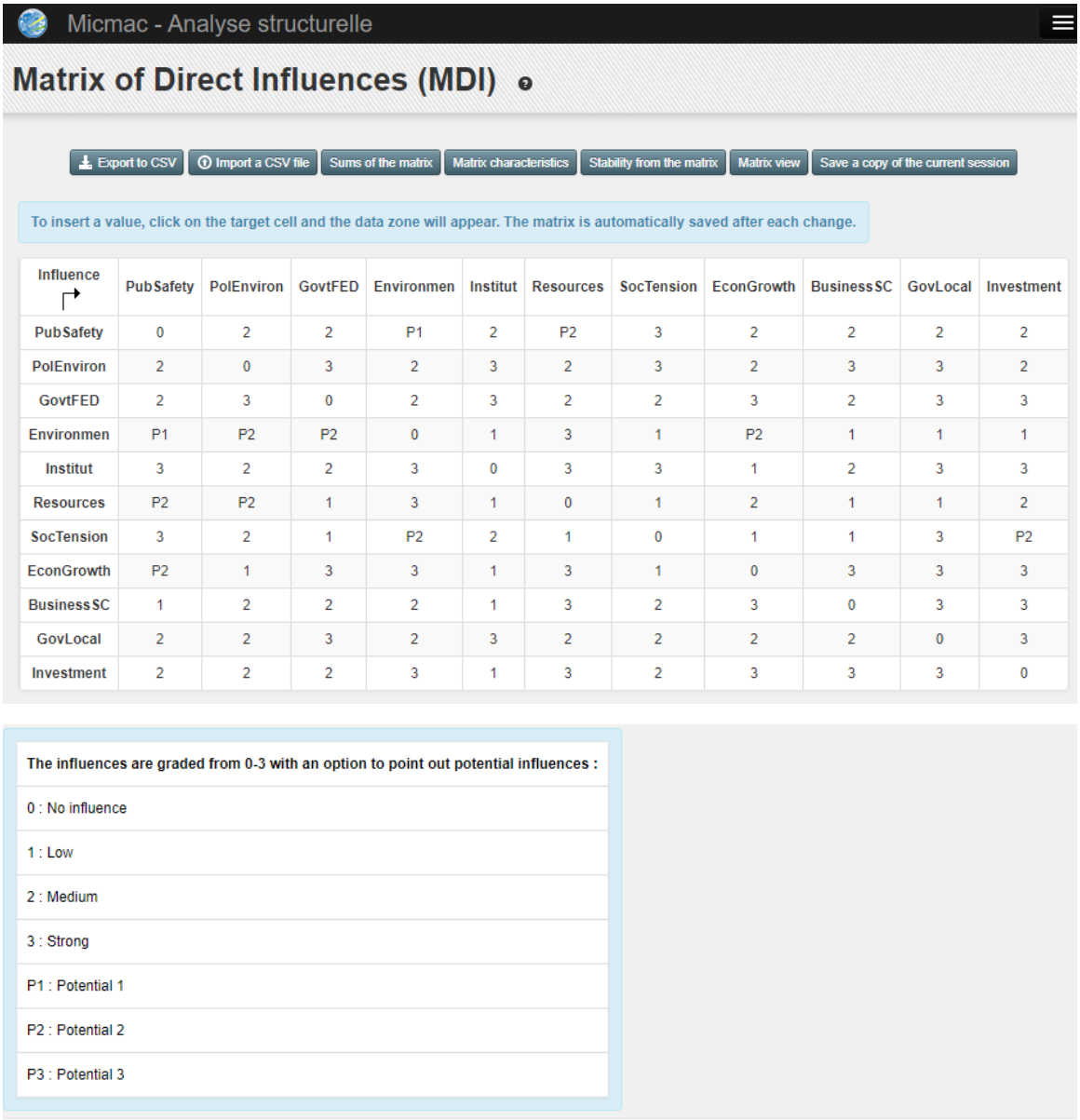




Theme name	Title	Short title	Description
Social	Public Safety	PubSafety	Public Safety as society experiences and the information and data that are published about the status of public safety (homicides, assults, crime rate, etc.) by the government.
Political	Political Environment & Parties	PolEnviron	Political parties, their actions and Mexican political life.
Political	Government /Federal level	GovtFED	Government/Federal level refers to the decision-making process, decisions and results executed by the Mexican federal goverment entities.
Environmental	Environment	Environmen	Environment - all related topics: water care, biodiversity, pollution, forest & maritime management, etc.)
Legal-Institutional	Institutions/Institutional Environment	Institut	Instituons and Institutional enviroment refer to the legal aspects such as transparency, accountability and the rule of law that are provided by Mexican institutions to society. As institutions are creation of political entities, they do reflect on the political aspirations and policy making of the ruling political power.
Environmental	Natural Resources	Resources	Natural resources - refers to the wealth or lack of some strategic resource (water, oil, minerals, trees, etc.) and the management of these resources.
Social	Social Tension & Polarization	SocTension	Social issues that express or refer to social tensions in Mexican society (discontent, frustration) be it latent, perceived or explicit, including violence or social confrontation.
Economic	Economic growth	EconGrowth	Economic growth that is expected, hoped for to provide well being to Mexican society, presently and for future generations.
Economic	Private/Business Sector / SMEs	BusinessSC	Behavior and business environment in Mexico.
Political	Government/state-local level	GovLocal	Instituons and Institutional enviroment refer to the legal aspects such as transparency, accountability and the rule of law that are provided by Mexican local institutions to society. As state and municipal level and institutions are creation of political entities, they do reflect on the political aspirations and policy making of the ruling political power of each entity.

Source: Author's own work with the software MICMAC

ANNEX G. MICMAC – Matrix of Direct Influences (MDI) -Value Table



Micmac - Analyse structurelle

Matrix of Direct Influences (MDI)

Export to CSV | Import a CSV file | Sums of the matrix | Matrix characteristics | Stability from the matrix | Matrix view | Save a copy of the current session

To insert a value, click on the target cell and the data zone will appear. The matrix is automatically saved after each change.

Influence	PubSafety	PolEnviron	GovtFED	Environmen	Institut	Resources	SocTension	EconGrowth	BusinessSC	GovLocal	Investment
PubSafety	0	2	2	P1	2	P2	3	2	2	2	2
PolEnviron	2	0	3	2	3	2	3	2	3	3	2
GovtFED	2	3	0	2	3	2	2	3	2	3	3
Environmen	P1	P2	P2	0	1	3	1	P2	1	1	1
Institut	3	2	2	3	0	3	3	1	2	3	3
Resources	P2	P2	1	3	1	0	1	2	1	1	2
SocTension	3	2	1	P2	2	1	0	1	1	3	P2
EconGrowth	P2	1	3	3	1	3	1	0	3	3	3
BusinessSC	1	2	2	2	1	3	2	3	0	3	3
GovLocal	2	2	3	2	3	2	2	2	2	0	3
Investment	2	2	2	3	1	3	2	3	3	3	0

The influences are graded from 0-3 with an option to point out potential influences :
0 : No influence
1 : Low
2 : Medium
3 : Strong
P1 : Potential 1
P2 : Potential 2
P3 : Potential 3

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Source: Author's own work with the software MICMAC

ANNEX H. Agenda of the Focus Group with Experts

Agenda del Conversatorio

Focus Group

organizado por Krisztina Lengyel, fecha 22/feb/2021

TEMA: VISIONES DEL FUTURO DE MÉXICO

Propósito

Conversar de temas seleccionados como seguimiento de la tercera fase en la investigación sobre los posibles escenarios futuros hacia el 2030, considerando el desarrollo sostenible en México.

Preguntas para discutir	Sugerencias
1. ¿Cuáles considerarían como **señales clave** que indican un cambio de rumbo?	1) La conversación es libre y se invita a todos que expresen su opinión. 2) Si hay personas en su entorno, favor de usar audífonos. 3) Favor de no interrumpir cuando alguien está hablando. Usar la función de *mute* cuando no están hablando.
2. ¿Cómo ven **la estrategia de vacunación** y **la recuperación de la crisis** por COVID-19?	
3. ¿Qué elementos de la **política económica (fiscal & monetaria)** ven necesarios para una recuperación más rápida?	
4. ¿Qué opinan de **los efectos de la política energética y de la nueva reforma?**	
5. ¿Qué **oportunidades** ven con la nueva administración en EEUU, con respecto a las **relaciones bilaterales entre México y EEUU**?	

Compromisos éticos

1) La participación es **anónima.**
2) Se pide **su permiso** para la videograbación del conversatorio para su transcripción posterior.
3) **No se divulga la información ni la grabación**, solo se usará los comentarios en el transcrito para el análisis posterior.
4) **Se compartirán los hallazgos** más importantes con los participantes en un reporte final.

¡Muchas gracias por su participación!

ANNEX I. Four Possible Scenarios for Sustainable Development Detailed

		Political- Institutional Environment	
		Unfavorable	**Favorable**
Economic Conditions	**Favorable**	**NON-DEMOCRATIC GROWTH** **Unfavorable political- institutional environment, but favorable economic conditions for growth.** *Governance:* Democratic processes are curtailed, society is more divided, with social tensions increasing. *Economic effects:* Investment levels may rise, especially public investment. Some confidence in future business ventures promotes new job creation, mostly monopolistic big firms prevail along with widespread informal economy for PYMES. Energy is still based on fossil fuels. *Environmental impacts:* Assuming the current leading party wins in 2024, little change expected in moving from fossil energy sources to more sustainable energy sources. Biodiversity loss, losing forests may continue contamination continues to rise. *Partial fulfilment* on UN Agenda (SDG 8, 9 met, SGD10,12,13, 16 not met).	**PROSPERITY AND SUSTAINABLE DEVELOPMENT** **Favorable political-institutional environment, coupled with favorable economic conditions for SD.** *Governance:* Democratic processes advance significantly, society is more supportive to the government, with social tensions decreasing. Less gap between poor & rich, gender differences decrease, creating a more inclusive and equitable society (meeting SDG 1,5,10,16,17). *Economic effects:* Increasing public and private investment raises confidence in business ventures due to democratic improvements. Informal economy is decreases. Energy is based less on fossil fuels and increasingly on alternative energy sources (SDG7, 8,9,11). *Environmental impacts:* Moving to sustainable energy sources lead to less contamination. Improved stewardship of biodiversity, forests, aquamarine life contribute (SDG 6,7,13,14,15). *It is possible to meet the UN Agenda 2030.*
	Unfavorable	**U-TURN AND LOST DECADE** **Unfavorable political- institutional environment, with unfavorable economic conditions for SD** *Governance:* Democratic processes are rolled back, society is more divided, with social tensions increasing. Insecurity and drug-related crime keep rising. Increased gap between poor and rich, social tensions, gender differences prevail. *Economic effects:* Low GDP growth, low investment, especially private. Informal economy expands, decent work opportunities are stagnating. Low confidence limits business ventures and energy is still based on fossil fuels. *Environmental impacts:* Little achieved towards weaning from fossil energy sources to more sustainable energy sources. Biodiversity loss, losing forests contamination continue to rise. *Incompletion* of the UN 2030 Agenda.	**DEMOCRATIC STAGNATION** **Favorable political- institutional environment, with unfavorable economic conditions for SD** *Governance:* Democratic processes advance significantly, society is more supportive to the government, with social tensions decreasing. More gap between poor & rich, gender differences still prevail, due to low economic development & job opportunities (SDG10). *Economic effects:* Low GDP growth, low investment, but increasing confidence in business ventures due to democratic improvements. Informal economy prevails. *Environmental impacts:* Little improvement from moving fossil energy sources to more sustainable energy sources. Biodiversity loss, losing forests have not been stopped, and contamination continues to rise. *Partial achievement* of the UN 2030 Agenda (e.g., SDG 5,16, 17 met, 1,7,8,9, 11, 12 not met).

Source: Author's work.

ANNEX J. Description of the five pillars of Global Sustainable Index

1. Natural Capital

Natural Capital Indicators	
Arable land (ha/capita)	Land at risk of desertification
Average rainfall (mm)	Land degradation (% of total)
Biodiversity Benefit Index (GEF)	Mineral reserves (per GNI and capita)
Cereal yield (kg per hectare)	Natural resource depletion (as percentage of GNI)
Electricity from hydropower (%)	Ocean Health Index
Endangered species	Population density
Energy self-sufficiency	Population living below 5m (% of total)
Extreme weather incidents	Potential arable land (ha/capita)
Fertilizer consumption/ha	Renewable freshwater availability/capita
Food Production Index	Tourist attractiveness
Forest area (% of total)	Land area below 5 m (% of total)
Fossil energy prevalence (% of total)	Climate extremes damages ($/1000 people)

2. Resource Intensity

Resource Intensity Indicators	
Air pollution - mean particle concentration	NOx emissions per capita
Air pollution exposure - population	NOx emissions per GDP
CO2 emissions / GDP	Renewable electricity excluding hydro (%)
CO2 emissions /capita	SO2 emission per GNI
Ecological consumption footprint	SO2 emissions per capita
Electricity consumption / GDP	Steel usage efficiency per capita (T/CAPITA)
Electricity consumption per capita	Transmission losses
Electricity from coal (%)	Waste per capita
Electricity from oil (%)	Waste per GDP
Energy per capita	Water productivity
Energy per GDP	Water usage per capita
Freshwater withdrawal rate	GHG emission per capita
Hazardous waste per GDP	GHG emissions per GNI

3. Social Capital

Social Capital Indicators	
Aging society	Overweight
Birth per woman	Peace Index
Child mortality (below age 5, death per 1000)	Press Freedom Index
Doctors per 1000 people	Prison population rate (per 100'000 people)
GINI coefficient (income distribution inequality)	Public health expenditure of total expenditure
Homicide rate (per 100'000 people)	Civic disease risk
Hospital bed availability	Suicide rate
Human rights index	Teen moms
Income quintile ratio	Top 10 % income share
Life expectancy	Women in parliament (% of MPs)
Life satisfaction index	Violent assaults/100000
Lower middle class income share (2nd 20%)	Women in management positions
Nurses per 1000 people	Health care efficiency index
Aging society	Drug use prevalence
Birth per woman	Freedom for and from religion
Obesity rate	

4. Intellectual Capital

Intellectual Capital Indicators	
Cost of business start-up	R&D spending
Education spending (% of GDP)	School dropouts secondary
High tech exports	Secondary education enrolment
New business registrations per 1 million people	Spending on education (% of state expenditure)
Patent applications (per GDP)	Spending per student (% of per capita GDP)
Patent applications per 1 million people	Tertiary education enrolment
Primary education completion	Trademark applications
Primary student repetitions	Pisa Test Results
Pupil gender ratio	Females with secondary education
Pupil-teacher ratio	R&D spending
R&D FTEs per million people	School dropouts secondary

5. Governance Performance

Governance Efficiency Indicators	
Access to electricity	Market fluctuation exposure: company value (% of GDP)
Austerity Index	Market fluctuation exposure: stock trading volume (% of GDP)
Bank capital-asset ratio	Military spending (% of total government spending)
Bribery payments - % of businesses	Mobile communication availability
Ease of doing business	Non-renewable resource income dependency
Employment in the manufacturing sector	Population (total)
Employment in the service sector	Poverty development
GNI (total)	Quality of public services
GNI per capita	Rail network per area & population
Government debt	TI CPI Index
Imports (% of GDP)	Unemployment
Internet availability	Debt service (% of government expenditure)
Investments	Democracy Index
Manufacturing value added	

Source: SolAbility Sustainable Intelligence, 2020.

ANNEX K. Validations of the Technological, Social and Environmental Dimensions

Validating the Technological Dimension

As technology and innovation are key drivers of economic growth, technological aspects of development are a critical issue. The experts also mentioned this topic with relation to competitiveness and productivity during the interviews. Table 5.12 summarizes the most relevant comments, literature, and recent reports on the subject.

Table 5.12. Validation for Topics related to Technological Issues

Topics	**Literature**	**# comments**	**Summary comments related**	**Trend observed (2022)**	**Based on reports as of 2022 (source/study, year)**	**Scenarios supported**
Technological progress / automation	Brynjolfsson & Collis (2019) Brynjolfsson et al (2018) IMCO (2021)	4	Automation: a huge challenge for the Mexican workers in manufacturing (replaced in the next 10 years)	stagnation	IMCO (2022), WEF (2021), Doing Business Index (2021) 60/190	2,3
Productivity, Innovation & Competitiveness	Haskel & Westlake (2019), Xala-i-Martín et al/WEF (2004) Aiginger (2015), Balkyté (2010), SolAbility (2013), IMCO (2021)	5	**Low productivity persists** in many sectors. **International competitiveness lags** other countries (e.g., Asia, China, Korea)	stagnation	Doing Business Index (2021), SolAbility (2022) IMCO (2022): Mexico 34/43 in 2019->37/43 in 2022m IMD:	3,4
Technology related to energy generation	UN Agenda 2030 (2015)	5	**Concern about the expansion of the oil industry**, PEMEX inefficiency, **rollback on solar** energy.	stagnation /U-turn - return to oil	Economist Intelligence Unit (2022), Mexico Evalúa (2022)	2,3

Source: Author's compilation based on interviews Anonymous (2020) and the documents cited in the table.

With respect to technology, the experts expressed their concern that Mexico was not ready for the coming automation in the manufacturing sector, that low productivity and low skill levels of Mexican workers in certain sectors might lead to unemployment if workers do not increase their skill levels as manufacturing firms increasingly rely on automated processes, robotics, machine learning. These gradual processes that the cited authors have described in other countries may unfold in the next decades, perhaps faster than expected. The lack of structural change and low productivity have been obstacles to international competitiveness as it is captured in international competitiveness rankings (IMCO, 2022a; SolAbility Sustainable Intelligence, 2021b; World Bank, 2020a) which have not shown significant improvement in the past three years.

As observed before, competitiveness data changes slowly, often over a decade, and the overlap with the pandemic-induced economic downturn certainly did not create a favorable environment for progress. It is also possible as Solow (1994) noted in the early 1990s, that productivity gains are visible to everyone except to the national statistics. Maybe the accounting of the growing intangible economy in Mexico, increased online activity and change in business models during the pandemic will bring greater productivity in the coming years as is suspected by some economists (Brynjolfsson et al., 2018). A strategic industrial policy may give a new push in this direction, resulting in greater competitiveness by the second half of the decade. The example of the medical industry mentioned by Gereffi et al. (2022) can be an inspiration for the interaction between the federal government and the private sector.

Another technology-related topic mentioned by several experts during the interviews was energy generation. The current administration's renewed investment in fossil fuel-based energy production was considered a disappointing policy direction.

Experts noted that the world is moving toward green energy generation, while the Mexican government is building and buying oil refineries and canceling energy projects using renewable resources. This policy direction contradicts the UN 2030 Agenda which clearly pushes for a shift away from fossil fuels towards renewable sources. Hence, in this aspect, scenarios 1 and 4 are not supported. This policy decreases the possibility of meeting SDG7, greener energy generation. More likely scenarios are 2 and 3 as inertia scenarios (The Economist Intelligence Unit, 2022).

Validating the Social Dimension

Table 5.13 summarizes the topics mentioned that are related to social issues. While Mexico has advanced, on assessments of social progress, it has not done so consistently or to the satisfaction of many of its citizens. As it was documented by authors such as Ríos (2021) and Loser et al. (2012) the country could and should attain better well-being but such structural problems as inequality, poverty, and a lack of opportunities persist. On the international comparative assessment of the Social Progress Index the country made gradual progress between 2015 and 2018 ranking on the 57th place in 2018, but between 2018 and 2021 the country has shown decline on several metrics, ranking on the Social Progress Index at the 66th place with an over score of 70 (El Observatorio Económico México Cómo Vamos A.C., 2020; Green et al., 2022). The areas where the country scored the highest include the basic needs, the foundations of well-being while lowest scores are mostly related to opportunities, such as inclusiveness, access to advanced education. Other weaker performing areas noted in this report are access to health and wellness and environmental quality for a large number of Mexicans.

Table 5.13. Validation for Topics related to Social Issues

Topics	**Literature**	**# comments**	**Summary comments related**	**Trend observed (2022)**	**Based on reports as of 2022 (source, year)**	**Scenarios supported**
Society: Social Polarization & Crisis, Migration	Ríos (2021), Arkonada (2019), Loser (2012)	6	Social polarization may rise and may lead to civil war and/or mass exodus of young people	no improve-ment	Social Progress Index (2022), Mexico Evalúa (2022)	2,3
Inequality /Poverty	Ríos (2021), Campos-Vázquez & Lustig (2017), Raphael (2015), World Bank (2018), Banerjee & Duflo (2012)	4	**Inequality may not decline, or even gets worse**, increasing people in poverty.	no improve-ment	*Acción Ciudadana Frente a la Pobreza* (2021), Delajara et al. (2021)	2,3
Social security, social inclusiveness /discrimination	Ríos (2021), ECLAC	7	No or **inadequate social security** for workers, especially for informal ones, many vulnerable groups	no improvement	Social Progress Index (2022), Mexico Evalúa (2022), Latinobarómetro (2021)	2,3
Violence / criminal groups / armed conflict	Valencia (2016); Latinobarometro (2019)	4	**Escalating violence**, potential for armed conflict between criminal groups, military	worsening trend	World Justice Project (2022), EIU (2022)	2,3
Insufficient education & opportunities	Ríos (2021), Calva (2019) Mexico Como Vamos (2020)	8	Insufficient /**inadequate education**, drop in educational level & skills	no/minor improvement	IMCO (2022), Social Progress Index (2022), Mexico Como Vamos (2020)	3

Source: Author's compilation based on interviews Anonymous (2020) and the documents cited in the table.

As is documented in official reports, the number of people whose income falls below the national poverty line was over 66 million (Acción Ciudadana Frente a la Pobreza, 2021). *Acción Ciudadana Frente a la Pobreza* (2021) recommended addressing pressing inequality and poverty in Mexico, by implementing a formula that includes dignified work, a public health care system and social security. This NGO argues that based on well-paid workers receiving proper social security should be the driving force

for economic growth instead of the existing export-oriented model that relies on low-paid laborers. This could result in a paradigm shift, in which competitiveness derives from better skilled and better paid workers who are more motivated to work, instead of the current low-productivity assembly-focused jobs that are based on the cheap wages and labor rights violations. Social security should include public health care services, a new system of national care services, and unemployment benefits that could be used in case of emergency. These or similar suggestions with respect to more adequate social safety net for workers appear in other articles and documents as well (Altamirano et al., 2020). They also mention another phenomenon: additional changes and shocks are likely to unfold in the labor market due to the implementation of AI and robotics in manufacturing and services sectors, affecting the low skilled workers more negatively than the highly skilled labor force (Agrawal et al., 2019; Korinek & Stiglitz, 2019).

Many other issues are related to social conditions that are not addressed here in more detail. Another important topic is the social polarization and growing divide, not only by income level but also from a political and regional perspective as well. If these social tensions are not attended adequately, they may pose a risk of political upheaval and set the stage for a social confrontation in an extreme situation. This potential wild card event was mentioned by a few experts and is also considered a high probability risk by the latest analysis of the Economist Intelligence Unit (2022). Social mobility, or the lack thereof, is another pressing issue in Mexico. A recent study by Delajara et al. (2022) demonstrates how it varies from region to region within Mexico, showing that there is a greater possibility for social mobility in the Northern richer states, while the situation is much more static between generations in the south of Mexico. The need for better quality education, another key driving force in development, was also often mentioned by several

experts and its insufficient level is well documented as well (Altamirano et al., 2020; International Monetary Fund, 2020; World Bank, 2020c).

Validating the Environmental Dimension

The following Table 5.14 includes the topics with the relevant literature, expert comments and latest assessments as well as news related to the environment.

Table 5.14. Validation for Topics related to Environmental Issues

Topics	**Literature**	**No. of comments**	**Summary comments related**	**Trend observed (2022)**	**Based on reports as of 2022** (source, year)	**Scenarios supported**
Environmental contamination & control of GHG (CO2, etc.)	UN Agenda 2030 (2015)	4	**No clear commitment**, no federal policy, **no shift to greener energy**	worsening / no shift to renewables	UN SDG Dashboard (2020c), Climate Action Tracker (2022b)Green Future Index (MIT, 2020)	2,3
Extractive practices by state-owned enterprises and private sector actors	Acemoglu & Robinson (2012)	3	**National security issue the energy generation**, extraction should be controlled carefully.	no improvement	UN SDG Dashboard (2022), Climate Action Tracker (2022)	2,3
Water shortage /inadequate management	UN Agenda 2030 (2015)	5	**Concern about water shortages**, management, and distribution	worsening trend: severe drought in Mexico	UNAM (2022), IPCC (2022), Stockholm Resilience Centre (2022)	2,3
Deforestation, deteriorating biodiversity	UN Agenda 2030 (2015)	3	**Concern about land ca**re and biodiversity loss	worsening trend as deforestation continues	UNAM (2022), IPCC (2022), Stockholm Resilience Centre (2022)	2,3

Source: Author's compilation based on interviews Anonymous (2020) and the documents cited in the table.

With respect to environmental issues, Mexico faces several challenges. First, one of the concerns experts cited most frequently was that the current administration returned to fossil fuels as a main energy source by investing in, building, and purchasing new oil refineries (Dos Bocas in Mexico, Deer Park in Texas) and that it rolled back renewable energy projects. Although energy security and Mexico's energy independence are desirable, investment and development of renewable and alternative energy sources would be much preferred options to the oil-based and extractive development, according to experts. On one hand, the overall evaluation of the country's commitment to the UN Agenda is highly rated (see Annex I) on the Governments' Commitment and Efforts for the SDGs Score (70/100) versus SDG Index Score (74/100) in 2022 (Sachs et al., 2022), similar to countries such as Austria and the Netherlands. On the other hand, real policies, particularly those of climate related SGDs (13, 14, 15) are assessed as "highly insufficient" by the international think-tank Climate Action Tracker (The Climate Action Tracker, 2022a). For example, the country has not committed to a specific target date by which it aspires to achieve net zero in its emissions. The organization noted the lack of long-term targets and comprehensive policies.

Although in 2016 the Mexican Government submitted its National Determined Contribution to the Paris Agreement to contribute to reducing GHG emissions and hence keeping the rising global temperature below 1.5 Celsius compared to pre-industrial level, in 2020, the Administration revoked it and submitted a less ambitious commitment in which the climate targets were less transparent, eliminating the 2026 target year for peak emissions and applied a higher base line (The Climate Action Tracker, 2022c). A visual summary overview is included in Annex M. This situation coincides with the experts'

concerns with respect to the government's half-hearted commitment to acting on climate change.

The rollback on climate-related regulation and action is especially worrying given that the country has seen a difficult year in 2021 with a drought in many parts of Mexico, and at critical levels in Northern Mexico (UNAM DGTIC, 2022). The estimated economic impacts are significant. According to the Banco de Mexico (2022), as by May 2022 more than 10% of the country's municipalities and about 15.1% of the national population are affected by the extreme drought. When the situation is considered a state of emergency, water cuts are obligatory for the productive sector and for the population. Given the conditions, about 54% of the GDP may be affected by the water shortages nationwide in 2022 according to the estimates of the abovementioned report. Obviously, the agricultural sector is heavily impacted by drought, making food production more difficult and expensive. The rising food prices impact families with lower income especially hard. The experts interviewed in the research identified mid- and long-erm water shortages as one of the pivotal issues related to the environment.

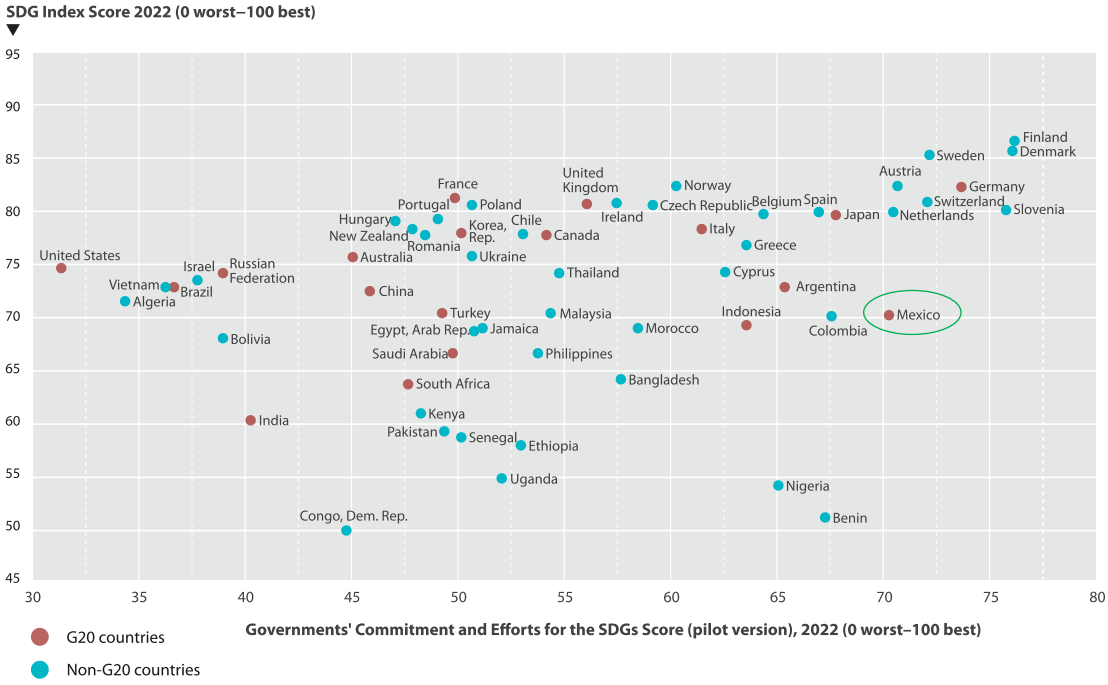
In 2022 persistently rising temperatures were also observed in Mexico, as the GHG emissions continue to rise (Cerezo-Mota & Martínez Arroyo, 2021; Harvey, 2021; Hicke et al., 2022; Intergovernmental Panel on Climate Change (IPCC), 2022).

To achieve the NDC, the *Iniciativa Climática de México*, an NGO, suggests that these targets could be viewed as opportunity for growth from four angles: from the point of view of sustainable development, climate justice, gender perspective and climate financing. This gives not only hope but clear ideas for action to mitigate the impacts of climate change. During the interviews, Experts expressed deep concern that t little has been done towards achieving net zero by 2050 and noted the rollback on investment and

incentives for renewable energy production instead of oil. Participants considered the current trend a U-turn back to the 1970s when Mexico's oil fortune were generating energy and income for the country. Participants did not consider this strategy adequate nor conducive to sustainable development fifty some years later when climatic, technological, and economic conditions are very different. Additional comments of concern referred to extractive economic development as a model that is not sustainable over the long term, echoing the observations of several authors (Acemoglu et al., 2017; Acemoglu & Robinson, 2012). Although it may bring growth in the short run, it is not sustainable in the long run.

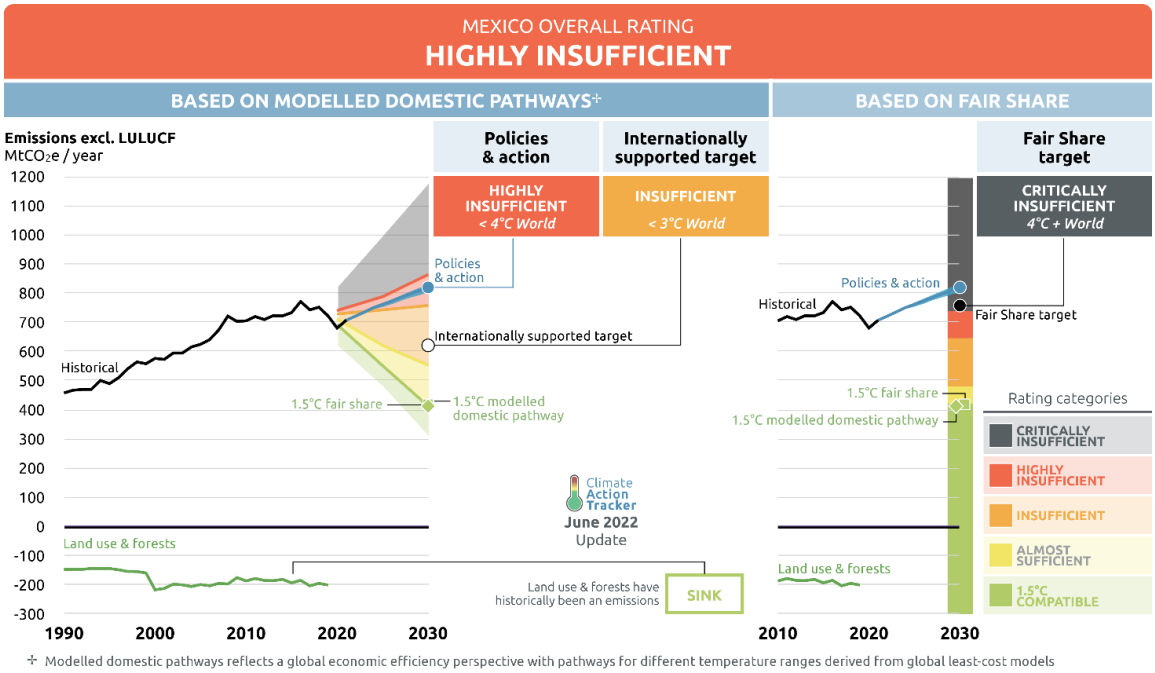
The COP27 Global Climate Summit in late November 2022 in Egypt resulted in a previously unseen breakthrough agreement in which wealthy countries committed to finance and assist vulnerable developing countries that are much more exposed to climate-related events such as rising sea levels, pollution and deforestation which are seen as climate injustice (UNFCCC, 2022). The agreement reaffirmed the global commitment to limit the global temperature rise to 1.5 degrees Celsius above pre-industrial levels. The "Loss and Damage" Fund financed by rich countries will aim at taking bolder and more concrete actions to cut GHG emissions and more adequately compensate countries suffering from the consequences of climate change. Difficult and ambitious, though, given that among the countries that made the least commitment at government level, such as the US (see Annex L), are among the greatest polluters. The US President Joe Biden made more commitments than his predecessors, however concrete actions and policies are yet to be seen. Mexico was also present and increased its commitment to reduce its GHG emissions (IMCO, 2022b).

ANNEX L. Governments' Commitment and Efforts for the SDGs Score (pilot version) versus SDG Index Score



Source: Sachs et al. (2022). Sustainable Development Report 2022. From Crisis to Sustainable Development: the SDGs as Roadmap to 2030 and Beyond, p. 49.

ANNEX M. The Climate Action Tracker – Mexico's Assessment, 2022



Source: The Climate Action Tracker, 2022a.