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The International Conference of the Institute of National Planning
GOVERNANCE AND SUSTAINABLE DEVELOPMENT

In Collaboration with:
School of International and Public Affairs, Columbia University

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GOVERNANCE AND SUSTAINABLE DEVELOPMENT

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TABLE OF CONTENTS

Preface

As a national think tank, the Institute of National Planning (INP) plays a pivotal role in supporting decision makers and policymakers through the preparation of research and policy papers that provide decision makers with scientific solutions and development alternatives; which contributes to the realization of Egypt's development goals in accordance with the Sustainable Development Strategy: Egypt Vision 2030. INP plays this role with an approach anchored in rooting sound scientific foundations when providing various development solutions and alternatives, supporting the exchange of experiences and insights, and drawing on national, regional, and international partnerships.

Each year, the Institute of National Planning (INP) selects the theme of its annual conference through serious studies and discussions, with the aim of making INP's annual conference a good tool for policymakers not only in Egypt, but also in the whole Arab world. In so doing, INP endeavors to cover one of the issues that are at the center of policymakers' attention, which usually constitutes a dilemma due to its complex and convoluted nature. This requires numerous research and studies to find scientific solutions to issues of public concern. Hence, almost a year ago, INP selected an important issue, namely governance and sustainable development. It was found that governance plays an essential role in achieving sustainable development and that, with accelerated changes and successive crises, we must rethink the relationship between governance and sustainable development in its economic, social, and environmental dimensions. We believe that rethinking this relationship starts not only from the theoretical foundations of the concepts of governance and sustainable development, but also from practical applications and international experiences. We decided that the INP's Annual Conference on Governance and Sustainable Development would be an international conference to make the most of it.

Not only that; we also believe that governance can play a key role in achieving sustainable development; we, hence, decided to delve deeper into defining this role and identifying its determinants. Therefore, we established the Economic Governance Unit to study and identify Egypt's complex economic and social problems through modelling and simulation, to develop system dynamics models and apply them within the national context to assist the Government in addressing development challenges and applying governance, to propose and evaluate policies to address Egypt's sustainable development and governance problems, and to offer different alternatives and scenarios.

In collaboration with the USAID-funded Economic Governance Activity (EGA) and the School of International and Public Affairs (SIPA) at Columbia University, we are here at INP's International Conference reviewing together an outstanding scientific production generated by a group of Egyptian and foreign researchers interested in the issue. The Conference discusses many issues, including the conceptual issues relevant to governance and sustainable development, corporate governance, the evaluation of IMF governance systems, the importance of multisectoral participation in health, the role of artificial intelligence in promoting sustainable development, ocean governance and climate change governance. I am confident that the outcome of this conference will serve as one of the main pillars relied on by decisionmakers in Egypt and the Arab Region.

Prof. Ashraf El Araby
President of INP and President of the Conference

Members of the Conference Team and Academic Committee

Team Members of the Institute of
National Planning's International Conference

GOVERNANCE AND SUSTAINABLE DEVELOPMENT

3-4 June 2023 ,Cairo

Prof. Ashraf El Araby
President of Institute of National Planning
President of the Conference

Prof. Hala Abou-Ali
Vice President of INP for Research & Post-Graduate Studies
Vice President of the Conference

Prof. Khaled Zakaria Amin
Head of Macroeconomic Policies Center, INP- Chairman of the Conference's Academic Committee

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Members of the Conference's Academic Committee

Prof. Nevien Kamal Hamed	Professor at Macroeconomic Policies Center, INP
Prof. Mohamed Magid Khashaba	Professor at Industrial Planning and Development Center, INP
Dr. Heba Saleh Moghieb	Head of Industrial Planning and Development Center, INP
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Dr. Sherine Boshra Ghaly	Assistant Professor at Macroeconomic Policies Center, INP
Mr. Mohammed Hassanien Abd El Rahman	Assistant Lecturer at Macroeconomic Policies Center, INP

Conference Agenda

Day 1 - Saturday: June 3, 2023	
9:30 - 10:00 AM	**Registration**
10:00 - 12:00 PM	**Opening Session**
10:00 - 10:30 AM	**Welcome Notes**
Prof. Khaled Zakaria Amin	Head of Macroeconomic Policies Center, INP / Chair of the Conference's Academic Committee
Prof. Lisa Anderson	Special Lecturer and James T. Shotwell Professor Emerita of International Relations, SIPA/Columbia; Former President of the American University in Cairo
Mr. Hermann Thiel	Chief of Party, USAID Economic Governance Activity
Prof. Ashraf El-Araby	President of INP / Former Minister of Planning, Monitoring, and Administrative Reform
Prof. Hala Helmy El-Said	Minister of Planning and Economic Development
10:00 - 12:00 PM	**Plenary Session:** **Role of Governance in Supporting Sustainable Development**
Moderator	**Prof. Khaled Zakaria Amin:** Head of Macroeconomic Policies Center, INP / Chair of the Conference's Academic Committee
Keynote Speaker	**Prof. Lisa Anderson:** Special Lecturer and James T. Shotwell Professor Emerita of International Relations, SIPA/Columbia; Former President of the American University in Cairo
Panelists	**Dr. Mohamed Salama:** Director of National Anti-corruption Academy, Administrative Control Authority **Dr. Salwa Tobbala :** Senior Governance Advisor at USAID **Prof. Sherifa Fouad Sherif:** Executive Director of the National Institute for Governance and Sustainable Development **Mr. Hosam Diaa El Din:** Senior Governance and Financial Management Specialist, World Bank, Egypt Office
12:00 - 12:15 PM	**Coffee Break**
12:15 - 2:15 PM	**Session 1:** Governance for Sustainable Development: Approaches and Methodological Issues
Chair	**Prof. Saleh El- Sheikh:** President of the Central Agency for Organization and Administration (CAOA)
Presenters	• Governance and Sustainable Development: A Bibliometric Analysis **Ms. Nahed Taha & Dr. Ahmed Okasha** • Opportunities and Challenges of Emerging Technologies Governance in Egypt to Support Sustainable Development **Prof. Mohamed Maged Khashaba; Dr. Moustafa EL Naqib; and Mr. Ayman Al-Dosoky** • Sustainable Development Determinants in Egypt: Does Governance Matter? **Dr. Bahy Yassin and Ms. Shimaa Mahgoub** • The Effect of Applying Public Governance Mechanisms on Achieving Sustainable Development Goals in Egypt- MENA Cross Countries Study **Dr. Menna-Allah Ghazi Burham**
Discussants	**Dr. Heba Mogheib:** Head of the Industrial Planning and Development Center, INP **Prof. Mathew Murray:** Professor, School of International and Public Affairs (SIPA), Columbia University
2:15 - 2:30 PM	**Coffee Break**
2:30 - 4:30 PM	**Session 2:** Role of Governance in Supporting the Economic Dimension of Sustainable Development
Chair	**Prof. Ahmed Kamaly:** Deputy Minister of Planning and Economic Development
Presenters	• External Debt and Economic Growth in MENA countries: Does Governance Matter? **Dr. Israa A. El-Husseiny; Ms. Noha Magdy; and Ms. Menna Sherif** • The Importance of Corporate Governance and its Related Factors for Implementation **Ms. Farah Attallah** • Governance and Sustainable Development in Developing Countries **Ms. Omnia Ossama El-Husseiny** • Assessing The IMF Governance System: A Proposal for Reform **Ms. Mayar Yahia Mansour**
Discussants	**Prof. Dong Guo:** Professor, School of International and Public Affairs (SIPA), Columbia University **Dr. Asmaa Ezzat:** Head of Governance Center, National Institute for Governance and Sustainable Development
4:30 - 5:30 PM	**Lunch**

Day 2 - Sunday: June 4, 2023	
9:00 - 9:30 AM	**Registration**
9:30 - 11:30 AM	**Session 1:** Role of Governance in Supporting the Social Dimension of Sustainable Development
Chair	**Dr. Nivine Kabbage:** Minister of Social Solidarity
Keynote Speaker	**Prof. Sherine Al- Shawarby:** Professor at Faculty of Economics and Political Science, Cairo University
Presenters	• Social Protection Programs: Governance and Effectiveness **Prof. Howaida Roman** Professor of Political Science at National Center for Social and Criminology Research • Cross-sector Partnerships and their Benefits in the Emerging Field of Telehealth **Prof. William Eimicke & Prof. Steven Cohen**
Discussants	**Dr. Hania Sholkamy** Associate Research Professor at Social Research Center, AUC
11:30 - 12:00 PM	**Coffee Break**
12:00 - 2:00 PM	**Session 2:** Role of Governance in Supporting the Environmental Dimension of Sustainable Development
Chair	**Dr. Laila Iskandar:** Former Minister of Environment/ Former Minister of Urban Renewal and Informal Settlements
Presenters	• Developing an Urban Sustainability Indicator System: A Participatory Approach **Prof. Dong Guo; Prof. Anyi Wang** • Exploring Role of GeoAI in Urban Governance Towards Supporting Sustainable Development **Eng. Eman Taha; Prof. Hassan El-gazouly; Dr Aly El Naggar; and Dr. Samy Ayyad** • Ocean Governance for Maritime Resource Sustainability **Dr. Khaled Addourr**
Discussants	**Prof. Abdul Aziz Ibrahim** Head of Analysis of Agricultural Policies Department at Agricultural Planning and Development Center, INP **Prof. Nafesa Abu Al Saud** Head of Environmental Planning Department at Environmental Planning and Development Center, INP
2:00 - 3:00 PM	**Lunch**
3:00 - 4:30 PM	**Policy Panel:** Environmental and Climate Change Governance
Moderator	**Prof. Hala Abou-Ali :** Vice President of INP for Research and Post-graduate Studies
Panelists	**Dr. Yasmine Fouad:** Minister of Environment **Prof. Mohamed Mohie El-Din:** Professor, Department of Economics – Cairo University; Special Envoy on Financing the 2030 Agenda for Sustainable Development- United Nations **Prof. Khaled Fahmy:** Former Minister of Environment / Head of Environmental Economics Department at Environmental Planning and Development Center, INP **Dr. Ali Abu Senna:** CEO of the Egyptian Environmental Affairs Agency **Mr. Mark Ahern:** Lead Economist, World Bank, Egypt **Eng. Yasser Sherif:** Environmental Affairs Expert & Managing Director of Environics
4:30 - 5:00 PM	**Closing Remarks**
Speaker	**Prof. Ashraf El Araby:** President of INP / Former Minister of Planning, Monitoring, and Administrative Reform

Concluding Remarks of the Conference

Prof. Ashraf El Araby, President of the Institute of National Planning (INP), concluded the activities of the International Conference of the INP, which lasted over two days. Prof. El Araby expressed his appreciation for the research papers that were presented and the discussion sessions held, which raised several points of great importance about the dynamics between governance and sustainable development, which can be formulated in the following concluding messages:

First: There are multiple levels and types of governance to include public governance, corporate governance, multi-level governance, economic governance, environmental governance, and others. Hence, it is of crucial importance to link these different types of governance in order to achieve comprehensive sustainable development.

Second: There is a positive impact of high levels of governance on achieving sustainable development goals. Therefore, Egypt's Vision 2030 devoted an entire pillar to discussing dimensions related to transparency and efficiency of institutions.

Third: There is no single "prescription" for reform to all countries. Realistically, variations exist among countries based on their context. Thus, adopting specific reforms or following the same international recommendations will not necessarily lead to achieving the desired results. Therefore, it is significant that the reforms set for each country be formulated in light of the existing economic, social and environmental circumstances, taking into account not overstating the peculiarity of each experience given that some reforms and models are similar in several countries.

Fourth: It is necessary to take into account "global disruptions," such as wars, geopolitical fluctuations, currency devaluation, financial disturbances, climate crisis, rapid developments in emerging technologies, and others. Hence, it is important to anticipate the future to keep pace with the uncertainty accompanying these changes. This can be achieved through assessment tools, provision of data and free access to information, in order to streamline decision-making process while achieving good governance. Also, the swiftness of decision-making depends on flexibility, inclusion, preparedness, responsiveness, responsibility, cooperation, and anticipating crises before they occur, which are all important elements for achieving good governance and combating corruption.

Fifth: It is important to streamline partnerships, especially with private sector and civil society, as the government cannot solely assume responsibility, but rather fostering cooperation and division of roles among all relevant stakeholders.

Sixth: It is necessary to take into account issues like; artificial intelligence, awareness raising, capacity building, and youth empowerment, as significant factors in achieving governance. There is also an urgent need to work on the digital transformation portfolio at the accelerating pace of developed countries. Given the gap in research and studies related to linking governance with digital transformation, the conference aspires to introduce this specific research agenda that universities and scientific institutions can adopt.

In addition, Prof. Ashraf El Araby stressed the need to believe in the concept of governance, and not to limit ourselves to only talking about it. Hence, it is important to work on the implementation of the mechanisms and strategies necessary to effectively achieve governance

in a way that supports sustainable and inclusive development.

Regarding the efforts of the INP, Prof. Ashraf El Araby stated that two policy papers were being prepared on: the Governance of Public Debt and the Sustainability of Government Debt in Egypt. This is in addition to the inclusion of governance in the INP's Quality Assurance Unit, to become the "Governance and Quality Assurance Unit". In addition, the "Economic Governance Unit" was established in partnership with the Economic Governance Activity (EGA) funded by the United States Agency for International Development (USAID). Furthermore, the Center of Data Analytics and Consultancy (CDAC) was established to maximize the benefits from data.

At another front, Prof. Ashraf El Araby indicated that the Arab Development Report – which is launched annually – is expected to be published in November 2023, shedding light on the pressing climate change challenges facing the Arab region.

In conclusion, Prof. Ashraf El Araby thanked the School of International and Public Affairs at Columbia University (SIPA/Columbia) for the active participation in the conference, praising the distinguished presence of experts and research papers presented, along with his aspiration to strengthen such partnership in the future. Prof. Ashraf El Araby also thanked experts of the World Bank and the USAID, particularly from the EGA. He also thanked Prof. Hala Abu Ali, Vice President of the INP for Research and Post-Graduate Studies and Vice President of the Conference; Prof. Khaled Zakaria Amin, Head of Macroeconomic Policies Center at INP and Chairman of the Conference's Academic Committee; and the distinguished members of the Conference's Academic Committee including: Prof. Nevien Kamal, Prof. Mohamed Magid Khashaba, Dr. Heba Moghieb, Dr. Heba El Baz, Dr. Israa Adel El Husseiny, Dr. Ali El Bagalaty, Dr. Dalia Ibrahim, Dr. Fatma El Hamalawy, Dr. Asma Meliegy, Dr. Sherine Boshra, and Mr. Mohammed Hassanien. His Excellency Prof. Ashraf El Araby also thanked Dr. Shaima Azab and expressed his sincere thanks and appreciation to the chairs of the conference sessions, presenters of research papers, speakers, discussants, all attendees, and thus announced the conclusion of the INP's International Conference.

RESEARCH PAPERS IN ENGLISH

Governance and Sustainable Development: A Bibliometric Analysis

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Abstract

The recent significant increase in academic and research literature regarding the role of good governance in sustainable development is the primary motivation for conducting this study. This study aims to conduct a bibliometric analysis of 8,193 documents published during the last 30 years. The results have been demonstrated via graphs, tables, and knowledge maps about the past trends, growth, and prospects. This study has identified prolific authors, journals, countries, academic and research institutions, and future pathways. The results indicate that China has the highest share of publications, followed by the United Kingdom and the United States. The most productive institutions are the University of London, followed by Wageningen University & Research and Utrecht University. This study proposes new avenues for further research concerning the governance and sustainable development nexus, such as rural revitalization, smart agriculture, environmental quality, green economy and growth, green finance, and green innovation. Besides, future research could focus more on big data-driven intelligence governance. Integrating modern technologies- big data, artificial intelligence, and the internet of things- is crucial for achieving sustainable development and environmental protection, and thus accomplishing the sustainable development goals (SDGs) by 2030.

Keywords: Governance; Sustainable Development; Sustainable Development Goals (SDGs); Bibliometric Analysis

الحوكمة والتنمية المستدامة: تحليل ببليومتري

مستخلص:

في الآونة الأخيرة، ازدادت بشكل ملحوظ المؤلفات البحثية والأكاديمية عن أثر الحوكمة الرشيدة في تحقيق التنمية المستدامة، وكان ذلك الدافع الأساسي لإجراء هذه الدراسة. حيث تهدف هذه الدراسة إلى إجراء تحليل ببليومتري لأكثر من ثماني آلاف بحثاً علمياً تم نشره خلال الثلاثين عاماً الأخيرة. وقد عرضت نتائج الدراسة من خلال مجموعة من الرسوم البيانية والجداول وخرائط المعرفة، وذلك للكشف عن الاتجاهات السابقة والنمو والتوقعات المستقبلية.

كما قامت الدراسة بتحديد كلاً من الباحثين الفاعلين، المجلات والدوريات العلمية، الدول، والمؤسسات الأكاديمية والبحثية غزيرة الإنتاج فيما يخص موضوع البحث. وأظهرت النتائج إلى أن الصين أعلى الدول من حيث النشر في هذا الموضوع، تلتها المملكة المتحدة، والولايات المتحدة الامريكية. أما فيما يخص بأكثر المؤسسات العلمية انتاجاً، فكانت أعلى ثلاث مؤسسات بالترتيب كالآتي: جامعة لندن، جامعة فاخينينجن، وجامعة أُترخت.

تقترح هذه الدراسة إجراء مزيد من البحوث حول العلاقة بين الحوكمة والتنمية المستدامة، مثل تنشيط الريف، الزراعة الذكية، الأبحاث المتعلقة بجودة البيئة، الاقتصاد الأخضر والنمو الاقتصادي، التمويل الأخضر، والابتكار الأخضر. بالإضافة الى ذلك وفيما يخص الأبحاث المستقبلية، فتقترح الدراسة التركيز بشكل أكبر علي الحوكمة الذكية القائمة على البيانات الضخمة. فالدمج ما بين التكنولوجيا الحديثة – البيانات الضخمة، الذكاء الاصطناعي، وإنترنت الأشياء أمر ضروري ومهم لتحقيق التنمية المستدامة وحماية البيئة، وبالتبعية تحقيق أهداف التنمية المستدامة بحلول عام ٢٠٣٠.

الكلمات المفتاحية: الحوكمة، التنمية المستدامة، أهداف التنمية المستدامة (SDGs)، التحليل الببليومتري

1- Introduction

"Governance" and "Sustainable Development" are highly related concepts. Both are gaining importance not only from the research community but also from government and international bodies. Good governance is vital to achieving society's sustainable development goals (SDGs) and the way in which sustainable development is built. Governance's objective is mainly to encourage the transformation of societies to be more sustainable and to guarantee the "quality of life" of individuals and the welfare of societies, and that in turn will be a mirror for achieving progress in SDGs.

As a result of the importance of this field of research, this study will utilize systematic review analysis – bibliometric analysis in specific- to perform knowledge analysis on "Governance and Sustainable Development" research to discover objective and unobservable patterns. The core aim of this study is to determine the development trends of the literature on "governance and sustainable development" research. Analysis helps in evaluating research achievements by giving a comprehensive view of past and current research achievements and suggesting future research directions that fill the literature gaps. The popularity of bibliometric analysis in social research is not a heresy but rather a reflection of its utility for handling a large and broad volume of scientific data. It is recently the most popular used tool to explore, map, and analyze the evolution of research fields/topics. This popularity is a result of the accessibility of scientific databases, such as Scopus, Web of Science (WoS), and Google Scholar, which easily offer large volumes of bibliometric data. Alongside this, the availability of bibliometric software tools, such as VOSviewer, Bibliometrix-R Package, and PRISMA (Broadus, 1987; Donthu et al., 2021).

Many bibliometric studies have been published offering retrospectives for similar and related research topics, such as sustainable development and national cultures (Piwowar-Sulej, 2022), environmental, social, and governance management research (Siao et al., 2022), smart public governance research (Vujković et al., 2022), global research trends on COVID-19 linked to sustainable development goals (Zyoud, 2022), contributions toward sustainable development (Effah et al., 2023), global reporting initiative (GRI)[1] (Mougenot & Doussoulin, 2023), corporate governance and environmental sustainability (Enciso-Alfaro & García-Sánchez, 2023), and sustainable development goals (Yamaguchi et al., 2023).

However, the previously mentioned studies focus on specific aspects of sustainable development or specific fields and disciplines, such as culture, the business sector, and smart governance. To the best of the authors' knowledge, no comprehensive, methodologically grounded bibliometric and qualitative literature reviews combining governance with sustainable development have been published so far. Therefore, this study is intended to fill this gap, by (1) investigating the broad and multiple interlinkages between the two concepts "Governance" and "Sustainable Development" and other related concepts and (2) analyzing related literature and uncovering the hotspots topics under this field of research. To achieve this objective, the following research questions (RQs) are pursued:

- RQ1. How well is the progress in governance and sustainable development research (i.e., scientific production and impact)?

[1] *The Global Reporting Initiative (GRI) is an international independent standards organization that helps businesses, governments and other organizations understand and communicate their impacts on issues, such as climate change, human rights, and corruption (Planken, 2013).*

- RQ2. Which research channels (e.g., countries, institutions, publishers, journals) are the most contributed/impactful in governance and sustainable development research?
- RQ3. Who are the most contributing authors to the governance and sustainable development research?
- RQ4. What are the core topics and hotspots for governance and sustainable development research? Are they linked to each other?
- RQ5. What are the frontiers and emerging future trends in the field that can give researchers new avenues in this field of research?

The rest of the study is organized as follows. Section 2 presents the literature background. Section 3 presents the data and methodology. Section 4 discusses the bibliometric results. Finally, Section 5 summarizes and concludes the study.

2- Literature Background

According to the Our Common Future report, issued by the World Commission on Environment and Development (WCED)[2], sustainable development is consistently associated with governance. Sustainable development was viewed as "Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. The concept of sustainable development does imply limits - not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities." (WCED, 1987).

But improving and managing technology and social organization can make way for a new era of inclusive economic expansion, alleviating poverty, and ensuring environmental sustainability. In this aspect, sustainable development requires generally meeting the essential needs and extending to all the opportunity to fulfil their aspirations for a better life. As a result, public participation in the decision-making process on environmental and development issues is critical. That is to achieve development goals, including meeting the needs of the poor and marginalized people, protecting the environment (especially poor regions that are always prone to ecological and other catastrophes), and respecting the welfare of future generations (WCED, 1987; Zhao et al., 2023).

The report views the environmental and development challenges that the world has faced—and continues to face—as a single problem that must be handled by cooperative global action rather than via the pursuit of national self-interest. In addition to looking at population and human resources and how the problems of poverty and population growth are interconnected. The report also looks at issues like food security, species and ecosystems, energy, industry, and 'the urban challenge' of people living in built environments. In addition, it develops common endeavors/approaches to (1) managing the commons (e.g., Space, Oceans, and Antarctica), (2) peace, security, development. and the environment, and (3) common action through proposals for institutional and legal change (WCED, 1987). To summarize, achieving goals in sustainable development involves logical planning and coordination, which

[2] *The UN's World Commission for Environment and Development, chaired by former Norwegian Prime Minister Gro Harlem Brundtland and thus referred to as the Brundtland Commission, published the report "Our Common Future," also known as the "Brundtland Report," in 1987.*

is the core of the "governance" concept: it encompasses the ability to plan, and create the organizations that are needed for sustainable development (UNDP, 2015; Güney, 2017).

Many scholars argued that governance concept covers public institutions upholding citizens› rights and the democratic process. However, the concept of governance is difficult to define. In the mid of the 1980s, the concept of "good governance" emerged, along with the wide, complex, and multi-faceted concept of "governance". The emergence of such a notion has accelerated with a change in expectations of public authority and social order, to promote building peaceful and secure societies with the stability needed to attract and sustain development investments (World Bank, 1991; DAC-OECD, 1993). Accordingly, the governance term includes features like efficiency and effectiveness, rule of law, participation, accountability, transparency, respect for human rights, fighting corruption, being tolerant of diversity and social equality (especially gender equality). Thus, governance plays a significant role in sustainable development and achieving the 2030 Sustainable Development Goals (SDGs) (Griggs et al., 2013; Glass & Newig, 2019).

In 2012, the United Nations (UN) Rio20+ summit in Brazil committed governments to create a set of sustainable development goals (SDGs) that would be integrated into the follow-up to the 2015 Millennium Development Goals (MDGs). In 2015, the Member States of the United Nations approved the 2030 Agenda for Sustainable Development, which is in line with what was previously mentioned in the report Our Common Future. With its 17 Sustainable Development Goals (SDGs), the agenda demonstrates the international commitment to achieve worldwide sustainable development in its social, economic, and environmental dimension. Unlike the MDGs, which concentrated on eradicating extreme poverty and the worst forms of human deprivation in developing countries, the SDGs broadened the scope to include universal goals such as reducing inequalities, boosting economic growth, providing decent jobs, sustainable cities and human settlements, industrialization, addressing ecosystems, oceans, and climate change, promoting sustainable consumption and production, and fostering peace and bolstering justice and institutions (Tawfik et al., 2011; United Nations, 2015; Yamaguchi et al., 2023).

Achieving the 17 SDGs requires good governance to (1) promote an enabling environment to foster common goals by and for collective action, (2) create a common vision on sustainable development, (3) ensure that the multiple actors engaged are held accountable, (4) maximize synergies between goals, targets and dimensions, and (5) deal with emerging complex trade-offs between the goals (e.g., climate action (SDG 13) and affordable and clean energy (SDG 7)) and within the goal itself (e.g., affordable and clean energy). In this line, governance is considered the 4th pillar of sustainable development (Kanie et al., 2014; Bowen et al., 2017; Güney, 2017; Kroll et al., 2019). Despite governance is a complex and multi-faceted concept as stated before, it can be defined as a collection of rules, stakeholder involvement and processes to fulfil a common goal. From this perspective, governance is a means to steer the process of sustainable development, that can be mapped on the continuum between environmental/ ecological sustainability and quality of life (Kemp & Martens, 2007; Zeijl-Rozema et al., 2008).

The literature tackles a wide and distinct range of topics under this nexus of governance and sustainable development as a road for achieving the 2030 SDGs agenda, including digital transformation, technological innovation, transition to green and sustainable growth, education for sustainable development, integrated water resources management, sustainable

industrialization, sustainable consumption and production, tourism sustainability, urban sustainability, corporate governance, environmental sustainability, climate change, human rights, corruption, etc. This can be investigated by reviewing the extensive multidisciplinary literature through bibliometric analysis.

3- Data and Methodology

In this study, bibliometric analysis was conducted in three phases (Figure 1) to capture the nexus of governance and sustainable development in different fields that usually tackle one or more aspects of the SDGs, leading to publication growth in this field of research from various and multiple perspectives. Below more detail about research methodology phases:

- Search and Data Collection. The data source for this analysis was the Clarivate Analytics' Web of Science (WoS) core collection database of the Institute for Scientific Information. WoS is a well-known, rich, and widely used scientific literature database to perform bibliometric studies (Falagas et al., 2008). Documents were retrieved by searching (Topic Search = "Governance" AND = "Sustainable Development") in the field "Topic", which searches in the title, abstract, author keywords, and keywords plus. The search was conducted on January 2023 ,1, and filtered to include articles, review articles, book chapters, and proceeding papers, resulting in 193 ,8 documents, which span 30 years of scientific output (2022-1992).
- Performance analysis. In this phase, the performance analysis technique was conducted on the retrieved documents to examine the contributions of research constituents under investigation (Noyons et al., 1999; Donthu et al., 2021). Through that, the following can be explored: (1) publication output and progress; (2) most productive countries, academic and research institutions; (3) most productive journals and publishers; (4) most productive and influential authors; and (5) top-cited publications. Besides, the total citations (TC), the average total citations per document (ATC Per Doc.), and the Hirsch index (h-index) were also used to assess the impact and productivity of published documents, authors, and publications titles. In this stage and the subsequent phase, three software tools were used in this study for managing, manipulating, and analyzing the extracted bibliometric data: Microsoft Excel, VOSviewer 1.6.19, and Bibliometrix R-package. Excel was used to handle and visualize data tables through tables and charts. VOSviewer is a free software tool for constructing and visualizing bibliometric networks, including journals, researchers, and/or individual publications. It was used to extract authorship, citation, and keyword data. In addition, co-citation, co-country, and co-word network analysis. It offers text mining functionality to construct and visualize co-occurrence networks of important terms/words extracted from a body of scientific literature (Van Eck & Waltman, 2009; Zaki & Zeini, 2019; Meschede 2020; Prieto-Jiménez et al. 2021). The R language environment was used to run the free source packages: Bibliometrix and Biblioshiny. Biblioshiny is an online data analysis platform that encapsulates the basic Bibliometrix algorithm, allowing users to do relevant bibliometric and visual analyses (Aria & Cuccurullo, 2017).

Network Mapping and Visualization Analysis. This stage utilized science mapping techniques to look at the intellectual structure through bibliometric maps and goes in depth in analyzing the intellectual interaction and uncovering the structural connections among research constituents. The following are examples of science mapping techniques: (1) Citation analysis:

analyzes the relation among publications by recognizing the most influential in the field of research; (2) Co-citation analysis: examines the frequency of two publications or sources being cited together by other publications to figure out the development of the foundational themes in the field of research; (3) Co-authorship analysis: examines the relations among authors and their affiliations and equivalent impacts on the development of the research field; (4) Bibliographic coupling: assigns publications into clusters based on their similarities to understand the periodical development of themes in the field; and (5) Co-word/co-keyword analysis: explores the relations among topics in a research field by focusing on the written content of the publication itself (Andersen, 2021; Donthu et al., 2021).

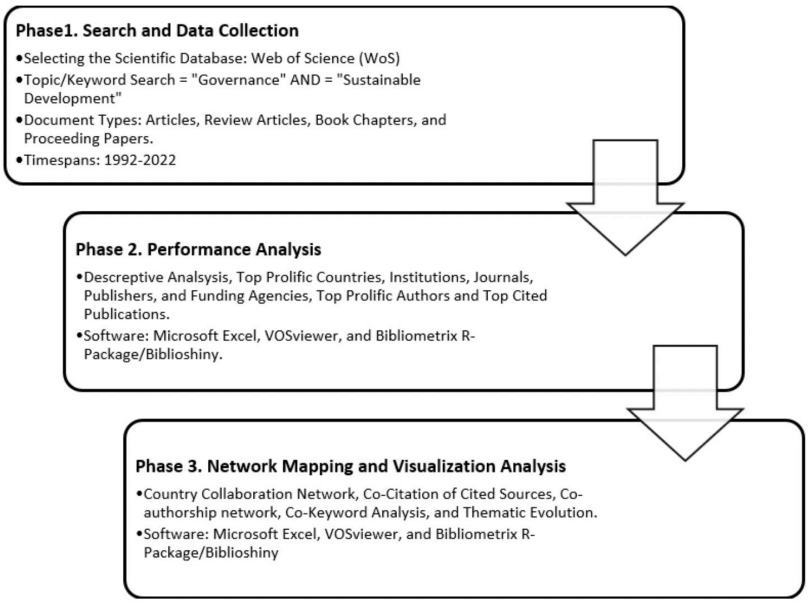

FIGURE (1): RESEARCH METHODOLOGY PHASES

Moreover, the thematic mapping was explored in this study using the Bibliometrix software package to highlight the different themes of a given field of research. In detail, through applying a clustering algorithm on the keyword network, the keywords that appear most together form a network of keywords. Then the relationships that a network of keywords establishes with other networks of keywords are calculated, and keywords are grouped according to the subject areas, distributing the themes/clusters according to centrality and density. Centrality measures the cluster/theme's relevance. Whereas density measures the cluster/theme's development (Cobo et al., 2015). Furthermore, the themes/clusters are classified into four groups based on both centrality and density (Figure 1) :(2) Niche themes: very specialized and peripheral themes; (2) Motor themes: well-developed and important research field structuring themes; (3) Emerging or declining themes: themes with low density and low centrality represent either emerging or declining themes; and (4) Basic or transversal themes: important themes, but not yet well-developed in the research field. These themes are basic and transversal to the research field. Finally, a longitudinal thematic map analysis was presented to study the topic evolution in terms of trajectory along time.

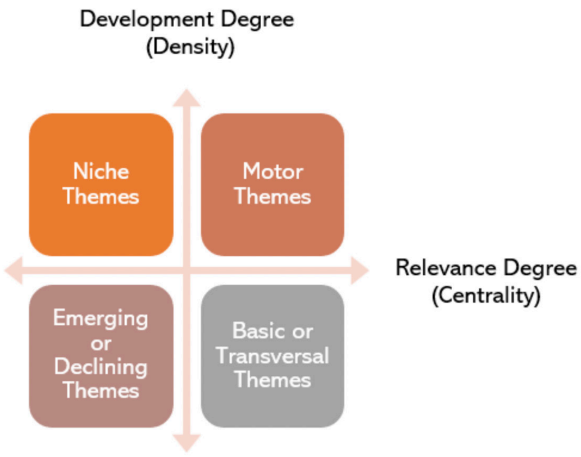

FIGURE (2): THEMATIC MAP

4- Results and Discussion

This section is divided into five subsections that analyze and discuss the results according to the five research questions, respectively.

4.1 General Descriptive Analysis

With an annual growth rate of 23.4 per cent, more than 8,000 research publications on "Governance and Sustainable Development" have been released, which span 30 years of scientific output and resulting in more than 135,400 citations (on average 16.5 citations per document). Despite the research period spanning 30 years of scientific output, the number of publications has increased dramatically in the last five years (2022-2018), representing more than 60 per cent of the total publications (TP). Figure (3) indicates a considerable increasing trend in total publications (TC) and yearly citations. A more descriptive analysis of the publication and citation structure is presented in Table 1.

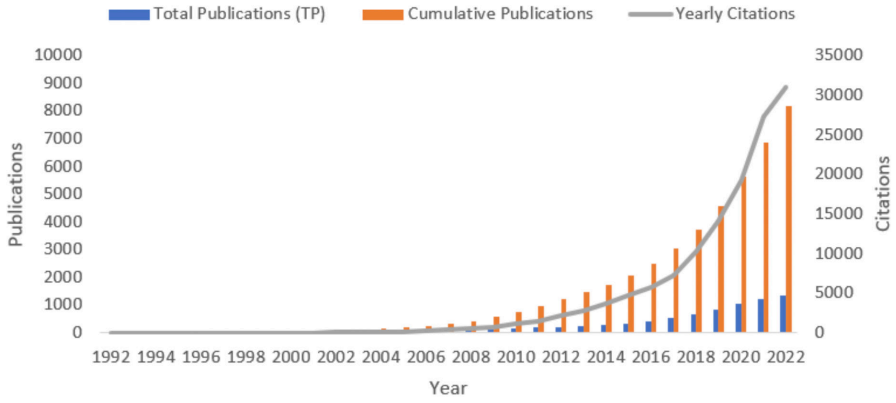

FIGURE (3): TIMES CITED AND PUBLICATIONS OVER TIME

TABLE (1): GOVERNANCE AND SUSTAINABLE DEVELOPMENT'S PUBLICATIONS AND CITATION STRUCTURE

Year	TP	% of 8,193	TC	ATC Per Doc.
1992	1	0.01	40	40
1993	0	0.00	0	0
1994	3	0.04	11	3.67
1995	3	0.04	37	12.33
1996	3	0.04	34	11.33
1997	9	0.11	127	14.11
1998	10	0.12	224	22.4
1999	8	0.10	85	10.63
2000	15	0.18	1,026	68.4
2001	16	0.20	419	26.19
2002	17	0.21	1,927	113.35
2003	22	0.27	624	28.36
2004	37	0.45	1,486	40.16
2005	41	0.50	2,641	64.41
2006	80	0.98	3,079	38.49
2007	77	0.94	2,180	28.31
2008	87	1.06	3,949	45.39
2009	161	1.97	4,033	25.05
2010	166	2.03	6,401	38.56

2011	223	2.72	7,851	35.21
2012	223	2.72	6,497	29.13
2013	258	3.15	7,967	30.88
2014	276	3.37	8,541	30.95
2015	345	4.21	7,340	21.28
2016	433	5.29	8,736	20.18
2017	535	6.53	11,283	21.09
2018	677	8.27	13,012	19.22
2019	855	10.44	14,127	16.52
2020	1,059	12.93	12,508	11.81
2021	1,219	14.88	7,285	5.98
2022	1,334	16.28	2,012	1.51
Total	**8,193**	**100**	**135,482**	**16.5**

Note(s): TP = Total Number of Publications; TC = Total Number of Citations of Publications of Each Year during 2022-1992; ATC Per Doc.= Average Total Citations Per Document

4.2 Top Contributors Channels

4.2.1 Prolific Countries and Institutions

The most productive countries on the topic of "Governance and Sustainable Development" in terms of total publications are presented in Table 2. Countries are ranked according to TP, and in the case of a tie, TC is used. The findings indicate that China has the highest contribution among all contributing countries with 1,386 publications, representing about 17 per cent of the TP. The United Kingdom and the United States are the next most productive countries with 13.1) 1,069 per cent) and 13) 1,066 percent) publications, respectively. The top 10 countries represent more than 86 per cent of the total publications worldwide. In terms of TC, the United Kingdom has the highest TC, followed by the United States and the Netherlands. In addition, Despite China having the highest TP, it has the lowest average total citation per document compared to the top listed countries, and the Netherlands is at the top, followed by Sweden and the United Kingdom. Among the top 10 contributing countries, 6 belong to Europe, 2 to North America, 1 to Asia, and 1 to Oceania.

TABLE (2): TOP 10 PROLIFIC COUNTRIES ON THE GOVERNANCE AND SUSTAINABLE DEVELOPMENT RESEARCH

No.	Country	TP	% of 8,193	TC	ATC Per Doc.
1	China	1,386	16.9%	12,892	9.3
2	United Kingdom	1,069	13.0%	32,083	30
3	United States	1,066	13.0%	27,318	25.6
4	Australia	637	7.8%	17,356	27.3
5	Germany	623	7.6%	14,329	23
6	Netherlands	533	6.5%	18,287	34.3
7	Canada	519	6.3%	13,705	26.4
8	Spain	430	5.2%	8,046	18.7
9	Italy	428	5.2%	6,365	14.9
10	Sweden	405	4.9%	12,687	31.3

To investigate and analyze the country collaboration network, VOSviewer was utilized for generating clusters and analyzing the network (Figure 4). Countries with a minimum of 5 publications were included, yielding a total of 114 countries and 2,189 connections. The size of each node indicates the number of documents of each country, while lines represent co-occurrence between every two countries and appear in our case when countries co-occur at least once. Clusters represent sets of closely related countries, and countries that co-occur more tend to be closer to each other. Eight clusters were generated using the LinLog/modularity normality[3] in VOSviewer. Although the clusters show the diversity of countries that co-occur together, there is some sort of categorization according to regional/geographic positioning, and language.

[3] *Modularity is an optimization method for detecting community structure in networks.*

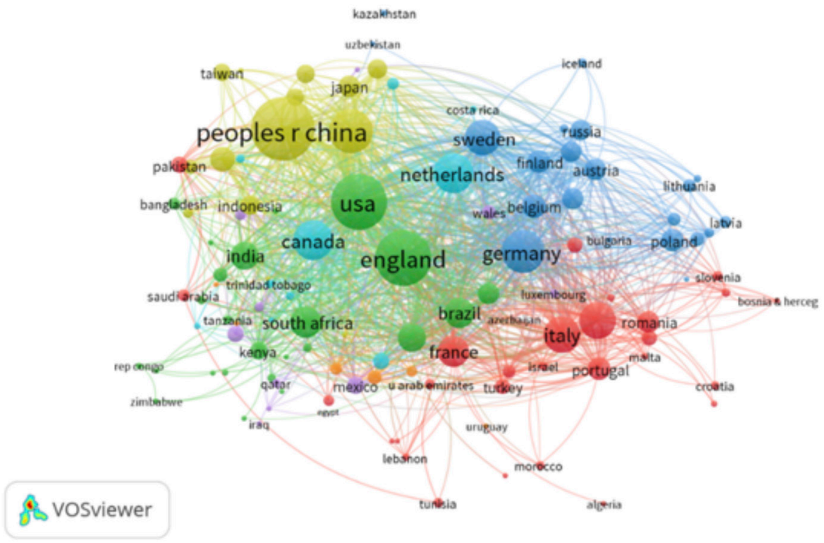

FIGURE (4): COUNTRY COLLABORATION NETWORK

The 20 most productive institutions in terms of TP are presented in Table 3. The findings indicate that University of London has contributed the highest number of articles with 171 publications, followed by Wageningen University & Research and Utrecht University with 113 and 106 publications, respectively. Stockholm University has received the highest number of citations with a total of 4,999, followed by University of London and Wageningen University & Research with 4,985 and 4,316 citations, respectively. Stockholm University has also the highest average citation per publication, followed by University of Oxford, Australian National University, and University of Cape Town. In terms of h-index, the publications published by Wageningen University & Research also attract the highest H-Index, equals to 34, indicating that of the 113 documents considered for the h-index, 34 have been cited at least 34 times. The 20 top academic and research institutions represent around 19 per cent of the total publications.

TABLE (3): TOP 10 ACADEMIC AND RESEARCH INSTITUTIONS.

Rank	Institution	Country	TP	% of 8,193	TC	ATC Per Doc.	H-Index
1	University of London	United Kingdom	171	2.09%	4,985	29.15	33
2	Wageningen University & Research	Netherlands	113	1.38%	4,316	38.19	34
3	Utrecht University	Netherlands	106	1.29%	2,847	26.86	29

4	Chinese Academy of Sciences	China	105	1.28%	1,907	18.16	21
5	Consultative Group for International Agricultural Research (CGIAR)[4]	-	92	1.12%	2,336	25.39	26
6	Helmholtz Association	Germany	84	1.03%	2,264	26.95	27
7	Stockholm University	Sweden	83	1.01%	4,999	60.23	31
8	University of California System	United States	82	1.00%	2,892	35.27	27
9	University of Queensland	Australia	79	0.96%	2,706	34.25	25
10	University of Oxford	United Kingdom	71	0.87%	2,977	41.93	26
11	University College London	United Kingdom	68	0.83%	2,664	39.18	19
12	University of British Columbia	Canada	66	0.81%	2,498	37.85	27
13	Lund University	Sweden	64	0.78%	2,185	34.14	24
14	Australian National University	Australia	61	0.74%	2,426	39.77	23
15	Centre National De La Recherche Scientifique (CNRS)	France	59	0.72%	1,378	23.36	19
16	UDICE French Research Universities	France	58	0.71%	1,632	28.14	17
17	University of Leeds	United Kingdom	58	0.71%	1,774	30.59	21
18	University of Cape Town	South Africa	56	0.68%	2,426	39.77	23
19	University of São Paulo	Brazil	55	0.67%	499	9.07	12
20	University of Waterloo	Canada	55	0.67%	1,651	30.02	19

[4] CGIAR is a global partnership that unites international organizations engaged in research about food security. CGIAR research aims to reduce rural poverty, increase food security, improve human health and nutrition, and sustainable management of natural resources.

The top contributing funding agencies to the governance and sustainable development research are depicted in Table 4. The National Natural Science Foundation of China (NSFC) is in the lead, with 4.9%) 398) publications, followed by the European Commission (EC) and the UK Research and Innovation (UKRI), with 2.7%) 221) and 2.3%) 185), respectively. Although the UK Research and Innovation (UKRI)[5] was founded recently in 2018 by the Higher Education and Research Act 2017, it ranked 3rd among the top 10 listed agencies. Generally, the top ten funded approximately 15 per cent of the technical project, indicating the great interest from various organizations, institutions, and governmental and non-governmental bodies in this research field.

TABLE (4): TOP FUNDING AGENCIES

Rank	Funding Agencies	Foundation Year	TP	% of 8,193
1	National Natural Science Foundation of China (NSFC)	1986	398	4.86%
2	European Commission (EC)	1958	221	2.70%
3	UK Research and Innovation (UKRI)	2018	185	2.26%
4	Economic Social Research Council (ESRC)	1965	109	1.33%
5	National Science Foundation (NSF)	1950	98	1.20%
6	Federal Ministry of Education and Research (BMBF)	1955	66	0.81%
7	Swedish Research Council (FORMAS)	2001	54	0.66%
8	National Social Science Foundation of China (NSSFC)	1986	53	0.65%
9	Consultative Group for International Agricultural Research (CGIAR)	1971	52	0.63%
10	Portuguese Foundation for Science and Technology	1997	48	0.59%

4.2.2 Productive Journals and Publishers

The 8,193 publications in this search were published in distinct journals, various books, and conference proceedings. An overview of the top 20 journals with the highest rates of publications is presented in Table 5. The top 20 most influential journals published 1,149 articles from 1997 to 2022, roughly accounting for 26 per cent of the TP, and resulting in more than 40,000 TGCWoS. The results also demonstrate that 7 journals of the top listed are owned by ELSEVIER, followed by MPDI, Wiley, Springer, Taylor & Francis, Resilience

[5] UKRI is a non-departmental public body of the Government of the United Kingdom that directs research and innovation funding, funded through the science budget of the Department for Business, Energy and Industrial Strategy.

Alliance, and Frontiers Media. Sustainability (MPDI) is at the top of the list, with the highest number of publications (775, accounting 9 per cent of TP), followed by the Journal of Cleaner Production (Elsevier) and Sustainable Development (Wiley), with 2.5) 204 per cent) and 1.5) 126 per cent), respectively. In terms of TGCWoS, Sustainability and Journal of Cleaner Production have the highest TGCWoS, followed by Business Strategy and the Environment (Wiley) and Ecology and Society (Resilience Alliance). Examining the impact factor of these journals, Table 5 depicts that the Journal of Cleaner Production (11.07) is in the lead, followed by Business Strategy (10.801) and Science of the Total Environment (10.754). Despite Sustainability having the highest TP and TGCWoS, it is a low-impact journal compared to the other listed journals (4.089) and has ranked 19th on the list. On the other hand, Science of the Total Environment is among the high-impact journals, however, ranked 18th in the list based on TP.

Figure (5) shows the journals in which the articles are published and demonstrates the results of co-citation analysis in the governance and sustainable development nexus. This was performed to cluster the journals on the basis of cited sources using VOSviewer. The higher the weight of the journal, the larger the circle and label of the journal (Van Eck & Waltman, 2020). For pictorial brevity, the map was drawn based on a particular criterion, i.e., having at least 100 citations. The connections among the journals on the map are shown through the lines, and the distance shows the relatedness of journals in terms of co-citations. The journals are grouped into clusters of five colors, and it is shown that the governance and sustainable development nexus literature is broadly published in the journals related to the field of Economics, Management and Business (green cluster), Environmental Planning and Sustainable Development (red cluster), Global Environmental Change (blue cluster), Food Security and Public Health (yellow cluster) and Sustainable Tourism (purple cluster). These results are coherent with Table 5.

TABLE (5): TOP 20 MOST PRODUCTIVE JOURNALS ON THE GOVERNANCE AND SUSTAINABLE DEVELOPMENT

Rank	Journal	Publisher	TP	% of 8,193	TGC_{WOS}	2021 IF	5 Year IF	1st Publication' Year
1	Sustainability	MDPI	775	9.459	8,608	3.89	4.089	2011
2	Journal of Cleaner Production	ELSEVIER SCI LTD	204	2.49	6,362	11.1	11.016	2003
3	Sustainable Development	WILEY	126	1.538	2,344	8.6	7.403	2006
4	Business Strategy and the Environment	WILEY	103	1.257	3,912	10.8	11.604	2012
5	Marine Policy	ELSEVIER SCI LTD	90	1.098	1,398	4.32	4.735	2003
6	Environmental Science & Policy	ELSEVIER SCI LTD	85	1.037	2,798	6.42	7.027	2009
7	Corporate Social Responsibility and Environmental Management	WILEY	79	0.964	2,048	8.46	8.796	2011
8	International Journal of Environmental Research and Public Health	MDPI	66	0.806	379	4.61	4.799	2012
9	Ecology and Society	RESILIENCE ALLIANCE	60	0.732	2,811	4.65	4.653	2006
10	Land Use Policy	ELSEVIER SCI LTD	60	0.732	1,221	6.19	6.158	2006
11	Frontiers In Environmental Science	FRONTIERS MEDIA SA	58	0.708	515	5.41	6.314	2018
12	Water	MDPI	54	0.659	768	3.53	3.530	2011
13	Environmental Science and Pollution Research	SPRINGER HEIDELBERG	53	0.647	306	5.19	5.053	2014

14	Land	MDPI	52	0.635	679	3.91	4.048	2015
15	Sustainability Science	SPRINGER JAPAN KK	51	0.622	1,673	7.20	7.934	2012
16	Ocean & Coastal Management	ELSEVIER SCI LTD	47	0.574	999	4.295	4.101	1997
17	Environment, Development and Sustainability	SPRINGER	46	0.561	389	4.080	3.972	2015
18	Science of the Total Environment	ELSEVIER	41	0.5	1,312	10.754	10.237	2003
19	Journal of Environmental Management	ACADEMIC PRESS LTD-ELSEVIER SCIENCE LTD	40	0.488	1,346	8.910	8.549	2008
20	Journal of Sustainable Tourism	ROUTLEDGE JOURNALS, TAYLOR & FRANCIS LTD	38	0.464	1,588	9.470	8.952	2009

Note(s): TP = Total Publications; TGCWOS = the total number of times an article was cited by other articles on WoS; 2021 IF = The impact factor in 5 ; 2021 Year IF = The -5year Impact Factor is the average number of times articles from the journal published in the past five years have been cited in the journal citation report (JCR) year. It is calculated by dividing the number of citations in the JCR year by the total number of articles published in the five previous years.

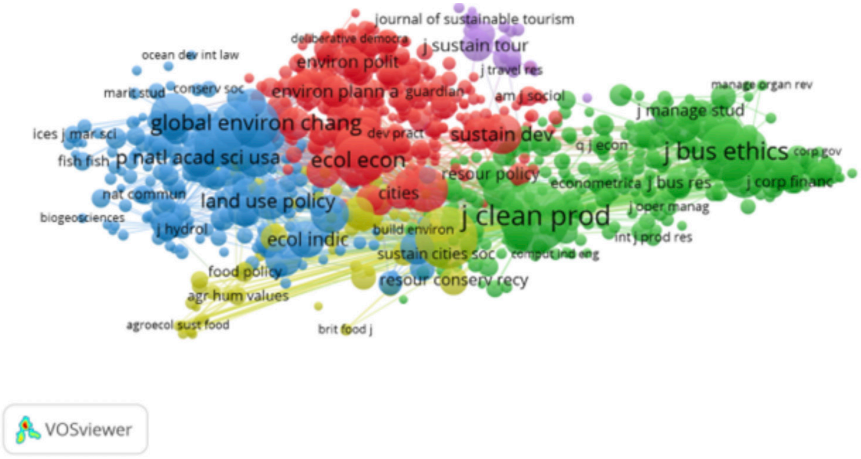

FIGURE (5): CO-CITATION OF CITED SOURCES

Finally, the top 10 publishers are presented in Table 6. ELSEVIER has the largest TP, with 18) 1,508 per cent of the total publications), followed by MPDI with 13) 1,091 per cent of the TP). The 1st five listed publishers accounted for more than 61 per cent of the total publications, namely Taylor & Francis, Sage, Wiley, Elsevier, and Springer Nature. The highest citation is exhibited by ELSEVIER, with 45,112, and it has the greatest H-index (92) among the top 10 publishers, followed by WILEY, with 20,182 TC and H-Index equal to 66.

TABLE (6): TOP 10 PUBLISHERS BY TOTAL PUBLICATIONS

Rank	Publishers	Total Pub.	% of 8,193	TC	H-Index
1	ELSEVIER	1508	18.41	45,112	92
2	MDPI	1091	13.32	10,946	42
3	SPRINGER NATURE	919	11.22	14,746	48
4	TAYLOR & FRANCIS	783	9.56	12,617	48
5	WILEY	714	8.72	20,182	66
6	EMERALD GROUP PUBLISHING	347	4.24	4,547	32
7	SAGE	237	2.89	6,800	38
8	FRONTIERS MEDIA SA	160	1.95	1,382	19
9	CAMBRIDGE UNIV PRESS	83	1.01	740	14
10	ROUTLEDGE	68	0.83	308	6

4.3 Top Prolific Authors

The most prolific authors in terms of publications among the many authors that have contributed to the governance and sustainable development research over time are included in Table 7, along with other citation and publication metrics. The authors are ranked according to their TP, and in the case of a tie, TC is used. As shown, Biermann, F. has contributed the highest number of publications, with a total of 29 publications with 895 total citations by the scientific community. Gupta, J. and Kim, R. E. are next on the list, with 17 and 14 publications, respectively. With 4 articles, Visseren-Hamakers, Ingrid J. is the most productive solo author, followed by Glasbergen, Pieter with 3 solo authorized articles. Moreover, Biermann, F. published 41%) 12) out of 29 articles in the last three years (2022-2020). More than 55 per cent of the listed authors' articles were published in the last five years (2022-2018), indicating the great interest of the scientific community in this research topic and related aspects.

TABLE (7): TOP 10 PRODUCTIVE AUTHORS

No.	Author	TP	SAP	TC	TC/TP	H-Index
1	Biermann, Frank	29	1	895	30.9	13
2	Gupta, Joyeeta	17	2	450	26.47	10
3	Kim, Rakhyun E.	14	1	646	43.07	9
4	Kalfagianni, Agni	13	1	338	26	5
5	Visseren-Hamakers, Ingrid J.	12	4	289	24.08	10
6	Leal Filho, Walter	12	0	217	18.08	6
7	Kanie, Norichika	11	0	1,006	91.45	9
8	Glasbergen, Pieter	10	3	431	43.1	9
9	Geng, Yong	10	0	150	15	6
10	Garcia-Sanchez, IM	10	0	804	80.4	9

Note(s): TP = Total Publications, SAP = Sole-Authored Publications, TC = Total Citations, TC/TP Citations Per Publication.

In terms of citations, Kanie, N. is the most impactful and influential author, with 1,006 citations, followed by Biermann, F., with 895 citations. Kanie, N.'s publications are cited in the scientific community, with an average of 91.45 citations per publication, which is the highest among all listed authors, followed by Garcia-Sanchez, IM., with 80.4 citations per publication, indicating the high impact and influence of both in the scientific community. The Hirsch index (h-index) is another author-level metric that measures both the productivity and citation impact of the publications of an author. The index is based on the set of the scientist's most cited papers and the number of citations that they have received in other publications. In terms of the

h-index, Biermann, F. has the highest local h-index, followed by Gupta, J., with 13 and 10, respectively.

Finally, to investigate and analyze the co-authorship network, VOSviewer was utilized for generating clusters and analyzing the network (Figure 6). Authors with a minimum of 5 publications were included, leading to a network of 39 authors, representing the largest set of connected authors who contributed to the topic. A node represents an author and lines connecting authors indicate that two authors are co-authors, at least once. The thicker the link, the greater the cooperation. There are 98 links between the 39 authors with a total link strength of 170. Clusters represent sets of closely related authors, and authors that co-occur more tend to be closer to each other. The visualization of the co-authorship network reveals 8 clusters of co-authorship with major clustering around Biermann, F. (Utrecht University, Netherlands), with a total link strength of 52. On the other hand, the figure shows isolated clusters to some extent, indicating low cooperation.

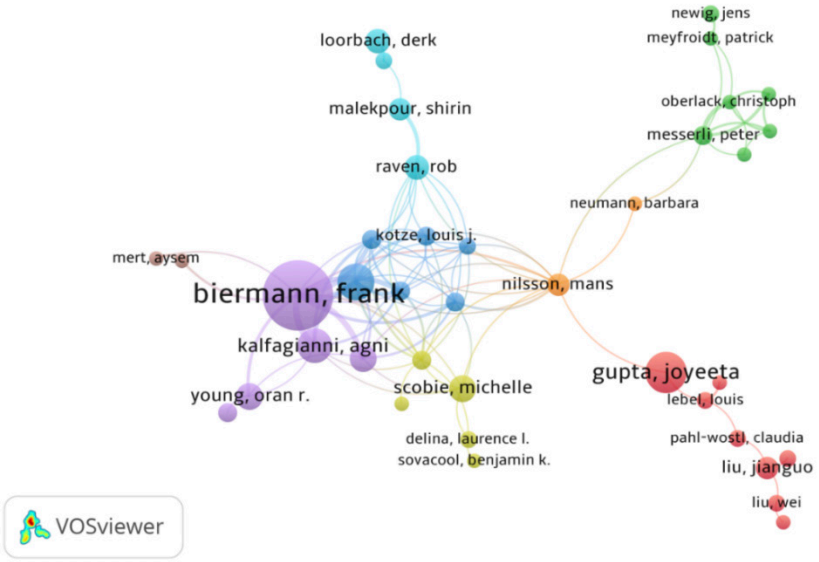

FIGURE (6): CO-AUTHORSHIP NETWORK

TABLE (8):TOP CITED PUBLICATIONS ON GOVERNANCE AND SUSTAINABLE DEVELOPMENT

Rank	Article Title	Author(s)	Pub. Year	Source Title	Publisher	TC (WOS, All Databases)	TC Per Year	Subject Area(s)
1	Resilience and Sustainable Development: Building Adaptive Capacity in A World of Transformations	Folke, C; Carpenter, S; Elmqvist, T; Gunderson, L; Holling, CS; Walker, B	2002	AMBIO: A Journal of the Human Environment	ROYAL SWEDISH ACADEMY OF SCIENCES	(1,603, 1665)	72.86	Environmental Sciences & Ecology
2	The Multi-Level Perspective on Sustainability Transitions: Responses to Seven Criticisms	Geels, Frank W.	2011	Environmental Innovation and Societal Transitions	ELSEVIER	(1,272, 1,294)	97.85	Environmental Sciences & Ecology
3	The Governance of Sustainable Socio-Technical Transitions	Smith, A; Stirling, A; Berkhout, F	2005	Research Policy	ELSEVIER	(1,162, 1,178)	61.16	Business & Economics
4	Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework	Loorbach, Derk	2010	Governance-An International Journal of Policy Administration and Institutions	WILEY	(812,824)	58.00	Government & Law; Public Administration
5	Neoliberal Nature and The Nature of Neoliberalism	McCarthy, J; Prudham, S	2004	GEOFORUM	ELSEVIER	(647, 651)	32.35	Geography
6	Reconfiguring Environmental Governance: Towards A Politics of Scales and Networks	Bulkeley, H	2005	Political Geography	ELSEVIER	(620, 635)	32.63	Geography; Government & Law
7	Smartmentality: The Smart City as Disciplinary Strategy	Vanolo, Alberto	2014	Urban Studies	SAGE	(573, 586)	57.30	Environmental Sciences & Ecology; Urban Studies

8	What About the Politics? Sustainable Development, Transition Management, And Long-Term Energy Transitions	Meadowcroft, James	2009	Policy Sciences	SPRINGER	(561, 562)	37.40	Public Administration; Social Sciences
9	Reconceptualising Adaptation to Climate Change as Part of Pathways of Change and Response	Wise, R. M.; Fazey, I.; Smith, M. Stafford; Park, S. E.; Eakin, H. C.; Van Garderen, E. R. M. Archer; Campbell, B.	2014	Global Environmental Change-Human and Policy Dimensions	ELSEVIER	(555, 560)	55.50	Environmental Sciences & Ecology; Geography
10	Government By Experiment? Global Cities and The Governing of Climate Change	Bulkeley, Harriet; Broto, Vanesa Castan	2013	Transactions of the Institute of British Geographers	WILEY	(541, 549)	49.18	Geography

Additionally, the top publications by global citation are presented and ranked in Table 8. The study entitled "Resilience and Sustainable Development: Building Adaptive Capacity in a World of Transformations" by Folke et al. (2002) is the most impactful publication among the reviewed articles, which has attracted a total of 1,603 citations and an average of 72.9 citations per year. This article is a summary of a report prepared by the Swedish Government›s Environmental Advisory Council as input for the World Summit on Sustainable Development (WSSD), which took place in Johannesburg, South Africa, from August 26 to September ,4 2002. Folke et al. (2002) employed the idea of resilience—the capacity to adapt, learn, and develop—as a framework for comprehending how to maintain and improve adaptive capacity in a challenging environment of quick changes.

The study of Frank W. G. (2011)- The Multi-Level Perspective on Sustainability Transitions: Responses to Seven Criticisms- is next on the list. It has garnered a total of 1,272 citations and the highest average of citations per year (97.85). In this article, seven criticisms for the multi-level perspective (MPL)[6] are summarized, rebuttals are made, and recommendations for additional study are made. The criticisms center around the following issues: (1) a lack of agency; (2) operationalization of regimes; (3) bias in favor of bottom-up change models; (4) epistemology and explanatory style; (5) methodology; (6) socio-technical landscape as residual category; and (7) flat ontologies versus hierarchical levels. The 3rd article entitled "The Governance of Sustainable Socio-Technical Transitions" by Smith et al. (2005) has gained a total of 1,162 citations and attracted an average of 61.16 citations per year. They discussed how the power to affect change relies on regime membership, the distribution of resources for change and expectations for the future. Finally, the findings presented in Table 8 depict the interdisciplinary nature of this field of research, reflecting its complex nature and multi-aspects related to this topic, including multiple socio-environmental aspects.

Moreover, to investigate the relationships among citing publications to understand the periodical/ present development of themes in this field of research, a bibliographic coupling network was delineated using VOSviewer. It splits publications into thematic clusters according to the shared references (Zupic & Čater, 2015). Publications with a minimum of 250 citations were included, leading to a total of 50 top cited documents published from 2002 to 2020, and divided into 5 clusters as shown in Figure (7). "Transition Management," "Sustainable Transition," and "Sustainability" are the core of 1st cluster (red), "Adaptive Capacity to Change through Accumulated Knowledge" is the core of 2nd cluster (green), "Global Governance," and "Climate Change" are the core of the 3rd cluster (blue), "Eco-restructuring for Sustainable Development[7]" is the core of the 4th cluster (yellow), and "Corporate Social Responsibility[8]" is the core of the 5th cluster (purple).

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[6] The multi-level perspective (MLP) has emerged as a fruitful middle-range framework for analyzing socio-technical transitions to sustainability.

[7] A new paradigm of eco-restructuring for sustainable development is introduced, involving shifts in technology, economic activities and lifestyles needed to harmonize human activities with natural systems.

[8] Corporate Social Responsibility (CSR): a strategic management concept whereby companies/organizations integrate social and environmental concerns in their business operations and interactions with their stakeholders. It generally understood as being the way through which a company/organization achieves a balance of economic, environmental and social imperatives ("Triple-Bottom-Line Approach"), while at the same time addressing the expectations of shareholders and stakeholders.

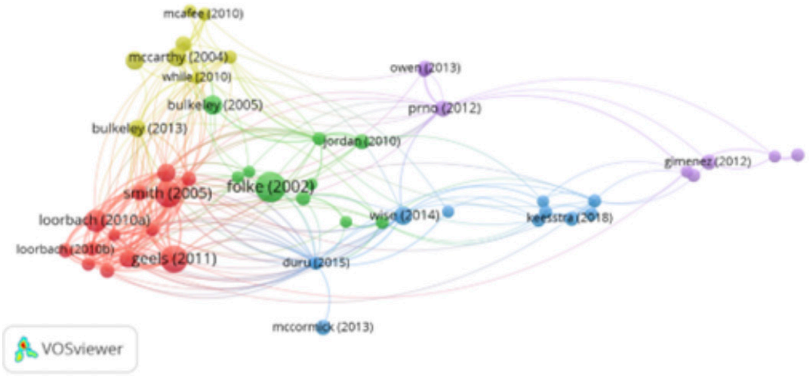

FIGURE (7): RESEARCH THEMES CLUSTERS

4.4 Author Keywords, Core Topics, and Hotspots

This subsection presents the core research topics in governance and sustainable development research, through co-keyword analysis techniques. The keywords and their average year of publication identify the emerging trends-hotspots, while fewer occurrences reveal niche areas (Khudzari et al., 2018; Gutiérrez-Nieto & Serrano-Cinca, 2019). Initially, 496 keywords were recorded, and 423 keywords were obtained that met the threshold of a minimum of 10 occurrences and were linked to each other.

The results in Figure (8) reveal that sustainable development with an average publication year 2017 is the most reflected keyword with 2,045 occurrences, 403 links to other keywords, and a total link strength of 3,579. The 2030 Sustainable Development Goals (SDGs) agenda and governance are the next on the list, with 350) 908) and 348) 831) occurrences (links), respectively. These three top keywords are in the center of the network. Similarly, other frequent keywords are sustainability (640), corporate social responsibility (321), climate change (291), stakeholder(s) engagement (184), adaptive capacity (176), corporate governance (152), environmental governance (152), smart cities (101), environmental policies (95), ecosystem services (95), institutional theory (89), innovation (81), sustainable urban development (78), and global governance (77), which are essential keywords connected to the research of governance and sustainable development.

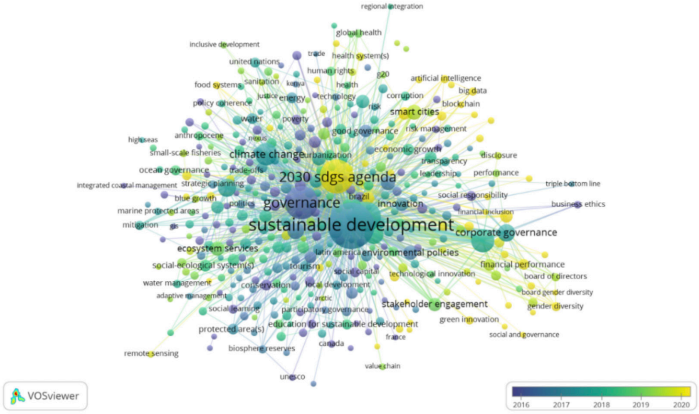

FIGURE (8): OVERLAID AUTHOR KEYWORK CO-OCCURRENCE NETWORK

Based on the keywords co-occurrence analysis of the bibliometric knowledge maps, Table 9 lists the potential emerging and hotspot topics in the governance and sustainable development research. It illustrates various features of the keywords such as the total link strength, number of occurrences, and average citations. The findings indicate that rural revitalization[9] is at the top of the list based on average publication year (2022) with a total link strength of (12) and its number of occurrences of (10). If the number of occurrences, link strength, and very recent average publication years is low, this indicates that the area should be a critical focus for future research avenues. This is followed by green innovation (26 ,32 ,2021), green finance (13 ,30 ,2021), Covid69 ,142 ,2021) 19-), corporate financial performance (12 ,23 ,2021), Smart Governance (14 ,34 ,2021), digital transformation (30 ,74 ,2021), machine learning (13 ,28 ,2021) and environmental, social, and governance (ESG) (89 ,180,2021) and board gender diversity (11 ,20 ,2021), etc.

Similarly, along with machine learning, which is a branch of artificial intelligence (AI). Big data, AI and blockchain are also emerging in governance and sustainable development. In addition to data envelopment analysis, which is an analytical tool that can assist in the identification of best practices in the use of resources among a group of organizations. Such identification can highlight possible efficiency improvements that may help entities to achieve their potential.

TABLE (9): GOVERNANCE AND SUSTAINABLE DEVELOPMENT NEXUS HOTSPOTS (BASED ON AVG. PUB. YEAR)

Rank	Keyword/Term	Total Link Strength (Links)	Occurrences	Avg. Pub. Year	Avg. Citations
1	Rural Revitalization	12(8)	10	2022	7.20
2	Green Innovation	32 (17)	26	2021	10.27
3	Green Finance	30 (17)	13	2021	7.69
4	Covid-19	142 (78)	69	2021	6.03
5	Corporate Financial Performance	23 (14)	12	2021	6.58
6	Smart Governance	34 (20)	14	2021	12.29
7	Digital Transformation	74 (45)	30	2021	7.60
8	Machine Learning	28 (20)	13	2021	8.15
9	Environmental, Social, And Governance (ESG)	180 (57)	89	2021	11.03
10	Board Gender Diversity	20 (12)	11	2021	14.55
11	Evolutionary Game	13 (12)	10	2021	8.20
12	Firm Performance	19 (14)	10	2021	18.60

[9] Rural revitalization is a way of positively transforming rural areas for present and future generations (Shen, 2020).

13	Green Development	5 (5)	11	2021	6.09
14	Multi-Stakeholder Partnerships	36 (23)	12	2021	8.42
15	Artificial Intelligence	62 (34)	25	2021	18.88
16	Gender Equality	29 (20)	15	2021	3.53
17	Belt And Road Initiative	22 (16)	10	2021	5.80
18	Inclusive Growth	31 (24)	11	2021	7.36
19	Carbon (CO_2) Emissions	44 (28)	25	2021	5.92
20	Blue Economy	63 (32)	33	2021	13.97

Table 10 depicts the areas that are highly cited in recent research on governance and sustainable development. As shown transition management is at the top of the list based on average publication year (2014) with a total link strength of (55) and its number of occurrences of (24). Followed by politics (24 ,63 ,2017), reflexive governance[10],31 ,2016) 10 10), adaptive management (12 ,31 ,2017), and science-policy interface (13 ,30 ,2018). Among the 20 list keywords, the following keywords are the most recent and have high average citations: nature-based solutions (17 ,49 ,2021), bioeconomy (20 ,52 ,2020), water-energy-food nexus (20 ,52 ,2019), agroecology (11 ,31 ,2019), global reporting initiative (GRI) (,2019 15 ,34), sustainability transitions (23 ,31 ,2018), human well-being (13 ,32 ,2018), and science-policy interface (13 ,30 ,2018).

TABLE (10): GOVERNANCE AND SUSTAINABLE DEVELOPMENT NEXUS

Rank	Keyword/Term	Total Link Strength (Links)	Occurrences	Avg. Pub. Year	Avg. Citations
1	Transition Management	55(37)	24	2014	130.46
2	Politics	63 (44)	24	2017	75.08
3	Reflexive Governance	17 (11)	10	2016	71.90
4	Adaptive Management	31 (24)	12	2017	66.25
5	Science-Policy Interface	30 (21)	13	2018	51.23
6	Sustainability Transitions	31 (29)	23	2018	51.00
7	Political Ecology	57 (40)	23	2017	47.39
8	Water-Energy-Food Nexus	52 (32)	20	2019	46.50
9	Mitigation	87 (32)	28	2018	46.29

[10] Reflexive governance is considered as a new type of governance that organizes a response to risks by swapping out conventional, hierarchical, and deterministic governing methods with more reflexive, flexible, and interactive ones that draw on various knowledge systems (Bütschi & Almeida 2016).

10	Agro-ecology	31 (26)	11	2019	46.09
11	Environmental Policy Integration	34 (29)	12	2015	45.75
12	Bioeconomy	27 (20)	16	2020	45.63
13	Political Economy	27 (22)	13	2016	45.62
14	Policy Coherence	48 (27)	19	2018	43.84
15	Nature-Based Solutions	49 (31)	17	2021	43.59
16	Human Well-Being	32 (19)	13	2018	42.62
17	Sustainable Consumption and Production	35 (25)	20	2018	42.60
18	Supply Chain Management	70 (39)	31	2017	41.74
19	Co-Production	44 (27)	14	2018	41.50
20	Global Reporting Initiative (GRI)	34 (19)	15	2019	41.40

To deepen the analysis of the themes and investigate the conceptual structure of the topic, the thematic map was explored through Bibliometrix R-package. This map combines performance analysis and scientific mapping tools to detect and visualize conceptual subdomains/themes (Mühl & Oliveira, 2022). The authors' keywords were used to generate the map, resulting in three clusters in the thematic map (see Figure 9), that contextualize and understand the themes in the research field. The thematic map shows that the green cluster (Sustainable Development, 2030 SDGs Agenda, and Sustainability) represents a basic theme (in the lower right quadrant). In this sense, such topics were highly investigated by scholars and able to influence the other themes related to this topic. Although they are general, basic, transversal themes, they are crucial for a research topic. The blue cluster (Governance, Climate Change, and Adaptive Capacity) is sandwiched between motor and niche themes. It includes themes that are more recent in the scientific literature on governance and sustainable development research. The last cluster- the pink cluster (Corporate Social Responsibility (CSR), Stakeholder(s) Engagement, and Corporate Governance) -is sandwiched between niche and emerging themes.

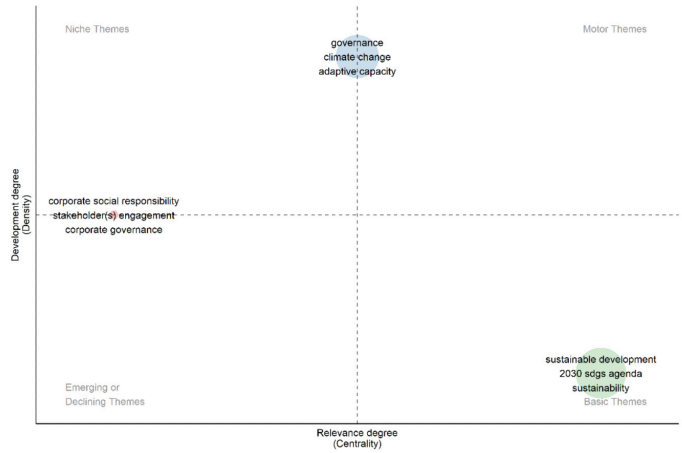

FIGURE (9): THEMATIC MAP BASED ON AUTHORS' KEYWORDS

4.5 Directions for Future Research

Through bibliometrics, insights into future research directions on governance and sustainable development are explored in this study. Future studies can discuss more governance strategies and tools for monitoring and evaluating performance in different sectors, which represent the core of more than one of the SDGs. Smart governance is one of the trendy topics and is about the use of technology and innovation for facilitating and supporting enhanced decision-making and planning through smart strategies. It is one of the smart cities' components, including a smart economy, smart mobility, smart environment, smart quality of life and smart people (Giffinger et al., 2007), that are clearly related to 2030 SDGs agenda. Accordingly, there is ample room for more research that tackles "Smart Cities," "Sustainable Cities," "Smart Governance," "e-Governance," "Citizen Participation," "Open Data and Transparency," "Digital Transformation".

Social change and socio-spatial inequalities in the communities, that result from a society organized by hierarchies of class, race, gender, place of residence that unequally distributed access to services, resources, and rights, must be also more addressed. That is without neglecting the effect of new technology, which can be positive or negative. The impact of the economic, environmental and cultural challenges on social life and the world economy can be discussed as well (Badurek, 2007; Zeini et al., 2018). In this line, terms such as "Green Technology Innovation[11]," "Green Growth," "Geo-Spatial Governance," "Environmental Governance," and "Environmental Goals," can be addressed. Therefore, the «Green Economy» is a good topic of research. There is also ample room for more research on the linkage of "Green Economy", "Green Finance," "Digital Finance," "Digital Divide," and "Spatial Technology". In addition, the terms "Blue Economy[12]," "Blue Finance," and "Ocean Governance" are among the trendy and recent topics in this field, aiming to propose innovative ocean financing strategies for mitigating the effects of environmental challenges.

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[11] Green Technology Innovation adheres to ecological and economic norms, aiming at protecting the environment and minimizing the total product cost at each stage of the product life cycle innovation process (Zhang et al., 2022).

[12] Blue economy is the "sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystem." (World Bank & United Nations Department of Economic and Social Affairs, 2017; Urban et al., 2022). It also defined as "All economic activities related to oceans, seas and coasts." (European Commission & European Climate, Infrastructure and Environment Executive Agency, 2021).

Moreover,"Big Data,""Artificial Intelligence (AI),""the Internet of Things (IoT),""Organizational Cybernetics (OC)[13]," "Viable System Model (VSM)[14]," and "Big Data Cybernetics" for "Intelligence Governance (I-Governance)" can also be applied further in this field of research for monitoring and evaluating global and local policies in the aim of achieving sustainable development: they can have a big impact on governance. In this line, concepts such as "Data-Driven Policymaking," and "Knowledge for Governance" have emerged in recent studies. Indeed, the role of these technologies and tools in sustainable development and environmental protection is crucial. It is an open area of research.

-5 Conclusion

The aim of this study is to comprehensively analyze the body of literature resulting from more than 30 years of research on the interlinkage between governance and sustainable development. Through a bibliometric analysis of 8,193 articles retrieved from the Web of Science (WoS) database, the key findings reveal that the dual theme is a fast-growing field, with a trend in the diversification of research areas. The publications have increased dramatically during 2022-2018. The research diversification reveals the multi-disciplinary nature of this field, to enhance the overall quality of life of societies and individuals, which relates to the three pillars of sustainability: social, economic, and environmental sustainability, along with cultural sustainability. In addition, diversification appears in journals of recognized impact.

The findings reveal that China, the United Kingdom, and the United States are the most prolific countries, while the University of London, the Wageningen University and Research, and Utrecht University are the most productive institutions. The leading funding agencies are the National Natural Science Foundation of China (NSFC), the European Commission (EC), and the UK Research and Innovation (UKRI). ELSEVIER and MPDI are the leading publishers. The top journals on governance and sustainable development are Sustainability, Journal of Cleaner Production, Sustainable Development, Business Strategy and the Environment, and Marine Policy.

Additionally, the thematic maps obtained via Bibliometrix give more insights into the research themes. Accordingly, this study suggests certain avenues as future pathways for further research, such as Environmental Quality, Smart Quality of Life, Rural Revitalization, Smart Agriculture, Green Economy and Growth, Green Finance, Green Technology through Innovation, and I-Governance in policy governance and sustainability toward sustainable development. In addition, future research can utilize more the "Big Data-driven Intelligence Governance," and "Big Data Cybernetics": as integrating modern technologies- big data, artificial intelligence (AI), and the internet of things (IoT)- is crucial for achieving sustainable development and environmental protection, and thus accomplishing the sustainable development goals (SDGs) by 2030.

Finally, this study has some limitations. Since using the WoS database may exclude valuable

[13] Cybernetics, a term derived from the Greek word or "kybernetes" which means "steering" or "governing", is the study of communication and control in man and machine (Wiener, 1948). The aim behind cybernetics is to understand and formalize the underlying principles of systems such as the living system and to employ feedback control and its vital mechanism, to achieve its main purpose of survival (Zeini, 2023).

[14] VSM is a powerful and versatile systems governance framework for designing flexible, adaptable organizations that balance external and internal perspectives and long and short-term thinking (Zeini, 2023).

results that can be extracted from other scientific databases such as Scopus, and especially in the light of the vast momentum of research in the bibliometric analysis field, there is a need for a unified and consistent database that collects the most famous databases effectively, which will lead to providing a larger range of results. On the other hand, a comprehensive and consistent database for non-English databases is needed. In addition, easy and user-friendly software is needed to deal with these languages.

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RESEARCH PAPERS IN ENGLISH

Sustainable Development Determinants in Egypt: Does Governance Matter?

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Abstract

The global transition to the Sustainable Development Goals (SDGs) has extensively guiding policies and funding until 2030. Since then, governance has become the way through which SD is built. Additionally, this transition was conducive to expanding the usage of the indicators criterion to measure development: Adjusted Net Saving (ANS) measures the degree of Sustainable Development (SD) of a country. Accordingly, the current research aims to empirically explore the main determinants of the SD in Egypt throughout the period (-1996 2021). In doing so, the Autoregressive Distributed Lag Model (ARDL) has been applied to test the Co-integration relationship between SD and selected variables that are seen to determine SD in Egypt. The research further employs the Error Correction Model (ECM) to explore the short-run relationship. The empirical results revealed that while Governance stimulated SD, it was not so for the Economic Freedom. The Error Correction Coefficient showed that 92% in imbalances in the SD will be adjusted through the next year. Building on that, this research recommends improving governance arrangements are crucial for delivering SDGs in Egypt by 2030. More specifically, additional attention should be paid to the governance aspects which have a downturn performance as the research will explain.

Keywords: Sustainable Development; Governance; Egypt; Autoregressive Distributed Lag Model (ARDL).

الحوكمة كأحد محددات التنمية المستدامة في مصر

مستخلص:

إن التحول العالمي نحو أهداف التنمية المستدامة يوجه السياسات وكذلك التمويل، على نطاق واسع، حتى عام ٢٠٣٠. ومنذ ذلك الحين، فإن الحوكمة أصبحت تمثل الطريق الذي يمكن من خلاله تحقيق التنمية المستدامة. بالإضافة إلى ذلك، كان هذا الانتقال مواتيًا للتوسع في استخدام المؤشرات التي تقيس التنمية: فصافي الادخار المعدل يقيس درجة التنمية المستدامة للدول. وبالتالي، فإن الدراسة الحالية تسعى إلى بيان المحددات الرئيسية للتنمية المستدامة في مصر خلال الفترة (١٩٩٦-٢٠٢١). ولتحقيق ذلك، اعتمدت الدراسة على تطبيق نموذج الانحدار الذاتي بإبطاء موزع "ARDL" لاختبار العلاقة التوازنية طويلة الأجل بين التنمية المستدامة ومجموعة من المتغيرات التي يتوقع أن تؤثر على تحقيق هذه التنمية المستدامة. كما استخدم البحث نموذج تصحيح الخطأ "ECM" لاختبار العلاقة قصيرة الأجل بين المتغيرات محل الدراسة. وتشير نتائج التقدير إلى أنه بالنسبة للأجل الطويل فإن الحوكمة تشجع على تحقيق التنمية المستدامة، بينما جاءت الحرية الاقتصادية لتؤثر سلبًا على تحقيق التنمية المستدامة. وتشير نتائج الأجل القصير إلى أن نحو ٩٢٪ من الاختلالات في تحقيق التنمية المستدامة يتم تصحيحها في السنة التالية. وفي ضوء ما تقدم توصي الدراسة بتحسين الترتيبات المرتبطة بالحوكمة، وتكثيف الجهود المبذولة في المجالات الفرعية للحوكمة، التي تشهد أداءً متراجعًا، بما يعزز دورها في تحقيق أهداف التنمية المستدامة في مصر ٢٠٣٠.

الكلمات المفتاحية: التنمية المستدامة-الحوكمة-مصر-نموذج الانحدار الذاتي بإبطاء موزع

1- Introduction

In September 17 ,2015 key objectives, 169 sub-goals and 229 linked indicators have been formed to address the well-being of individuals and communities. Many countries worldwide have correspondingly committed to meeting the global goals by 2030: Sustainable Development Strategies (SDS) have been designed to support the transition to the new Agenda. With this shift, development has been taken as a very complex, broad and multi-faceted connotation; where objectives transformed from only promoting growth to broadly promoting well-being.

Furthermore, the level of development is no longer shorthanded to only one indicator such as the income level and, therefore, the usage of the indicators approach has been expanded to measure the achievement of the SDGs (Parris & Kates, 2003; Morgan & Bach, 2018). In this context, adjusted net saving (ANS) is regarded as an important indicator to measure the degree of the sustainable development (SD) of a country (Larissa et al., 2020).

On the other side, Sustainable Development Goals (SDGs) are extensively guiding policies and funding for the next 15 years of its declaration to end hunger and poverty as the top of their priorities (Petrenko et al., 2017). Importantly, governance principles have received a vital concern (Hanlin & Brown, 2013). More specifically and according to the multifaceted SD concept, which has reformulated in -2015 and the previous commitments made at the Rio Earth Summit in -19920 governance arrangements have become a crucial path in achieving SDGs; through coordinating the responded actions while achieving their goals.

In other words, governance is the way by which SD could be built: it facilitates and guarantees the societal transformation needed for meeting well-being. Therefore, achieving SDGs requires, as a prerequisite action, governance to pave the way for an enabling environment for collective action, guaranteeing accountability principles among involved stakeholders so as to cope with emerging complex trade-offs and counterproductive issues while achieving the goals. This gave rise to place governance as the "fourth pillar of sustainable development," according to Bowen et al. ([1].(2017

In addition, good governance has not only been taken as a proactive measure against corruption, but it also increases the competitiveness of the economy, improves the institutions' performance, and effectively manages national resources, which in turn, support delivering SD in a more efficient way (National Management Institute - Governance Center, 2018).

Therefore, the importance of this research is revealed by exploring the relationship between Governance and Sustainable Development (SD) in Egypt, considering it one of the main determinants for achieving SD, which have not previously been used together in studies applied to Egypt, using annual data for the period (2021-1996). In addition, the study proposes a set of applicable recommendations to help decision-makers adopt sound policies that enhance SD requirements in Egypt.

1.1 Evolution of Development Notion and Measurement

It is arguably referred to as the practical and conceptual problems that usually exist in studying development related to the processes and measurement tools Jr. & Quintella (2008). Nonetheless, defining the meaning of development serves as a guide to evaluate or judge it.

[1] *https://www.iddri.org/*

Under the pure economic perspective, Gross Domestic Product or Gross National Income GDP/ GNI has been widely used as proxies in measuring and evaluating the overall level of national development and also welfare (Ames & Carlson, 1968; Barbier, 1987; Nafziger, 2006; Cypher & Dietz 2009; Todaro & Smith, 2012). As found in (Islam & Clarke, 2002). Using GDP as a measure of welfare is favorable to both economists and non-economists; this preference is due its tangibility and simplicity to be understood by many. As for the well-being, it was also traditionally measured in its economic aspect by relating it to the income level. Therefore, the rise of per capita income/ consumption reflects better well- being and vice versa (See for example: Acemoglu, 2009; Cypher & Dietz 2009). It has been also argued that the material wellbeing is closely correlated to the accomplishment of growth over the long term (Nafziger, 2006).

Proponents who claim that growth may be necessary but not sufficient for development go beyond the simple concern about economic aspect of development to broadly engage aspects; social, human, political and institutional (Nafziger, 2006). All economists recognize this, including those who use a nation's income per person as an index for the broader development ambitions (Cypher & Dietz, 2009).

Sachs (2015) pointed out that this traditional measure only captures one aspect of what determines human wellbeing. Furthermore, it could not reflect the distributional inequalities due to its biased nature and is considered misleading and unsatisfactory when measuring the material wellbeing because it is heavily weighted by income shares of the richer in society[2] and does not provide any information about the dispersion of actual incomes around this mean (Fielding et al., 2006; Cypher & Dietz, 2009). Increasingly, a given specific growth rate for the rich has much more impact on the economic growth rate than the impact of the same rate for the poor (Nafziger, 2006).

Due to these shortages, other alternative weighted measures have been emerged; and was conducive to considering "indicators approach"[3] criterion to measurement. Accordingly, the UNDP has constructed the Human Development Index (HDI) at the beginning of the 1990s as an alternative measure to development and welfare; the ultimate purpose was to incorporate economic, social and human aspects in one index (Nafziger, 2006; Morgan & Bach, 2018). This Humanity approach has shifted the focus from only the economy to the person (Alkire & Deneulin, 2009). By this evolution, HDI as a composite index has partially substituted GDP/ GNI as a development and welfare measurement tool (Decancq et al., 2009).

Also, HDI has undergone certain changes from time to time. Just as the adjustments made to modify the traditional measure of the GDP/ GNI so as to provide a more reliable and credible standard, HDI has been modified to reflect better how gender equity, disparities in education, health, income, and political participation can influence social development (Cypher & Dietz, 2009). The main consequence was the establishment of GDI by the UN in 1995 to measure the gender- related development by taking the inequality in achievement between men and women (Islam & Clarke, 2002; Nafziger, 2006; Mahajan, 2013; Stewart, 2019). Increasingly, a Human Poverty Index (HPI)[4] (Nafziger, 2006; Cypher & Dietz, 2009;

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[2] It has been claimed that using mean income places a large weight on the income of the rich, because income distributions are left-skewed.

[3] For more details about indicators criterion and its classifications, see for example (Wadeaa, 2002).

[4] 1997 to directly capture the conditions living of the poor. The (HPI) provide information about the levels of relative deprivation of different countries to be complemented with HDI value.

Todaro & Smith, 2012; Stewart, 2019), and more recently, the Multidimensional Poverty Index (MPI) in 2010 (Morgan & Bach, 2018).

Furthermore, critics had also directed their attention to the HD measures due to the ignorance of the environmental aspect. Therefore, substantial changes were made to extend the scope away further from the social and health issues. With these broader and ambitious goals, level of development couldn't be captured by only one indicator. More importantly, the MDGs were an evolution of the Human- Centered Approach that had a prominent place in the 1990s. MDGs came with the beginning of the 2000s to expressly include human beings and their rights in development and to place them at the forefront of any development strategy (United Nations Human Rights, 2013).

Recently, the SDGs have been built on the eight of the MD to define the post2015- agenda and to broadly cover the sustainability consideration along with social and human factors, including this combination of the three pillars of sustainability; economic, social and environmental. In addition, SD constitutes new measurement challenges because development has been understood as a very complex, broad and multi-faceted notion. As a result, numerical 'indicators' were developed for each target to track the progress towards achieving these goals (Morgan & Bach, 2018). More specifically, literature has claimed that lots of effort have been initiated with the appearance of the SD concept at the beginning of the 1990s to find appropriate criteria that seek to integrate the sustainability approach; more than 500 sustainable indicators, according to Böhringer & Jochem (2007).

According to these evolutions of the thought, SDGs represent a holistic sense that has historically and incrementally crystallised from the contributions made in the decades after the war to involve multiple developmental aspects. By 2017, the UN agreed upon 230 sustainable development indicators with 169 targets and 17 goals (Morgan & Bach, 2018). Furthermore, the SDG index has been built in light of the ongoing and continuous efforts made by the UN Statistical Commission to set a global indicator framework for each of the mentioned targets and goals using the most recent published data.[5]

Building on this, GDP/GNI are no longer regarded as well-suited measures to development with these broader and ambitious development goals and the scope evolved and embodied in the SDGs. This is conducive to expanding the usage of the indicators approach and identifying a tool to measure the progress towards achieving the SDGs (Parris & Kates, 2003). This expansion is seen concerning the ratio of the goals to the mentioned indicators: HDI is 1:3, MDGs are 8:60 and, SDGs are 17:230 (Morgan & Bach, 2018). In this respect, Adjusted Net Saving (ANS) is regarded as an important indicator to measure the degree of sustainable development of a country (Larissa et al., 2020).

ANS was firstly introduced by the World Bank in the late 1990s to express a more comprehensive measure of national saving. As a composite index, it has been recently tackled as a new lens on development, providing a more accurate measure of the SD through the information it gives on the environment and natural resources, besides the socio-economic front. What's more, it ensures that economic growth is on a sustainable path. ANS further measures the extent to which savings and investment rates of a country compensate for a resource depletion of physical and natural capital and pollution damages. Most importantly, it

[5] *The official indicators proposed by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs).*

has been regarded as an adequate indicator regarding the national planning process, addressing the sustainability of the investment policies of a country. Thus, it helps policymakers take premature actions about correcting the country's path on sustainability (Hess, 2010; World Bank, website, https://www.worldbank.org/). Thereby, it is seen- by the researchers- as a best suited measure to the SD.

1.2 Development Background of Egypt

Egypt had turned to full state planning, taken over by government control under the belief in the imperative role of planning as a way out to solve socio-economic backwardness. Accordingly, comprehensive and central Planning as an approach had been assured by the declaration of the first comprehensive development plan of FY (1965/1964-1961/1960). The prime goal was to make the Egyptian economy self-sufficient, producing all products needed to deliver goods and services to the wider society groups. The broader goal was to achieve rapid economic development without suffering social pain (Mabro, 1974; Amer, 1981; Kamel, 1985).

During the seventies, the Open Door Policy (ODP) was implemented to manage economic and social development. The main objectives of the openness policy were to encourage domestic and foreign capital to participate in the development process, and to raise the economic growth rate to about 6.7%. In an attempt to get rid of the stringent rules of the previous restricted and socialist era on one hand, and to allow a greater role for the private sector, on the other, a generous package of incentives had been provided. In addition, partial liberalization of the trade sector and exchange rate regime were made (Weiss & Wurzel, 1998; Allam, 2003; El-Beshry, 2015).

In tandem, a ten-year plan (1982-1973) had been formulated to improve the country›s economic conditions, double local income, and provide three million jobs (Amer, 1981). It is worth noting that the opening-up policy continued with the provision of FY plans at the beginning of the 1980s under the new political power for which economic policies were crafted on the free market economy (Sakamoto, 2013).

Some benefits resulted from adopting ODP, especially concerning achieving high growth rates. Despite that, it was not associated with income distribution and further negatively affected the pattern of development itself (Sakr, 1978). As a result, the pace of growth did not last long. Furthermore, the need for strengthening military spending to confront the requirements of the October War in 1973 slowed down planning efforts: medium-term plans were replaced by annual ones. Economic conditions, unfortunately prevented them from being implemented (Institute of National Planning, 1998; El-Beshry, 2015). Yet, by the beginning of the eighties, a new tendency to the national comprehensive planning approach and the formulation of the FY plans re-emerged.

According to these evolutions, a new development strategy was formulated at the beginning of the 1980s. The ultimate goal was to realistically deliver the goal of raising the standard of living of the mass population. The resultant FY plan (86-1982) was the first part of a long-term plan, which extended to 2002. Furthermore, another strategy was supposed to be designed and launched with the fourth FY plan (2002-1998) and finished by 2017 (El-Beshry, 2015).

Along with this, planning approach had to explicitly transform from being central-based on administrative decisions to another form of planning approach based primarily on policies

to motivate the economy, which is known as "indicative planning" (El-Beshry, 2015). Crucial efforts have been made to build the appropriate multi-sectoral model to be aligned with the new planning paradigm (Institute of National Planning, 1998).

In September 2000, Egypt -as one of the UN member states- was committed to achieving the MDGs within the fifteen years since its Declaration. Under this commitment, two FY plans were issued; (2007-2002) and (2011-2007). In addition, a participatory planning approach has been adopted to strengthen decentralization in the decision-making process by which all the stakeholders should participate in the planning process (Allam, 2003). Several goals have successfully been achieved at the national, regional and governorate levels. There was partial success towards others, however. On the other side, other goals were not met: partially due to the political, economic, and social circumstances the country faced during the period following the January revolution in 2011 (MoPMAR & UNDP, 2015).

It is worth mentioning that although all of the efforts have been exerted regarding achieving developmental goals, the Egyptian economy suffered from several internal and external structural imbalances. Additionally, most of the citizens benefited little from the pattern of growth even during the periods of achieving high-income growth rates; 7% for (2008-2006), and 5% between (2008 and 2010), on average. Despite these relatively high rates, they were not felt by the majority of citizens. In fact, poverty rose during the same period. The fact is that Egypt's economy was still suffering income inequality because income and resources were unequally distributed. Additionally, the high growth rates did not generate sufficient productive jobs opportunities for new entrants in the labour market. Furthermore, the business environment did not see marked improvement (MoPMAR, 2016a). This disappointing socio-economic performance called for adopting a new development agenda.

2- Sustainable Development and Governance, Economic Freedom, and External Debt in Egypt

According to the aforementioned, SDGs have been accepted as an overarching theme to Egyptian development until 2030 to confront socio-economic challenges. By 2014, Egypt has embarked on establishing Egypt Vision 2030 under the participatory planning approach as the basis for formulating Egypt's strategy and vision. All relevant development partners have actively participated in a large number of conferences and seminars involving local and international institutions, which lasted for about two years, witnessing conflicts, different views and debates (MoPMAR, 2016b).

Eventually, it has been agreed on a unified vision and strategy: Egypt Vision 2030 that takes into account the consistency between national goals and the global counterparts. The vision is currently formed as long-term development trends and organized framework for the consequent development plans emanating from the strategy. Also, it has been launched and prioritized in light of the previous progress achieved within about fifteen years of the MDGs: lessons learned, the challenges prevented their achievement, and the possibilities to overcome them.

Egypt›s Strategy Vision›s main dimensions are the same as the SD dimensions, which are Economic (four pillars), Social (four), and Environmental (two) dimensions. Additionally, main objectives, sub-objectives, KPIs, Quantitative targets for each KPI, challenges, newly suggested indicators, policies, programmes, and projects have been identified.

Consequently, the resultant SD plans have been prepared in the light of those pillars, objectives, and programs of the national Sustainable Development Strategy (SDS): Egypt Vision 2030, at the same time, the Government›s Work Program and the Economic Reform Program. Additionally, the mentioned strategy has been modified since 2019 to align with the emerging circumstances at national, regional, and international levels.

In 2021, the MPED announced six SDGs that have been formulated in light of the globally seventeen and inclusive to them. (Next graph). In addition, it has been localized within the national context. (MPED, VNR, 2021).

FIGURE (1): UPDATING STRATEGY FRAME WORK (SDS)

Source: constructed by the researchers, based on (MPED, VNR report, 2021).

As per the above chart, enhancing the role of governance represents the sixth goal of the national goals. It is worth mentioning that governance role first attention has first been given in Egypt to support economic reform program (ERSAP) initiated in the early nineties (National Management Institute - Governance Center, 2018). Recently, it has received a strong attention from the Egyptian government in order to enhance decentralization and implement local administration reform. Most importantly, the six national SDGs has been localized at the governorate level to improve the role of governance and enhancing accountability (MPED, VNR, 2021).

In 2019, for example, a joint work between by UNDP and the Ministry of Local Development (MoLD) has been taken place to implement local administration reform and promoting decentralization in the fields of local planning, execution, monitoring and evaluation and good governance. The main objective is to inform social justice and promoting empowerment to the neediest citizens (Ministry of Local Development, Website: https://mld.gov.eg/en/projects/details/1021). Governance as well constitutes the fourth enablers of the reform program in Egypt (MPED, VNR, 2021).

Furthermore, it has further been recognized as a base through which development could be efficiently achieved. In this context, National Institute for Governance and Sustainable Development" (NIGSD) has been established in 2020 under the auspices of the MPED to serve Egypt's Vision 2030, aiming at setting national strategy and action plan in coordination with different GOE agencies and promoting the concepts of governance and good governance.

Moreover, one of the NIGSD aims is to promote human development, putting the human

aspect at the forefront of its priorities. Additionally, improve regulations concerning facilitating interactions with different public institutions and ensuring coordination between the relevant stakeholders.

2.1 Related indicators to governance with regard to the SDG16: PEACE, JUSTICE, & STRONG INSTITUTIONS:

- WB data indicates that Worldwide Governance indicators covers six main sub- indicators, which primarily focus on the perception, as the following points describes:
- Control of Corruption that captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.
- Government Effectiveness that focuses on the perceptions of public service quality and independence degree from political pressures. Also, the quality of policy formulation, and the credibility of the government›s commitment to such policies.
- Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism.
- Regulatory Quality gives more attention to the perceptions of the government›s ability to formulate and implement sound policies and regulations that promote the private sector›s role in development.
- Rule of Law captures perceptions of how much agents have confidence in and abide by the rules of society, particularly the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
- Voice and Accountability measure perceptions of a country›s citizens› ability to participate in selecting their government, as well as freedom of expression, freedom of association, and free media.

It is well known that strong institutions- transparent and efficient- are imperative for ensuring the inclusiveness of development. The next graph illustrates Egypt's performance in governance arrangements' related indicators.

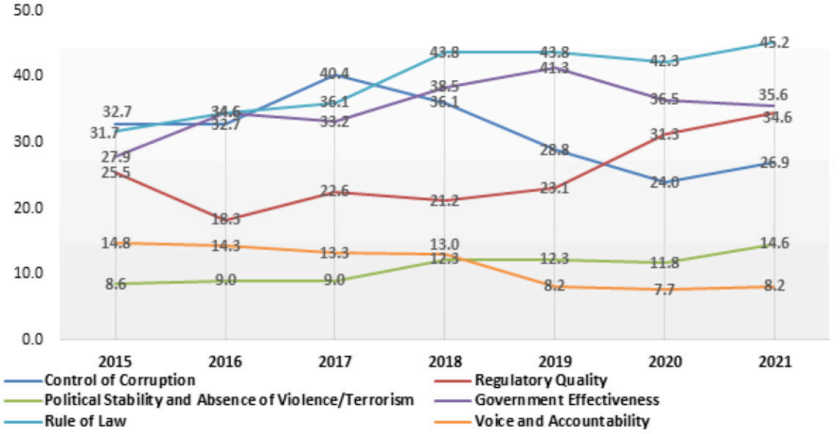

FIGURE (2): GOVERNANCE INDICATORS (PERCENTILE RANK)

Source: researchers based on (World Bank, 2022).

As per the above graph, Egypt has achieved progress regarding Political Stability & Absence of Violence/Terrorism, Rule of Law, and Regulatory Quality in 2021. Specifically, Egypt achieves a remarkable improvement in Regulatory Quality, jumping about 10 ranks, compared to 2015. Additionally, similar progress has been found regarding Rule of Law, and Political Stability and absence of violence and terrorism, which reached 54.2 and 14.6 percentile rank, respectively.

On the contrary, Egypt's performance has witnessed deterioration regarding Control of Corruption although the improvement achieved in 2017. A slight improve has been noticed in 2021. Similarly, Government Effectiveness has retreated by about 6 percentile rank from its rank in 2019 (World Bank, 2022). The main findings to be drawn here is that Egypt government should pay more attention regarding the weak performance of the mentioned three indicators and to maintain the improvements of the other three in order to pave the way towards the achievement of the SD. According to this, the research addresses the relationship between governance and SD performance throughout the research period.

2.2 Economic Freedom:

Economic Freedom as a concept, indicates that every human has a right to control labour and property, and thereby, greater prosperity could be brought about. Importantly, the Economic Freedom Index explains the positive relationship between economic freedom and a variety of positive social and economic aspects.

Therefore, the ideals of the index imply healthier societies, cleaner environments, greater per capita wealth, human development, democracy, and poverty elimination. Furthermore, the index is measured based on 12 quantitative and qualitative factors, with equal weight being given to each, which is graded on a scale of 0 to 100.

These factors are grouped into four broad pillars: Rule of Law (property rights, government integrity, judicial effectiveness); Government Size (government spending, tax burden, fiscal health); Regulatory Efficiency (business freedom, labour freedom, monetary freedom); and Open Markets (trade freedom, investment freedom, financial freedom).

Data indicates that Egypt›s score on the economic freedom index moderately increased by about 3.7 points between 1996 and 2021. Despite the modest improvement, the score achieved in 2021 is still less than the highest level achieved across the total period by about 59.1 points in 2011. (Next Chart)

Furthermore, The Heritage Foundation data[6] indicates that Egypt's Economic Freedom status is repressed, scoring 49.6, and occupying the economy the 151st[7] freest in the 2023 Index. According to this, Egypt ranked 11th out of 14 countries in the Middle East and North Africa region. Importantly, the overall score is below the regional and world averages (Heritage Foundation, 2023).

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[6] *https://www.heritage.org/index/pdf/2023/countries/2023_IndexofEconomicFreedom-Egypt.pdf*

[7] *Out of 176 Countries in Economic Freedom Index 2023. This rank could be attributed to the Weak and low performance of some sub-indexes (such as: Fiscal Health "4.1", Judicial Effectiveness "22.1", Government Integrity "27.9", Labour Freedom "33.4", and Property Rights "39.7"). (Heritage Foundation, 2023).*

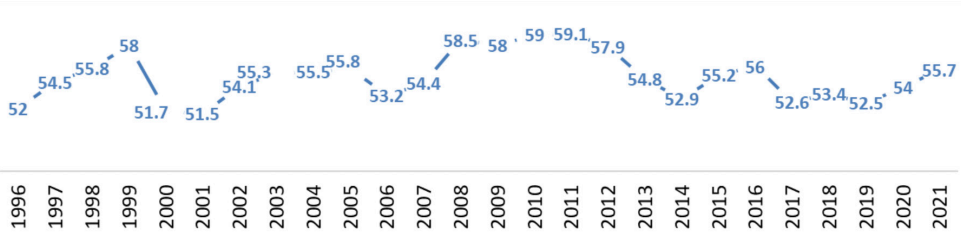

FIGURE (3): EVOLUTION OF ECONOMIC FREEDOM INDEX IN EGYPT DURING THE PERIOD (2021-1996)

Source: researchers based on (World Bank, 2022).

2.3 Egypt's External Debt

Given the fact that rising external debt burdens absorb a growing share of countries' resources. It is seen crucially to investigate its impact on the SD, considering it one of the main determinant in Egypt since debt stock has significantly surged between 1996 and 2021, recording about USD143.2 bn. in the last year, an increase of 354.6 % compared to 1996 (World Bank, WDI, 2023).

Egypt's external debt stock has significantly surged between 1996 and 2021, recording about USD143.2 bn. in the last year, an increase of 354.6 % compared to 1996 (World Bank, WDI, 2023). The following figure illustrates that the total debt service (% of GNI) in Egypt has increased by about 1.4 % between 1996 and 2021. This ratio takes a general upward trend throughout the total period (2021-1996), revolving around 2.4 %.

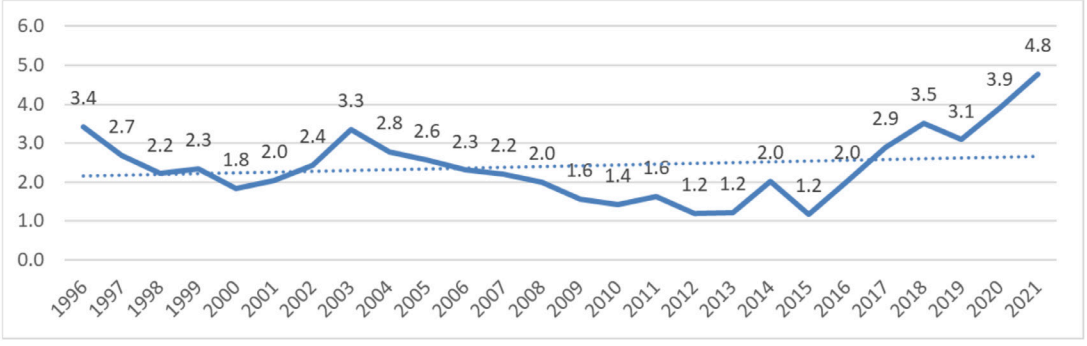

FIGURE (4): TOTAL DEBT SERVICE (% OF GNI) IN EGYPT DURING THE PERIOD (2021-1996)

Source: (World Bank, WDI, 2023)

3- Literature Review

Governance- as one of the main aspects of the sustainability connotation - would explain why some countries could achieve remarkable economic growth and at the same time protecting environment with a high-quality democratic system established, while others are lagged behind; for example, increasing poverty rates and environmental degradation. Literature revealed that governance and economic growth (generally development) are positively correlated, specifically the democratic aspect. What's more, improving governance is conducive to achieve economic growth, which thereby support government in investing

more to improve governance, according to Chong and Calderón ([8](2000 Therefore, it is arguably taken not only as a main driver for promoting SD achievement but also, it is widely considered one of the main determinants by which this achievement could be met.

An empirical analysis has been conducted by Glass & Jens Newig (2019) to explore governance arrangements for the SDGs implementation at the national level, relying on a comparative approach and applied to 41 high and upper-middle-income countries. A multiple regression for Sustainable Governance Indicators, the Global SDG Indicators Database and other official sources has been used to test the influence of different aspects of governance. The results showed that among the estimated factors democratic institutions, participation, economic power, and education and geographic location serve to explain SDG achievement.

In a similar vein, Güney (2017) has quantatively examined relationship between governance and sustainable development throughout the period (2012-1996) applied to 121 developed and developing countries. The research adopted the ANS to express the SD as a more holistic index that contain the three pillar of sustainability. The results showed that the level of SD rises as the governance level is high in all developed and developing countries included in the analysis. Despite that, the results investigated that effect of governance on SD in the developed is higher than in the developing ones (Güney, 2017).

Literature also addressed that Economic freedom is important to the SD. For instance, Mushtaq & Khan (2018) investigated the effect of economic freedom on SD, using sustainable development index for 58 countries and contained 39 variables classified according to the main sustainability pillars into economic, society and environment. Panel OLS has been applied for the years 2015-2000. A positive impact on sustainable development has been found.

Since financing SD has nowadays become a crucial issue, literature has also tackled the relationship between achieving sustainable development and External Debt in particular. In this context, Afolabi, et al. (2022) explored foreign debt stock and foreign debt servicing influence on SDGs in Nigeria using OLS. The main finding was that foreign debt servicing considerably contributes to SDGs in Nigeria. In addition, as long as the cost of foreign debt outweighs its benefit, the research assured its negativity on the economy.

In addition to the literature that examined the relationship between governance and SD, and between economic freedom and SD, other studies have explored the determinants of the SD using ANS (Pardi et al., 2015; Kaimuri & Kosimbei, 2017; Pardi, 2018). For example, Pardi et al. (2015), employed the Johansen test and VECM between 1971 and 2011 in Malaysia. The empirical results showed long-run and short-run relationships between the selected independent variables with the ANS.

Pardi and Nawi (2016) aimed empirically at investigating the factors that affect SD path in Malaysia during (2011-1972) using ARDL. The long run findings showed that total merchandise exports and the urban population tend to have a significant impact on the country's sustainability.

Furthermore, Kaimuri & Kosimbei (2017) applied ARDL to test the long-run and short-run relationships between SD and the variables that were expected to impact the SD in Kenya during (2014-1991). The estimation showed that household per capita consumption,

[8] *Gobel & Maslow.*
https://www.sginetwork.org/docs/publications/Asia20%Study_Assessing_Pathways_to_Success.pdf

unemployment and energy efficiency negatively affected the SD.

In a similar place, Pardi (2018) found that valuation exports of manufactured goods and natural resources were the most significant determinants for the SD. Additionally, Koirala & Pradhan (2019), in their research that applied to 12 Asian countries during the period (-1990 2014), concluded that while GDP per capita and financial development positively affected SD, inflation and natural resources rent negatively impacted SD.

In more recent research, Sofrankova et al., (2021) similarly investigated some determinants on the SD within EU countries (2018-2011) employing panel regression. The selected variables, focusing on the institutional factors such as Global Innovation index, Human Development, Doing Business, Economic freedom, and Corruption. Researcher' results reveal that innovation, business environment, corruption and human development have influenced SD.

Research gap: It could be noticed, according to the literature reviewed, that the majority of the literature have paid lots of attention to the economic aspects that influence SD performance, the current research on contrary, focuses on the institutional factors that might affect SD performance in Egypt.

TABLE (1): LITERATURE REVIEW

Focus of analysis	literature
Explore the relationship between governance and SD	Güney (2017) - Glass & Newig (2019)
Explore the SD' other main requirements	Economic Freedom: (Mushtaq & Khan, 2018), External Debt: (Afolabi et al., 2022) (Sofrankova et al., 2021)
Explore the determinants of the SD using ANS	Pardi et al. (2015), Pardi and Nawi (2016), Kaimuri & Kosimbei (2017), Pardi (2018), & Koirala & Pradhan (2019)

Source: researchers

4- Questions, Hypotheses, and Objectives

In line with the above discussion, the current research addresses the following two questions: What are the main determinants of SD in Egypt? And, to what extent does particularly, governance- among the selected variables- have an impact on the SD?

The work, therefore, tests a key hypothesis: there is a significant long-run relationship between SD, proxied by ANS, as a dependent variable, and some explanatory variables (External Debt, Governance, and Economic Freedom) that are seen as main determinants to the SD during the period 2021–1996 according to the literature reviewed. The data will be obtained from the World Bank, World Development Indicators (WDI), and other relevant sources.

Bearing in mind the above discussion, the purpose of this research is twofold: firstly, explore the empirical relationship between SD and governance, as one of the main variables that are expected to have an impact on the SD in Egypt; secondly, formulate specific policy implications that help the decision maker to implement applicable policies to promote the achievement of the SD in Egypt by enhancing the role of governance.

Therefore, the study aims to empirically investigate the influence of the main selected variables (External Debt, Governance, and Economic Freedom) on the SD achievement in Egypt during the period (2021-1996), which have never previously been applied to the Egyptian case during the period of analysis.

To test the study's hypothesis, the current research employs the ARDL & ECM to test both long-run and short-run relationships among these variables.

5- Methodology

In order to test the study›s hypothesis and answer the previously mentioned questions, the ARDL will be employed. In contrast to previous co-integration models, such as Johansen and Engle-Granger, ARDL tests the relationship between time series of different orders [0 or/and 1]. The model could further interpret the long and short-run relationships, yielding precise results, particularly with short time series (Pesaran et al, 2001; Hasan & Showman, 2013). Since the ARDL technique shifts from a general to a specific approach, it can tackle several econometric problems that could not be avoided using the traditional co-integration approach (i.e. serial correlation and endogeneity) (Ghouse et al., 2018). According to (Engle & Granger, 1987; Charemza & Deadman, 2002), the existence of an error correction mechanism (ECM) requires the time series to be co-integrated. The research proposes the following

$$\Delta sd_t = a_0 + a_1 sd_{t-1} + a_2 govind_{t-1} + a_3 ef_{t-1} + a_4 exs_{t-1} + \sum_{j=1}^{p} \gamma_1 \Delta sd_{t-1} + \sum_{j=1}^{k_1} \gamma_2 \Delta govind_{t-j} + \sum_{j=1}^{k_2} \gamma_3 \Delta ef_{t-j} + \sum_{j=1}^{k_3} \gamma_4 \Delta exs_{t-j} + \varepsilon_t.$$

This is where the dependent variable (SD) denotes sustainable development proxied by ANS (% of GNI). The explanatory variables expected to have an influence on SD in Egypt for the period (2021-1996) are selected in light of the availability of data to bridge the existing gap in the literature. (govind) denotes governance indicator, percentile rank, as an average of the sub-indicators. (ef) denotes economic freedom (the values vary from 100-0, whereas 0 denotes the worst value and 100 refers to the best rank). (exs), denotes the total debt service (% of GNI). p indicates the number of lagged periods for the regressand. (k_1-k_3) denote the number of lagged periods for the regressors. a_s , γ_s denote the long-run and short-run coefficients, respectively.

The data for sustainable development and total debt service obtained from World Bank, World Development Indicators (WDI). Governance data calculated based on the World Bank, worldwide governance indicators dataset. Economic freedom data obtained from Heritage Foundation dataset.

The data for sustainable development and total debt service obtained from World Bank, World Development Indicators (WDI). Governance data calculated based on the World Bank, worldwide governance indicators dataset. Economic freedom data obtained from Heritage Foundation dataset.

5.1 Preliminary steps

Since ensuring the normal distribution of data is a pre-requisite before running the estimation. Table (2), shows that the probability values of Jarque-Bera statistic for all variables are more than the 5% significance level, supporting the statistically use of the data.

TABLE (2): DESCRIPTIVE STATISTICS

	Mean	Median	Max.	Mini.	Std. Dev.	Skew.	Kurtosis	Jarque-Bera	Prob.
SD	6.0753	6.5787	11.6801	0.8879	2.7236	0.0600	2.2416	0.6387	0.7266
govind	32.3261	34.0336	41.3295	22.9636	6.2601	-0.0812	1.5718	2.2382	0.3265
ef	55.0538	55.0000	59.1000	51.5000	2.2922	0.2674	2.0557	1.2757	0.5284
exs	2.4052	2.2587	4.7703	1.1677	0.8851	0.7361	3.2768	2.4312	0.2965

(Source: Eviews 12 Output)

After verifying the normal distribution of data, the paper seeks to test the stationarity of time series as a prerequisite before using the ARDL model. For this purpose, the study employed the augmented dickey-fuller (ADF) test to verify that all variables are integrated of order [I(0) or I(1) or I(0 and 1)]. As indicated in Table (3), the time series for the variables sd, govind, ef, and exs are not stationary, as their critical values are greater than the absolute values of the calculated ADF test values. As a result, we cannot reject the null hypothesis of the existence of a unit root. However, after taking the firs difference, these time series became stationary or integrated of the first order I(1), where the critical values at the 1% significance levels are less than the absolute values of the calculated ADF test values. Consequently, we can reject the null hypothesis at the first difference and therefore run the ARDL model to test the long-run relationship between the variables.

TABLE (3): THE RESULTS OF ADF TEST

Variables	I (0)		I (1)		Sign. level
	Calculated values of ADF test	P-value	Calculated values of ADF test	P-value	
sd	-1.6182	0.4588	-7.3783	0.0000	1%
govind	-1.0406	0.7223	-4.6210	0.0013	1%
ef	-2.9606	0.0527	-4.8762	0.0007	1%
exs	-0.7051	0.8278	-4.5665	0.0017	1%

(Source: Eviews 12 Output)

5.2 Testing the long-run relationship using the ARDL

In this section, the study employs the Co-integration approach "ARDL & ECM" to analyse the SD function. The paper can do so using the following three steps.

The first step considers the determination of the optimal lag length. As shown in Table (4), the optimal lag is one period.

TABLE (4): DETERMINING THE OPTIMAL LAG LENGTH

Lag	Logl	LR	FPE	AIC	SC	HQ
0	-204.2030	NA	402.9992	17.3502	17.5465	17.4023
1	-147.2109	90.2375*	13.5649*	13.9342*	14.9159*	14.1946*
2	-135.7293	14.3518	22.4906	14.3107	16.0778	14.7795

(Source: Eviews 12 Output)

The second step aims at using the bounds test to verify whether the long-run relationship between variables exists or not. Pesaran Et al., (2001), identified three distinct cases by comparing the calculated value of the F-statistic with the critical upper and lower bounds at the 5% significance level. (a) If the calculated value of the F-statistic is higher than the critical upper bound, we can reject the null hypothesis of no long-run relationship. (b) If the calculated value of the F-statistic is less than the critical lower bound, we cannot reject the null hypothesis. (3) If the calculated value of the F-statistic falls between the critical lower and upper bounds, we cannot reject or accept the null hypothesis. As stated in table (5), F-tests seem robust since the calculated value of the F-statistic is 9.76 and exceeds the critical upper bound at significance levels. Consequently, we can reject the null hypothesis

$$(H0: a\ 1 = a\ 2 = a\ 3 = a\ 4 = 0)$$

of no long-run relationship and alternatively accept the alternative hypothesis of the existence of a long-run relationship

$$(H1: a\ 1 \neq a\ 2 \neq a\ 3 \neq a\ 4 \neq 0)$$

TABLE (5): BOUNDS TEST RESULTS

The F statistic value	Critical bounds values (restricted constant & no trend)		
	Significance	I(0)	I(1)
9.76	1%	4.61	5.96
	5%	3.27	4.3
	10%	3.58	2.52

(Source: Eviews 12 Output)

-since the sample is less than 30, the critical values developed by Pesaran et al (2001) are unlikely to be valid for the sample size. So, the study uses the critical values introduced by Narayan (2005) for small samples. These critical values are for upper and lower bounds at 30 observations.

The third step seeks to test the model stability over the sample period. In order to do so, the paper uses the two tests "CUSUM & CUSUM of Squares" suggested by Pesaran and Shin (1999) (Institute of National Planning, 2018). Figure (5) show that the cumulative sum and the cumulative of squares values remained between the critical bounds at the significance level of 5%. This result suggests that the models' estimated coefficients are stable over time, and the residual variance is as well.

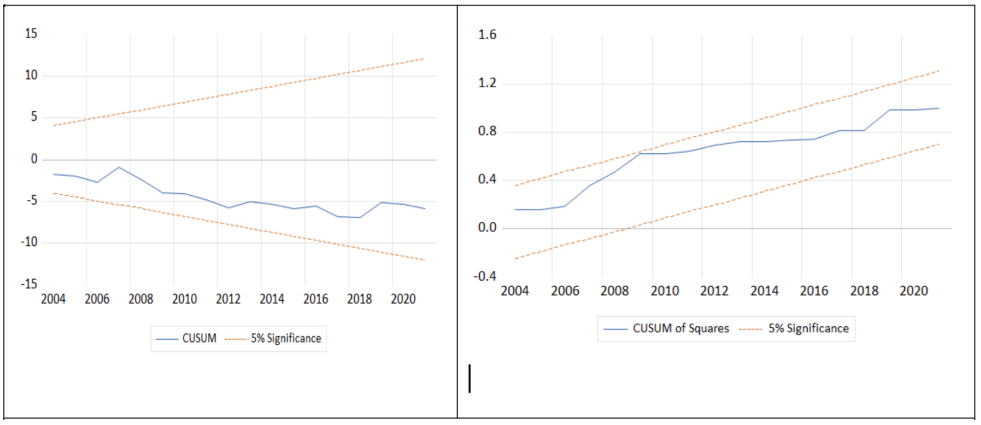

FIGURE (5): PLOTS OF CUSUM & CUSUM OF SQUARES

(Source: Eviews 12 Output)

5.3 Long-run estimation results

As shown in table (6),Adjusted R2 is 0.81, revealing that the model explains 81% variation in SD in Egypt. Besides, the probability of the F-statistic is 0.000001, supporting the statistical significance of the ARDL results.

TABLE (6): LONG-RUN ESTIMATIONS

VARIABLE	Coefficient	Std. Error	t-Statistic	Prob.
SD(-1)	0.0757	0.1735	0.4362	0.6678
GOVIND	0.0450	0.1112	0.4046	0.6905
GOVIND (-1)	0.3009	0.1103	2.7264	0.0139
EF	0.0384	0.1309	0.2932	0.7727
EF(-1)	-0.5515	0.1374	-4.0138	0.0008
EXS	-0.5419	0.3346	-1.6197	0.1227
C	23.8616	8.3895	2.8442	0.0108
R^2	0.8645	Mean dependent var		6.0490
Adjusted R^2	0.8193	S. D. dependent var		2.7764
S. E. of regression	1.1801	Akaike info criterion		3.4006
Sum squared resid	25.0681	Schwarz criterion		3.7418
Log likelihood	-35.5075	Hannan-Quinn criter.		3.4952
F-statistic	19.1411	Durbin-Watson stat		2.0467
Prob (F-statistic)	0.000001			

(Source: Eviews 12 Output)

As shown in Table (7), govind and ef are statistically significant. While the coefficients of govind is positive, implying that the SD in Egypt is positively affected by governance (govind). The coefficient of ef is negative, indicating that the economic reform have a negative impact on the SD in Egypt.

TABLE (7): LONG-RUN ESTIMATIONS

Variables	Coefficient	Standard Error	t-statistic	p-value
govind	0.3742	0.0432	8.6584	0.0000
ef	-0.5551	0.1945	-2.8530	0.0106
exs	-0.5863	0.3934	-1.4903	0.1534

(Source: Eviews 12 Output)

5.4 Short-run estimation results

Considering testing the short-run relationship between the governance, economic freedom, external debt, and sustainable development in Egypt for the period (2021-1996), the paper used the Error Correction Model (ECM). As stated in Table (8), the error correction term (ECT) is significant with a coefficient of 0.92- which implies that 92% of the imbalances of sustainable development in Egypt in one year will be adjusted in the next year. Furthermore, the results show that adjusted R2 is 0.73, indicating that the model explains 73% variation in sustainable development in Egypt in the short-run.

TABLE (8): SHORT-RUN RESULTS

VARIABLE	Coefficient	Std. Error	t-Statistic	Prob.
D(GOVIND)	0.0450	0.0914	1.1509	0.6287
D(EF)	0.0384	0.0983	0.3905	0.7007
ECT(-1)	-0.9242	0.1196	-7.7234	0.0000
R^2	0.7350	Mean dependent var		-0.1703
Adjusted R^2	0.7109	S. D. dependent var		1.9853
S. E. of regression	1.0674	Akaike info criterion		3.0806
Sum squared resid	25.0681	Schwarz criterion		3.2268
Log likelihood	-35.5075	Hannan-Quinn criter.		3.1211
Durbin-Watson stat	2.0467			

(Source: Eviews 12 Output)

5.5 Assessing model quality and stability

As indicated in Table (9), the F-statistic's probability value of the Breusch- Godfrey (LM) test is insignificant at all levels of significance. Hence, we cannot reject the null hypothesis of no serial correlation between the estimated models' residuals. Besides that, the F-statistic's probability of the Breusch–Pagan–Godfrey test for heteroscedasticity is insignificant at all levels of significance. As a result, we cannot reject the null hypothesis of homoscedasticity

TABLE (9): TESTING SERIAL CORRELATION & HETEROSKEDASTICITY

Breusch - Godfrey (LM Test)	F statistic	0.1368	Prob.	0.7160
	Obs* R^2	0.1996	Prob.	0.6550
Breusch- Pagan- Godfrey	F statistic	0.7023	Prob.	0.6516
	Obs* R^2	4.7425	Prob.	0.5772

(Source: Eviews 12 Output)

According to Figure (6), the Jarque–Bera statistic is 3.4746 with a probability of 0.1759, indicating the insignificance at the 1%, 5%, and 10% significance levels, supporting the acceptance of the null hypothesis. Thus, the residuals are normally distributed.

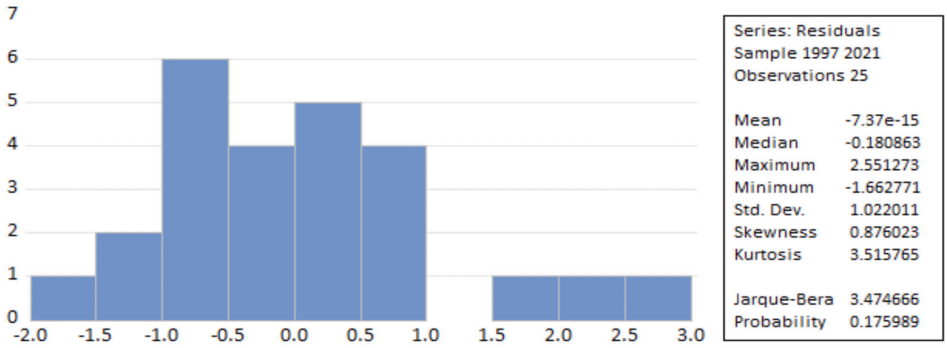

FIGURE (6): JARQUE-BERA TEST FOR NORMAL DISTRIBUTION OF THE RESIDUALS

(Source: Eviews 12 Output)

6- Conclusion and Policy Recommendations

This work addressed the literature gap by testing the long-run and short-run relationships between SD as a dependent variable and some explanatory variables that are expected to have an impact on achieving SD in Egypt according to the literature reviewed, which are Governance, Economic Freedom, and External Debt, during the period (2021-1996).

The long-run results showed that Governance positively affects SD. SD, on the contrary, has been negatively affected by Economic Freedom, which is aligned with the literature for the purpose. These findings shed light on the crucial role that governance can play in achieving SD in Egypt.

In this context, promoting governance arrangements/dimensions "political stability, regulatory quality, control on corruption, government effectiveness, voice and accountability, and role of law" will positively influence SD achievement in Egypt. In addition, enhancing economic freedom in Egypt is a milestone in promoting the business climate and achieving the SD in Egypt.

Therefore, it could be said that despite the efforts have been recently taken to improve governance; whether in the national SDGs and their enablers as well as or the reform programme' main enablers, Egypt performance still needs lots of effort in order to meet the SDGs by 2030.

Building on this, enhancing the imperative role of governance throughout the SD plans will help government in boosting the sustainability requirements as well as implement the second phase of the reforms known as "the structural reforms" aimed at supporting certain sectors and increasing the competitiveness of the Egyptian economy.

On the other side, as long as the research findings showed that Economic freedom is insignificant, due to the week performance of the index, the research recommends enhancing fiscal health, judicial effectiveness, Government integrity, labour freedom, and property rights which could help Egyptian government in promoting the SD requirements.

Furthermore, the results showed that external debt is insignificant. This could be explained

by the fact that the debt has been utilized by projects that might not be properly to achieve the SD in Egypt and might be directed to an unsustainable development path. Therefore, the research recommends adopting an effective debt management strategy to ensure efficient debt usage, by which the sustainability path should be paved (Obianuju, 2021).

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RESEARCH PAPERS IN ENGLISH

The Effect of Applying Public Governance Mechanisms on Achieving Sustainable Development Goals in Egypt

MENA Cross Countries Study

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Abstract

There are now widely accepted arguments that public governance should play a stronger role in implementing sustainable development goals and that the "one-size-fits-all" model of governance do not work. Public governance promotes the stability needed for development investments to be sustained. So, it is a prerequisite for local sustainable development. On the practice, there is still a lack of researches that discuss how could public governance mechanisms affect achieving SDGs. The research would discuss this relation according to the Egyptian public governance practices and comparing it with its similarities in some countries in the MENA region through cross - country analysis. Most of data about MENA countries are drawn at 2020 from the World bank index to analyze the effect of public governance mechanisms that are: justice and equity, rule of law, E-governance, participation in public policy, on SDGs. This research resulted in the need for more investment in technology infrastructure, more awareness for increasing the public participation in policy-making, enhance the rule of law in some sectors to achieve more equitability and facilitate services to protect rights of public and achieve SDGs in different fields of life.

Keywords: Governance, sustainable development, justice and equity, E-governance, participation in public policy.

أثر تطبيق آليات الحوكمة الحكومية في تحقيق أهداف التنمية المستدامة في مصر - دراسة مقارنة مع دول منطقة الشرق الأوسط وشمال أفريقيا

مستخلص:

أصبح الدور المؤثر الذي تقوم به الحوكمة الحكومية في تحقيق أهداف التنمية المستدامة من الأمور التي باتت منتشرة على نطاق واسع حيث لم يعد في الإمكان تعميم نموذج موحد للحوكمة ليلائم جميع المجتمعات. وتعزز الحوكمة من وجود مجتمعات سلمية وآمنة توفر الاستقرار اللازم لاستدامة الاستثمارات اللازمة لعملية التنمية وبالتالي فهي أصبحت شرط أساسي للتنمية المحلية المستدامة. وفيما يتعلق بعلاقة الحوكمة بالتنمية المستدامة، فإنه يوجد قصور في الأبحاث التي تناقش كيف يمكن أن تؤثر الحوكمة على تحقيق أهداف التنمية المستدامة. سوف يتم تطبيق هذا البحث على الحوكمة الحكومية في مصر مع المقارنة مع الممارسات المماثلة مع بعض البلدان في منطقة الشرق الأوسط وشمال إفريقيا من خلال التحليل عبر البلدان. تم استخلاص معظم البيانات المتعلقة ببلدان الشرق الأوسط وشمال إفريقيا في عام ٢٠٢٠ من مؤشر البنك الدولي لتحليل تأثير آليات الحوكمة الحكومية وهي: العدالة والإنصاف، وسيادة القانون، والحوكمة الإلكترونية، والمشاركة في السياسة العامة، على أهداف التنمية المستدامة. وقد توصل هذا البحث إلى الحاجة إلى مزيد من الاستثمار في البنية التحتية التكنولوجية، والمزيد من الوعي لزيادة المشاركة العامة في صنع السياسات، وتعزيز سيادة القانون في بعض القطاعات لتحقيق المزيد من العدالة وتسهيل الخدمات لحماية حقوق الجمهور وتحقيق أهداف التنمية المستدامة في مختلف مجالات الحياة.

الكلمات المفتاحية: الحوكمة، أهداف التنمية المستدامة، الحوكمة الإلكترونية، سيادة القانون، المشاركة في السياسة العامة، العدالة والإنصاف

1- Introduction

Governance is not the same as government. Governance is a catchword that has come to symbolize good government under new, more complicated, and uncertain circumstances. Governance is a new type of government that aspires to tackle new and old problems with mechanisms based on transparency, participation, and accountability (Albassam,2021). It started with the internationalization and Europeanization of national policies, the decentralization processes that have affected a number of countries and followed with the new forms of partnership between public and private actors. (Aguilar and Montiel,2011). It includes the actions of the state and, in addition, includes actors such as communities, businesses, and NGOs (Bouchama and Bensaim, 2021).

Governance is one of the key pillars for promoting the right of development, as it involves the principles of justice, participation, transparency and rule of law. These principles allow comprehensive sustainable development (SD) to be achieved (if effectively and efficiently applied). As an example of the important role that institutions play in the development process, Goal 16 of the SDGs aims to secure peace and justice and to establish effective, accountable and inclusive institutions at all levels. It focuses on achieving stability, ensuring human rights, and strengthening governance which based on the rule of law through ensuring equal access to justice for all; establishing effective, transparent and accountable institutions; decreasing corruption; ensuring citizens' access to information and making decisions in a responsive and inclusive manner. (Egypt Human Development Report, 2021)

The myriad of events that are shaping our world, such as global warming, poverty and economic instability calls for a shift from government to governance. This change demands a cooperative type of governance to achieve sustainability. This type of governance consists of individuals who are closest to the structures of public administration and acts as agents in governance and they need to be equipped with the required knowledge, attitudes and skills, about and for SD. This can be addressed awareness about sustainable development, a lifelong tool which requires adaption to national requirements, but most importantly to societal needs (Cassar,2022).

The term "sustainable development" (SD) was coined in 1987 by the United Nations World Commission on Environment and Development and defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). It ensures future generations will have better access to resources and will enjoy longer, healthier lives as compared to the current generation (Alsayegh and Others,2023). Or "Sustainable development is a way for people to use resources without the resources running out" (Awad & Elnady, 2020). Furthermore, these definitions clear that SD based on three interdependent dimensions; social, environmental and economic systems in which should be transformed and interlinked with each other to ensure societal health, human well-being, and limited the environmental impact (United Nations, 2019), (El-Gohary, 2022).

The 2030 SD agenda consists of "17 SDGs including 169 targets and 304 indicators", which cover a broad range of development related issues (ElMassaha. & Mohieldin, 2020), The successful implementation of the 2030 SD agenda relies on the collaboration between the private sector, governments, civil society, institutions, and agencies across various sectors,

levels, locations and borders. In addition to, their engagement and understanding of the scientific realities that enhance the relations between the natural world and human activity (United Nations, 2019), (El-Gohary, 2022). What makes the SDGs special is the broad acceptance and commitment of the international community and they are measurable through many indicators (Glass and Newig,2019).

Egypt Vision 2030", which was launched in February 2016. This strategy aligns with the 17 SDGs, reflects the SD dimensions: economic, social and environmental. It involves projects and programs that are planned to be implemented until 2030 (Ministry of Planning, Monitoring, and Administrative Reform, 2018). The Egyptian strategy to achieve SD is to "possess a balanced, competitive, and diversified economy, depending on knowledge and innovation and based on social integration, justice, and participation. As well as, it is characterized by a balanced and varied ecosystem, using the place and humans' ingenuity in order to achieve the SD and improve the citizens' life quality. This strategy aims to place Egypt among the top 30 countries in the world, in terms of fighting corruption, economic development, market competitiveness, quality of life and human development. Furthermore, the strategy takes into account the optimal use of resources and supporting the fairness of their usage, the equal opportunities' principles, ensuring the rights of next generations and bridging some development gaps (Ministry of Planning Monitoring and Administrative Reform, 2018). (El-Gohary, 2022).

This research will focus on the public governance importance, its mechanisms and the Egyptian practices in governance field. Public governance mechanisms include justice and equity, rule of law, e_governance and participation in public policy. It will analyze how could each mechanism affect achieving specific SDGs and how it could be a helpful tool for that objective. It also would make a comparative study between the Egyptian governance practices and some of MENA countries (Tunisia, Morocco, Algeria, UAE, Suadi Arabia, Kuwait, Jordan) to highlight the weakness points. All of these points would help the Egyptian government and policy makers to activate some public governance tools to enhance implementing SDGs in Egypt vision 2030.

2- Literature Review and Hypotheses Development

Governance is broader than institutions and includes relations between state and people. There is a growing acceptance that the "one-size-fits-all" models of governance do not work and there are different pathways toward more inclusive political and economic institutions. Governance provides mechanisms for cooperations between different sectors. It also addresses some of the fundamental obstacles to SD such as exclusion and inequity (UNDP,2014) and tries to transform SD into a more proactive efforts to achieve sustainability (Alsayegh and Others,2023).

Regarding the relation between governance and SD, there is a belief that good public governance promotes national SD. Good governance may be categorized as general governance meant to rule the country and specific governance to achieve SDGs. Different studies have highlighted the impact of public governance in various ways. For example, some of them found that governance is positively related to human development others found a positive impact on economic development (Alsayegh and Others,2023).

(Aguilar and Montiel,2011) discussed participatory processes as a governance mechanism

in wildland fire management (WFM) as participation is an essential element of both the European SD Strategy and the White Paper on Governance. It concluded that an overspread weakness in WFM because of lack of real participation of stakeholders which affect their contribution to WFM in high-risk areas. It concluded that a sustainable forest policy (more precisely, a sustainable WFM) has to be surrounded by governance mechanisms based on broad social participation. The role of stakeholders (basically, local communities, forest owners, fire technicians and local and regional administrations) and fire networks is crucial.

(Ramzy,2019) discussed the two concepts: SD and good governance. This research provided a literature review on both of the two concepts and their histories and explore the interrelation and integration between them. It is determined that achieving SD requires good governance, and vice versa. It concluded that there is a strong relationship between good governance and SD. It proved the importance of applying good governance on the success of the institutionalization of SD and concluded that without good governance, it couldn›t be applicable to achieve SD in application and practice in a fair, equitable, and transparent manner.

(Glass and Newig,2019) indicated that the importance of governance for SD has gained considerable attention in research and public debate particularly since the drafting of the 2030 Agenda and the SDGs as both concepts are ambiguous definitions. This research aimed to assess the relationship of different aspects of governance with the achievement of the SDGs at the national level. The research suggested that the enhancement of democratic institutions and participation could lead to greater progress in SDG implementation. Both participatory and democratic governance structures seem to facilitate the decision-making process, implementation and acceptance of policies directed towards the achievement of SD. Findings further seem to support the hypothesis that democratic institutions create a healthy environment for SDG achievement by ensuring accountability and transparency in policy-making. It recommended future research to look more closely at different aspects of governance and their relation to SDG achievement.

(Rahman,2021) tried to assess the performance of achieving the targets of SDGs by aligning with the recent initiatives taken by different ministries and divisions in Bangladesh. It also examines the institutional challenges associated with the implementation of SDGs. It found that ambiguous roles of different ministries and divisions have caused overlapping jurisdiction, followed by conflicts of interest and lack of consistency. Inaccurate stakeholder analysis, data unavailability, lack of competency and accountability and a top-down policy approach can be considered as the major institutional bottlenecks in achieving SDGs. The study recommends minimizing jurisdictional overlapping for better integration and coordination by revising the allocation of roles between various ministries responsible for achieving SDGs. The bottom-up approach and engagement of multi-stakeholders may help appropriate policymaking.

(El-Gohary,2022) highlighted the concept of the SD and how the communication and information technology industry contribute in achieving SD. He reviewed the 17 SDGs and explains how information technology has affect each goal and then it displays the endeavors of Egypt's government to utilize ICT in achieving SD. These endeavors are represented in the digital projects and initiatives that were launched by the "Ministry of Communication and Information Technology" in collaboration with other partners whether governmental entities or the private sector.

Contrarily, (Alsayegh and Others,2023) found that public governance has a significant but negative impact on SDGs. It was interesting because, according to the findings, the current governance model is a bureaucratic style of governance, which is also called governance through rules which is entirely different from governance through goals. As a result, the findings suggest that structural transformation at all levels is required to achieve the SDGs. The governance model should be shifted from governance through rules to governance through goals.

Through the previous literature reviews, it could be concluded that there is a relationship between public governance and SDGs implementations. It could be more illustrated though studying the governance mechanisms and its impact on SDGs. So, the main research question would be:

HOW COULD PUBLIC GOVERNANCE MECHANISMS AFFECT ACHIEVING SDGS?

And this could be studied through analyzing the impact of justice and equity, rule of law, e_ governance and participation in public policy as public governance mechanisms on achieving SDGs. So, the main research hypothesis could be as follows:

There is an impact of public governance mechanisms on achieving SDGs

The sub-hypotheses are:

H1.1. There is a positive impact of justice and equity on achieving SDGs

H1.2. There is a positive impact of rule of law on achieving SDGs

H1.3. There is a positive impact of E_governance on achieving SDGs

H1.4. There is a positive impact of participation in public policy on achieving SDGs

3- Research Methodology

This research will address the public governance mechanisms and its impact on achieving SDGs in Egyptian environment. The relevant literature will be reviewed depending on inductive approach. An analysis of public governance mechanisms (rule of law, e-governance, participation in public policy, justice and equity) will be illustrated. Also, a benchmark analysis with public governance mechanisms practices in some MENA countries will be executed to evaluate the current Egyptian situation about governance practices and spot on weakness points. Data will be collected from the (World Bank), (OECD) and Arab Parometer. The study's findings were collected from governance country level of MENA countries whose most of data in 2020.

Conceptual Framework:

Based on the literature review and hypotheses, the following conceptual framework could be developed to find the effect of public governance mechanisms on achieving SDGs.

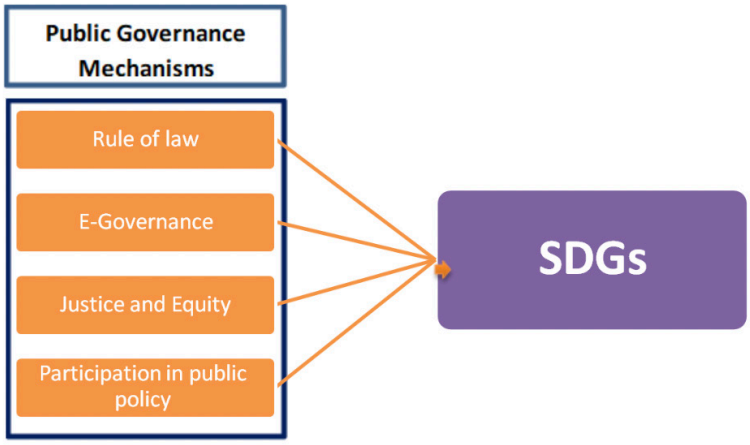


FIGURE (1):THE CONCEPTUAL FRAMEWORK

3.1. The Variables

3.1.1. PUBLIC GOVERNANCE

The World Governance Indicators (WGIs), which are published by the World Bank, used as a proxy for country-level good governance six core governance indicators— rule of law, regulatory quality, stability of the political systems and effective government. So, this research would use rule of law, justice and equity as an indicator about regulatory quality, participation in public policy as an indicator about stability of the political systems and e-governance as an indicator about effective government.

3.1.2. SUSTAINABLE DEVELOPMENT

Meeting the needs of the present without compromising the ability of future generations to meet their own needs (IISD, 2023).

4- Research Significance and Intended Contribution

Recently, public governance and its mechanism are considered to be one of the most important tools that assist in achieving SDGs. This research would help policy makers achieving SDGs through analyzing public governance mechanisms by concentrating on governmental multi-stakeholder through participation in public policy mechanism and make them involved in this process to achieve equity and justice. It would also help them eliminating the overlap or duplication between authorities and institutions through rule of law and new ways for effective implementation depending on e_governance that would all support achieving SDGs.

5- Governance and Sustainable Development

Public governance› principles have been employed as a tool to promote sustainable development. Many governments have adopted, at varying levels, the model of good governance based on the participation of citizens and non-governmental organizations in the political and decision-making process as an alternative to the traditional model in managing state affairs. In the same context, and in its description of governance in the public sector, the United Nations offers the elements of good governance which include that the management of state affairs be participatory, applying the rules of accountability and transparency that are characterized by justice and equity among members of society and commitment to apply the law (Albassam,2021), (ez-elarab, 2021)

Governance was defined as "the process of decision-making and the process by which decisions are implemented (or not implemented)". Governance was also defined in the report of the commission on global Governance as: "The sum of the many ways individuals and institutions, public and private, manage their common affairs. It is a continuing process through which conflicting or diverse interests may be accommodated and co-operative action may be taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interest (ez-elarab, 2021).

Good Governance is a complex process among all layers of citizens and groups where they have to adopt and mediate their differences and act according to the legal rules and obligations. It covers three dimensions of sustainable development. The economic dimension emphasizes the capabilities and the effectiveness of the governments to manage the limited resources to fulfill their minimum expectations. This requires transparency and accountability for managing natural resources and protecting the environment within the private and public-sector activities. The social dimension ensures the inclusion of all the groups within society to act and work without discrimination and promote tolerance towards society. It also includes also the political dimension denotes the lawfulness of the government and the accountability of the political elements of government and respect for the human rights and the rule of law. From this perspective, the concept of good governance emerged and became the approach for the SD (Sobol,2007). In 1992, the World Bank›s report entitled Governance and Development. governance is defined as "the manner in which power is exercised in the management of a country's economic and social resources for development" Which obviously determined the relation between governance and managing resources; either it is economic or human resources and the approach to the development (ramzy,2019).

Public services are provided by the state to citizens, including water and sanitation, health care, infrastructure, transportation, land registration systems, and licensing, among others. Citizens usually evaluate the quality of governance as a whole from their experience in accessing these services. Thus, provision of public services is the main channel of communication between citizens and public institutions as they represent the principles of good governance. It assures the issue of justice by providing efficient and effective basic services to all citizens, including the poorest groups. The link between the concept of justice and the provision of services is due to the fact that citizens' level of satisfaction with public services increases when services are provided in an equitable manner and to those most in need (Egypt human development

report, 2021).

By 2030, the new Egypt will achieve a competitive, balanced, diversified and knowledge-based economy, characterized by justice, social integration and participation, with a balanced and diversified ecosystem, benefiting from its strategic location and human capital to achieve SD for a better life to all Egyptians (Egypt vision 2016 ,2030). A set of key mechanisms of public governance include justice, participation, transparency and rule of law would help to achieve comprehensive SD through effective, transparent, responsive and accountable public institutions. These public institutions link between the state, citizens, the private sector and civil society organizations that helps boost growth, reduce poverty, and achieve stability (Egypt Human Development Report, 2021). The following section will discuss the main mechanisms of public governance and how it would affect achieving the SDGs in Egypt and comparing the Egyptian public governance practices with the MENA countries most of data are in 2020.

5.1. The Effect of Justice and Equity on SDGs

Voices have raised to focus on improving equitable access to justice to enable people, in particular the poor and marginalized groups, to claim rights and services (UNDP,2014). Justice and equity as a governance mechanism are an essential component of achieving SD goals. Equity ensures that everyone has access to the resources they need to live and the benefits of development are shared fairly among all members of society. On the other side, SDGs aimed at ending poverty, protecting the planet, and ensuring that all people can live in peace and prosperity. Moreover, the SDGs recognize the importance of justice and equity in achieving SD as the concept of governance in the public sector focuses on enhancing transparency and publicists seek to achieve the principle of justice and equity between individuals and organizations to develop government performance (Albassam,2021).

Justice and equity enhance achieving SDGs through Goal no.1 End poverty in all its forms everywhere, Goal no.2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture, Goal no.3. Ensure healthy lives and promote well- being for all at all ages, Goal no.4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all, Goal no.5. Achieve gender equity and empower all women and girls and Goal no.16 promote peaceful and inclusive societies, providing access to justice for all.

So, the first hypothesis will be:

- H1.1. There is a positive impact of justice and equity on achieving SDGs

According to social justice goal, By 2030, Egypt is a fair interdependent society characterized by equal economic, social, political rights and opportunities realizing social inclusion. A society that supports citizens' right in participation based on efficiency. UNODC organized a national workshop in collaboration with the Ministry of Justice in Egypt to discuss the topic of access to justice for victims and further enhance their technical capacities in this regard. Also, the USAID enabled Egypt's nationwide referral system to prevent and respond to violence against women and girls by training more than 3,000 service providers and increasing the number of women and girls receiving services each year from approximately 1,000 in 2015 to over 50,000 in 2020 (UN,2022).

TABLE (1): KEY PERFORMANCE INDICATORS FOR SOCIAL JUSTICE UNTIL 2030

S.N	Indicator	Current value	2020 target	2030 target
	Strategic results			
1	Geographical gap in human development index	0.086	0.06	0.043
2	GDP per capita (USD)	3436.3	4000	10000
3	Income and consumption distribution index	31	20	10
	Outcomes			
4	International rank of the gender gap index	129	100	60
5	Confidence in government indicator	60%	70%	80%
6	Geographical gap in completing primary education index	7	4	2
7	Geographical gap in child mortality rate	8.2	4	2
8	Geographical gap in the percentage of population under poverty line	17%	10%	5%
9	Percentage of female headed households living under poverty line	26.3%	12%	0%
10	Percentage of population under extreme poverty line	4.4%	2.5%	0%

Sources: SDS document

Quality Education goal, Egypt launched the Egyptian Knowledge Bank is the world›s largest digital library granting unlimited resources exclusively for Egyptians. Also, the Minister of Education and Technical Education, said that illiteracy in Egypt reached 23.8% at the end of 2022 in the age group 15 years and over, which was 29% in 2016. USAID provides technical, and higher education programs to improve the learning skills and workforce readiness of women and girls. Also, it provides scholarship programs to expand access to high-quality education for youth and implement intergenerational literacy programming in rural areas.

TABLE (2): EDUCATION ENROLMENT INDICATORS IN EGYPT

Governorate	"Net enrolment rate (%) 2019/2020"							Dropout Rate (%) Between 2017/2018 and 2018/2019	
	Pre-primary education	Primary education	Lower secondary education	Secondary education - general	Secondary education - technical	Secondary education - commercial	Secondary education - Agricultural	Primary Stage	Lower secondary Stage
Total	25	100.2	85.3	28.5	13.6	11.8	3.2	0.3	2.7

No poverty goal, Egypt also, issued the national initiative «Hayah Karema» endorsed by H.E President Abdel Fattah Al-Sisi, President of the Arab Republic of Egypt. It is a multi-faceted and integrated initiative in its features. This initiative stems from a civilized responsibility and a human dimension as its goal is greater than just being an initiative aimed for improving the living conditions of citizens and keep their dignity and rights to have a decent life in a sustainable way by providing an integrated package of services including various health, social, and economic projects.

Gender equity, the United States Government, through the U.S. Agency for International Development (USAID), is working to reduce gender disparities, empower women and girls to help Egypt build an economically stable, sustainable future. Despite the efforts of USAID, the Egyptian government faces significant hurdles related to equity particularly in terms of gender gaps, violence against women, rapid rates of population growth, and high levels of poverty. In 2020, Egypt ranked 134th out of the 153 countries in the Global Gender Gap Index. It ranked

140th out of 153 countries in women's economic participation and opportunity. Only 18% of the working-age women are participating in the economy, compared to 65% of men. Also, USAID supported Egypt's technical secondary schools. It helped over 4,000 young women access jobs following graduation from technical and vocational schools and supports female entrepreneurs in developing their businesses and improving productivity through training, business incubators, career fairs, and business-to-business matchmaking events

Peace, justice and strong institutions: MCIT tends to launch several projects to automate the legislative entities services involved in the system with the aim of developing an integrated system to facilitate procedures, improve and accelerate services for citizens, speed up the implementation of judgments and ensure justice. These projects including Citizen Security and Law Enforcement, Prompt Justice Initiative, Law Enforcement, Developing Supreme Constitutional Court, Achieving Personal Status Documents, Administrative Prosecution Authority Lawsuits, Electronic Management, Automating the Legal Departments at the Ministry of Justice, Automation of Family Courts (El-Gohary, 2022)

Justice and equity could be measured by many indicators like the Human Development Index (HDI), the Gender Development Index (GDI), the Gender Inequity Index (GII) to be able to Compare the Egyptian efforts in the field of justice and equity as one of the public governance mechanisms to the MENA countries practices.

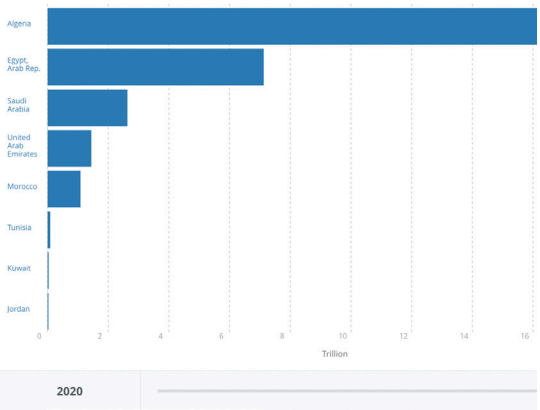
Human Development Index (HDI): is a summary measure for assessing long-term progress in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living.

Country	Most Recent Year	Most Recent Value
Algeria	2021	76
Egypt, Arab Rep.	2021	70
Jordan	2021	74
Kuwait	2021	79
Morocco	2021	74
Saudi Arabia	2021	77
Tunisia	2021	74
United Arab Emirates	2021	79

FIGURE (2): LIFE EXPECTANCY AS AN INDICATOR OF LONG AND HEALTHY LIFE IN EGYPT AND MENA COUNTRIES – WB INDICATORS

Source: https://data.worldbank.org/indicator/SP.DYN.LE00.IN?end=2020&locations=DZ-EG-TN-KW-AE-MA-JO-SA&start=2020&view=bar

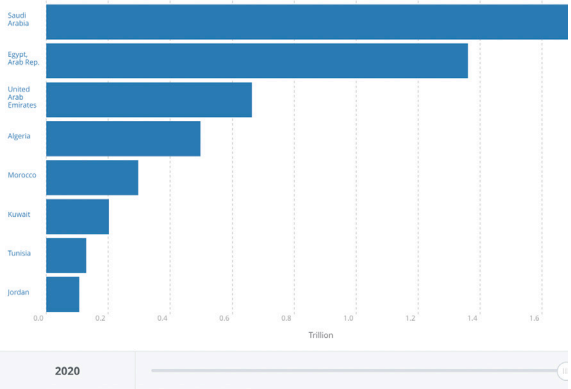
Standard of living: is measured by Gross National Income (GNI) per capita or purchasing power parity (PPP) conversion rates



Country	Most Recent Year	Most Recent Value (Millions)
Algeria	2022	19,408,812.00
Egypt, Arab Rep.	2022	7,842,500.00
Jordan	2022	31,604.83
Kuwait	2022	39,646.00
Morocco	2022	1,188,141.53
Saudi Arabia	2022	2,984,636.02
Tunisia	2022	94,387.06
United Arab Emirates	2022	1,623,516.81

FIGURE (3): GPD AS AN INDICATOR OF STANDARD OF LIVING IN EGYPT AND MENA COUNTRIES – WB INDICATORS

Source: https://data.worldbank.org/indicator/NY.GDP.MKTP.KN?end=2020&locations=DZ-EG-TN-KW-AE-MA-JO-SA&start=2020&view=bar



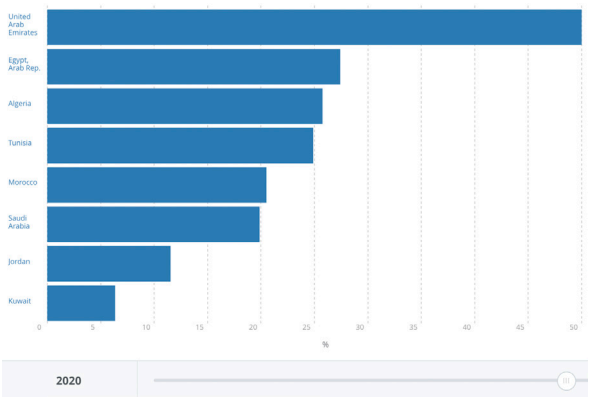
Country	Most Recent Year	Most Recent Value (Millions)
Algeria	2022	593,925.51
Egypt, Arab Rep.	2022	1,675,505.49
Jordan	2022	126,513.44
Kuwait	2022	249,085.37
Morocco	2022	363,135.45
Saudi Arabia	2022	2,158,310.85
Tunisia	2022	154,249.20
United Arab Emirates	2022	835,435.92

FIGURE (4): PPP AS AN INDICATOR OF STANDARD OF LIVING IN EGYPT AND MENA COUNTRIES - WB INDICATORS

Source: https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD?end=2020&locations=DZ-EG-TN-KW-AE-MA-JO-SA&start=2020&view=bar

Gender Inequity Index (GII): it could be interpreted as the loss in human development due to inequity between female and male achievements in the three GII dimensions which are reproductive health, empowerment, and economic activity. For an example,

Empowerment: is measured by the share of parliamentary seats held by women and attainment in secondary and higher education by each gender (UN. 2018)



Country	Most Recent Year	Most Recent Value
Algeria	2022	8
Egypt, Arab Rep.	2022	28
Jordan	2022	12
Kuwait	2022	6
Morocco	2022	24
Saudi Arabia	2022	20
Tunisia	2022	26
United Arab Emirates	2022	50

FIGURE (5): WOMEN SEAT'S PERCENTAGE IN PARLIAMENTS AS AN INDICATOR OF GENDER DEVELOPMENT INDEX IN EGYPT AND MENA COUNTRIES – WB INDICATORS

Source: https://data.worldbank.org/indicator/SG.GEN.PARL.ZS?end=2020&locations=DZ-EG-TN-KW-AE-MA-JO-SA&start=2020&view=bar

5.2. The Effect of Rule of law on SDGs

Good governance is a foundation for SD and the rule of law at the national and international levels are essential for achieving SD including sustained and inclusive economic growth, social development, environmental protection (General Assembly resolution 288/66). It has been shown that countries adhering to the rule of law have higher levels of growth and investment through the protection of property rights. In addition, it can promote equity, gender equity for example, the protection of legal identity and more equitable access to resources for both women and men. Effective implementation of rule of law mitigates violent crime and protect citizens (UNDP,2014).

Rule of law is relevant to all three dimensions of SD: economic, social and environmental by providing stable and transparent legal regimes. It encourages economic development by ensuring equal opportunity, equitable access to basic services. It promotes social development by providing stable and transparent legal regimes and ensures environmental sustainability through strengthening the laws to protect the environment and ensure proper management of natural resources (International Development Law Organization,2030 .(2015 agenda assure a clear understanding that human rights, peace and security, and development are deeply interlinked and mutually reinforcing. Through its entirety, the importance of enhancing access to justice, ensuring safety and security, and promoting human rights for SD are reflected (UN,2023). Rule of law as a governance mechanism enhance accountability that reduce corruption. This, in turn, can help to build public trust in government institutions and promote sustainable development.

This enhance achieve goal of SDGs no. 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. Goal 13. Take urgent action to combat climate change and its impacts, Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development, Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

So, the second hypothesis will be:

- H1.2. There is a positive impact of rule of law on achieving SDGs

The following table shows the improvement in Egypt's performance in terms of the Regulatory Quality index which is due to the government's adoption of a package of policies that help strengthen the rule of law. Egypt has taken a number of measures related to both the promotion of investment and development of the private sector, such as issuing the Investment Law (Law No. 72 of 2017) which provides facilities for the private and the Restructuring, Preventive Composition and Bankruptcy Law (Law No. 11 of 2018). Egypt has also made major efforts to support micro, small and medium-sized enterprises during the past few years (Egypt human development report, 2021).

TABLE (3): EGYPT PERFORMANCE IN RULE OF LAW IN THE WORLD BANK WORLDWIDE GOVERNANCE INDICATORS

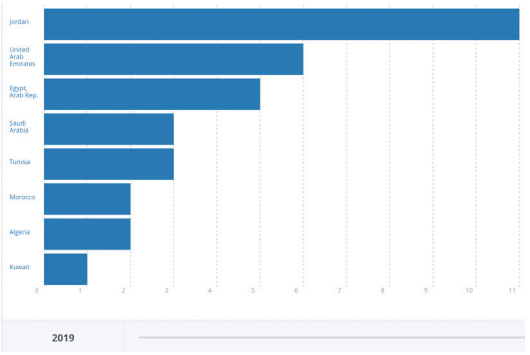
Rule of Law	49.67	41.78	40.38	33.33	29.33	31.25	32.69	32.69	37.5	37.98
Egypt's performance on the World Bank's Worldwide Governance Indicators, 2010-2019 (percentile rank)										
Year/ Index	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019

Gender equity: Egypt has issued a lot of laws and regulations that protect women rights like

- Law No. 10 of 2004 establishing family courts (as a specialized court).
- Law No. 11 of 2004 establishing the Family Insurance System Fund, affiliated to Nasser Social Bank.
- Law No. 4 of 2005 raising the age of custody to 15 years.
- Law No. 12 of 2003 issuing the Unified Labor Law and what it includes of many rights for working women, their children, their families, their health, and so on.
- Law No. 95 of 2003 amending the Egyptian Penal Code No. 58 of 1973 to increase penalties for sexual assault on women.
- Amending some provisions of the law regulating the exercise of political rights and the law of the National Elections Commission to comply with the constitutional amendments by allocating a quota of no less than 25% of parliament seats for women on a permanent basis (Law No. 140 of 2020).

legal rights: Egypt has issued a lot of laws and regulations in that field like;

- Penal Code, Law No. 189 of 2020 was issued to amend some provisions of the Penal Code and stipulate the criminalization and punishment of bullying.
- Industry, innovation and infrastructure, Egypt issue the Fighting information technology crimes law. In the health SDGs, Egypt issues the Medical Responsibility Law and Universal Health Insurance Act, Law No. 23 of 2012 regarding the health insurance system for women with breadwinners mandated health insurance for women who are breadwinners and recognizing their presence in society.
- Furthermore, in some countries of the MENA region comparing the strength of legal rights to highlight the current Egyptian situation. The following graph show the results.



Country	Most Recent Year	Most Recent Value
Algeria	2019	2
Egypt, Arab Rep.	2019	5
Jordan	2019	11
Kuwait	2019	1
Morocco	2019	2
Saudi Arabia	2019	3
Tunisia	2019	3
United Arab Emirates	2019	6

FIGURE (6): STRENGTHEN OF LEGAL RIGHTS AS AN INDICATOR OF RULE OF LAW IN EGYPT AND MENA COUNTRIES – WB INDICATORS

Source: https://data.worldbank.org/indicator/IC.LGL.CRED.XQ?end=2019&locations=DZ-EG-TN-KW-AE-MA-JO-SA&start=2019&view=bar

5.3. The Effect of E_Governance on SDGs

Governance is considered an important factor for public and private institutions to able them improving their performance and increasing the quality of services they provide (Ez-elarab, 2021). Also, new technologies in e_governance promise to deliver great benefits in achieving SD as they change the way people live, work, interact, move and experience in countless ways (Niestroy,2015). It represents a national asset and a tool to create sustainability, wealth and value to promote competitiveness, and the direct contribution to create knowledge and digital economies overall the world. It can also increase the engagement and participation of citizens in the decision-making process, while the classic methods are often time-consuming and expensive. Consequently, digital transformation supports achieving SDGs through inclusive data collection and analyze it by the computational techniques (ElMassaha. & Mohieldin, 2020).

Digital transformation is defined as "a way to rebuild business models following the needs of customers by using new technologies. Digital transformation plays an important role in achieving SDGs and makes the government's services delivery more efficient. E-governance enhances citizens› confidence in the performance of government agencies and its› applications are important and helpful tools towards achieving advanced levels of governance (Albassam,2021). Digital transformation is gradually transforming governments and businesses, and making them more competitive, as well as it offers several opportunities for economic growth and prosperity. Therefore, it becomes a mandate for governments to shape the future, as government officials, business leaders and policymakers are more aware of the technology value and its importance for achieving the desired socioeconomic development (El-Gohary, 2022).

E-governance and SD are closely related concepts, as the use of technology in government operations can contribute to SD in several ways. Firstly, e-governance can improve the efficiency and effectiveness of government operations, reducing the need for paper-based systems and increasing the speed and accuracy of decision-making. This can lead to cost savings and reduced resource consumption, contributing to environmental sustainability

This enhance implement goal of SDGs no 12. Ensure sustainable consumption and production patterns

Secondly, e-governance can promote transparency and accountability in government operations, allowing citizens to participate more fully in decision-making processes and hold government officials accountable for their actions. This can lead to more responsive and inclusive governance, contributing to social sustainability.

This enhance achieve goal of SDGs no 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

Thirdly, e-governance can facilitate the delivery of public services, such as healthcare and education, to remote and underserved populations. This can contribute to economic sustainability by promoting access to education and healthcare services, which are essential for economic development.

This enhance achieve goal of SDGs no.8 Promote productive employment and decent work, Goal 3 Ensure healthy lives and promote well-being for all at all ages, Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all and Goal 9. Which Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

So, the third hypothesis will be:

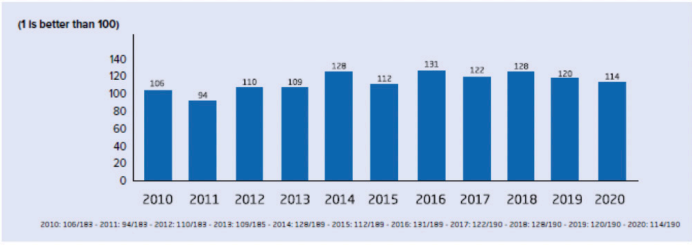
- H1.3. There is a positive impact of e_governance on achieving SDGs

The following table shows the improvement in Egypt's performance in terms of the World Bank's Worldwide Governance Indicators (Egypt human development report, 2021).

TABLE (4): EGYPT PERFORMANCE IN GOVERNMENT EFFECTIVENESS IN THE WORLD BANK WORLDWIDE GOVERNANCE INDICATORS

Government Effectiveness	42.11	35.07	32.22	20.85	20.19	22.12	27.88	29.33	30.77	36.54
Egypt's performance on the World Bank's Worldwide Governance Indicators, 2010-2019 (percentile rank)										
Year/ Index	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019

Figure (7) shows the improvement in Egypt's performance on the World Bank's Ease of Doing Business Index, which focuses on a set of dimensions related to the regulatory environment for business through a set of indicators based mostly on opinion surveys on issues related to start a business, property registration, access to electricity, cross-border trade and other issues that affect the business environment (Egypt human development report, 2021).



Source: World Bank (multiple years) Doing Business Report.

FIGURE (7): EGYPT RANKING ON THE WORLD BANK'S EASE OF DOING BUSINESS INDEX

The Egypt's digital transformation strategy focuses on developing infrastructure, investing in human capital, creating a conducive business environment, supporting digital entrepreneurship especially by women and creating smart cities and communities with the aim of promoting innovative technologies and digital transformation (Daily News,2019). Therefore, Egypt has invested heavily in building its national infrastructure to be able to effectively use information and communications technology (ICT) for economy's development and growth, as well as, expand the economy's disposition in both global and regional economies. (El-Gohary, 2022). The following paragraphs shows how governance affect achieving SDGs in different sectors.

Peace justice and strong institutions, In 2018, Egypt launched the Egypt Government Excellence Award to encourage the spirit of competition and excellence between employees and between government entities and to achieve the goals of the 'Sustainable Development Strategy: Egypt Vision 2030'.There are six awards in total: The Distinguished Institution Award, the Distinguished Unit, Government Services, Institutional Innovation and Creativity, Distinguished Leaders, and Individual Excellence, and they will be awarded periodically (Egypt Award for Governmental Excellence,2023).

Education and Training, the Ministry of Education and Technical Education tend to transform the educational system in Egypt, with a budget of 500$ million in order to support the strategy of reforming education. This strategy aims to adopt technologies such as; interactive smart boards, online simulations, tablets and a digital library, to transform the educational system gradually to digital learning materials rather depending on textbooks such as, Egyptian Knowledge Bank which including several digital materials for higher and pre-university education.

Gender equity, various programs are launched by both MCIT and the private sector – Google and Microsoft – to support, qualify and empower women using the various tools of ICT in all life aspects to bridge the growing gap between the workforce and the required skills in the labor market. Such as; Qodwa-Tech initiative, Maharat training program, Hack4Girls initiative

Health, several digital projects are implementing in the health sector with the aim of ensuring the citizens' accessibility to the healthcare services, improving its scope and quality, saving the patients' time and money and the financial sustainability for health coverage services. These projects including Universal Health Insurance program, National Network for Public Health Treatment, Clinical Laboratory Information Systems project and many mobile applications that help in spreading health awareness.

Industry, Innovation and Infrastructure, the ministry of trade and industry started to digitalize the industry sector. It has Launched the "Digital Transformation and Technology Support Program Action Plan 2020-2019" through the Industrial Modernization Centre (IMC), to develop fintech and digital transformation in companies. Also, The Ministry of Electricity and Renewable Energy has adopted a new plan in collaboration with some Chinese companies to develop a smart energy grid based on innovative solutions in the communication and information technology fields (El-Gohary, 2022).

However, all the Egypt's achievements in digital transformation field, Egypt is still the early stages and has lower levels of investments of ICT that focused SDGs. Egyptian government has to give more attention to the ICT industry, innovation, research and development. Egypt's government must enhance the internet speed. There is a need to activate the use

of information technology and artificial intelligence in all sectors, to utilize them in data analyses and decrease costs. There are big digital illiteracy and low investments in information technology sector particularly in the SDGs related-areas (El-Gohary, 2022).

In an attempt to compare the ease of doing business as one of e-governance practices in some countries of the MENA region with the current Egyptian situation, figure (8) shows the results. According to (ESCP Business School›s report in 2021, Egypt is one of the most advanced countries in the Middle East and North Africa on issues related to digital transformation and financial inclusion (Egypt human development report, 2021).

Source: World Bank (2020) Doing Business Index.

FIGURE (8): EGYPT AND MENA COUNTRIES' RANKING ON THE EASE OF DOING BUSINESS INDEX, 2020

5.4. The Effect of Participation in Public-Policy on SDGs

Public consultation can help to improve both the quality of regulation and governments' responsiveness to citizens and businesses (OECD,2011). This could be happened through governance in the public sector that contributes to human development by expanding the scope of participation and capacity-building for various cadres of all categories who are able to tackle tasks and jobs. (United Nations, 2015). Governance means the involvement of many stakeholders in the decision-making process and implementation (Sobol,2007). In this regard, civil society and the private sector have an enormous role to support the state government. Promoting such participatory relation between the three major players in good governance (the government, private sector, and civil society) is a must for good governance (Ramzy,2019). Therefore, it can be said that countries that score low levels in good governance indicators achieve lower levels than other countries in development indicators (Albassam,2021).

In fact, when society is not engaged in the decision-making process of local development, it is an open field for corruption. Creation of partnership and dialogue between the local community and government is believed to be of critical importance for achieving SD. If people are encouraged to perform as actors in local development, they would feel responsible for the vision and directions of development set in local policy (Sobol,2007). Participation enhance trust between citizens and the government, and lead to better development outcomes through the participation of different groups such as women, young people, people with disabilities, and the poor (Christopoulos, et al, 2012), (UNDP,2014), (Niestroy,2015), strengthening the role of participation has considerable potential for substantially improving institutional capacities and hence, public service delivery and achieve SDGs (Mohamed, 2022),(Cassar,2022).

Participation is both a right, and a means to more SD. When communities are actively engaged in their own development processes, project outcomes will be better targeted to local needs and results will be more sustainable. There is a strong positive relationship between the degree of political participation by citizens and the achievement of advanced levels in the quality of governance and economic development. The more positively this affects the level of governance quality and the achievement of sustainable development (Albassam,2021). By involving stakeholders in public policy processes, governments can better understand the needs and perspectives of different groups and incorporate them into policy decisions. This can lead to more effective and sustainable policies and programs that are more likely to be implemented successfully. Furthermore, participation in public policy can promote ownership and a sense of responsibility among stakeholders, leading to greater support and engagement in the implementation of policies and programs. This can contribute to the long-term sustainability of development initiatives.

This enhance achieve goal of SDGs no 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

So, the fourth hypothesis will be:

- H1.4. There is a positive impact of participation in public policy on achieving SDGs

There are many forms of participation. It may be through direct election or partial representation of citizens, with representatives of the people in the decision-making circle such as parliaments, people's assemblies, and legislative assemblies as well (Albassam,2021). Over recent years, Egypt has implemented many new practices to help boost participation and transparency. For example, since fiscal year 2015/2014, the Ministry of Finance has issued a citizen's budget as an effective tool for communicating with the public. It aims to involve citizens in preparing the state's general budget and to enhance confidence between the citizen and the state by disclosing budget items and giving information on the most important directions of fiscal policy, social programs, and economic reforms in a simple way that all citizens can understand (Egypt human development report, 2021).

Egypt has also worked for increasing the participation through different forums like the national and international world youth forums with its 5 versions that aim to collect youth from different cultures and share their experiences and knowledge and make sessions related to different topics like policy, SD, employment and entrepreneurship. The Egyptian government has also made the economic forum to increase awareness about the importance of public participation in the public policy decisions related to economic strategy and the investment situation and the role of the government to increase the national GDP and economic growth and declare any obstacles it faces during implementing its strategy to make more transparency with the public opinion.

In an attempt to compare the level of Egyptian citizen participation in public policy as one of governance mechanisms with some countries of the MENA region. It was found that across the MENA region, young people's trust in government and public institutions is low and their participation in the policy cycle and their representation in state institutions are limited, with people under 40 years of age representing only 16% of members of parliament on average. At the same time, young people demonstrate agency by participating in the public debate through non-institutionalized channels and contributing to community life, via civil society

organizations and through volunteering activities, both online and offline. Also, people under 40 years of age represent only 16.4% of members of parliament on average in the MENA region compared to compared with 22% in OECD countries. (OECD, 2021).

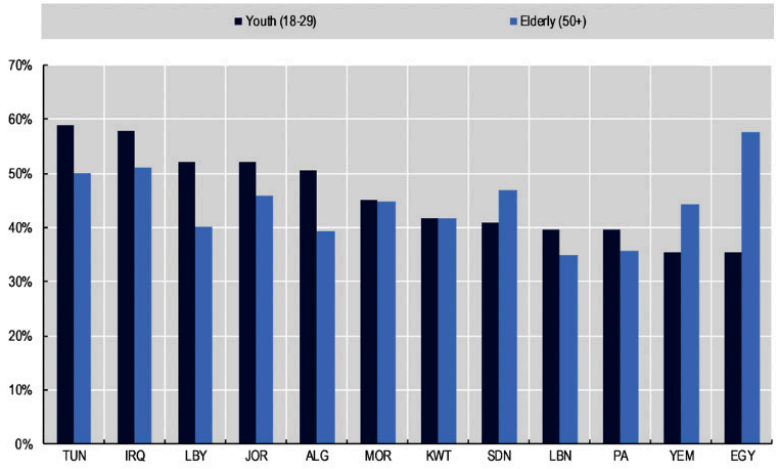


FIGURE (9): INTEREST IN POLITICS IN THE MENA REGION BY AGE GROUP, 2019-2018

Source: OECD, 2021, Participation and representation of young people and youth stakeholders in public and political life

In terms of youth age requirement to participate in the national elections, it is 28 years in 25 years in Egypt, Jordan, 23 years in Tunisia and 18 years in Morocco. In Jordan, the minimum age to run for parliament was reduced from 30 to 25 years as part of a broader constitutional reform in 2022.

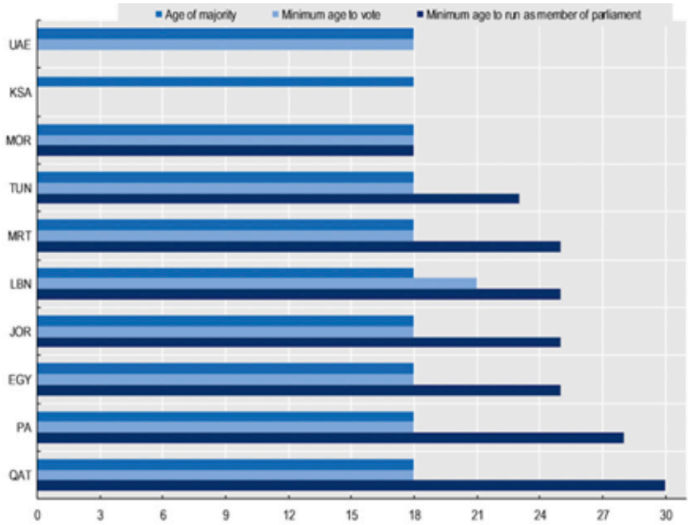


FIGURE (10): MINIMUM AGE REQUIREMENTS IN PUBLIC AND POLITICAL LIFE ACROSS THE MENA REGION

Source: OECD, 2021, Participation and representation of young people and youth stakeholders in public and political life

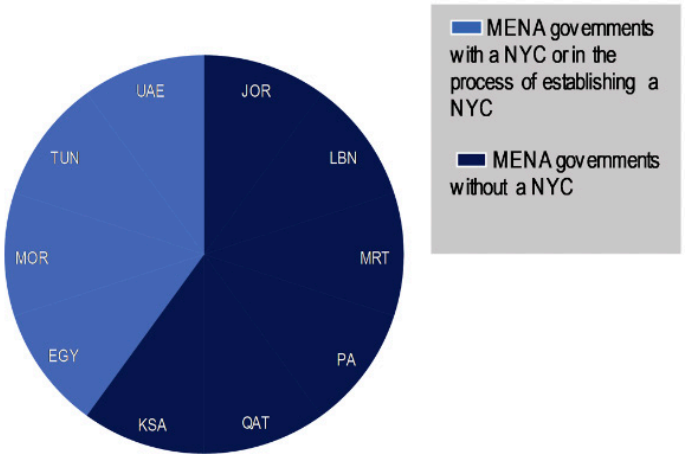


FIGURE (11): NATIONAL YOUTH COUNCILS IN THE MENA REGION

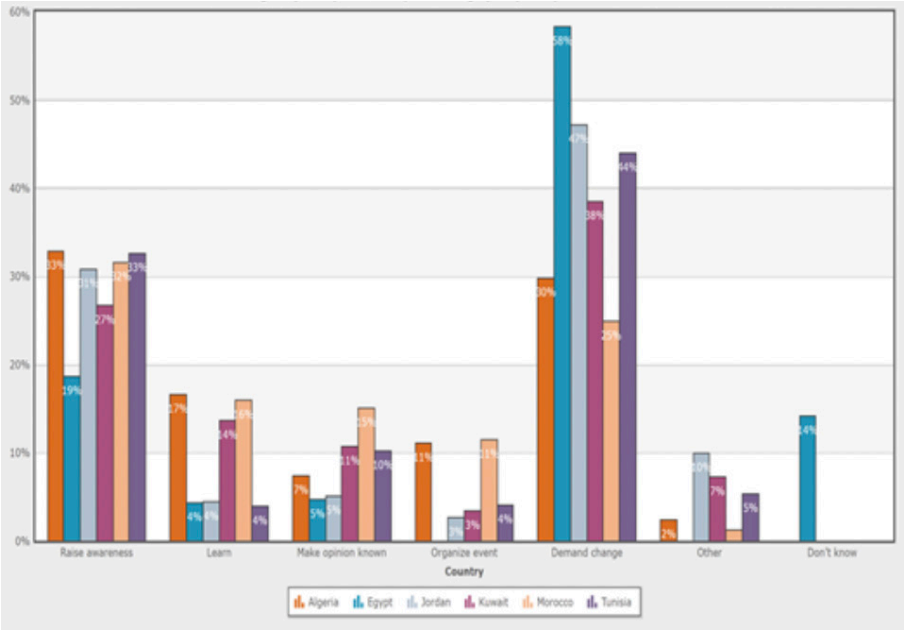


FIGURE (12): YOUTH PARTICIPATION IN PUBLIC ACTIVITIES - ARAB PAROMETER

Conclusion

Governance is a mean and not an end in itself. Adopting and applying governance mechanisms such as participation, rule of law, justice and equity and e_governance are means to enhance the efficiency of the public sector which resulted in the optimal use of available resources in sustainable way. The four hypotheses from H1.1 to H1.4 are accepted as all public governance mechanisms have a positive impact on achieving SDGs in different sectors.

Justice and equity lead to increase equitability in different sectors. It decreases poverty ratios and provide citizens with their right of decent life and enhance building strong communities with equal opportunities. It was also found that e_governance enhance the effectiveness and efficiency in using resources like paperless usage and depends more on technology that reduce a lot of time, effort and costs. It also has a great impact on increasing the quality of life and services provided to citizens and build sustainable projects, institutions and cities. One of the most important steps to enhance the use of e-governance is to strengthen the legislative and regulatory structure. It was found that Rule of law has the power to protect the use of resources and impose penalties upon damages. It enhances equitability between all citizens and facilitate a lot of matters that represent an obstacle to achieve SDGs. Participation in public policy also enhance SD initiatives by achieving more levels in transparency. The more comprehensive and expanded participation takes place in accordance with a constitutional framework, the positive results will be in enhancing levels of SD.

Recommendations

This research recommends some issues that would solve the current weakness points in the Egyptian public governance practices and would help the Egyptian government and policy makers to get benefit from some public governance tools to enhance implementing the Egyptian SDGs. It recommends increase the authorities given to the National Institute for Governance & Sustainable Development to be an independent governmental entity specialized at ensuring the implementation of Egypt vision 2030. This entity has to participate in setting budgets related to implementing SDGs and giving opinions about re-direct the financials spend on national projects and programs that are related to the SDGs. So, it has to make sure of the consistency between the implementation plans and the Egypt vision 2030, collecting database about the implementations ratio, making trainings and building capacity for its employees about how to monitor the performance of different ministries and governorates, how to analyze data through KPIs and writing quarterly reports. It could be affiliated with the Presidency institution to have the upper hand on all governmental entities and achieve coordination between them and the civil society, business organization and monitoring and regulating entities to get their feedback and put any deviation on the track.

Egyptian policy makers have to increase investment in the human capital and training them on information and communication technologies. It also has to raise the awareness of SD among all governmental sectors not only through initiatives but also by increase the engagement of employees in achieving SDGs by setting clear strategic objectives of each institution and make all its employees involved in achieving these goals and teach them how its main strategy is divided into sub-objectives. This would be related also to the performance and programming and budget (PPB) which could be an effective tool to guarantee the effective applications of

PPB and provide opportunity to correct any deviations that could be happened immediately.

Also, it would be helpful tool to make a general policy coherence and an institution description like job description that is clear enough and very obvious to determine the roles of each institution according to its objectives, authorities in laws and regulations. It should be declared and announced to overcome any overlap of authorities that could be happen due to the current some of ambiguous cases that would affect the citizens› interest. Egypt's government has to improve the digital infrastructure through supporting the legislative and regulatory structure by enhancing digital awareness and providing data bases for all sectors that helping them in the development strategy and to reduce the digital illiteracy particularly in the SDGs related-areas and increase the internet speed to cope with the global rate. Egypt also has to promote the participation of young people and youth stakeholders in public life, it has to deliver relevant, clear and accessible public communications , reviewing, where appropriate, voter registration rules and minimum age requirements for the participation in public and political life; increasing age diversity in legislative and executive bodies, engaging youth stakeholders in all stages of the public policy cycle and encouraging civic engagement and participation among young people

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RESEARCH PAPERS IN ENGLISH

External Debt and Economic Growth in MENA Countries: Does Governance Matter?

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Abstract

This paper aims at examining the relation between external debt and economic growth in selected countries in the Middle East and North Africa (MENA) region over the period (1996-2021). It also aims at exploring how governance indicators affect such relation, by applying tools of panel co-integration analysis. The results of the Pedroni co-integration test revealed the existence of a long run relation among the variables examined in this study. Furthermore, the results of the dynamic OLS signified a positive significant impact of external debt on economic growth over the studied period, in one of the two estimated specifications, but the magnitude of the impact was very weak. Moreover, adding the governance indicator mildly improved such relationship. Accordingly, this implies that the MENA countries are in need to design alternative policies to enhance their economic growth and to improve their governance performance.

Keywords: External debt – Governance indicators – Economic growth – MENA countries – Panel co-integration

أثر الحوكمة على العلاقة بين الدين الخارجي والنمو الاقتصادي في دول الشرق الأوسط وشمال أفريقيا

مستخلص:

تهدف هذه الورقة إلى دراسة العلاقة بين الدين الخارجي والنمو الاقتصادي، واختبار تأثير مؤشرات الحوكمة على تلك العلاقة، في مجموعة من دول الشرق الأوسط وشمال أفريقيا خلال الفترة (١٩٩٦-٢٠٢١). واعتمدت هذه الدراسة على نموذج التكامل المشترك للبيانات المجمعة panel co-integration analysis لدراسة العلاقة بين المتغيرات. وأشارت نتائج اختبار Pedroni للتكامل المشترك إلى وجود علاقة طويلة الأجل بين متغيرات الدراسة، كما أشارت نتائج المربعات الصغرى الديناميكية إلى وجود تأثير إيجابي ضعيف للدين الخارجي على النمو الاقتصادي في واحد من النموذجين المقدرين في هذه الدراسة. علاوة على ذلك، ترتب على إضافة مؤشرات الحوكمة في النموذج تحسن طفيف في العلاقة بين الدين الخارجي والنمو الاقتصادي. وفي ضوء تلك النتائج، يجب على دول الشرق الأوسط وشمال أفريقيا صياغة سياسات بديلة لتعزيز نموها الاقتصادي وتحسين أداء مؤشرات الحوكمة لديها.

الكلمات المفتاحية: الدين الخارجي – مؤشرات الحوكمة – النمو الاقتصادي – دول الشرق الأوسط وشمال أفريقيا – نموذج التكامل المشترك (المتناظر)

1- Introduction

Achieving "sustained and inclusive" economic growth lies at the core of the Sustainable Development Goals (SDGs), as manifested in the articulation of its SDG 8. Since external debt has been one of the significant issues that faced developing countries, especially during the past decade, its impact on economic growth is important to examine. Moreover, it is of paramount importance to investigate how the performance of the MENA countries in the arena of governance indicators affected the relationship between external debt and economic growth.

According to the World Bank, external debt is defined as "the debt owed to non-resident creditors and repayable in foreign currency, goods, or services by public and private entities in the country" (World Bank, 2017). External debt is a major source of finance for the countries that do not have sufficient domestic resources to cover the saving-investment gap and to finance the fiscal deficit. Governments of the developing nations borrow from foreign creditors with the aim of boosting the economic growth of their nations through using those funds in financing the development plans that could not be achieved with the existing insufficient domestic resources. The extent to which external debt boosts countries' economic growth performance has been one of the controversial issues between scholars since the debt crisis in the 1980s. Some argue that external debt has a positive effect on economic growth if it is devoted to productive activities that boost the welfare of nations. Others argue that external debt hinders economic growth due to the huge debt service obligations (Siddique et al., 2016). Finally, it is worth noting that governance structures are important for enhancing the delivery of the SDGs in different countries including economic growth. Moreover, any nation will not be able to achieve the objectives of the SDGs without strong institutions and effective governance structures that are based on transparency, accountability and rule of law.

This research is concerned with examining the relationship between external debt and economic growth in the MENA region countries over the period 1996 till 2021. It is worth noting that some countries in the region resorted to relying on external debt, especially in the aftermath of 2011, where they signed different loan agreements with the International Monetary Fund (IMF), in order to boost confidence in their economies and strengthen their weakened fundamentals in light of the political upheaval that they encountered. For instance, Tunisia signed a Standby agreement with the IMF in 2013 and an Extended Fund Facility in 2016. Moreover, both Egypt and Jordan signed extended fund facilities in 2016, where Jordan also opted for a Stand-by agreement in 2012. The same goes for Morocco where a Precautionary and Liquidity Line were agreed upon with the fund in 2012 (Mosallem, 2015). Some of these agreements were primarily targeting the enactment of structural reforms that have the end goal of achieving macroeconomic stabilization and growth. It is also important to highlight how the increase in debt levels could act as a constraint on the developing countries' attempts towards achieving their targeted economic growth rates. Accordingly, it is important to examine the role of external debt in affecting economic growth.[1]

Moreover, the figures incorporated in the SDGs index report for Arab countries indicated that seven countries out of the ones included in the study face major challenges in SDG

[1] *Debt as an Obstacle to the Sustainable Development Goals, Available at: https://www.un.org/development/desa/en/news/financing/debt-as-an-obstacle-to-sdgs.html*

8 of economic growth, where they are either stagnating or achieving moderate increases (UNDP, 2022). Finally, the examination of the performance of the countries under study in the selected governance indicators reveals that all countries recorded on average negative figures for these indicators over the years under study, except for Jordan. (World Bank, 2022).

Based on what is mentioned above, this study adds to the existing literature by examining the relationship between external debt and economic growth in the MENA region and investigating the role of governance in affecting this relationship. The main research questions that will be addressed in this paper are: what was the relationship between external debt and economic growth in MENA countries over the period (1996-2021)? And how did the governance indicators affect the relationship between external debt and economic growth?

The structure of the paper is as follows: after the introduction, the theoretical and empirical literature will be demonstrated in section 2 and then section 3 will include descriptive analysis and stylized facts about external debt in MENA region countries. Sections 4 and 5 will address the model specification, methodology and estimation results, respectively. Finally, the paper will end with some concluding remarks and the policy implications.

2- Literature Review

One of the debated issues in economics is the relation between external debt and economic growth. Despite the theories that have been put to examine this relation, researchers did not manage to agree on whether it is a positive or a negative one. Furthermore, empirical studies reached different results for different regions and countries. Hence, this paper will first present the various theories tackling this issue and also demonstrate the relationship between governance and economic growth. Then, it will introduce the different studies applied to various countries and regions using different econometric techniques to test such relationships.

2.1. Theoretical literature

The theoretical side that tackles the relation between external debt and economic growth includes theories that argue that there exists a positive relation between external debt and economic growth and other theories that argue that there exists a negative relation between the two variables. Concerning the theories that argue that there exists a positive relation between external debt and economic growth, the Harrod-Domar growth model emphasizes the role of savings and capital accumulation in promoting economic growth. Thus, external debt can be used to fill the saving- investment gap and enhance the nation's economic growth which relies on its savings level and capital output ratio. Based on the work of Chenery and Strout (1968), the dual gap model also emphasizes the role of savings in promoting the domestic investment and growth. From a theoretical point of view, savings are expected to be equal to investments but in reality, savings do not cover investments and thus, savings are insufficient to stimulate development. The dual gap model assumes that the majority of the developing countries do not have sufficient level of domestic savings to stimulate their economic growth. As a result, those nations go for foreign exchange in order to finance intermediate goods and capital goods with the aim of fostering their economic growth. Therefore, external debt can be used to enhance growth through filling the saving-investment gap and the foreign exchange gap (Onakoya and Ogunade, 2017). However, the savings gap

theory has been largely discredited empirically because capital inflows promote growth in several ways including: the conditionality of lenders, imposing greater market discipline on policy makers, providing a cheaper source of credit than domestic funds, etc.

In contrast to the previous theories, other theories argue that external debt affects economic growth negatively. The debt overhang theory postulates a negative relation between external debt and economic growth as the accumulated debt discourages investment because private investors expect to be taxed heavily, which means that external debt acts as a tax disincentive for private investors. This is because when the country is faced with high debt and huge debt service payments, investors expect that any future income they gain will be taxed heavily by the government with the aim of raising funds to finance the debt service payments. This acts as a tax disincentive for investors and discourages them from allocating funds for investment in the overall economy which will be associated with retarding the economic growth of the nation (Iliya and Tahir, 2017).

The over-crowding out effect theory emphasizes that external debt affects economic growth negatively. The intuition behind the over- crowding out effect theory is that the accumulated debt service payments will crowd out investments, whether public investments which include expenditure on social investments such as health and education that are vital for promoting the economic growth of the nation, or private investments (Iliya and Tahir, 2017; Senadza, 2017). This is because the nation uses the foreign exchange to repay its debt obligations which reduces the revenues available for the domestic economy to stimulate investment and growth (Cohen, 1993).

The liquidity constraint hypothesis or import compensation effect argues that high debt obligations require enough inflow of foreign exchange to service the debt. Debt servicing may be challenging for a nation when it faces low exports, low capital inflows and inadequate reserves of foreign exchange. Therefore, if the country suffers from inadequate reserves, it may resort to devaluating or depreciating the national currency or restricting the imports which will increase the prices of capital goods and impede the economic growth of the nation.

The debt Laffer curve theory argues that there exists a nonlinear relation between external debt and economic growth as it argues that external debt stimulates economic growth till a certain threshold. Beyond that threshold, the repayment capacity of the nation starts to decrease and thus, external debt affects economic growth negatively. This is because when a country faces a budget deficit and borrows with the aim of financing its budget deficit, resources will be utilized at first stages to finance capital investments which will be associated with promoting the economic growth of the nation. However, when a country continues borrowing beyond a certain threshold, debt overhang and debt service challenges may exist which will be associated with a decline in economic growth (Senadza et al., 2018).

As for the relationship between governance and economic growth, scholars postulated the role of governance in fostering economic growth through enhancing markets' efficiency where this mechanism is coined as "the market promoting governance strategy". It is also worth noting that the theories put in place by the school of "New Institutional Economics" laid the foundation for the emergence of and the role of governance (Singh, 2019).

In this respect, it is important to get back to the pioneering study by Acemoglu et al. (2004) who laid the theoretical foundations for postulating the pivotal role of institutions,

especially economic institutions, in accounting for the disparities or the variations in the growth performance of different countries. The authors demonstrated the role of economic institutions in affecting the actions of the economic agents in the society with regard to "investments in physical and human capital and technology, and the organization of production". They also elaborated the role of economic institutions in affecting the future distribution of resources in any country. Acemoglu and Robinson (2008) also demonstrated the interconnectedness between economic and political institutions and the importance of investigating the needed tools to transfer countries from bad to good political equilibrium status and accordingly towards better economic institutions. They also emphasized that the introduction of reform programs should be based on a careful understanding of the features and driving forces of the existing political equilibrium.

Finally, it is worth noting that the World Governance Indicators were developed by the World Bank to quantify governance into measurable indicators and they are relied on extensively in the literature. They were established to cover three thematic areas which are: the process by which governments are selected, monitored and replaced, the capacity of the government to effectively formulate and implement sound policies, and finally the respect of citizens and the state for the institutions that govern economic and social interactions. Voice and accountability along with political stability fall under the first theme, whereas government effectiveness and regulatory quality are related to the second, and lastly control of corruption and rule of law are related to the third category. It is also worth noting that these indicators rely on "perception-based data sources" which comprise surveys on firms, households and public sector entities (Kaufmann, 2010).

2.2. Empirical literature

Many empirical studies tackled the relation between external debt and economic growth. The results of those empirical studies were mixed. The theoretical side could give an interpretation to the mixed results on the empirical side. Studies in which the relation between external debt and economic growth turned out to be positive indicate that the countries were able to manage the external debt well through using those funds in filling the saving-investment gap and the foreign exchange gap, which resulted in stimulating economic growth. On the other hand, countries in which the relation between external debt and economic growth turned out to be negative are those countries which did not have a good management of the external debt and thus fell in huge debt obligations and liquidity constraint problems. Thus, this study groups the empirical studies in two strands. The first strand includes studies that show a positive relation between external debt and economic growth. The second strand includes studies that show a negative relation between external debt and economic growth.

For the first strand of studies, Jayaraman and Lau (2008) examined whether external debt was associated with economic growth of the Pacific Island countries over the period (1988-2004). By regressing external debt stocks per unit of GDP, exports per unit of GDP and budget deficit per unit of GDP against GDP, the study concluded that external debt promotes the economic growth of the pacific island countries in the short run. However, there is no long run relationship between external debt and economic growth of those countries. For Tanzania, Kasidi and said (2013) analyzed the relationship between external debt and economic growth over the period (1990-2010). Using the Augmented Dickey Fuller (ADF) unit root test and Johansen cointegration, the study found that external debt has a significant

impact on GDP. However, the study found no long run relationship between external debt and economic growth. For Nigeria, Ndubuisi (2017) investigated the relationship between external debt and economic growth over the period (1985-2015). Using ADF unit root test, Johansen cointegration and error correction test, the study found that external debt stock had a long run significant effect on Nigeria's economic growth and that the relationship between external debt and economic growth turned out to be positive and statistically significant. For the Asian developing and transition economies, Dawood et al. (2020) examined the impact of external debt on economic growth over the period (1995-2019). By applying the fixed effect model with two robust estimators of the feasible generalized least square estimator (FGLS) and Driscoll-Kraay standard error (DSKE) estimator to tackle the cross-sectional dependence, heteroscedasticity, and autocorrelation, the study found that external debt promotes economic growth. For Nigeria, Yusuf et al. (2021) assessed the impact of government debt on economic growth over the period (1980-2018) by applying the Autoregressive Distributed Lag (ARDL) technique. The study found that external debt promotes economic growth in Nigeria in the short run.

On the MENA region level, limited studies have been dedicated to the empirical investigation of the relationship between external debt and economic growth, but two important studies are worth highlighting in this respect. Hadad et al. (2021) examined the relationship between external debt and economic growth in selected MENA region countries including Egypt, Bahrain, Morocco, Tunisia, Lebanon and Jordan over the period 2006 till 2019. The authors employed the quintile panel data regression model, in order to account for "the distributional impact" of external debt on economic growth, not only at the mean level, but also at "the tails of the distribution". The results of the regression indicated the presence of a negative significant effect of external debt on the growth rate of GDP per capita in the event of having low levels of growth rates.

As for the second paper, its scope was wider and related to public, rather than external debt. The objective of the paper was to estimate a public debt-to-GDP ratio threshold (for 20 MENA region countries over the years 1990 till 2016) after which further increases in public debt could lead to its negative impact on economic growth. The authors employed a panel threshold regression and concluded that a public debt-to-GDP ratio below 58% is associated with a positive relation between debt and growth, whereas after this percentage an inconclusive relationship between both variables prevails (AlShammary et al., 2020).

When it comes to the relationship between governance and economic growth, several studies were conducted to examine such relationship through employing the different governance indicators developed by the World Bank. Akinci et al. (2022) investigated the existence of a long run relationship between the six governance indicators on one hand and economic growth that was measured by GDP per capita growth rates. The study covered the period from 1996 to 2019 and tackled 27 EU member countries and 7 EU candidate countries. The authors employed the Westerlund co-integration test, which confirmed the existence of a long-run relationship between economic growth and the included governance indicators. Moreover, the results of the study indicated the significance of the control of corruption and the political stability in the EU countries where an increase in the control of corruption and political stability were associated with an increase in economic growth of 25% and 11%, respectively. On the other hand, the other remaining governance indicators were found to be insignificant.

For a number of 29 emerging economies, Nguyen et al. (2018) used the percentage change in each governance indicator as a proxy for institutional quality, in order to examine its association with economic growth in these countries, over the course of 1994 up to 2005, in six different models. The authors made use of the system (GMM) where variables on trade openness and foreign direct investment (FDI) were included with the institutional quality variable and economic growth was measured as real GDP growth rate. Moreover, interactions of trade and institutional quality and FDI and institutional quality were incorporated in the model. The results of the model indicated that the interaction terms are negative and significant. The institutional quality variable as measured by the percentage change in control of corruption, government effectiveness, rule of law, and voice and accountability, respectively, was found to be positive and significant in each case. However, the institutional quality variable measured using regulatory quality and political stability was insignificant in both models.

Finally, a quintile regression model was employed to investigate the impact of governance on economic growth in Sub-saharan African countries where a composite index for governance was constructed using data on the six indicators developed by the World Bank. Other variables were included alongside governance including school enrollment, aid as percentage of Gross National Income (GNI), gross fixed capital formation in US dollars, FDI inflows as percentage of GDP and trade as percentage of GDP. The composite governance index was found to be positive and significant where a 1% increase in this index was associated with 0.15 % increase in economic growth, which was measured in terms of GDP per capita. It is also worth noting that the impact of good governance was stronger for countries with low- and high-income levels, as compared to middle income levels (Fayissa & Nsiah, 2013).

To emphasize the role of institutional quality in enhancing the economic development of the nations, Acemoglu et al. (2004) firstly employed two quasi-natural experiments in history and divided Korea into two parts each with different institutional quality, and then the study developed a dynamic theoretical framework that deals with political institutions and the distribution of resources as state variables. The study found that institutions foster economic growth of the nations when institutions impose constraints on power holders, little rents are gained by power holders, and when institutions distribute power to groups that enforce property rights.

In the context of the MENA region, few studies tackled the relation between governance and economic growth and the results were mixed. For instance, Mehanna et al. (2010) studied the relation between governance and economic development for a sample of 23 MENA counties over the period 1996-2005 by applying the (GMM). The study showed that ameliorating the governance performance is a challenge for the MENA countries to enhance their economic growth. Similarly, Han et al. (2014) explored the relation between governance gap and economic growth by employing a Dynamic Generalized Method of Moments for different regions. For the MENA region, the results of the study showed that improving governance performance is vital for promoting economic growth.

In contrast to the previous views, Emara and Johnsa (2014) analyzed the relation between governance and economic growth for 197 countries by utilizing a Two-stage Least Square (TSLS) regression. For the MENA countries, the results showed that the estimated income per capita in those countries is higher than the per capita income of the remaining countries in the sample despite the low governance performance of those countries. In the same vein,

Emara and Chiu (2016) investigated the impact of governance on economic performance for a global sample using the Principal Components Analysis (PCA) method. The results revealed that economic growth of the MENA countries does not depend on the governance performance.

To sum up, the literature did not agree on whether external debt promotes economic growth or not. Some theories argued that external debt promotes economic growth as it can be used in filling the saving-investment gap and the foreign exchange gap. Other theories argued that external debt retards economic growth due to the huge debt obligations and the liquidity constraints. On the empirical side, the results were also mixed. Thus, the relationship between external debt and economic growth is ambiguous.

Concerning the relation between governance performance and economic growth, most of the empirical studies argued that good governance fosters countries' economic growth trajectories. Despite the huge literature that examined the relation between external debt and economic growth, few studies examined such relation in the MENA countries. Thus, this study adds to the previous literature by exploring the relation between external debt and economic growth in the MENA countries. Additionally, to our best knowledge, this is the first study that will investigate the role of governance indicators, namely control of corruption and political stability, in affecting such relation in the MENA countries.

3- Stylized Facts of External Debt and Economic Growth in the MENA Region

The international debt statistics developed by the World Bank revealed important figures and provided historical trends for the volume of external debt in different regions including that of MENA. Since the report is newly released, it includes data points only starting from the year 2010. As evident from Figure 1, a significant growth in external debt stocks was realized after 2014 where it reached an all-time high of 13 % in 2017 (World Bank, 2021). The most recent version of the report released in 2022 pointed to a growth rate of external debt stocks in the MENA region of 6 % in 2021, compared to 7 % in 2019 (World Bank, 2022)

The World Bank also highlighted that the external debt to exports ratio dramatically increased in the MENA region, where it reached 184 % in 2021, compared to 58 % in 2010.

It is also worth noting that the increase in external debt stocks on the aggregate level was also accompanied by an increase in the loan agreements signed with the IMF over this period, compared to the agreements signed in the world's other regions (Zaki and Youssef, 2021).

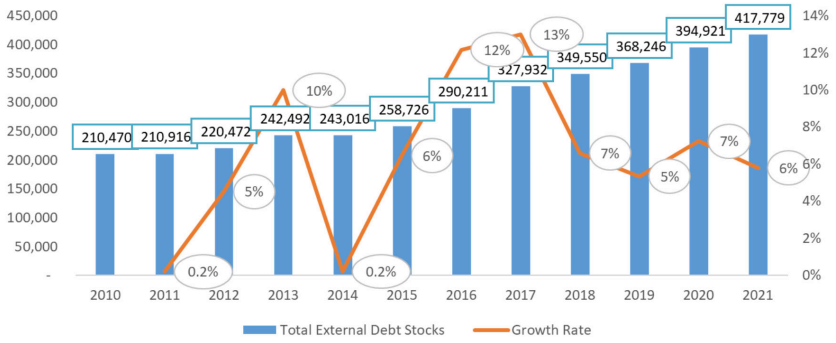

FIGURE (1): EXTERNAL DEBT STOCKS IN MILLION USD MENA (2010-2019)

Source: World Bank international debt statistics

The figures below (2 and 3) demonstrate the structure of the total external debt stocks in the MENA region by debtor over the period (2017-2021), both in absolute terms and as relative shares of total external debt. The postulated figures indicate the growth in the share of the use of IMF credit & SDR allocations from 7 % in 2017 till 2019 to 12 % in 2021. On the other hand, the share of private sector not guaranteed debt declined over the years (World Bank, 2022).

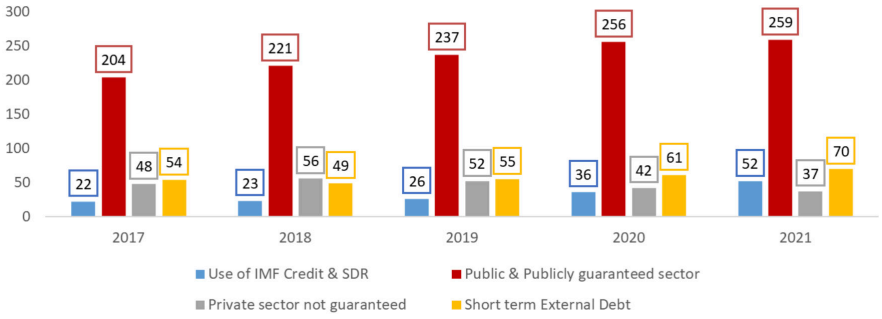

FIGURE (2): EXTERNAL DEBT DATA BY DEBTOR IN THE MENA REGION (IN BILLION USD)

Source: World Bank international debt statistics

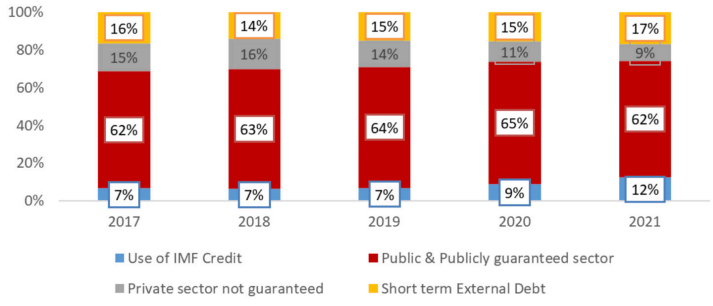

FIGURE (3): AUTHORS' CALCULATIONS OF DEBTORS' SHARES IN EXTERNAL DEBT IN MENA

Source: World Bank international debt statistics

Due to lack of data availability on the aggregate level of the MENA region prior to 2010, the two figures below postulate the evolution of the external debt as percentage of GDP over the period (1996-2021), for selected countries. Figure (4), which is focused on Sudan, Morocco and Tunisia, demonstrates how this percentage has been declining since 1996 and how it started to increase again after 2011.A comparable relationship could also be deduced for Egypt, Jordan and Lebanon where external debt as percentage of GDP demonstrated higher figures post 2011(See Figure 5). Such performance demonstrated within the figures highlights the growing role of external debt and the importance of studying its impact on economic growth.

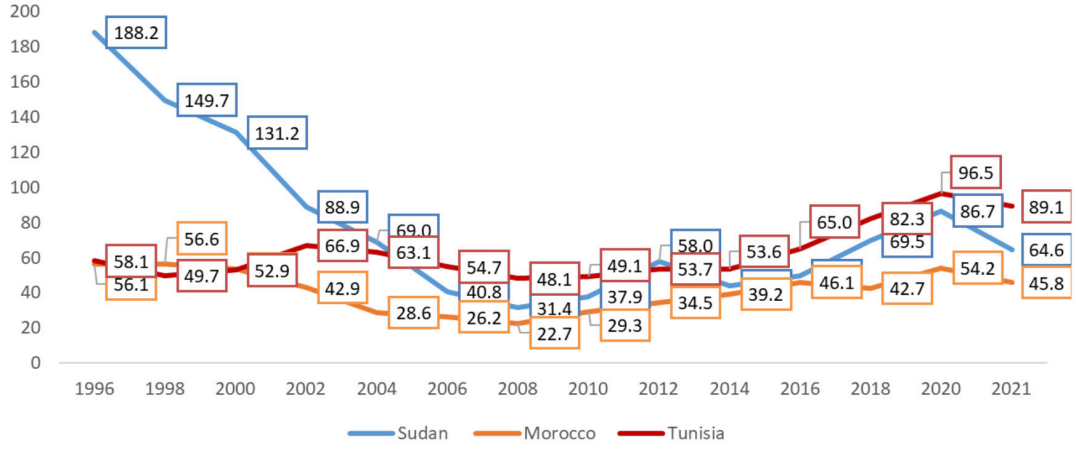

FIGURE (4): EXTERNAL DEBT AS % OF GDP IN SUDAN, MOROCCO AND TUNISIA

Source:World Bank Development Indicators

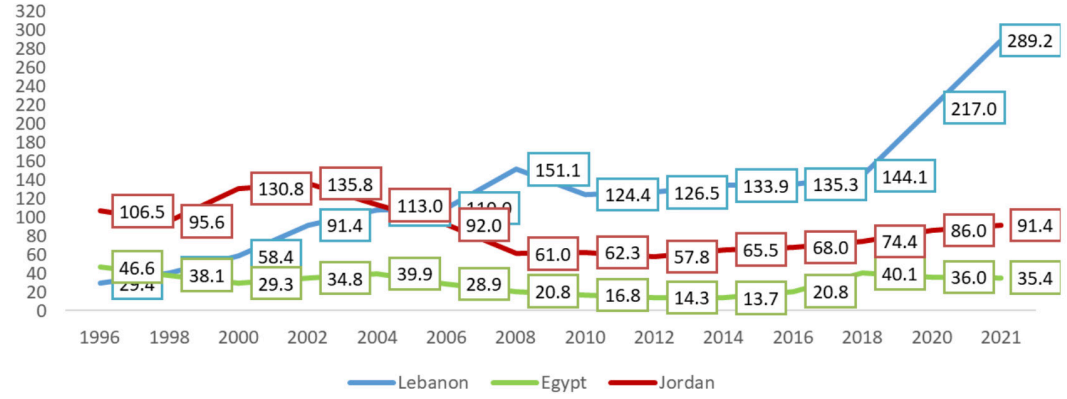

FIGURE (5): EXTERNAL DEBT AS % OF GDP IN LEBANON, JORDAN AND EGYPT

Source:World Bank Development Indicators

It is also important to shed light on the economic growth performance of the MENA region over the same period, that was characterized by a general downward trend. It even reached 3.5-% in 2020 due to the economic pressures associated with the outbreak of COVID19-pandemic. International organizations, such as the Organization for Economic Cooperation and Development (OECD) pointed to the worse off growth status of the MENA region compared to different emerging and Asian economies. Such downward trend in economic growth in the region could be linked to the fluctuations in oil prices, the continued political challenges and instability, along with the still unlocked potentials of the private sector (OECD, 2016)

FIGURE (6): GDP GROWTH ANNUAL PERCENTAGE, MENA (2004-2021)

Source: World Bank Development Indicators

3.1. Descriptive statistics

Table (1) comprises the computed summary statistics for the following variables that will be further investigated in the empirical estimation section. As evident from the figures, the mean value for the GDP annual growth in the studied countries over the pre-identified time period was 3.44 %. The minimum value for this figure was recorded in Lebanon, whereas the maximum value was observed in Morocco. When it comes to the external debt as percentage of GDP, its mean value was approximately 56.6 %. Its highest value was encountered in Lebanon, whereas the least value was observed in Iran.

TABLE (1): DESCRIPTIVE STATISTICS OF THE VARIABLES

Variable Name/ Statistic	Mean	Standard Deviation	Minimum	Maximum
Real GDP growth rate	3.44	4.36	-21.46	19.04
Gross capital formation as % of GDP	27.1	8.1	3.462	50.8
Total population	35,400,000	29,400,000	2372900	109262178
Trade as % of GDP	65	28	0.76	146.9
External Debt as % of GDP	56.6	42.4	1.25	289.2
Control of Corruption	-0.5	0.43	-1.54	0.38
Political Stability	-0.89	0.71	-2.6	0.382

Authors' calculations using the countries dataset in STATA

4- Modelling the Relationship between External Debt and Economic Growth

4.1. Variables and model specification

Following the econometric model developed by (Siddique et al., 2016), the study included the following explanatory variables:

- Total external debt as percentage of GDP (EDGDP): This variable comprises the debt owed to nonresidents repayable in currency, goods, or services. It is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, short-term debt, and use of IMF credit. Data are in current U.S. dollars.
- Total trade as percentage of GDP (TRGDP): This variable comprises the sum of exports and imports of goods and services assessed as a percentage of GDP.
- Gross capital formation as percentage of GDP (GCFGDP): This variable comprises land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment assessed as a percentage of GDP.
- Total Population (POP): This variable comprises all residents regardless of legal status or citizenship.
- Control of corruption and political stability estimates: which are the governance indicators that will be tackled in the study. The choice of such indicators is influenced by different factors which are as follows: Political stability has been an important determinant of the economic performance of several MENA countries, especially the ones that witnessed political turmoil in 2011. It is also worth noting that the external debt of these countries as percentage of their GDP started to remarkably increase since that year, as elaborated in the previous section. On another front, control of corruption was considered as a crucial element and governance indicator for economic growth in a study that incorporated 145 countries over the period from 2002 to 2014 (Samarasinghe, 2018).

The dependent variable in the study is the annual real GDP growth rate (GDPG). Since the objective of this research is to investigate how governance affects the relationship between external debt and economic growth, another explanatory variable which is the interaction of external debt and control of corruption estimate (ED*CC) will be added to the model. Moreover, another model will be estimated that alternatively includes the interaction of external debt and political stability estimate (ED*PS). Accordingly, the following model specifications will be estimated:

$$GDPG_{it} = \beta_0 + \beta_1 GCFGDP_{it} + \beta_2 TRGDP_{it} + \beta_3 POP_{it} + \beta_4 EDGDP_{it} + \beta_5 EDGDP*CC + \epsilon_{it} \quad (1)$$

$$GDPG_{it} = \beta_0 + \beta_1 GCFGDP_{it} + \beta_2 TRGDP_{it} + \beta_3 POP_{it} + \beta_4 EDGDP_{it} + \beta_5 EDGDP*PS + \epsilon_{it} \quad (2)$$

The research relied on secondary annual data obtained from the World Development Indicators (WDI), World Bank over the period (1996-2021). Due to the limited data availability, the study is applied to a sample of 10 countries in the MENA region which are: Algeria, Jordan, Sudan, Tunisia, Lebanon, Morocco, Egypt, Mauritania, Turkey and Iran.

Moreover, data on the control of corruption and political stability indicators were obtained for the selected countries from the World Governance Indicators (WGI) dataset.

4.2. Methodology

This study will perform the panel co-integration analysis to examine the relation between external debt and economic growth in the MENA countries over the period (1996-2021) and to examine how governance indicators affect this relation. The application of panel data is associated with many advantages that include its capacity to control for endogeneity, heteroscedasticity, and serial correlation (Al-Mulali, 2014). Following the studies of Al-Mulali (2014) and Sherif et al. (2022), this study will firstly test for the stationarity of the variables using the (ADF) unit root test. The null hypothesis of this test is the existence of unit root which indicates that the variable is non-stationary. Secondly, this study will examine the long run dynamic relation among the variables by applying the Pedroni co-integration test. Thirdly, this study will explore the co-integrating vector between the co-integrated variables demonstrated by the Pedroni co-integration test by performing the Dynamic OLS (DOLS) estimator. Finally, the study will examine the short run and long run dynamics of the cointegrated series through applying the Vector Error Correction Model (VECM).

5- Estimation Results

5.1. Fisher-Augmented Dickey Fuller (ADF) test

Table (2) demonstrates the results of the (ADF) test which is based on the Chi-square. The null hypothesis of the test is the existence of unit root, which indicates that the variable is non-stationary. The selection of the lag length is based on the Schwarz Information Criterion (SIC) and is determined automatically.

According to the results of the ADF test, the test's null hypothesis for the gross fixed capital formation as a % of GDP (gcfgdp), trade as a % of GDP (trgdp), external debt as a % of GDP (edgdp), external debt *control of corruption (ed*cc) and external debt *political stability (ed*ps) cannot be rejected at %1 significance level which signifies that the five series are non-stationary at level. By applying the first difference for the five series, the null hypothesis could be rejected at %1 significance level. Additionally, the null hypothesis for GDP growth (gdpg) and population (pop) could be rejected at %1 significance level, which indicates that the two series are stationary at level.

Thus, gross fixed capital formation as a % of GDP (gcfgdp), trade as a % of GDP (trgdp), external debt as % of GDP (edgdp), external debt *control of corruption (ed*cc) and external debt *political stability (ed*ps) follow the I(1) process. While GDP growth (gdpg) and population (pop) follow the I(0) process. By considering the results of the ADF test, this paper will carry out the Pedroni co-integration test to examine the long run dynamic relation among the variables.

TABLE (2):THE FISHER-AUGMENTED DICKEY FULLER (ADF) UNIT ROOT TEST RESULTS AT LEVEL AND AFTER APPLYING THE FIRST DIFFERENCE

Variables	Level statistic (P-value)	First difference statistic (P-value)
GDPG	94.0639 (0.0000)[a]	
GCFGDP	22.6993 (0.3038)	79.3792 (0.0000)[a]
TRGDP	11.0624 (0.9446)	99.3471 (0.0000)[a]
POP	48.0760 (0.0004)[a]	
EDGDP	5.54757 (0.9994)	63.2254 (0.0000)[a]
ED*CC	20.6985 (0.4151)	73.8149 (0.0000)[a]
ED*PS	28.4143 (0.0999)	104.942 (0.0000)[a]

(a) denotes the rejection of the null hypothesis at 1 % significance level

5.2. Pedroni co-integration test

This paper performed the Pedroni co-integration test to examine the long run dynamic relation among the variables. The null hypothesis of the test is the absence of co-integarion among the variables. The selection of the lag length is based on the Schwarz Information Criterion (SIC) and is determined automatically.

The Pedroni co-integration test is an Engle and Granger-based co-integration test that relies on the evaluation of the residuals. If the null hypothesis is not rejected, then the residuals will follow the I(1) process which signifies the non-existence of a long-run relation among the variables. If the null hypothesis is rejected, then the residuals will follow the I(0) process which signifies the presence of a long-run association among the variables. The Pedroni co-integration test is based on seven test statistics that are derived from the predicted residuals. Out of the seven statistics, four statistics are based on the within-dimension statistics and three statistics are based on the between-dimension statistics (Sherif et al., 2022).

Tables (3) and (4) show the outcome of the Pedroni co-integration test. The results of the Pedroni co-integation test reveal the existence of co-integation among the variables in the two specifications.

TABLE (3): PEDRONI CO-INTEGRATION TEST RESULTS (INCLUDING THE CONTROL OF CORRUPTION AS AN INTERACTION TERM).

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	1.456828	0.0726	-2.271203	0.9884
Panel rho-Statistic	0.274624	0.6082	1.041377	0.8511
Panel PP-Statistic	-7.042105	0.0000	-5.171408	0.0000[a]
Panel ADF-Statistic	-6.497143	0.0000	-5.018075	0.0000[a]

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	1.207005	0.8863
Group PP-Statistic	-9.537359	0.0000[a]
Group ADF-Statistic	-6.508546	0.0000[a]

Alternative hypothesis: common AR coefs. (within-dimension)
(a) denotes the rejection of the null hypothesis at 1 % significance level

TABLE (4): PEDRONI COINTEGRATION TEST RESULTS (INCLUDING THE POLITICAL STABILITY AS AN INTERACTION TERM)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	1.658783	0.0486	-2.455028	0.9930
Panel rho-Statistic	0.290441	0.6143	1.157179	0.8764
Panel PP-Statistic	-6.131057	0.0000	-4.056185	0.0000[a]
Panel ADF-Statistic	-5.576054	0.0000	-4.044823	0.0000[a]

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	1.248344	0.8940
Group PP-Statistic	-9.031670	0.0000[a]
Group ADF-Statistic	-5.953906	0.0000[a]

Alternative hypothesis: common AR coefs. (within-dimension)
(a) denotes the rejection of the null hypothesis at 1 % significance level

5.3. Dynamic OLS estimation results

The estimation will then proceed with employing the Dynamic OLS estimation, in order to avoid having spurious results, since the variables are not all stationary at levels. Such estimation method has the advantage of avoiding the problems of endogenity and autocorrelation (Sherif et al, 2022). The results of the Dynamic OLS model indicated that both Gross fixed capital formation as percentage of GDP and external Debt as percentage of GDP have a positive significant effect on GDP growth rate. A 1 percentage point increase in gross fixed capital formation leads to approximately 0.25 percentage point increase in GDP growth and a 1 percentage point increase in external debt leads to, on average, 0.07 percentage point increase in GDP growth, an impact that is considered minor in its magnitude.

On the other hand, the coefficient of the population variable was found to be negative where this could be attributed to the economic pressures induced by the sizeable populations in the MENA region countries. Finally, and most importantly, the coefficient of the interaction between external debt and control of corruption was found to be positive and significant. This result implies that the improvement in the estimate of the control of corruption indicator reinforces the positive relationship between external debt and economic growth.

In the context of the second model where the interaction term was between external debt and political stability, the gross fixed capital formation and population variables were found to be significant. The same impact was estimated for gross fixed capital formation where a 1 percentage point increase in it leads, on average, to approximately 0.25 percentage point increase in GDP growth, whereas the impact of population was negative and of very small magnitude. As for the external debt and the interaction term, they were found to be insignificant.

TABLE (5): RESULTS OF THE DYNAMIC OLS ESTIMATION (INCLUDING THE CONTROL OF CORRUPTION AS AN INTERACTION TERM)

Variable	Coefficient	Standard Error	T Statistic	Prob.
GFCF GDP	0.254966	0.101193	2.519604	0.0131**
TR GDP	-0.013493	0.028105	-0.480107	0.6320
POP	-2.5E-07	7.59E-08	-3.337707	0.0011***
EDGDP	0.072801	0.022308	3.263466	0.0014***
ED*CC	0.075499	0.020722	3.643383	0.0004***

R- Squared	0.907810	Mean Dependent Variance	3.440743
Adjusted R-squared	0.801023	Standard Error Dependent Var	4.358699
S.E of regression	1.944280	Sum squared resid	453.6268
Long run variance	1.303195		

(* significant at 1 %, ** significant at 5 %, *significant at 10 %)**

TABLE (6): RESULTS OF THE DYNAMIC OLS ESTIMATION (INCLUDING THE POLITICAL STABILITY AS AN INTERACTION TERM)

Variable	Coefficient	Standard Error	T Statistic	Prob.
GFCF GDP	0.245318	0.115678	2.120701	0.0360**
TR GDP	-0.027649	0.035503	-0.778772	0.4376
POP	-1.75E-07	1.01E-07	-1.736509	0.0850*
EDGDP	0.015204	0.025566	0.594722	0.5531
ED*PS	-0.004318	0.012488	-0.345798	0.7301

R- Squared	0.883204	Mean Dependent Variance	3.440743
Adjusted R-squared	0.747915	Standard Error Dependent Var	4.358699
S.E of regression	2.188418	Sum squared resid	574.7011
Long run variance	1.620382		

(* significant at 1 %, ** significant at 5 %, *significant at 10 %)**

5.4. Panel VECM

This paper assessed the short run and long run dynamics of the cointegrated series through applying the Vector Error Correction Model (VECM) which is examined through two steps. The first step of the VECM is to derive the residuals which are regarded as lagged error correction term (ECT) after examining the long-run parameters from the cointegrating equation. The second step is to estimate the dynamic VECM.

The short-run causal relation exists if the variable's lagged differences are significant, while the long-run causal relation exists in case the error correction term is negative and statistically significant. The error correction term reflects the idea that the last period deviation from the long-run equilibrium affects the short-run dynamics of the dependent variable (Sherif et al., 2022). Tables (7) and (8) below show the outcome of the panel VECM in the two specifications. The lag length is determined based on the Schwarz Information Criterion (SIC).

TABLE (7): PANEL VECM RESULTS (INCLUDING THE CONTROL OF CORRUPTION AS AN INTERACTION TERM)

Regressand Variable	Short run Δgdpg	Δgcfgdp	Δtrgdp	Δpop	Δedgdp	Δed*cc	Long run ECT
Δgdpg		[1.03394] (0.3014)	[-1.73761] (0.0825)*	[1.63732] (0.1018)	[0.97077] (0.3318)	[-1.35491] (0.1757)	[-5.83039] (0.0000)***
Δgcfgdp	[1.88602] (0.0595)*		[-0.46853] (0.6395)	[-0.02483] (0.9802)	[-2.00536] (0.0451)**	[1.45112] (0.1470)	[-0.64370] (0.5199)
Δtrgdp	[0.32264] (0.7470)	[0.07728] (0.9384)		[-0.76207] (0.4462)	[-2.58466] (0.0099)	[2.70772] (0.0069)	[1.64005] (0.1012)
Δpop	[1.33864] (0.1809)	[0.93577] (0.3496)	[-0.30080] (0.7636)		[-0.92890] (0.3531)	[1.65830] (0.0975)*	[-1.15943] (0.2465)
Δedgdp	[-0.41435] (0.6787)	[0.14194] (0.8871)	[0.66172] (0.5083)	[-1.11145] (0.2666)		[2.93190] (0.0034)***	[-1.09975] (0.2716)
Δed*cc	[0.23462] (0.8145)	[1.68667] (0.0919)*	[-1.05958] (0.2895)	[0.30670] (0.7591)	[-0.86051] (0.3897)		[2.16799] (0.0303)**

The t-statistics are written in [], while the P-values are written in ().(* significant at 1 %, ** significant at 5 %, *significant at 10 %)**

TABLE (8): PANEL VECM RESULTS (INCLUDING THE POLITICAL STABILITY AS AN INTERACTION TERM)

Regressand Variable	Short run Δgdpg	Δgcfgdp	Δtrgdp	Δpop	Δedgdp	Δed*ps	Long run ECT
Δgdpg		[1.03908] (0.2990)	[-1.68790] (0.0917)*	[1.71795] (0.0860)*	[1.02831] (0.3040)	[-0.48817] (0.6255)	[-5.58047] (0.0000)***
Δgcfgdp	[2.12613] (0.0037)***		[-0.19581] (0.8448)	[-0.06474] (0.9484)	[-2.18804] (0.0288)**	[-0.00764] (0.9939)	[-0.61509] (0.5386)
Δtrgdp	[0.19501] (0.8454)	[-0.08145] (0.9351)		[-0.75648] (0.4495)	[-2.55898] (0.0106)	[0.64213] (0.5209)	[1.35468] (0.1758)
Δpop	[1.33344] (0.1826)	[1.08388] (0.2786)	[-0.44201] (0.6586)		[-1.03779] (0.2996)	[1.05150] (0.2932)	[-1.23808] (0.2159)
Δedgdp	[-0.66566] (0.5057)	[-0.89447] (0.3712)	[0.11704] (0.9068)	[-1.23950] (0.2154)		[0.61887] (0.5361)	[-1.16474] (0.2443)
Δed*ps	[-0.40848] (0.6830)	[-0.31875] (0.7500)	[-1.56692] (0.1174)	[-0.02137] (0.9830)	[-1.05360] (0.2923)		[1.99406] (0.0464)**

The t-statistics are written in [], while the P-values are written in ().().(* significant at 1 %, ** significant at 5 %, *significant at 10 %)**

The estimated error correction term in the specification that includes the interaction of external debt and control of corruption and lagged GDP annual growth was negative and significant and with a value of 0.685647- which indicates that the system adjusts any disequilibrium towards the long-run equilibrium status at 68.5 % speed of adjustment or

that 68.5% of the disturbance in the short run is corrected each year. As for the other specification with political stability, the error correction term was also found to be negative and significant (0.672849-) where 67.2% of the disturbance in the short-run is corrected each year. With regard to the short-run dynamics, there are short run causal relations that go from population and trade to GDP annual growth in the second specification.

6- Conclusion and Policy Implications

The main objective of this research was to examine the relationship between external debt and economic growth in selected MENA region countries and more importantly how certain governance indicators, namely control of corruption and political stability affected this relationship. The findings of this paper indicated a positive significant impact of external debt on growth over the studied period in the control of corruption specification. However, the magnitude of the impact was found to be minor. Moreover, adding the governance indicator of control of corruption did improve such relationship, as evidenced by the obtained estimated coefficients, but again with a small magnitude.

It is worth noting that this positive relationship could turn into a negative one after a certain threshold (certain external debt-to-GDP ratio) which could be examined in future research studies. Furthermore, the obtained positive results should be complemented with other studies that examine whether or not the debt levels of the included countries are on sustainable paths. For instance, the most recent debt sustainability assessment for Egypt by the IMF highlighted that the country's debt is sustainable but "not with high probability", due to the risks related to the considerable financing requirements and debt service, along with expected lower growth in the medium term (IMF, 2023). Additionally, another important angle to examine is the importance of attaining the primary balance, in order to keep the debt-to-GDP ratio at the same standing point (Yoshino et al., 2018). Finally, a comparable study could be tackled in the future considering the composition of the total external debt.

The paper's obtained results could be attributed to different factors. First of all, the loans in many developing countries tend to be directed towards consumption rather than productive purposes and uses (Berenssman, 2019). Examples for this include payments of wages and salaries to public sector officials, spending on food and energy subsidies, in addition to interest payments. The inability of some MENA region countries to make the best use of such loans and to direct them towards the sectors that create the largest value added in their economies may also explain the weak positive relationship between external debt and economic growth.

As a result, alternative policies are needed to attain growth in the long run. These policies include promoting the role of the private sector and expanding its contribution to the value added created in these economies. According to the World Bank reports, the private sector is considered "the key driver for growth in the MENA region" and its role could be maximized if certain policies are put in place.

Such policy interventions comprise the following measures: investing in education and skills' development, eliminating the obstacles that impede better access to different sources of finance, encouraging further research and innovation, along with promoting a more competitive business climate (World Bank, 2016).

Over the studied period, the average value of the control of corruption and political stability estimates were negative, except for Jordan which recorded an average control of corruption

estimate of 0.14. Moreover, the ranking of the countries under study in the Corruption Perception Index for the latest available year (2022) was lagging, compared to other developed countries. For instance, Egypt was ranked as the 130th country out of 180 countries, Sudan's ranking was 162, Lebanon's was 150th and that of Algeria was 116th. Better ranks were recorded for Jordan and Tunisia whose ranks were 61st and 85th respectively.[2]

Some MENA countries have already formulated policies to control corruption, but those policies did not lead to the desired outcomes. For instance, Algeria passed an anti-corruption legislation with the aim of eliminating bribe payments in the public sector. Moreover, some MENA countries have signed the United Nations Convention Against Corruption (UNCAC) with the aim of fostering good governance. Additionally, an anti-corruption institution was established in Morocco and Jordan in 2006 (Haykal, 2017). Furthermore, Egypt took significant steps to curb corruption. For instance, Egypt issued its National Anti-corruption Strategy (2014-2018), followed by the second issue covering the period ([3].(2019-2022 Lately, in December 2022, Egypt issued the third version covering the period (2023-2030) with the aim of fighting the different forms of corruption. Moreover, a National Anti-corruption Academy was established in Egypt with the aim of developing and publishing researches and studies related to curbing corruption and offering an academic master in the field of governance and fighting corruption.[4] Despite those efforts, the MENA countries are still suffering from high levels of corruption that are reflected in their ranks in the indicators mentioned above.

Based on our analysis, the MENA countries are in need to formulate policies to curb corruption and address their weak performance in this arena. Effective practices to fight corruption that were adopted by different countries could help MENA countries shape sound policies in this respect. These practices include the ones developed by the European Union which comprise promoting the availability and accessibility of data in a transparent manner and making sure of availing "public information" to all citizens of the country, in order to eliminate the inequality of access to data and information. This is in addition to putting in place rules and regulations that help achieve such objective and oblige different stakeholders to disclose information regarding their activities on regular basis. Moreover, the coordination of efforts among the different governmental entities and the involvement of citizens in the implementation process of anti-corruption practices (through the provision of information, ensuring that they are aware of the government functions and procedures and getting feedback from them) is of paramount importance for the effectiveness of such practices. Finally, endorsing integrity and promoting it within public and private sector organizations through "codes of conduct" will indeed help embed it as a cornerstone in the MENA region countries (European Commission, 2023).

Finally, other crucial policies may include introducing economic reforms in MENA countries as corruption could be attributed to poverty and government failure in those countries. Such reforms may focus on promoting fair income distribution and social justice among citizens which in turn reduces poverty in those countries and curtails corruption. Moreover, MENA countries should enhance the start-up of new industries with the aim of creating new jobs and improving the standard of living of their citizens (Haykal, 2017).

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[2] *Corruption Perception Index, available at: https://www.transparency.org/en/cpi/2022*

[3] *Administrative Control Authority, available at: https://aca.gov.eg/News/1631.aspx*

[4] *Administrative Control Authority, available at: https://aca.gov.eg/News/1636.aspx*

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RESEARCH PAPERS IN ENGLISH

The Impact of Women Empowerment and Financial Sustainability Via BSC on the Added Value of Corporate Governance

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Abstract

Women empowerment and financial sustainability are two important and interrelated aspects of corporate governance. Women empowerment refers to the process of enabling women to achieve their full potential and participate equally in all aspects of society. Financial sustainability refers to the ability of a company to generate enough revenue to cover its costs and make a profit. The impact of women empowerment and financial sustainability on corporate governance is a complex issue that is still being researched. However, there is growing evidence that these two factors can have a positive impact on corporate governance. By empowering women and ensuring financial sustainability, companies can improve their decision-making, reduce risk, and create value for all stakeholders.

Keywords: Financial Sustainability, Women Empowerment, Corporate Governance

تأثير تمكين المرأة والاستدامة المالية عبر BSC على القيمة المُضافة لحوكمة الشركات

مستخلص:

تهدف هذه الدراسة إلى دراسة تأثير تمكين المرأة والاستدامة المالية على القيمة المضافة لحوكمة الشركات، كذلك يتم تقديم عرض عام لمفاهيم العلاقة بين حوكمة(إدارة) الشركات واستدامة الشركات. تُجري الدراسة تقييم للدراسات السابقة حول الموضوعات ذات الصلة بتنفيذ الحوكمة الرشيدة للشركات وكيف يساهم ذلك في تعزيز استدامة الشركات. أشارت النتائج إلى أنه تم تعزيز اللوائح التي تحكم الحوكمة القوية للشركات؛ ومع ذلك، لا يزال هناك مجال للتحسين من حيث التنفيذ. نظرا لأن الحوكمة الجيدة للشركات لها أثر إيجابي على استدامة الشركات. بالإضافة إلى ذلك، تبين أن الاستدامة تحتاج إلى قدر أكبر من الاهتمام لأنها تتعلق بكيفية مساهمة الشركة في الحفاظ على الطبيعة والبيئة، وكذلك كيف يمكن للشركة تحقيق أرباح وقيمة مضافة للمجتمع من خلال استدامة الشركات (CS). تقدم هذه الدراسة رؤى جديدة بالغة الاهمية حول الدور الذي تلعبه حوكمة الشركات الفعالة في تحقيق استدامة الشركات وتقترح الدراسة نموذجًا تصوريا(نظريا) يمكن اختباره بشكل أكبر في البحوث المستقبلية.

الكلمات المفتاحية: الاستدامة المالية-تمكين المرآة-حوكمة الشركات

1- Introduction

1.1. Overview

Corporate Governance is an internal protocol that a government follow and respectively the corporate business to set a political and legal framework that would ensure ethical standards are being adopted properly. Corporate Governance in emerging markets is set to be subjective due to the lack of agreed upon set of standard procedures that should be followed and set by the government. Thus, the government shall have the upper hand in supporting organization to have corporate governance at the corporate structure level and embedded in their corporate strategy. Not only is effective governance essential for businesses, but it is also critical for society. There is a growing consensus that good corporate governance and social responsibility are inextricably linked. This is being acknowledged more and more. The public›s trust and confidence in the nation›s business leaders increase when good corporate governance is in place. The legislative process was developed to safeguard society against recognized dangers and prevent issues from emerging or resurfacing. Recent corporate crises have put light on the relationship between companies and social responsibility. Companies› increased attention to environmental, social, and governance concerns also known as ESG and corporate social responsibility (CSR) make businesses more responsible and accountable to the people and organizations that are important to them. Therefore, there is an increase in the amount of pressure that firms are placing on themselves to enhance best practices for corporate governance to improve their relationships with stakeholders. Corporate governance is one of the main strategic approaches if not the only one for reaching corporate sustainability. Corporate sustainability is the capacity of the organization to preform certain procedures in a strategic sustainable manner that would allow for long-term growth and sustained profits. The long term planning is crucial for any corporate business and as well Non-Governmental Organizations (NGOs). The long-term planning is cascaded across strategic business unit of the top management is following a standardized agreed and aligned corporate strategy. The most significant incentive for businesses to focus more of their attention on sustainability is the possibility that doing so will, in the long run, boost their capacity to grow and prosper. In the areas of ESG and CSR, businesses have a responsibility to take the initiative. This is because of the expectation that companies will publish ESG disclosures. Businesses that are aware that their operations have an effect on the surrounding environment generate an instinctive feeling of responsibility to the society in which they operate. A significant amount of care and attention is given to the next generation while considering sustainable practices. It is to a company›s best advantage to manage social responsibility since doing so will ensure its continued existence. Both the company and society can see proof of the influence in the here and now and in the future.

In addition, companies are investigating how they might integrate sustainable practices into their long-term planning. For businesses to be successful while using this strategy, they need to consider four vital components, all of which should be approached with the same level of significance. The first kind of influence is societal, and it describes how society affects the organization, including the effect it has on stakeholders. The second kind of impact is known as the environmental impact, and it describes the company›s effect on the natural environment in terms of things like water waste, paper waste, and energy waste. The third aspect of an organization›s culture is its organizational culture, which refers to the interaction

between the company, including its management, and its internal stakeholders, most notably its workers and everything involved in those ties. Finally, there is finance, which refers to the influence that the potential for risk and the amount of risk have on the financial return that the organization generates. These four aspects take into account the fact that the company›s success is ultimately dependent on the participation of everyone and everything.

The foundation of effective corporate governance is often laid on three prior achievements: economic growth, social advancement, and environmental advancement. So, sustainable governance promotes sustainability, creates sustainable values, and assists businesses in achieving these goals. Companies also realize long-term advantages, including a reduction in risks, the attraction of new investors and stakeholders, and an increase in the organization›s equity. The general public will get information on the link between enhanced governance of corporations and increased sustainability as a result of initiatives to increase transparency. The link between good corporate governance and environmental sustainability will grow more robust over time if stakeholders understand the connection between the two concepts.

Women empowerment and financial sustainability can have a positive impact on corporate governance in a number of ways. For example, women empowerment can lead to improved decision-making, as women are often more likely to take a long-term view and consider the interests of all stakeholders. Financial sustainability can also help to improve corporate governance, as companies that are financially healthy are less likely to engage in risky or unethical behaviour.

During the recent string of financial crises, there has been a frenzy of change in the marketplace. The growth of corporate companies includes many aspects, including the interaction between corporate governance, corporate sustainability, and corporate social responsibility. As they start to think about these concepts and begin their path toward adopting a more integrated approach to corporate governance and sustainability, many companies are looking to external resources for help. Corporate directors are expected to consider the new issues being addressed in today›s boardrooms, but doing so needs them to have extra knowledge, experience, and points of view. The tone for this is being established from the top of the organization.

1.2. Research Aim

The aim of this research is to study the phenomena of corporate governance and its significance on business corporations. The researcher begins by defining the concept followed by clear tactical implementation for corporate governance. The objective of this study is to highlight the difference between the standard corporate governance that is being guided by specific legal and political guidance to achieve close supervision in contrast to sustainable corporate governance that is being formed under the determinants of internal processes and strategic vision both aiming to impact and get impacted by the society in a positive sustainable manner. The researcher provides the preliminary requirements in the board of directors to achieve corporate governance while highlighting the potential impact when corporations adopt this model. This is conceptual research study that aims to further test the proposed conceptual model through PLS SEM for the researcher to statistically examine the proposed relationships and model fit. The model will include in the future research moderator which is going to be the Balanced Scorecard "BSC" and the impact will be measured on two stages

first the efficiency of implementing sustainable corporate governance followed by its impact on financial inclusion.

This research investigates the impact of women empowerment on corporate governance using the balanced scorecard. Specifically, the research will examine the following questions:

- How can the balanced scorecard be used to measure the impact of women empowerment on corporate governance?
- What are the key performance indicators (KPIs) that can be used to measure the impact of women empowerment on corporate governance?
- How can the balanced scorecard be used to track the progress of women empowerment initiatives and identify areas for improvement?

2- Literature Review

2.1. Corporate Governance

The corporate governance of a corporation is a collection of regulations that, in addition to defining the interaction between stakeholders, management, and the board of directors, also affect how the firm functions (Cooper & Owen, 2007). Issues that arise when ownership and control are kept separate are dealt with under the umbrella of corporate governance. Nevertheless, it involves more than a transparent connection between stakeholders and management (OECD, 2004). The long-term relationship which deals with checks and balances, incentives for managers, and communications between management and investors and the transactional relationship which deals with transparency and authority are the two components that make up corporate governance (Darus et al., 2011).A fair and open business climate, as well as the ability for businesses to be held responsible for their decisions, are all outcomes that are guaranteed by effective corporate governance. On the other hand, poor corporate governance may lead to waste, poor management, and even corruption. It is also crucial to remember that despite the fact that corporate governance was first developed to run contemporary joint-stock companies, it is just as vital in state-owned enterprises, cooperatives, and family businesses. This is something that should be kept in mind. Strong governance is the only thing that can reliably provide sustained good business performance regardless of the kind of enterprise. Governance is the framework that enables control and the proper direction of an organization›s people, policies, and procedures in order to achieve its strategic objectives. It is the set of actions designed to ensure that the business strategy not only has a clear purpose, but also considers the environment and acts in accordance with an ethical culture based on values and principles. Good corporate governance necessitates that leaders are aware of the impact the company has on its stakeholders, have the capacity to respond to stakeholder requirements, and are always prepared to confront the various challenges the future may present.

2.1.1. Benefits of Corporate Governance

A corporate governance structure benefits the stakeholders the firm, and the national economy. The owners and managers of firms may reap the benefits of increased openness and disclosure if they comply with CG standards. Additionally, it is beneficial to stakeholders because it provides the appropriate incentives for the board of directors and management

to pursue goals that are in the interest of the company and stakeholders, it facilitates effective monitoring, it offers greater investment security, and it ensures that stakeholders are adequately informed on decisions pertaining to fundamental issues. Finally, it is beneficial to the national economy because it plays a role in increasing the corporate value of companies and attracts global institutional investors who are willing to pay a premium for the shares of a company that has sustainable governance rather than a company that is considered to have poor governance but has a financial record that is comparable (Muigua, 2015). A healthy economy and successful businesses are both dependent on sound corporate governance. Because of this, investors continue to have faith in the firm, which allows it to efficiently and effectively raise cash, reducing the cost of capital and positively influencing the share price. A further benefit of good corporate governance is that it reduces the likelihood of waste, corruption, risk, and poor management. It assists in the construction and growth of brands and guarantees that an organization is handled in a way that is in everyone›s best interests (Muigua, 2015).

2.1.2. Sustainability in the Corporate Governance

Due to climate change, equality issues, and other significant social and environmental concerns, sustainability is one of the greatest challenges confronting the world today. In order to ensure the long-term sustainability of our planet, policymakers, regulators, and intergovernmental organisations are adopting extensive measures to alter the ways in which we live, work, and attain prosperity. Businesses can play a significant role in accelerating the transition to a climate-neutral and more sustainable economy. To perform this role, however, they need governance practises that ensure they comprehend the impact of their activities on society and the environment, and incorporate these factors into business decisions. The contribution of corporations and corporate governance to the development of more equitable and sustainable socioeconomic models is vital

2.1.3. Putting together Sustainability and efficiency in Corporate Governance

The concept of sustainable governance refers to systems and institutions that are able to provide results that are in line with the aims of society while also making the most efficient use of the resources at their disposal. In the context of efficient governance, the concept of efficiency encompasses the extent to which the management utilize the internal resources across different strategic business units to produce at most while considering the use of natural resources and the protection of the surrounding environment. Based on the definition mentioned above, there are six elements of dimensions for a sustainable corporate governance.

2.1.3.1. Directors' Independence

The features of directors in governance have been the primary focus of research on naive independent directors. An independent board of director is someone who is not in a materialistic relationship with the company. Most academics agree that independent directors have the propensity to put in much effort and, as a result, acquire a positive reputation in the market (Tran, 2015; Xue, 2019). According to the career concern model developed by Holmstrom (1982), at the beginning of their careers, managers who are conscious of the importance

of career growth will put in much effort to establish strong reputations for themselves. According to Yermack (2004)›s findings, most newly hired outside directors create their reputations purely based on their present or former work at the firm. According to Kang et al. (2016), independent directors actively monitor regardless of age. Because of this, independent board members who are new to the board market prioritize putting in as much effort as possible to establish a positive reputation for themselves; in turn, a positive reputation results in more prospects. Current studies also suggest that independent directors with knowledge of career development are more inclined to confront or oppose existing management and, as a result, acquire more board seats in the director market (Dewally & Peck, 2010; Jiang & Kim, 2015). According to Chen et al. (2022), directors with greater career worries work more actively and, as a result, are more eager to attend board meetings. According to certain other pieces of research, being on a company›s board of directors may have a beneficial impact on the company›s overall success. When the reputation of the director›s seat is greater, the number of times directors attend board meetings rises, which in turn leads to an improvement in the firm›s performance. The active engagement of independent directors in board meetings gives them tremendous prestige and significant cash incentives. According to research by Masulis and Zhang (2019), businesses with independent directors experience an increase in their firm valuation and operating performance and higher accounting quality.

The appointment of independent board of directors is essential to the company in ensuring that there will be no biased voting; the objectivity of the decisions taken. Independent directors are essential to sound corporate governance and should be appointed to the board of directors. A board with a preponderance of independent directors would be better adapted to supervise the CEO than one with dependent directors. Additionally, appointing a larger number of independent directors typically results in greater third-party counsel and expertise (due to the diverse origins of the executives). Since, by definition, directors do not have a material relationship with the company, the management team cannot exert undue influence over them. The majority of the board in large and medium corporations shall be independent but it still depends on the nature on the business.

2.1.3.2. Diversified Boards

For many years, regulatory agencies have put a significant amount of importance on addressing various issues related to the board of directors. However, there is not a single agreed-upon definition of diversity on boards. To break up the monotony of a board of directors, it is common practice to take into account the directors› ages, races, genders, educational backgrounds, and professional credentials, among other characteristics. Some people may perceive board diversity as meaning taking into consideration fewer concrete characteristics like life experience and personal opinions. In a nutshell, the purpose of board diversity is to encourage the cultivation of a wide range of demographic qualities and traits inside the boardroom. Including females on the board is a straightforward and standard way to foster board diversity. This is a typical and easy strategy

to take (Hunjra et al., 2021). It is generally agreed that diversifying the board leads to improvements in decision-making that are more effective, better use of the talents, and improvement of corporate image and investor relations via the establishment of the firm as a responsible corporate citizen (Leung, 2015).

2.1.3.3. Compensation Management

Recently, stakeholders, regulators, media members, and the general public have all turned their attention to the contentious issue of CEO remuneration. The increasing number of high-profile business failures has sparked a heated discussion (Coles et al., 2012). Because of this, the appropriateness of the corporate structure that determines CEO remuneration and the links between executive compensation packages and business success has come into doubt. In addition, the performance of companies has garnered an ever-increasing amount of attention, particularly following the reverberations of the financial crisis that occurred between 2007 and 2009. Controlling executive compensation requires effective use of the instruments provided by corporate governance. When it comes to promoting greater performance and avoiding agency difficulties, the compensation structure of executives is a crucial component to consider. Most of the empirical information pertaining to executive compensation is concentrated in the United States. Even in American companies, larger agency difficulties are related to inferior governance procedures. This is shown in executives receiving higher remuneration than can be explained by their company›s success (Core et al., 1999). A best practice of corporate governance is to have "compensation committees" on the board that also include independent directors that it allows for fair non-subjective compensation plans. The committee could be members that are assigned specifically for this mission or the management could appoint some of the independent members but from the persons who are aware of the field industry.

2.1.3.4. Auditor Independence

The independence of the auditor is essential since it has an effect on the quality of the audit. Audit quality may be thought of as the chance that the auditor will find a violation and the auditor will report the violation. If auditors are not allowed to maintain their independence, they will be less inclined to raise abnormalities, which will reduce the quality of audits. Numerous research has been conducted on the subject of independence since it is regarded as one of the most important issues in the auditing profession (Naiker et al., 2013). The four primary challenges to auditor independence are the significance of the client, services other than auditing, the length of time an auditor has been in practice, and client association with audit companies. There are financial incentives for auditors to give in to client pressure in order to keep significant customers and clients who purchase more lucrative non-audit services. This might potentially result in the auditors› independence being compromised. Long periods spent working together and client association with audit companies may lead to a familiarity that puts the auditor›s independence and the quality of the audit at risk (Naiker et al., 2013).

2.1.3.5. Takeover Regulations

The goal of an appropriate takeover law is to design an optimal set of rules that strikes a balance between promoting an efficient market for corporate control and protecting the minority stakeholders in a takeover bid from being exploited by bidders, majority stakeholders, or their management (McCahery & Renneboog, 2004). This is accomplished by striking a trade-off between promoting an efficient market for corporate control and protecting the minority stakeholders. Prior theoretical and empirical work has heavily emphasized the mandatory bid rule as the key provision in takeover law (Rossi & Volpin, 2004). Other researchers have investigated the impact of ownership disclosure, squeeze-out rights, sell-out rights, and management neutrality in takeover regulation (Armour et al., 2007). It is one of the goals of takeover legislation to safeguard the interests of target stakeholders, although a takeover rule substantially favouring target stakeholders, might raise the takeover barriers for bidders, inadequate shareholder protection may impose losses on target stakeholders in a takeover effort, particularly on minority owners. As a result, reasonable investors will either demand a greater discount when they invest in a legal system that provides a low level of takeover protection or withdraw their investments completely from the stock market (Schouten & Siems, 2010).

2.1.3.6. Proxy Voting

Institutional investors are able to put into effect many tactics for interacting with stakeholders. These strategies include conversation, shareholder proposals, and proxy voting. The term «proxy voting» refers to the process by which a shareholder vote may be cast at a shareholder meeting, such as an annual general meeting, on behalf of an institutional investor or a proxy voting business (Solomon & Solomon, 2006). Proxy voting may be done by a variety of institutional investors, not only those solely concerned with RI, and it can be a component of a larger shareholder engagement plan that also includes shareholder activism (Ruggeri, 2019). Institutional investors are diverse, and the reasons for their investments may run the gamut (Westphal & Zajac, 2013). Shareholder participation may increase business efficiency and promote corporate sustainability (Secinaro et al., 2020). This is because there is a win–win link between economic and environmental performance. Proxy voting may signify increasing monitoring by institutional investors, although there are numerous arguments against sustainability performance assessments, such as nonfinancial ratings (Boiral et al., 2020). RI and shareholder engagement strategies, such as proxy voting, started with advocacy groups (King & Gish, 2015) and religious organizations (Proffitt & Spicer, 2006) putting pressure on companies about major social causes, such as those advocated by the civil rights and anti-apartheid movements. King & Gish (2015) cited proxy voting as one of the earliest examples of RI and shareholder engagement strategies. Significant pension funds and asset management companies are increasingly adopting such techniques (Lee & Lounsbury, 2011), which has led to enhanced monitoring of sustainability performance and real adjustments.

2.2. Women Empowerment

Women empowerment and financial sustainability are two important and interrelated aspects of corporate governance. Women empowerment refers to the process of enabling women to achieve their full potential and participate equally in all aspects of society. Financial sustainability refers to the ability of a company to generate enough revenue to cover its costs and make a profit.

2.2.1. The Balanced Scorecard (BSC)

The Balanced Scorecard (BSC) is a strategic planning and performance management framework that helps organizations translate their vision and strategy into a set of measurable goals and objectives. The BSC typically includes four perspectives: financial, customer, internal business processes, and learning and growth.

2.2.2. The Impact of Women Empowerment and Financial Sustainability on Corporate Governance

Women empowerment and financial sustainability can have a positive impact on corporate governance in a number of ways. For example, women empowerment can lead to improved decision-making, as women are often more likely to take a long-term view and consider the interests of all stakeholders. Financial sustainability can also help to improve corporate governance, as companies that are financially healthy are less likely to engage in risky or unethical behavior.

2.2.3. The Added Value of Corporate Governance

Corporate governance is the system by which companies are managed and controlled. Good corporate governance can help to ensure that companies are run in a responsible and ethical manner, and that they create value for all stakeholders. The impact of women empowerment on corporate governance is a complex issue that is still being researched. However, there is growing evidence that these two factors can have a positive impact on corporate governance. By empowering women and ensuring financial sustainability, companies can improve their decision-making, reduce risk, and create value for all stakeholders. In addition to the points mentioned above, here are some other ways that women empowerment and financial sustainability can impact corporate governance:

- Women empowerment can lead to increased diversity and inclusion in the workplace, which can improve innovation and decision-making.
- Financial sustainability can help to reduce corruption and unethical behavior, as companies are less likely to take risks that could jeopardize their financial health.
- Both women empowerment and financial sustainability can help to improve corporate reputation and attract investors.

2.3. Corporate Sustainability in the Strategy

The pursuit of sustainability in business practices is becoming an increasingly essential objective for managers in every sector. In a recent extensive study of business managers, ninety percent of respondents said their company must be environmentally responsible (Kiron et al., 2017). In order to solve global concerns such as climate change and poverty, policy

officials, like everyone else, realize the significance of sustainable business practices. Academic publications on corporate sustainability have skyrocketed in the past decade, including in the most highly-ranked management journals (Eccles et al., 2014; Hahn et al., 2017). This is a direct reflection of the real-world importance of corporate sustainability. Similarly, articles published in practitioner journals explain how managers can embed corporate sustainability in their companies and why doing so will allow their companies to generate long-term benefits (Bhattacharya & Polman, 2017; Whelan & Fink, 2016). However, despite the increased focus on corporate sustainability, this line of research has recently come under fire for failing to adequately explain how businesses can contribute to sustainable development and how corporate governance can benefit from sustainability (Dyllick & Muff, 2016). Sustainability as previously defined is the extent to which any corporation or business whether for profit or not-for-profit can exercise their operations while gaining and contributing to the society. This exercise results in mutual benefit. To be more specific, corporate governance is the practical perspective of sustainability which is related to the legal, political framework that shall be framed and abided by with close monitoring to achieve strategic goals. The management may ensure the sustainability of corporate governance through assessment pillars and business model such as the "Customer Relationship Management" (CRM) and that will be from an internal perspective to ensure the achievement of goals. In fact, those corporations shall bring bag returns to the society and contribute to the economic and environmental pillars which is why sustainability shall be in the mission of any corporation cascaded to the objectives and tactics.

2.3.1. Historical Overview

When seen through the lens of history, the evolution of sustainability reporting and its emphasis on the environment may be broken down into many distinct phases (Fifka, 2012; Kolk, 2010). Research mainly focused on social reporting in the 1970s and 1980s; however, in the 1990s, environmental reporting was the topic that garnered the most interest and was the primary focus of most studies. Following the turn of the century, the focus primarily switched to an examination of corporate social responsibility (CSR) or sustainability reporting (Fifka, 2012). This pattern is closely connected to the Global Reporting Initiatives› (GRI) growth of voluntary standard-setting (Kolk, 2010). According to Aras and Crowther (2008), many phases of maturity represent an organization›s level of adoption of CS and CSR.

In the beginning, companies started participating in only window-dressing activities by altering the phrasing to reflect CSR terms that had no substance. The second step, known as cost containment, involves companies reengineering their business processes to minimize their use of water and energy, lowering their expenses and improving their financial performance. The third stage is called the engagement of stakeholders, and it is at this stage that companies start caring about how satisfied their employees and customers are. Communication about these activities is developed in the fourth step, which comprises producing CSR reports. The fifth step is sustainability, which would need significant adjustments to standard business procedures and a considerable degree of reengineering existing processes. In light of these considerations, it would seem that the CS idea has a promising future due to the fact that, at its heart, it answers and encapsulates the essential concerns of the general public about the interactions between business and society (Aras & Crowther, 2008).

2.3.2. Measuring Corporate Sustainability

The management and documentation of gains in sustainability are both helped by methods that combine and aggregate various indicators that capture diverse aspects of sustainability. Sustainability indicators are absolutely necessary if one is to record and demonstrate both the present state of and progress made in the area of corporate sustainability. In response to the need to widen the emphasis on sustainability in company performance beyond that of financial performance, independent advising companies with the objective of sustainability evaluations have been established. These evaluations or standards of sustainability are comprehensive, encompassing a significant number of indicators to capture a variety of aspects of sustainability. For instance, Sustanalytics1 evaluates the management systems, practices, and policies of businesses in relation to environmental, social, and governance risk and then gathers data on over 150 different indicators as a result of this evaluation.

The consequences of using a composite indicator to measure the sustainability of businesses may be seen in a variety of contexts. At the company level, the composite indicator assists companies in evaluating their performance compared to that of their peers and in determining the priorities for sustainable changes. Given the pressure from stakeholders and the desire to improve company image, the composite sustainability indicator is also becoming more essential in the decision-making process of businesses (Lee & Saen, 2012). At the aggregate level, the evaluation of the overall performance of sustainability may be helped by the distribution of the composite indicators. Composite indicators can provide a concise summary of complex and multi-faceted ideas while still keeping the information basis they are based on (Saisana & Tarantola, 2002). Composite indicators are simpler to comprehend than a group of separate indicators, which helps improve communication with the general public and other stakeholders.

2.3.3. Corporate Sustainability Theories

The literature study revealed that corporate sustainability science scholars had used various ideas when attempting to conceptualize it. It also showed that there are two distinct sorts of research in terms of their theoretical contribution. To begin, some of the research was fact-centred, also known as phenomenon-driven, and as a result, they did not structure their analyses inside any of the existing theories. These types of studies provide a description of the facts (or case studies) and draw conclusions based on the observed phenomena (Beddewela & Herzig, 2013; Williams, 2015). Other studies are framed within certain theories such as institutional, agency, legitimacy, signalling, stakeholder theory, or resource-based view theories (Aguinis & Glavas, 2012). The social environments in which firms' function were given much attention in institutional theory (Bansal, 2005). The foundations of this theory are found to be valuable by CS researchers in order to explain the institutionalization process surrounding the formation and expansion of sustainable companies (Russo, 2003), as well as the acceptance, extent, and quality of CS and associated activities (Campbell, 2007).

In accordance with the agency theory, managers are able to use CS as a kind of entrenchment in their positions (Chintrakarn et al., 2016). According to Mohamed et al. (2014), managers provide sustainability disclosures for three contentious reasons: to cut agency costs, to minimize stringent internal monitoring, and to benefit from providing sustainability disclosures in capital markets. All three of these reasons are controversial.

The literature extensively uses legitimacy theory to understand different CS reporting methods (Lu et al., 2015). According to the legitimacy hypothesis, for a business to have a social license to function, it is necessary to have legitimacy (Deegan, 2002). According to this theory, businesses participate in sustainability reporting to gain legitimacy, which is of critical strategic relevance to businesses (Haniffa & Cooke, 2005).

According to Muttakin et al. (2015), the signalling theory postulates that when there is an imbalance in the distribution of information between two parties, one side would strive to transmit information about itself to the other party reliably. It has been used as a significant theoretical framework to explain variations in sustainability disclosures seen in the body of published work (Charumathi & Ramesh, 2015). According to stakeholder theory, the applicability of a company in society is closely tied to stakeholder thinking, which argues that management›s interest should extend to a broader spectrum of all of the company›s constituents (Ioannou & Serafeim, 2015). According to the theory, disclosures of CS may be seen as a mechanism for assuring compliance with the social compact (Muttakin et al., 2015). According to the resource-based approach, successful corporate strategies should increase rent-earning resources and capacities; hence, resource-based rationales should work well for the sustainable growth of corporations (Bansal, 2005).

3- The Relationship between Corporate Governance and Corporate Sustainability

It would appear that governance is a broad concept that includes not only the quality of the board of directors to ensure that investments are made in accordance with the wishes of investors but also includes a strategic vision of the company›s role in society, its choice of domains, technologies, strategies, and stakeholder engagement, as well as firm performance. Governance structures and systems and the quality of governance in independent CSR structures and systems and environmental management structures all impact performance. The performance of the company as a whole is a complicated issue, including environmental, social, and financial sustainability. There has been a lot of research done over the years investigating the relationship between the characteristics of a company and its disclosure and the benefits of CS (Burke & Longsdon, 1996). It is evident that these benefits also have a direct connection to the viability of a company as well as the accomplishments of that company. Therefore, some attention must be devoted to the concept of sustainability within the framework of a firm›s corporate governance. Because of this, it is essential to study the specifics of how sustainability is discussed within such corporate governance. Strong corporate governance is anticipated to promote sustainability in general and deal mainly with each of the four components of sustainability. CS is very dependent on the quality of GCG because an efficient execution of GCG will ensure the continued confidence of stakeholders. The agency issues inside the firm will be mitigated if the GCG implementation is robust (Adams et al., 2015; Nadeem et al., 2017).

Due to the fact that they establish the policies and procedures that are followed inside the organization (Naciti, 2019), the boards bear the whole responsibility for the company›s performance with regard to sustainability. The contribution of GCG to the improvement of CSP is significant. The implementation of GCG will raise the level of confidence that stakeholders have in the company›s performance toward sustainability (Hussain et al.,

2018). A powerful GCG will adhere to the following five principles: justice, accountability, responsibility, transparency, and independence (Burak et al., 2017). Sustainability performance reporting is based on the execution of these principles as the foundation (Naciti, 2019; Schäuble, 2019). Companies need to increase their GCG to eliminate agency difficulties arising from the conflict of interest between stakeholders and agents. In order to do so, companies need to improve their GCG. The boards are the primary parties responsible for bolstering GCG and preserving the confidentiality and interests of stakeholders. They do this by overseeing and guiding the managers, which enables them to make choices suitable for the situation (Naciti, 2019).

To ensure the long-term viability of their innovations and generate value that supports their continued existence and expansion, businesses need to consider several critical factors. It is necessary to effectively apply corporate governance to carry out monitoring, which will lead to legitimacy and sustainability (Hussain et al., 2018). In addition to that, the successful implementation may also improve the firm›s financial performance, which increases the confidence that this will positively influence the organization (Jo & Harjoto, 2011). When carrying out their tasks appropriately, the board of directors may be used for monitoring and oversight activities. In the meanwhile, an independent audit committee with specialized financial knowledge may assist in the oversight of financial reports, external audits, and an internal control mechanism to help eliminate agency conflicts. The overall disclosure score on the corporate social responsibility activities of public businesses is still low, which shows that the corporations still have not fully committed to CSR (Hapsoro & Fadhilla, 2017). According to Amran et al. (2014), many corporations declared their actions related to corporate social responsibility because they believed doing so would result in enhanced economic advantages owing to increased openness.

Based on the above reviewed literature, the following conceptual model could be proposed for further testing in future research:

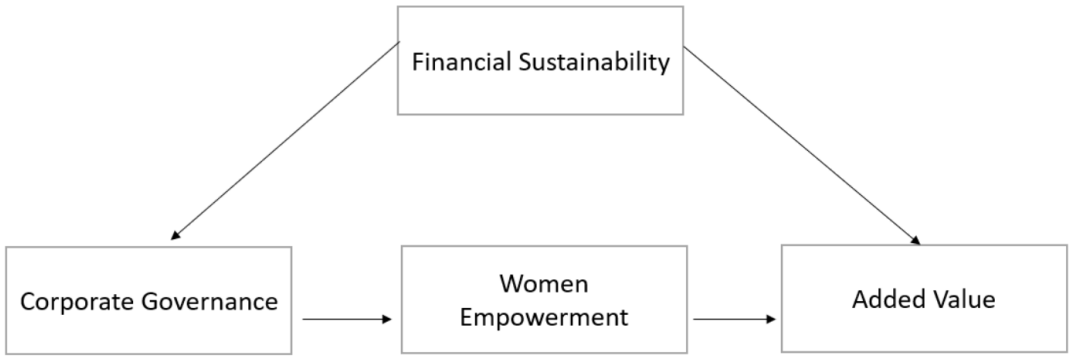

FIGURE (10): CONCEPTUAL MODEL

4- Conclusion and Recommendations

Every corporation must make it a point to see that the principles of good corporate governance (GCG) are implemented in every facet of their operations and at every level of the organization. The CG elements should be followed to ensure sustainability by paying attention to various stakeholders. Guidelines for responsible corporate governance have been strengthened globally, but there is still room for improvement in how they are enforced. This is due to the fact that the most effective use of sound corporate governance will have a beneficial effect on the continued existence of the organization. Because of this, the participation of both society and business is required in order to promote the synergy of effective corporate governance. In today›s ever-changing and cutthroat business environment, sustainability is essential for creating firm values that can compete successfully. In order to establish a relationship that is mutually beneficial for the company in its role as organizer, the community in its role as a user, and the environment of the business, each component plays a role in creating a healthy environment and reducing the costs associated with stigmatizing community empowerment as an investment. Because of this harmonization, excellent corporate governance will be created, and the firm will be able to do business sustainably.

It is recommended to ensure good corporate governance in every aspect of the company and establish corporate values to make this governance a reality, it is an element of company commitment and consistency to always care about company profits (profit), community (people), to protect and maintain the environment (planet), to develop and prosper together with the community (prosperity), and to be able to become a partner for the community. This can be achieved by having good corporate governance in every aspect of the company and establishing corporate values to make this governance a reality (partnership). Successfully establishing strong sustainability will favour the link between corporate governance and financial performance in organizations. Therefore, it is very necessary to place emphasis on sound corporate governance, the production of values, the enhancement of financial performance, and sustainability.

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RESEARCH PAPERS IN ENGLISH

Governance and Sustainable Development Nexus in Developing Countries

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Abstract

The study investigates the causality relationship of governance disparities in achieving the Sustainable Development among developing countries. Limited contribution of efficiencies or financial resources are considered challenges in achieving progress. Hence, we propose to analyze that governance indicators, such as corruption control, government effectiveness, political stability, and rule of law are influencing factors in achieving sustainable development. The study represents an empirical cross-country analysis using a sample of 130 developing countries with diverse levels of economic performance. Findings suggest that effective governance fosters confidence in government institutions, which can encourage investment in sustainable development initiatives leading to higher economic performance. Also, dialogue between researchers and policy makers is required. Finally, the study extracts and comes up with some recommendations to enhance the role of governance in achieving sustainable development.

Keywords: Sustainable Development; Governance; Institutional Quality; Panel data analysis; Developing countries.

الحوكمة والتنمية المستدامة في الدول النامية

مستخلص:

تبحث الدراسة في العلاقة السببية لتباينات الحوكمة في تحقيق التنمية المستدامة بين البلدان النامية. وتعتبر المساهمة المحدودة للكفاءات أو الموارد المالية تحديات للتقدم. ومن ثم، فإننا نقترح تحليل مؤشرات الحوكمة، مثل مكافحة الفساد، وفعالية الحكومة، والاستقرار السياسي، وسيادة القانون، وهي عوامل مؤثرة في تحقيق التنمية المستدامة. تمثل الدراسة تجربة عبر البلدان باستخدام عينة بيانات من ١٣٠ دولة نامية ذات مستويات متنوعة من الأداء الاقتصادي. تقترح النتائج أن الحوكمة الفعالة تعزز من الثقة في المؤسسات الحكومية، والتي يمكن أن تشجع الاستثمار في مبادرات التنمية المستدامة التي تؤدي إلى أداء اقتصادي أعلى. كما أن الحوار بين الباحثين وصانعي السياسات مطلوب. وأخيراً، تستخلص الدراسة وتخرج بمقترح توصية لتعزيز دور الحوكمة في تحسين إدارة التنمية المستدامة.

الكلمات المفتاحية: التنمية المستدامة- الحوكمة- جودة المؤسسات- تحليل بيانات Panel- الدول النامية

1- Introduction

The 2030 Agenda for sustainable development in September 2015, is a global platform of action that sets out a path for humanity to "leave no one behind". And so, the necessity of implementing SDGs that comprise concerns of economists arises from the perpetual growth in population compared to limited resources. It emphasizes the need for good governance schemes to deliver on potentials of sustainability (UN.org, n.d.). However, good governance could help ensuring that development policies and programs are effectively implemented.

We proceed from the premise that institutional quality is considered a strong predictor of structural growth. It can decide whether short-term gains are long-term sustainable. Additionally, having high-quality institutions will not prohibit an economic crisis, but will increase the likelihood to weather, and recover from it. The analysis of institutions as a crucial component of good governance focusing on developing countries, highlighting the impact of weak institutions on economic growth. There are some successful cases of economic growth resulting from institutions that create market-oriented incentives, protect property rights, and promote political stability include Chile for example (Rodrik et al., 2004).

So, governance is defined, according to the World Bank, as the method at which state affairs are exercised through institutions to shape public policy and provide public goods and services. While good governance is not a single thing, it can be characterized by seven essential features: accountability, effective leadership, strong public institutions, responsiveness to citizens' needs, and reducing corruption (UNESCO.org, n.d.). Also, good governance involves collaboration between policy implementers and target beneficiary to ensure effective decision-making, access to resources for all, protection of citizens' rights and social justice (Gedifew & Lakew, 2022).

So why is governance important? As governance works to achieve several aspects, such as implementing values of justice, transparency and integrity of transactions, promoting the rule of law against corruption, regulating of boundaries between private rights and public interests, and preventing the abuse of power. And since many of the developing countries have challenges in forms of; resources misallocation, and other barriers disabling them from achieving SDGs. Therefore, adopting good governance enhances financial and technical practices, protecting property rights, respecting drawn policies, strengthening the stability of financial markets and improving the competitiveness of the economic units.

Accordingly, institutions are associated with development through its impact on the incentives of dealers of economic resources through property rights. Literature has categorized the concept of institutions, as a set of formal and informal standards, and procedures that govern the behavior of individuals and their interaction within the society. Property right is guaranteed through formal restrictions such as laws, regulations and legislation, as well as customs and traditions. Having no clear definition of property rights in a certain country will escalate the cost of enforcing transactions. It will also shrinkage the economic activity and leads to political and social instability.

Meanwhile, the question remains, which institutions matter for developed countries and which ones are relevant for developing ones? And is there a one-size-fit-all institutional methodology to be applied to any country? Evidence from empirical literature proved that foreign-made policies often fail to address local issues. As per contemporary global advances,

and based on the vital and effective role of applying the principles and mechanisms of governance in countries. The general research question can be formulated as follows: To what extent is the impact of the application of governance on promoting sustainable development in developing countries?

Research sub-questions:

1. What is governance, its importance and the mechanisms of its application in developing countries?
2. What are the dimensions and indicators of sustainable development?
3. What is the impact of governance indicators on achieving sustainable development?

The focal point the research deals with is, examining the causal relationship between governance and sustainable development using sustainable development indexed by Adjusted Net Saving indicator. Therefore, the study is divided into five sections. Second section highlighting some relevant literature. Third section includes data description with their sources. Fourth section analyzes data, reviews and interprets the results. As for the last section, presents conclusion and recommendations of the study.

2- Literature Review

Literature have demonstrated the significance of good governance (Güney, 2017). In this regard, Halkos & Skouloudis (2016) claim that a country›s institutional scheme has a significant role in achieving sustainable development. The term «governance» can be defined as «the traditions and institutions implemented by a state,» according to (Kaufmann et al., 2010). This comprises the capability of the government to successfully develop and implement policies that are suitable for the country (UNDP, 2015). Accordingly, SDG 16 is a goal considered for supporting other goals rely on peace, justice and strong institutions, which hinge upon having good governance. However, economists divided institutions into two main components (D. North, 1990): formal (such as; rules and legislations that regulate economic activities, and informal (which includes social interactions and are derived from cultural norms and traditions).

Numerous empirical research has shown the importance of governance quality in influencing sustainable development. For instance, Stoever (2012) employs a panel dataset including 138 countries from 1970 to 2006 and an instrumental variables (IV) regression technique to look at how governance affects sustainability. His findings demonstrate a positive and statistically significant relationship between strong institutions and sustainable development using the average of the six worldwide governance indicators (WGI) developed by Kaufmann et al. (2010) as an indication of institutional and governance quality. He also used the adjusted net saving as a proxy for sustainability. Venard (2013) clarifies that the quality of institutions is influenced by the six governance indicators of Kaufman using the partial least square structural equation modelling method.

According to their income, Lahouij (2017) examined samples of developing countries. Economic growth in lower middle-income countries is significantly and favorably influenced by governance, investment, and human capital. Trade openness can boost government revenue. Additionally, governance and investment have a positive effect on the economic growth of

upper middle-income economies. Therefore, policies must allow for the growth of the private sector while also improving the delivery of public services. Also, through FDI, investment, and trade openness, governance can spur economic growth in these economies.

Much is acknowledged about institutions in Western Europe, but there is a need for extra research concerning the developing countries. Lack of reliable information is considered a barrier to applying these instruments in poor countries (Menard & Shirely, 2005). Consequently, poor countries fail to promote constructive investments and protect property right as a result of poor quality of institutions. However, (Michalopoulos & Papaioannou, 2011) perform an analysis in Africa region using historical data of colonization. They utilized satellite data on light density at night to determine economic performance due to data unavailability. They recognized a positive correlation between institutions and regional development. Meanwhile, economists could not verify which institutions accurately matter.

Acemoglu et al. (2004) observed the association between institutions and long-run growth. They claim that there is a causality between economic institutions and economic growth as political power urges property rights. According to (North, 1994), learning has a vigorous role in altering norms and beliefs and thus supporting institutional changes. Well-trained economists and think tanks played an important role in structural changes in Latin America, particularly in Chile (Corbo, 2000). A study of Barro (1991), concluded that growth rates are directly proportional to political stability and inversely to market distortions. While Rodrik et al. (2004) showed that institutional quality (such as geography and trade) helps explain differences in incomes between countries. Acemoglu et al. (2004) explained the role of institutions in explaining differences in economic growth. Also, they involve economic and political institutions in a new model, which considers economic outcomes and social decisions about resource allocation. Moreover, Ang (2012) demonstrated the historical impact of development stages on economic performance by developing institutional quality.

Furthermore, World Bank has acknowledged governance indicators as standard in evaluating the economic performance. Mauro (1995) and Knack & Keefer (1995) are among the first economists to use indicators to measure the quality of institutions and to prove that countries with strong institutions record high economic growth rates. Edison (2003) examined the association between the quality of institutions and GDP per capita in a sample of developing countries. And concluded that institutions have a statistically significant effect on economic performance. The results also showed that improving the quality of institutions contributes to an increase in income by two and a half times. Additionally, Nazier et al. (2013) concluded that the quality of institutions and governance are positively related to GDP in the Arab countries.

Han et al. (2014) found that Asian countries with governance surpluses experienced an increase in government effectiveness, regulatory quality, and control of corruption that was nearly two percentage points faster than that of nations with governance deficits during the period from 1998 to 2011. According to a study of 27 sub-Saharan countries, Osman et al. (2011) claim that political stability has a positive and significant impact on economic performance.

TABLE (1): A SUMMARY OF EXPLANATIONS FOR UNDERDEVELOPMENT INSTITUTIONS IN POOR COUNTRIES

Explanations	Summary	Authors
Colonial Inheritance	Countries inherited poor institutions from their invaders with different outcomes. Countries had valuable resources, seducing colonizers to draw extractive institutions.	(North, 1990) (Acemoglu et al., 2001)
Political Conflict	Countries had too little political competition to build institutions that serve institutional development.	(Herbst, 2000)
Beliefs & Norms	Countries had beliefs and norms preventing them from building institutions that encourage trade and investment.	(Acemoglu et al., 2004) (Knack & Keefer, 1997)

Source: (Menard & Shirely, 2005)

o, by explaining the reasons behind having underdeveloped institutions, how is it possible for developing countries to change their institutions? According to the New Institutional Economy NIE, institutional change is difficult to implement unless it is compelled by dominance. Norms and beliefs in societies are typically resistant to significant change (North, 1990). Due to the adhesiveness of beliefs and norms, underdevelopment cannot be remedied by merely importing institutions that have worked successfully in other nations. According to Levy & Spiller (1994), an imported institution, such as laws governing private utilities, cannot function in a nation lacking in fundamentally supportive institutions.

3- Data Sources and Methodology Used

There is no consistent model of good practice. Countries with good institutions have made significant progress in fulfilling sustainable development. In comparison to other Latin American countries, Chile and Brazil are considered good models for successfully implementing structural reforms. Overall, there is a strong correlation between welfare gains of sustainable development and institutional quality. So, in light of the research problem, the researcher relied on a proposed framework extracted from relevant literature that reflects the role of governance in achieving the sustainable development in developing countries.

Since non-stationary data can result in spurious regressions (Granger & Newbold, 1974), our study utilized a number of unit root tests to determine whether our dataset was stationary. The Augmented Dickey-Fuller (ADF) test, developed by Dickey & Fuller (1979) is utilized. This test, however, performs poorly in the presence of a structural break (Perron, 1989). As a result, the KPSS test, which was suggested by Kwiatkowski et al. in 1992, has been used to test stationarity. Besides, the results have been cross-checked using Phillips–Perron (PP) test provided by Phillips & Perron (1988). The Dickey-Fuller test can be formatted as follows:

$$Y_t = \alpha + \beta_t + \delta Y_{t-1} + \varepsilon_t \qquad 1$$

where $\delta = 1$ represents the unit root, t is the deterministic time trend, $t = 2, 1 \ldots T$ and $\mathcal{E}_t$ is the white noise error term. The testing procedure for the Augmented Dickey–Fuller (ADF) test is formatted as follows:

$$\Delta Y_t = \alpha + \beta_t + \delta Y_{t-1} + \sum i = 1 m \gamma i \Delta Y_{t-i} + \varepsilon_t \qquad 2$$

The lag order is selected based on Akaike Information Criterion (AIC) or Schwarz Bayesian Information Criterion (BIC). The KPSS test can be formatted as follows:

$$Y_t = \beta_t + r_t + \varepsilon_t \qquad 3$$

where β represents the intercept, t is the time index, $rt = rt - 1 + ut$ is a random walk, and ut is stationaryerror.

The Granger causality test is employed to demonstrate that there is a clear cause-and-effect relationship between the two variables. Granger causality allows for the identification of the direction in which one variable influences another without the need to infer the variables involved in a particular subnetwork. It identifies the causality relationship based on two assumptions:

1. The cause happens prior to its effect.
2. The cause has unique information about the future values of its effect.

Given these two assumptions about causality, Granger proposed to test the following hypothesis for identification of a causal effect of variable X on variable Y:

$$\mathbb{P}[Y(t+1) \in A \mid \mathcal{I}(t)] \neq \mathbb{P}[Y(t+1) \in A \mid \mathcal{I}_{-X}(t)],$$

where *P* refers to probability, *A* is an arbitrary non-empty set, and $\mathcal{I}(t)$ and $\mathcal{I}_{-X}(t)$ respectively.

If the above hypothesis is accepted, we say that X Granger-causes Y. Moreover, considering literature, there is a strong argument whether the effect of governance on sustainable development is positive or insignificant. So, the research question revolves around the following main point:

- The more relevance countries implementing good governance, the higher ranks of sustainable development they achieve.

1. Conceptual framework

Sustainable development is indexed by Adjusted Net Saving (ANS) by measuring gross national savings, adjusted for gains and losses. Experiencing negative ANS records indicate that wealth is being worn out, and vice versa. According to a report by the World bank measuring the impact of institutions on sustainable development in North Africa and the Middle East during the period from 1970 to 2003 (World Bank, 2006). Results indicated that ANS declined by 10 percentage in correlation with petroleum as a natural resource. Whereas, a large percentage of the earnings from natural resources is headed for consumption instead of production. Aidt

(2010) also found a negative correlation between sustainable development represented by the ANS index and the quality of institutions represented by the corruption index.

Additionally, there are three main dimensions of sustainable development recognized; economic, social and environmental, comprising 17 goals and 169 targets, and covering a wide range of sustainable development issues. Until recent institutional studies revealed a fourth pillar that is influential and contributes significantly to achieving SDGs; which is the institutional dimension. Each dimension can be indexed by an indicator submitted by international organizations such as the World Bank. As for the economic pillar, Gross National Income (GNI) is often used as an indicator of a country›s economic strength and development, and is used to classify countries by income level. Meanwhile, World Governance Indicators (WGI) are used to measure governance performance ranking and estimates within countries. These indicators were utilized to describe the status of countries according to their performance.

Figure (1): illustrates the conceptual framework for this study as indicated in sustainable development pillars. Variables are defined in the next section.

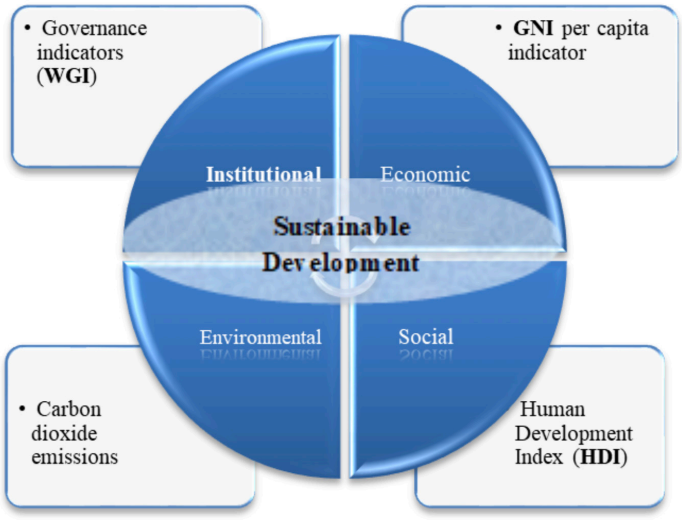

FIGURE (1): CONCEPTUAL FRAMEWORK

The main dimensions of sustainable development as explained in the previous graph. And since the study deals with the axis that discusses the role of governance in supporting the economic dimension of sustainable development. Therefore, it depends on the independent variable (WGI) in defining ANSc as an indicator for sustainable development.

Moreover, the economic structure of developing countries lacking strong institutions and effective policies is superficially damaged. Absence of property rights and corruption discourages entrepreneurs from introducing new technologies or products, unlike strong institutions that promote investments and lead to sustainable growth. Corruption is considered a challenge to achieving governance in developing countries. To help maintain this challenge, an institutional framework that supports a market economy is required.

2. Data description

The core objective of this study is to check whether control variables, as concluded from various literature; i.e., GNI, and WGI can enhance sustainable development for the developing countries, using data during the period 2021 – 2002. The study depends on a panel data set for 130 selected sample of developing countries according to data availability using EViews 12 package. The sample includes some countries like: Albania, Korea, Rep., Portugal, Romania, etc.

The Worldwide Governance Indicators (WGI) issued by the World Bank consist of six indicators that represent the different dimensions of governance. Governance indicators are used in cross-country comparison in order to emphasize political commitments and control procedures (Kaufmann et al., 2010). A detailed definition of the variables is presented in Table 2.

TABLE (2): DESCRIPTION OF A SAMPLE OF THE VARIABLES AND DATA SOURCES

Variable	Description	Data source
Adjusted Net Savings per capita (ANS)	Is calculated by subtracting the consumption of fixed capital and investment in human capital, depletion of natural capital, and pollution damages from the gross savings. It is considered a global indicator for sustainable development.	World Bank
Control of corruption (CC)	The stronger is the control of corruption, the more economic success is a function of effort and competence.	World Governance Index (WGI)
Government effectiveness (GE)	Capturing the quality of public services and the degree of its independence from political pressures, the quality of regulations and their implementation, and the credibility of the government's commitment to these regulations.	World Governance Index (WGI)
Political Stability (PS)	Measures the possibility of destabilizing the government, or the use of violence. Also, the extent to which the protection of the political rights of individuals by governments and social organizations, including Procedural justice in the law and the right to participate in the civil society and politics, such as the right to vote. 0 on scale refers to very high political instability and 7 Political stability is very high (Alesina & Perotti, 1996).	Freedom House
Regulatory Quality (RQ)	Represents the government's ability to formulate and implement policies and regulations to allow the promotion of private sector development.	World Governance Index (WGI)
Rule of law (RL)	Captures the extent of dealers' confidence in applying the law by the government equally to all individuals and organizations, and in particular the extent of the ability to protect property rights and implement contracts. Ranging between 0 (very high rule) and 6 (very low rule).	The Political Risk Service (The PRS Group, Inc)
Voice and accountability (VA)	Capturing the extent to which a country's citizens' ability to participate in electing their government, freedom of expression, freedom of the media, and freedom of association.	World Governance Index (WGI)

Source: Prepared by the researcher, using various databases.

According to these indicators, countries can be classified into three main categories:

- Good governance, with a rate ranging between 52%-75%. Moderate governance, with a rate ranging between 44%-50%. And poor governance, with a rate ranging between 20%-40 %.

3. Data Analysis

Summary statistics of variables is provided in the appendix (A.1). Results of descriptive statistics show that all variables have a skewness greater than 0 and less than 1, which means that the right tail of distribution is longer than the left. Skewness describes the asymmetry of the series distribution around its mean. While ANSc, which indicate a greater value than 3, and is highly skewed. Meanwhile, the positive sign of skewness indicates that the series is skewed to the right. Kurtosis provides the flatness or peakedness of the distribution of the series. The value of kurtosis of ANSc is 20.73, which means that the variable can experience broader fluctuation resulting in greater potential for extremely high or low returns. According to the results of kurtosis, the distribution of governance variables (WGI) is platykurtic (kurtosis values ≤ 3). Meaning that, the variables have less kurtosis than a normal distribution. Platykurtic is thin-tailed meaning that outliers are infrequent (brownmath.com, n.d.). Consequently, we proceed to test for stationarity using unit root test.

3.1. Panel Unit Root Test

We took advantage of a summary of the three-unit root tests (ADF, KPSS and PP tests) to detect unit root. The test outcomes outline that our dataset is stationary at level confirmed by the ADF test. Similar outcomes have also been observed through the KPSS test and PP test. Therefore, we can conclude that there is no unit root issue among the panel dataset and results are displayed in appendix (A.3). Therefore, we can now run the VAR model. The optimal lag length selected by AIC is two. The AIC has the minimum value, so we choose lag two for our model. Also, at lag two, there is no autocorrelation problem. And since the variables used represent (I(0)); meaning that a short run relationship may exist and no need for cointegration estimation. Hence, there may be a causality relationship between them. Consequently, we proceed to test for causality test.

3.2. Granger Causality Test

To put credibility on the previous outcomes, we performed the Granger causality test to detect the direction of causation between governance and sustainable development. Granger causality is an econometric test utilized to verify the usefulness of one variable to forecast the other variable. We have further assessed the relationship between sustainable development and indicators of governance harnessing the Granger causality test suggested by (Granger & Newbold, 1974). The Granger causality test for two stationary variables Xt and Yt involve the estimation of following equation:

$$Y_t = \alpha + \sum i = k\beta_i \, \Delta X_{t-i} + \sum i = jY_j \, \Delta Y_{t-j} + \varepsilon_{yt} \qquad 4$$

$$X_t = \alpha + \sum i = k\beta_i \, \Delta X_{t-i} + \sum i = j|Y_j \, \Delta Y_{t-j} + \varepsilon_{xt} \qquad 5$$

where ε_{yt} and ε_{xt} are uncorrelated white noise error terms. The null hypothesis is tested using F-test. When the p value is significant, the null hypothesis of the F-statistic is rejected, which implies that the first series Granger causes the second series and vice versa.

The hypothesis to test can be emphasized as follows:

- H_0: xt doesn't Granger-cause y_t
- H_A: xt does Granger-cause y_t
- Where x, y refers to variables of the study.

Decision is made according to P-value: Statistically significant P-value > 0.05; means we accept H0 and vice versa.

According to Granger-causality test results, as in appendix (A.5), P-value = 0.05 > 0.0001 in approximately all variables except for GE and VA. Therefore, decision would be to reject H0, accept HA. Meaning that, there is a causality between variables. It is obvious from the outcomes in appendix (A.5), ANSc does Granger cause CC, PS, RL, and RQ in developing countries. Further, the Granger causality test establishes a bidirectional causality between ANSc and PS means both can cause each other. For instance, political stability in developing countries can help accelerating achieving SDGs. Meanwhile, a unidirectional causality exists between ANSc and CC, RL and RQ, but the direction goes from ANSc to other variables. And a unidirectional causality exists between ANSc and VA, but the direction goes from VA to ANSc. Thus, the VAR-Granger endorses that CC, PS, RL, and RQ are mainly responsible for achieving sustainable development in developing countries.

Presentation of the Model

For testing the previous hypothesis, we develop a model involve each of the six components of governance defined above included in WGI. We assume that the observed score as a linear function of governance indicators in country j in time i, and a disturbance term, ε_{jk}, as follows:

$$ANS_{ji} = \beta_0 + \beta_1 WGI_{ji} + \varepsilon_{ji}$$

Where β represent parameters which map unobserved governance in country j in time i. ANS_{ji} represents Adjusted Net Saving per capita, and ε_{ji} represents the error term.

3.3. Vector Error Correction Model (VECM)

To analyze the robustness of the VAR model, we have employed the vector error correction model (VECM). This model will help to find out the presence of a long-run relationship among the panel data. To run the VECM model, an error correction model (ECM) constituting an error correction term (ECT) has been constructed. The ECT can be formatted as follows:

$$\varepsilon_t = Y_t - \beta X_t$$

where β stands as cointegrating coefficient and ε_t is the error derived from a regression of Y_t on X_t. Therefore, the ECM can be written as follows:

$$\Delta Y_t = \alpha \varepsilon_{t-1} + \gamma \Delta X_t + U_t$$

where βs the long-run parameter, α and γ re short-run parameters, ε_{t-1} is the equilibrium error of the previous period, U_t is independent and identically distributed. Furthermore, the Jarque–Bera test is applied to test the normality of the model (Bera & Jarque, 1981), the Breusch–Pagan test is applied to test the heteroskedasticity in the model (Breusch & Pagan, 1979)

Furthermore, the robustness of the baseline results of the VAR model is further assessed by the vector error correction model (VECM) It is evident from appendix (A.4) that the ECT is negative (0.089-) and influential as the short-run shock gets adjusted in the long run. The value lies between 0 and 1-, which implies that the previous periods deviation from long-run equilibrium is corrected in the current period as an adjustment speed of 8.9 %. The findings of the VECM debunk that long-run relationships exist between sustainable development and governance nexus. Therefore, we can conclude that the outcomes of the VECM are reliable (although the level of significance is different).

3.4. Empirical Results and Discussions

The result of beta coefficients as in appendix (A.8) shows that the value is slightly above the estimated coefficient obtained for the lagged value of ANSc, CC, GE, PS, RL, RQ and VA, each of which has a beta coefficient of 6.54 ,1.803- ,3.33 ,1.37 ,3.37 ,0.995 and 1.659-. The constant coefficient value of C is 214.51-. R-squared and adjusted R-squared represent the explanatory power of the model, which are 0.979259; meaning that 97% of the variance of the dependent variable (ANSc) is explained by the variance of the independent variables (WGI).

The study findings indicate that different countries require different reform measures to achieve their development goals in different socio-economic contexts. There is no fixed scheme to be applied in all countries to come up with same results. In addition, some dimensions of good governance may have negative effects on indicators of sustainable development in some cases. The current focus on good governance is seen as a way to overcome the failure of past policies. Korea, Rep., for instance, achieved the top score of SDGs in comparison with other developing countries. Figure (2) shows the overall ranking of some developing countries performance according to the Sustainable development report.

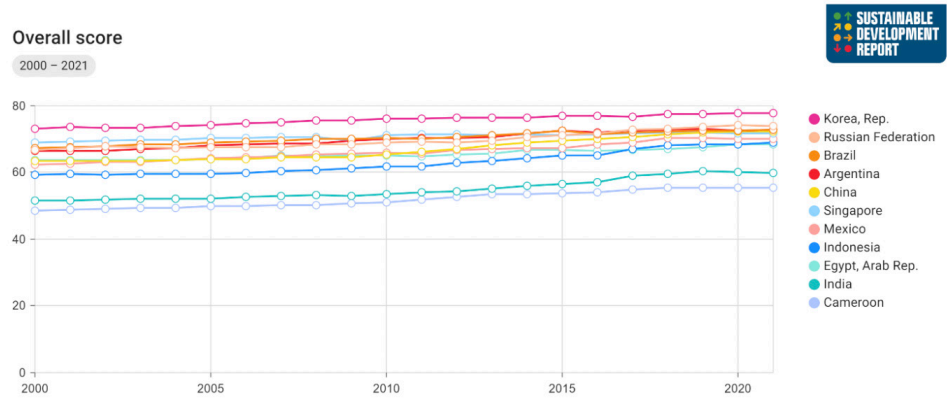

FIGURE (2):THE OVERALL RANKING OF SOME DEVELOPING COUNTRIES PERFORMANCE (2021-2000)

Source: Sustainable Development Report, 2021.

As per figure (2), South Korea is recognized on top list of sustainable development achievers within developing countries (The Sustainable Development Goals Extended Report, 2022). By referring to South Korea›s successful reforms that can be attributed to good governance which also includes increased educational spending. However, central planners often lack the knowledge and skills to manage complex economies. To ensure sustainable economic growth, governments must protect property rights and allow market movement.

Conclusion

This study intends to unveil the uncharted causality between governance and sustainable development in developing countries, harnessing a panel dataset of 130 countries from 2002 to 2021 and employing the vector autoregression (VAR) approach and Granger causality test. Besides, impulse response function (IRF) and variance decomposition (VDC) methods have been used to capture the response of sustainable development after a given shock on an explanatory variable. Furthermore, we have tested the stability of our empirical model through different tests and checked the robustness of the core VAR model by applying the VECM approach. However, the Granger causality test further filters the determinants.

Good governance is a crucial component of successful economic policy. Governments provide the regulations that allow markets to function effectively and they fix market imperfections. They require revenues, as well as agents to collect revenues and create the public goods, in order to fulfil their duty. This calls for systems of accountability, sufficient and accurate information, and effectiveness in the management of resources and the provision of public services. However, there is no guarantee that institutional frameworks supportive of development and the reduction of poverty would develop on their own. Such frameworks must arise given the right incentives and institutional capabilities.

After conducting extensive research and analysis, it can be concluded that the government›s endeavor to achieve governance can only be achieved through the process of political reform, which requires that all state institutions perform effectively and have the ability to adhere to the reforms undertaken by the state. However, there is no one-size-fits-all approach to addressing the complex political, social, and economic factors that influence governance outcomes. For instance, while Singapore›s success experience in promoting good governance may be difficult to transfer to other countries due to interfering of political preference and unfavorable policy contexts in these countries (Quah, 2013).

Also, what distinguishes good governance is the existence of harmonious and interrelated policies concerned with sustainable development, as achieving this depends mainly on a comprehensive government strategy, coordination between country institutions, stakeholders' engagement, and strong follow-up and evaluation systems.

Finally, as this study highlighted one proxy for each pillar of sustainable development, it would be interesting to test with respect to sustainable development goals, and several other economic, social and environmental indicators can be considered.

Recommendations

The study recommends the following for improving the performance of the economies especially the developing countries:

- Establishing an effective monitoring and evaluation system by following up the implementation of activities, as well as review the plans whenever necessary.
- Dialogue between researchers and policy makers is required.
- Creating a favorable investment climate to increase economic growth and ensure proper allocation of resources towards sustainable development projects. This can be achieved by supporting small and medium-sized enterprises.
- Raise awareness among stakeholders through various events, enact legislations and regulations that improve board performance and rights, and increase disclosure and transparency in companies.
- Offering incentives to attract FDI and prioritizing investments in education, health, human development, and technology R&D, as South Korea›s successful development experience has shown.
- Supporting youth with development programs that enhance their capabilities and prepare them for labor market, also enhance labor productivity.
- Focusing on good governance standards, including periodic elections, advocate the principles of democracy, rule of law, and respect for human rights. This can foster political stability and resolve internal conflicts, which are key conditions for sustainable development.
- Enhance the educational scheme, specialized and professional trainings.

Consolidating international cooperation to grant support in fields like technology transfer, capacity-building, and financial aid for sustainable development projects.

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Appendices

A.1. Descriptive Statistics:

Sample: 2002 2021

	ANSC	CC	GE	PS	RL	RQ	VA
Mean	5801.199	40.44316	42.07378	38.99811	39.70672	42.60004	39.07362
Median	2820.775	37.88939	41.16240	36.19048	37.98077	41.80898	37.50000
Maximum	81275.57	99.51923	100.0000	99.04762	100.0000	100.0000	100.0000
Minimum	50.80319	0.000000	0.000000	0.000000	0.469484	0.000000	0.000000
Std. Dev.	9411.934	24.43969	23.97905	24.26203	23.13762	23.54976	23.04554
Skewness	3.775878	0.344208	0.201042	0.434110	0.337507	0.194427	0.326353
Kurtosis	20.73548	2.168445	2.154727	2.320748	2.313205	2.166751	2.277020
Jarque-Bera	39975.40	125.3777	94.26003	130.7340	99.76548	90.96297	102.0669
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	14978697	104424.2	108634.5	100693.1	102522.8	109993.3	100888.1
Sum Sq. Dev.	2.29E+11	1541628.	1484062.	1519295.	1381737.	1431399.	1370761.
Observations	2582	2582	2582	2582	2582	2582	2582

A.2. Correlation:

Covariance Analysis: Ordinary
Date: 05/18/23 Time: 12:57
Sample: 2002 2021
Included observations: 2582
Balanced sample (listwise missing value deletion)

Correlation t-Statistic Probability	ANSC	CC	GE	PS	RL	RQ	VA
ANSC	1.000000 ----- -----						
CC	0.574516 35.65309 0.0000	1.000000 ----- -----					
GE	0.607899 38.88775 0.0000	0.862132 86.42646 0.0000	1.000000 ----- -----				
PS	0.489418 28.50681 0.0000	0.712253 51.54122 0.0000	0.635509 41.80823 0.0000	1.000000 ----- -----			
RL	0.606369 38.73287 0.0000	0.902527 106.4543 0.0000	0.903835 107.2942 0.0000	0.701855 50.04746 0.0000	1.000000 ----- -----		
RQ	0.571372 35.36302 0.0000	0.779570 63.22259 0.0000	0.873809 91.27433 0.0000	0.585470 36.68241 0.0000	0.866205 88.05028 0.0000	1.000000 ----- -----	
VA	0.285940 15.15678 0.0000	0.603427 38.43691 0.0000	0.596742 37.77350 0.0000	0.503649 29.61214 0.0000	0.658514 44.44565 0.0000	0.660754 44.71360 0.0000	1.000000 ----- -----

A.3. Unit root test

Panel unit root test: Summary
Series: ANSC
Date: 05/18/23 Time: 12:58
Sample: 2002 2021
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 4
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.28392	0.0000	130	2381
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.36345	0.0091	130	2381
ADF - Fisher Chi-square	336.126	0.0010	130	2381
PP - Fisher Chi-square	413.926	0.0000	130	2452

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: CC
Date: 05/18/23 Time: 12:59
Sample: 2002 2021
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 4
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.72132	0.0000	130	2406
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.11807	0.0000	130	2406
ADF - Fisher Chi-square	430.524	0.0000	130	2406
PP - Fisher Chi-square	405.798	0.0000	130	2470

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

A.4. ECM:

Dependent Variable: D(ANSC)
Method: ARDL
Date: 06/08/23 Time: 16:18
Sample: 2003 2021
Included observations: 2452
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): CC GE PS RL RQ VA
Fixed regressors: C
Number of models evalulated: 2
Selected Model: ARDL(1, 1, 1, 1, 1, 1, 1)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
	Long Run Equation			
CC	80.82315	8.212967	9.840919	0.0000
GE	70.57735	8.868444	7.958256	0.0000
PS	-19.86083	5.118101	-3.880508	0.0001
RL	-158.8176	14.24788	-11.14675	0.0000
RQ	40.90588	7.903263	5.175822	0.0000
VA	-37.14603	10.44953	-3.554805	0.0004
	Short Run Equation			
COINTEQ01	-0.088787	0.010720	-8.282446	0.0000
D(CC)	-7.224640	15.46775	-0.467078	0.6405
D(GE)	-60.33436	47.21746	-1.277798	0.2015
D(PS)	1.395332	5.839454	0.238949	0.8112
D(RL)	46.05806	23.97259	1.921281	0.0549
D(RQ)	19.04033	11.29989	1.685001	0.0922
D(VA)	27.81684	59.59835	0.466738	0.6408
C	1238.859	232.6606	5.324746	0.0000
Log likelihood	-16571.92			

*Note: p-values and any subsequent tests do not account for model selection.

A.5. Granger Causality test:

Pairwise Granger Causality Tests
Date: 05/18/23 Time: 13:01
Sample: 2002 2021
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
CC does not Granger Cause ANSC	2322	17.3247	3.E-08
ANSC does not Granger Cause CC		3.47977	0.0310
GE does not Granger Cause ANSC	2322	15.4541	2.E-07
ANSC does not Granger Cause GE		10.1917	4.E-05
PS does not Granger Cause ANSC	2322	8.48435	0.0002
ANSC does not Granger Cause PS		3.92740	0.0198
RL does not Granger Cause ANSC	2322	14.1324	8.E-07
ANSC does not Granger Cause RL		9.27819	0.0001
RQ does not Granger Cause ANSC	2322	15.4683	2.E-07
ANSC does not Granger Cause RQ		7.02475	0.0009
VA does not Granger Cause ANSC	2322	6.15817	0.0022
ANSC does not Granger Cause VA		0.02138	0.9788
GE does not Granger Cause CC	2340	15.9603	1.E-07
CC does not Granger Cause GE		10.8217	2.E-05
PS does not Granger Cause CC	2340	5.46086	0.0043
CC does not Granger Cause PS		11.9703	7.E-06
RL does not Granger Cause CC	2340	25.3230	1.E-11
CC does not Granger Cause RL		18.8228	8.E-09
RQ does not Granger Cause CC	2340	5.29008	0.0051
CC does not Granger Cause RQ		9.06903	0.0001
VA does not Granger Cause CC	2340	12.0199	6.E-06
CC does not Granger Cause VA		0.72171	0.4860
PS does not Granger Cause GE	2340	5.31132	0.0050
GE does not Granger Cause PS		9.30306	9.E-05
RL does not Granger Cause GE	2340	13.4440	2.E-06
GE does not Granger Cause RL		33.0186	7.E-15
RQ does not Granger Cause GE	2340	6.07897	0.0023
GE does not Granger Cause RQ		23.4239	8.E-11
VA does not Granger Cause GE	2340	1.94821	0.1428
GE does not Granger Cause VA		0.53952	0.5831
RL does not Granger Cause PS	2340	5.51207	0.0041
PS does not Granger Cause RL		16.5470	7.E-08
RQ does not Granger Cause PS	2340	9.96399	5.E-05
PS does not Granger Cause RQ		4.05190	0.0175
VA does not Granger Cause PS	2340	7.21415	0.0008
PS does not Granger Cause VA		0.71987	0.4869
RQ does not Granger Cause RL	2340	12.4656	4.E-06
RL does not Granger Cause RQ		13.0827	2.E-06
VA does not Granger Cause RL	2340	6.24611	0.0020
RL does not Granger Cause VA		1.86216	0.1556
VA does not Granger Cause RQ	2340	9.36973	9.E-05
RQ does not Granger Cause VA		0.17621	0.8385

A.6. Vector Autoregression Estimates.

Vector Autoregression Estimates
Date: 06/06/23 Time: 19:21
Sample (adjusted): 2004 2021
Included observations: 2322 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	ANSC	CC	GE	PS	RL	RQ	VA
ANSC(-1)	1.100462	5.57E-05	0.000174	7.01E-05	0.000122	0.000168	-1.23E-05
	(0.02195)	(6.2E-05)	(6.7E-05)	(8.7E-05)	(5.3E-05)	(6.0E-05)	(4.7E-05)
	[50.1346]	[0.89696]	[2.59234]	[0.81021]	[2.31051]	[2.82103]	[-0.25973]
ANSC(-2)	-0.107563	-4.52E-05	-0.000144	-4.18E-05	-0.000106	-0.000149	8.13E-06
	(0.02208)	(6.3E-05)	(6.7E-05)	(8.7E-05)	(5.3E-05)	(6.0E-05)	(4.8E-05)
	[-4.87140]	[-0.72282]	[-2.13212]	[-0.48035]	[-2.00353]	[-2.48945]	[0.17048]
CC(-1)	-3.996935	0.874882	0.039077	0.030606	0.010515	0.014490	0.003870
	(7.59298)	(0.02150)	(0.02320)	(0.02994)	(0.01824)	(0.02064)	(0.01639)
	[-0.52640]	[40.6967]	[1.68440]	[1.02213]	[0.57653]	[0.70222]	[0.23613]
CC(-2)	10.22025	0.060615	-0.011627	0.011420	0.017483	-0.019071	-0.003521
	(7.51146)	(0.02127)	(0.02295)	(0.02962)	(0.01804)	(0.02041)	(0.01621)
	[1.36062]	[2.85021]	[-0.50662]	[0.38553]	[0.96899]	[-0.93421]	[-0.21713]
GE(-1)	0.838682	0.049553	0.847513	0.044433	0.072132	0.092629	0.008175
	(7.23565)	(0.02049)	(0.02211)	(0.02853)	(0.01738)	(0.01966)	(0.01562)
	[0.11591]	[2.41886]	[38.3362]	[1.55720]	[4.15017]	[4.71056]	[0.52342]
GE(-2)	0.997442	-0.027269	0.088701	-0.042795	-0.041554	-0.069098	-0.004452
	(7.33545)	(0.02077)	(0.02241)	(0.02893)	(0.01762)	(0.01994)	(0.01583)
	[0.13598]	[-1.31298]	[3.95770]	[-1.47938]	[-2.35831]	[-3.46609]	[-0.28114]
PS(-1)	6.524507	0.025052	0.028684	0.860638	0.050788	0.015365	0.001319
	(5.09882)	(0.01444)	(0.01558)	(0.02011)	(0.01225)	(0.01386)	(0.01101)
	[1.27961]	[1.73541]	[1.84126]	[42.8021]	[4.14674]	[1.10885]	[0.11988]
PS(-2)	-5.016804	-0.019630	-0.029268	0.088065	-0.043259	-0.019399	0.000908
	(5.06738)	(0.01435)	(0.01548)	(0.01998)	(0.01217)	(0.01377)	(0.01094)
	[-0.99002]	[-1.36823]	[-1.89036]	[4.40690]	[-3.55396]	[-1.40864]	[0.08301]
RL(-1)	-10.31081	0.089356	0.079466	-0.013263	0.844386	0.031026	0.033096
	(9.39201)	(0.02659)	(0.02870)	(0.03704)	(0.02256)	(0.02552)	(0.02027)
	[-1.09783]	[3.36037]	[2.76925]	[-0.35809]	[37.4282]	[1.21553]	[1.63247]
RL(-2)	6.353134	-0.048544	-0.076620	-0.019931	0.069755	-0.016805	-0.029390
	(9.34523)	(0.02646)	(0.02855)	(0.03685)	(0.02245)	(0.02540)	(0.02017)
	[0.67983]	[-1.83469]	[-2.68345]	[-0.54082]	[3.10744]	[-0.66170]	[-1.45690]
RQ(-1)	6.785606	-0.008321	0.014538	0.074740	0.036127	0.757882	-0.021176
	(7.91017)	(0.02240)	(0.02417)	(0.03119)	(0.01900)	(0.02150)	(0.01708)
	[0.85783]	[-0.37156]	[0.60153]	[2.39597]	[1.90133]	[35.2549]	[-1.24017]
RQ(-2)	-0.847814	-0.006220	0.011222	-0.074051	-0.021598	0.193601	0.015030
	(7.86307)	(0.02226)	(0.02402)	(0.03101)	(0.01889)	(0.02137)	(0.01697)
	[-0.10782]	[-0.27940]	[0.46709]	[-2.38809]	[-1.14348]	[9.05981]	[0.88550]
VA(-1)	5.894427	0.103378	0.027602	0.063656	0.080332	0.073700	1.051614
	(9.84981)	(0.02789)	(0.03009)	(0.03884)	(0.02366)	(0.02677)	(0.02126)
	[0.59843]	[3.70698]	[0.91717]	[1.63879]	[3.39530]	[2.75324]	[49.4597]
VA(-2)	-7.128589	-0.098549	-0.036592	-0.046351	-0.080514	-0.061510	-0.062959
	(9.89113)	(0.02800)	(0.03022)	(0.03901)	(0.02376)	(0.02688)	(0.02135)
	[-0.72071]	[-3.51909]	[-1.21083]	[-1.18832]	[-3.38877]	[-2.28823]	[-2.94872]
C	-194.9298	0.163735	0.549488	0.562117	0.064836	0.223057	0.335799
	(68.4726)	(0.19386)	(0.20921)	(0.27002)	(0.16448)	(0.18609)	(0.14781)
	[-2.84683]	[0.84459]	[2.62652]	[2.08173]	[0.39420]	[1.19868]	[2.27188]
R-squared	0.979368	0.973824	0.968556	0.947967	0.979073	0.974175	0.982882
Adj. R-squared	0.979242	0.973665	0.968365	0.947651	0.978946	0.974019	0.982778
Sum sq. resids	4.52E+09	36229.05	42191.10	70286.52	26077.65	33380.65	21059.80
S.E. equation	1399.674	3.962823	4.276482	5.519659	3.362099	3.803852	3.021366
F-statistic	7821.935	6130.593	5075.758	3002.140	7709.574	6216.128	9461.682
Log likelihood	-20107.81	-6484.544	-6661.420	-7253.961	-6102.828	-6389.476	-5854.707
Akaike AIC	17.33230	5.598229	5.750577	6.260948	5.269447	5.516345	5.055734
Schwarz SC	17.36945	5.635375	5.787723	6.298094	5.306593	5.553490	5.092880
Mean dependent	6115.226	40.35291	42.08597	38.76293	39.77072	42.63527	39.05481
S.D. dependent	9714.880	24.41980	24.04370	24.12446	23.17099	23.59889	23.02307

Determinant resid covariance (dof adj.)	1.58E+13
Determinant resid covariance	1.51E+13
Log likelihood	-58295.54
Akaike information criterion	50.30193
Schwarz criterion	50.56195
Number of coefficients	105

A.7. Variance Decomposition

Variance Decomposition of ANSC:

Period	S.E.	ANSC	CC	GE	PS	RL	RQ	VA
1	1399.674	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	2082.812	99.93295	0.003559	0.001050	0.028170	0.014878	0.012669	0.006728
3	2595.061	99.88132	0.006093	0.005156	0.040335	0.026048	0.033268	0.007777
4	3018.368	99.80218	0.026889	0.013563	0.052506	0.035232	0.061699	0.007928
5	3386.224	99.69207	0.068278	0.026632	0.065133	0.042965	0.097067	0.007853
6	3715.551	99.55189	0.129515	0.044498	0.078515	0.049416	0.138440	0.007721
7	4016.221	99.38353	0.209224	0.067268	0.092703	0.054637	0.185044	0.007592
8	4294.587	99.18902	0.305926	0.095021	0.107694	0.058674	0.236175	0.007490
9	4555.027	98.97033	0.418187	0.127810	0.123457	0.061587	0.291207	0.007426
10	4800.711	98.72928	0.544659	0.165664	0.139949	0.063456	0.349584	0.007405

Variance Decomposition of CC:

Period	S.E.	ANSC	CC	GE	PS	RL	RQ	VA
1	3.962823	0.007720	99.99228	0.000000	0.000000	0.000000	0.000000	0.000000
2	5.432552	0.017122	98.88345	0.289123	0.155555	0.346016	0.004566	0.304172
3	6.515602	0.038168	98.11839	0.526605	0.258857	0.592417	0.012674	0.452889
4	7.385679	0.062399	97.41325	0.779783	0.349597	0.828784	0.023440	0.542753
5	8.119024	0.090328	96.71534	1.053900	0.437419	1.061476	0.035499	0.606043
6	8.755745	0.122454	96.00948	1.348915	0.524871	1.291334	0.048019	0.654931
7	9.320100	0.159087	95.29362	1.662657	0.612730	1.516818	0.060313	0.694779
8	9.828059	0.200416	94.56991	1.992388	0.701045	1.736040	0.071870	0.728333
9	10.29077	0.246571	93.84177	2.335265	0.789598	1.947303	0.082329	0.757167
10	10.71635	0.297641	93.11276	2.688547	0.878072	2.149258	0.091452	0.782268

Variance Decomposition of GE:

Period	S.E.	ANSC	CC	GE	PS	RL	RQ	VA
1	4.276482	0.032992	5.406103	94.56090	0.000000	0.000000	0.000000	0.000000
2	5.732329	0.334363	6.812532	92.47963	0.129969	0.216680	0.007351	0.019475
3	6.837397	0.531229	7.666792	91.29701	0.169874	0.259154	0.045890	0.030046
4	7.723443	0.696887	8.457351	90.23732	0.190919	0.287892	0.097681	0.031955
5	8.469962	0.851681	9.204544	89.23269	0.204396	0.308522	0.167135	0.031031
6	9.116781	1.005286	9.925715	88.24871	0.214163	0.326606	0.250447	0.029076
7	9.688588	1.161693	10.62525	87.27419	0.222020	0.344109	0.345897	0.026846
8	10.20182	1.322856	11.30471	86.30544	0.228839	0.362000	0.451483	0.024674
9	10.66809	1.489752	11.96441	85.34178	0.235110	0.380779	0.565459	0.022711
10	11.09593	1.662859	12.60419	84.38388	0.241121	0.400712	0.686224	0.021013

Variance Decomposition of PS:

Period	S.E.	ANSC	CC	GE	PS	RL	RQ	VA
1	5.519659	0.100119	1.188295	0.748119	97.96347	0.000000	0.000000	0.000000
2	7.357361	0.180171	1.746402	1.261057	96.62456	0.001672	0.123259	0.062879
3	8.736953	0.253206	2.208610	1.372367	95.92043	0.002897	0.119108	0.123387
4	9.832663	0.313567	2.656841	1.414284	95.30246	0.010423	0.120025	0.182400
5	10.74376	0.371134	3.108567	1.427626	94.70736	0.024057	0.116417	0.244836
6	11.52141	0.428510	3.565323	1.427487	94.11310	0.042025	0.111653	0.311896
7	12.19738	0.487094	4.026511	1.420954	93.51231	0.062819	0.106154	0.384159
8	12.79298	0.547529	4.490450	1.411335	92.90350	0.085068	0.100405	0.461715
9	13.32333	0.610153	4.955276	1.400466	92.28724	0.107685	0.094707	0.544476
10	13.79966	0.675141	5.419180	1.389385	91.66494	0.129828	0.089283	0.632246

Variance Decomposition of RL:

Period	S.E.	ANSC	CC	GE	PS	RL	RQ	VA
1	3.362099	0.085492	8.107635	5.243624	1.794134	84.76912	0.000000	0.000000
2	4.601023	0.393702	9.307250	7.753698	3.255346	78.96445	0.069492	0.256062
3	5.513492	0.588515	10.53685	9.021369	3.677896	75.70484	0.108727	0.361806
4	6.243348	0.738846	11.74714	10.08658	3.942481	72.90515	0.157896	0.421907
5	6.858622	0.872997	12.95064	11.04665	4.120757	70.33569	0.212204	0.461063
6	7.394551	1.001772	14.13842	11.94110	4.252446	67.90542	0.271580	0.489259
7	7.872397	1.129940	15.30313	12.78443	4.353315	65.58329	0.335081	0.510814
8	8.306039	1.259852	16.43821	13.58275	4.431934	63.35740	0.401905	0.527940
9	8.705044	1.392777	17.53835	14.33902	4.493439	61.22322	0.471291	0.541906
10	9.076266	1.529434	18.59946	15.05490	4.541253	59.17889	0.542556	0.553506

Variance Decomposition of RQ:

Period	S.E.	ANSC	CC	GE	PS	RL	RQ	VA
1	3.803852	0.129534	3.822817	7.940198	0.442853	2.163710	85.50089	0.000000
2	4.928631	0.583429	4.882939	11.04819	0.679438	2.552500	80.06567	0.187828
3	5.863336	0.820377	5.245328	12.16830	0.752747	2.846015	77.87670	0.290532
4	6.625276	1.004030	5.527361	13.14312	0.782767	3.048286	76.11445	0.379984
5	7.282958	1.159927	5.758801	13.94916	0.793561	3.222614	74.65626	0.459672
6	7.863129	1.304272	5.969750	14.67841	0.795256	3.375381	73.34103	0.535897
7	8.384195	1.443418	6.170466	15.35170	0.792096	3.513433	72.11860	0.610282
8	8.858225	1.580802	6.366552	15.98340	0.786305	3.639548	70.95967	0.683724
9	9.293860	1.718315	6.560996	16.58083	0.779104	3.755568	69.84862	0.756568
10	9.697508	1.857085	6.755523	17.14853	0.771220	3.862683	68.77602	0.828930

Variance Decomposition of VA:

Period	S.E.	ANSC	CC	GE	PS	RL	RQ	VA
1	3.021366	0.002170	3.813015	0.206894	1.580211	2.324009	0.056680	92.01702
2	4.406228	0.005952	4.040737	0.267764	1.635046	2.795510	0.142735	91.11226
3	5.440962	0.008130	4.141215	0.307035	1.708398	2.944437	0.172156	90.71863
4	6.292135	0.010065	4.216288	0.338353	1.767867	3.017510	0.198665	90.45125
5	7.026262	0.012050	4.281389	0.365836	1.822804	3.060354	0.222668	90.23490
6	7.677234	0.014116	4.342238	0.391344	1.874924	3.087769	0.245825	90.04378
7	8.264962	0.016269	4.401047	0.415503	1.925151	3.106225	0.268517	89.86729
8	8.802353	0.018503	4.458841	0.438636	1.973910	3.118900	0.290949	89.70026
9	9.298348	0.020812	4.516131	0.460903	2.021436	3.127591	0.313206	89.53992
10	9.759458	0.023189	4.573178	0.482397	2.067868	3.133399	0.335323	89.38464

Cholesky Ordering: ANSC CC GE PS RL RQ VA

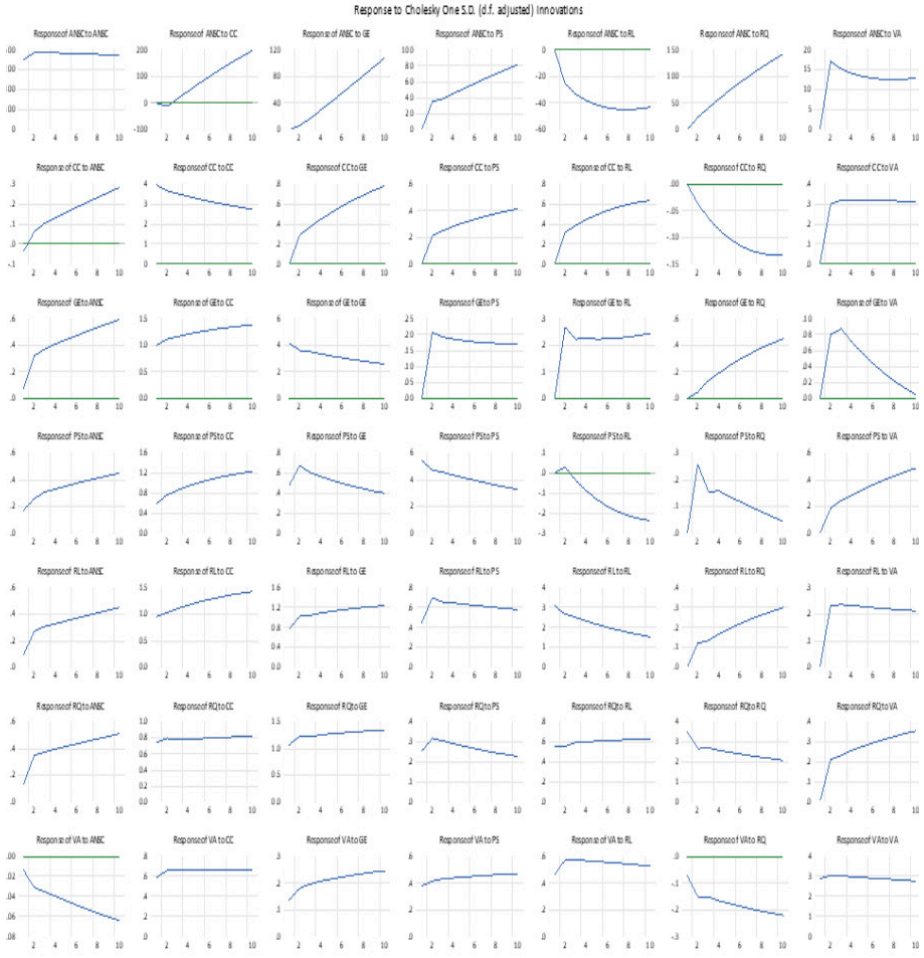
A.8. Panel least-squared

Dependent Variable: ANSC
Method: Panel Least Squares
Date: 05/18/23 Time: 13:30
Sample (adjusted): 2003 2021
Periods included: 19
Cross-sections included: 130
Total panel (unbalanced) observations: 2452

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ANSC(-1)	0.995665	0.003938	252.8530	0.0000
CC	3.378890	2.900512	1.164929	0.2442
GE	1.379057	3.158535	0.436613	0.6624
PS	3.338649	1.698651	1.965471	0.0495
RL	-1.803340	3.841787	-0.469401	0.6388
RQ	6.545906	2.762370	2.369670	0.0179
VA	-1.659103	1.718047	-0.965691	0.3343
C	-214.5130	65.26423	-3.286838	0.0010

Root MSE	1377.158	R-squared	0.979259
Mean dependent var	5959.846	Adjusted R-squared	0.979200
S.D. dependent var	9564.472	S.E. of regression	1379.410
Akaike info criterion	17.29996	Sum squared resid	4.65E+09
Schwarz criterion	17.31889	Log likelihood	-21201.75
Hannan-Quinn criter.	17.30684	F-statistic	16484.60
Durbin-Watson stat	1.772018	Prob(F-statistic)	0.000000

A.9. Impulse responses



RESEARCH PAPERS IN ENGLISH

Assessing the IMF Governance System: A Proposal for Reform

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Abstract

This paper examines the IMF governance system and how it impacts the organization›s legitimacy as an international institution. It also sheds light on the recent reforms, particularly related to quotas and voting power. The paper considers the quota system as a cornerstone of the IMF governance system, reflecting members› ability to contribute to the Fund›s operations, access to resources, allocate Special Drawing Rights (SDRs), and determine voting power. Furthermore, it explores the relationship between the IMF›s structural conditionality and corruption in borrower countries.

The findings suggest that the IMF quota reviews, conducted twice in 2008 and 2010, resulted in a quota increase that primarily increased the voting share for 135 countries, most notably raising China›s voting power from 3.8% to 6%. However, these reforms were perceived as modest and fell short of the developing countries' expectations. It is concluded that there are factors within IMF lending that can contribute to corruption in borrowing countries, such as the concentration of bureaucratic power, weak regulatory institutions, and the limited role of civil society organizations. Moreover, the IMF›s conditionality programs often prioritize economic reforms and fiscal adjustments over addressing governance issues and corruption.

Given that the IMF›s policies directly impact the lives of millions of individuals, it is crucial for the organization to adhere to governance principles and standards in its operations to gain credibility and acceptance from member countries. The IMF is also required to effectively apply anti-corruption measures to the conditions of its loans, ensuring the efficient utilization of resources. Considering the emergence of various alternative sources of lending in recent times; it is crucial for the IMF to uphold its legitimacy and significance.

Keywords: SIMF, Conditionality, Governance, Corruption, IMF Reform, Articles of Agreement.

تقييم نظام حوكمة صندوق النقد الدولي: رؤية مقترحة للإصلاح

مستخلص:

يتناول هذا البحث تقييمًا لنظام حوكمة صندوق النقد الدولي وتأثير ذلك النظام على شرعيته كمنظمة دولية، ويسلط الضوء على الإصلاحات الأخيرة المتعلقة بحصص الأعضاء وقوتهم التصويتية، مع اعتبار أن نظام حصص الأعضاء هو حجر الأساس داخل نظام حوكمة صندوق النقد الدولي؛ والذي يعكس قدرة الأعضاء على المساهمة في عمليات الصندوق، والموارد التي يمكن سحبها من صندوق النقد الدولي، وقوتهم التصويتية، وتوزيع مخصصات حقوق السحب الخاصة. كما طرح البحث تساؤلًا حول العلاقة بين المشروطية الهيكلية ومستوى الفساد في الدول المقترضة، ودور صندوق النقد الدولي في تقويض ممارسات الفساد في الدول المتلقية للقروض.

أشارت النتائج إلى أن المراجعات التي تم إدخالها في عامي ٢٠٠٨ و ٢٠١٠ على نظام صندوق النقد الدولي أسفرت عن زيادة في الحصص تجسدت بشكل أساسي في زيادة القوة التصويتية ل ١٣٥ دولة، وعلى رأس هذه الإصلاحات كانت زيادة القوة التصويتية للصين من ٣,٨٪ إلى ٦٪؛ إلا أن هذه الإصلاحات اعتُبرت متواضعة، ولم ترقى لتطلعات البلدان النامية. وقد توصل البحث إلى أن هناك عوامل قد تسهم في زيادة مستوى الفساد داخل الدول

المقترضة وهي عوامل ذات الصلة بمؤسسات الدول المتلقية للقروض، مثل وجود سلطة مركزية والبيروقراطية وضعف المؤسسات الرقابية، هذا فضلًا عن الدور الهامشي لمنظمات المجتمع المدني، كما ثبت أن الصندوق غالبًا ما يعطي الأولوية للإصلاحات الاقتصادية وعلاج اختلال ميزان المدفوعات على حساب قضايا الحوكمة والفساد.

وفي ضوء ظهور مصادر بديلة متنوعة للتمويل في السنوات الأخيرة، فإنه من الضروري بمكان على صندوق النقد الدولي الالتزام بمبادئ الحوكمة لكسب المصداقية والقبول من الدول الأعضاء. كما يتوجب على صندوق النقد الدولي تطبيق إجراءات فعالة لمكافحة الفساد على شروط القروض الممنوحة، مما يضمن الاستخدام الفعال للموارد.

الكلمات المفتاحية: صندوق النقد الدولي، المشروطية، الحوكمة، الفساد، إصلاح صندوق النقد الدولي، اتفاقية تأسيس صندوق النقد الدولي

1- Introduction

As part of commitment to the SDGs, IMF began to work on fostering good governance to support economic reforms, political legitimacy, and institutional effectiveness during the last decade of the twentieth century. (IMF and Good Governance, 2022). In 1997, the IMF endorsed a policy on economic governance, which was manifested in the Guidance Note «The Role of the IMF in Governance Issues.» To strengthen policy implementation, a new Framework was adopted for to enhance engagement on governance in 2018 aiming to promoting more engagement with member countries on critical governance vulnerabilities, such as corruption, that affect macroeconomic performance.

Since its inception in 1944, the IMF has relied on conditionality in its lending arrangements and economic assistance to fulfil the institutional goals of correcting macroeconomic imbalances. Conditionality is integrated into a borrowing country›s eligibility for lending arrangements and continued financing eligibility by the IMF. Membership in the IMF and access to lending arrangements are generally contingent on a country implementation of certain mandatory policy commitments and reforms. (Ataman, 2022)

The IMF utilizes conditionality to mandate governance-related practices, reform existing institutional rules and regulations, and ensure compliance to foster good governance in recipient countries. The IMF defends conditional reforms related to borrowers› governance as inherently relevant to its core organizational scope and mission. Poor governance undermines a borrowing nation›s economic stability by disrupting agreed-upon channels of loan distribution and impeding the borrower›s prospects for loan repayment (Waleed, 2022).

However, many observers, scholars, and policymakers have criticized the IMF, asserting that the institution has neither prevented nor resolved various global financial crises that have arisen since the 1970s (Jiang, 2014). In addition, there are criticisms related to the cost of conditionality in developing countries and how it falls short of its recommendations to member states in terms of accountability and transparency. These criticisms highlight the necessity for the IMF to adhere to the principles and standards of governance in its institutional structures and call for the establishment of a more legitimate, accountable, and effective IMF.»

The Research Objectives

This paper will discuss the governance system in the IMF, mainly by focusing on some aspects of the organizational structure and quota system, analyze and evaluate the reforms that intended to the quota system, and identify to what extent the IMF needs more reforms in its internal system, and also with the conditionality accompanied its lending arrangements and determine to what extent it has impact on the corruption practices in the borrower countries.

The Main Research Question

Considering the emergence of various alternative sources of lending in recent times, the main research question is "How can the IMF enhance their internal governance system and utilize the conditionality to reduce corruption practices and ensure the application of good governance in the borrower countries?" In other words, What sort of reforms needed to ensure the IMF's relevance and significance in the international financial system?

Research Questions

1. How does the IMF's system of governance manage to strengthen its legitimacy of representing the member countries as an international organization?
2. Have the recent reforms – related to membership quotas and voting power- enhanced the IMF's governance system?
3. Is there a correlation between structural conditionality and corruption reduction in the borrower countries?

Research Approach

To answer the research questions, the researcher will assess the governance system of the IMF based on Neo-Gramscians's view, that is categorized under the umbrella of the post-positivist critical theory in studying the international relations; this theory mainly criticizes the current social practices and institutions empowered by the new-liberal agenda, while also advancing emancipation[1] by promoting ideas adhere to universalist principles of justice (Dunne et al.2010). According to the Neo-Gramscian perspective, the core objective of institutions such as the IMF and World Bank is to sustain hegemony, thereby spreading the capitalist system globally. They do this by promoting free trade policies through the WTO and by issuing conditional loans through the IMF. (Gil and Aguilera, 2017)

The Neo-Gramscian approach, which involves examining historical events and power dynamics, shed light on how production patterns have evolved and how the state and global system have reinforced hegemonic power. This analysis can be useful in understanding how these factors have influenced policy-making at the IMF. (Mueller 2011).

The researcher intends to employ neo-Gramscian assumptions in examining the governance system within the IMF both prior to and subsequent to the endorsed reforms.

The Structure of the Paper

Section 1: The Governance Structure of the IMF.

Section 2: Review of IMF governance reform in 2000s: Crisis As An Approach to Enhance Governance Mechanism.

Section 3: Controversy of The IMF conditionality and Corruption Practices in The Borrower Countries.

Section 4: Conclusion and Recommendations.

Previous Literature

The Studies relevant to the research topic can be categorized under four main groups; the first group tackled (the governance of the IMF). Kaul et al.,2002 focused on the IMF's quota system as a main pillar of the IMF's governance system and proposed some aspects to reform the IMF as restructuring the executive board and revise quota formula to cope with the

[1] *Emancipation is an essentially negative concept of freedom that emphasizes the removal of repressive constraints or dominating relationships. Many critical theorists are intellectually influenced by Karl Marx and draw from his analysis of human inequality and his normative goal of eliminating exploitation. For more information look Smith, S. M., Dunne, T., & Kurki, M. (Eds.). (2010). International Relations Theories: discipline and diversity. (Oxford: Oxford University Press).*

transformations in the global economic order, another scholar, Waleed Khallaf (Waleed,2022) evaluates the governance system in a more comprehensive way, questioning the degree of its legitimacy of representing the interests of its member states. Carlo Cotarelli (Cottarelli,2005) assumes that designing appropriate governance structures for the IMF is not an easy task and needs a trade-off between legitimacy and efficiency.

The Second group outlined (Conceptual Framework of Governance), Marc Hufty (Hufty,2011) compared four most popular approaches to governance: corporate governance, global governance, good governance, and modern governance; both their gaps and potential contributions as analytical tool in social sciences, Naigre Woods (Woods,1999), Woods focuses on the concept of "good governance". She lists three factors that serve as key principles to determine the presence or absence of good governance in international organizations in general, which are "participation", "accountability", and "fairness.

The Third group highlighted (Evaluating the IMF Reforms and proposing suggestions), Lara Merling and Ralph C. Bryant (Merling,2021.Bryant,2016) stressed on the need to reform the current quota system if the IMF is to maintain both its legitimacy and relevance in the coming decades, as the proposed package in 2008 and 2010 falls short its huge role in the international monetary system, Yueting Jiang (Jiang,2014) proposed a bloc voting system that would create two sets of voting blocs (economic blocs) and (regional blocs), that ultimately satisfies the principles of participation, accountability, and effectiveness, thus restoring good governance and fulfilling its purposes. Niti Bhasin and Surbhi Gupta (Bhasin and Gupta,2018) suggested areas of IMF's improvement should be given to governance, transparency, openness, accountability; promoting trade liberalization and free markets; and combating corruption and nepotism. Syed Ahmed & Abdulhamid Sukar (Ahmed and Sukar,2018) stressed on the importance of adopting more concrete reforms at the IMF, warning that the developing countries started to escape from the IMF's umbrella by seeking other source of Funds.

The Fourth category (The relationship between IMF Lending and Corruption Practices in the borrower countries), Yala Ataman (Ataman,2014) assess the impact of IMF structural conditionality on corruption within 131 countries between 2000 and 2014 The findings indicate structural conditionality does not help in reducing corruption. Juan Carlos Linares (Linares,2005) went further steps by studying the case of Argentina, claims that the IMF's soft stance on corruption contributed to Argentina›s financial decline, and has contributed in more corruption practices.

Another paper (Devesh Kapur and Richard Webb ,2000) analyzed a sample of 25 upper-tranche arrangements in 1999 of governance-related conditionality, and he found out that the results were not inviting, due to distortions and ineffectiveness that result from a narrow focus on borrower governments, to the exclusion of private actors and civil society.

Another study (Reinsberg, B. et al. 2020) claims that IMF policy measures, such as privatization of state-owned enterprises, can create rent-seeking opportunities while limiting state institutions› ability to limit corrupt behavior.

The researcher benefited from previous studies in understanding the IMF›s governance system and assisting in evaluating recent reforms. This study attempts to fill a gap in the literature by correlating the IMF›s use of conditionality to impose governance-related practices on borrower countries and its internal governance system, assuming that, in order for IMF policies and programs to gain credibility and acceptance by its member countries, and, more

importantly, to play a much more influential role in the international economic system, the IMF is required to adhere to governance principles and standards in its operations.

Section 1: The Governance Structure of the IMF

In this section, we will give a brief overview on the IMF's establishment, the meaning of the governance system in the international Organizations, and finally, the criticism directed towards the IMF's governance system from the Neo-Gramscian's perspective.

1.1. Introduction on the IMF's establishment in 1944

The International Monetary Fund (IMF) has been playing an important role in the international financial architecture. The IMF is not only responsible for helping member countries facing their economic balance of Payments, but also shapes national economies through giving its policy advice and introducing financial assistance through conditionality associated with its loans. (Bohoslavsky, J.P., Cantamutto, F. & Clérico, L., 2022).

Historically, the international monetary system was subjected to deterioration after WWI and the preceding events (i.e 1930s Great Depression and the Second World War) and these events had negative impacts on international trade and investment. During the interwar period of 1944–1914, most countries directed towards devaluating their currencies as to gain advantages in the world export market and increasing the price of imports. (Nahasin & Gupta, 2018).

In short, the period between WW1 and WWII was marked by economic and political instability, bank failures, deteriorating global trade, currency issues, cross-border capital flight, in an effort to restructure the world economy and design the post-war international monetary system, representatives from 44 countries met in July 1944 at Bretton Woods, New Hampshire, USA. On July 1944 ,24, the Bretton Woods Conference resulted in the establishment of two multilateral institutions, the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (World Bank). The Articles of Agreement were signed by the founding members which act as the core of the Bretton Woods system. (Nahasin & Gupta, 2018).

The IMF has evolved constantly in response to the world economic situation, the performance of the IMF has consistently focused on international monetary issues including cooperation, development, exchange stability, and payment difficulties assistance, all of which are still fully consistent with the purposes stated in Article I.(Lindblad,2010)

The IMF has been subjected to criticisms, as it was established primarily to restore and maintain stability in the world financial system. The criticisms were mainly concerned with the institution's inability to neither prevent nor solve the various global financial crises that have arisen since the 1970s. When the IMF was founded, its basic function was to stabilize the world's system of currency exchange rates[2].(Abdel-Haleem, 2011)

[2] *According to the IMF's articles of agreement, IMF works to achieve sustainable growth and prosperity for all of its 190 member countries. It does so by supporting economic policies that promote financial stability and monetary cooperation, which are essential to increase productivity, job creation, and economic well-being, that's why some researchers considered it accountable for the crises that hit the international financial system.*

1.2. The Meaning of Governance System in The International Organizations

By the end of the Cold War, as demands for having better governance and democracy grew louder and as anticipation for what international organizations might do to advance this goal, good governance was introduced onto the agenda of many international organizations such as the UN and other multi-lateral organizations (Woods,1999) considering the fact that International organizations (IOs) are involved in various activities from international peace and security to global economic governance, humanitarian assistance, and sustainable development, which make these organizations deemed as central players in the architecture of global governance.(Cannon, Cecilia, and Thomas Biersteker, 2020).

On the other hand, many scholars started to question how good governance reflected on the way the organizations are internally structured and make and implement decisions. Some of research papers has shown poor performance of these organizations to establish a standard for themselves. (Woods, 2021). Generally, "good governance" in international organizations has three basic factors that serve as key principles to determine the presence or absence of governance. These factors are "Participation", "Accountability", and "Fairness". (Jiang, 2014)

Participation.: participation in decision making and implementation means giving people a sense of ownership in a project and vital interest in its success, participation principle requires the key stakeholders - the affected parties – to have access to decision-making process and power, a member country needs to obtain significant voting power in order to participate (Jiang, 2014)

Accountability. means that "institutions inform their members of decisions and also of the grounds on which decisions are taken and it requires clarity about for whom or on whose behalf the institution is making and implementing decisions" . In other words international institutions should be called to account by not only their member countries but also NGOs, individuals, and other non-state actors.

Fairness: "how equitable the outcomes of an institution are" and as involving the "general equality and the distribution of power, influence, and resources within an organization". The IMF›s governance determines the economic contributions made by its members as well as the IMF›s role within the international financial architecture. In short, the IMF›s policies and decisions are linked to the organization›s governance structure - the decision-making system and power dynamics. (Ataman, 2014)

Many reforms have been implemented over the years to improve and strengthen developing countries› representation in governance, surveillance, and loan conditionality. Despite several reforms implemented over a -70year period, the IMF has received criticism from developing and least-developed countries, mainly on four critical issues relating to loan conditionality, the quota system, dominance, and governance, The IMF is constantly working to reform its operations and governance in response to such allegations. (Nahasin & Gupta, 2018).

1.3. Criticisms to Internal governance (Organizational Structure and Quota System)

Developing countries claim that the IMF must address its own internal governance- problems in the internal system – if it exists - before solving international financial problems and calling the other countries to abide by governance-practices and policies.

1. Appointing top executives has been considered one of the most sacred traditions in the institutions inherited from the Bretton Woods system: always an American as President of the World Bank, always a European as managing director of the IMF. Since its inception, the IMF has had ten managing directors, distributed as follows by country of origin: France 4, Sweden 2, and 1 each for Belgium, the Netherlands, Germany and Spain (Lindblad, 2010)

   Almost most operational decisions require a simple majority of voting shares, but certain changes, such as articles of agreement amendments, quota increases, voting share distribution, and new SDR allocations, require an 85 percent majority, which is not easily applied. Since the IMF›s inception, the United States has held over 15% of the votes, effectively giving it a veto over important issues and reforms. (Merling,2022)

   Some researchers have argued that restricting the nationality of top executives is outdated (Waleed, 2021). They believe that this approach fails to acknowledge the significant changes that have occurred on the global political landscape since 1945. Furthermore, it overlooks the rising influence of emerging economies, which are now in direct competition with and sometimes even surpass the economies of European countries and the United States.

   In the light of endorsing reforms at IMF related to issues of governance; ASEM 8[3] at Brussels in October 2010 came for this purpose. They discussed the procedure for the appointment of top executives, staff diversity at senior and mid-level positions, and the size and composition of the Fund's executive board .According to the Brussels declaration of ASEM 8, top executives at the IMF should be selected in an 'open, transparent and merit-based process((Lindblad, 2010)

2. As illustrated in Figure (1), The IMF›s highest decision-making body is the Board of Governors. Each member country has one governor and one alternate governor. The governor is chosen by the member country and is typically the finance minister or the central bank's governor, While the Board of Governors has delegated most of its powers to the Executive Board (24 members elected from member countries-having the highest IMF Quota), it is still having the authority to approving quota increases, SDR allocations, new member admission, compulsory withdrawal, and amendments to the Articles of Agreement and By-Laws. (IMF,2021)

[3] The 8th Asia-Europe Meeting Summit (ASEM8), was held on 5-4 October 2010 in Brussels, Belgium, was the eighth meeting to help the expression of Asia and Europe views. it also focused on the relationship between the two regions. They sought to strengthen their political dialogue, enhance their trade and investment relationship, expand people to people and cultural exchanges and further develop ASEM as their common strategic asset, URL: https://aseminfoboard.org/asem_events/8th-asem-summit-asem8/

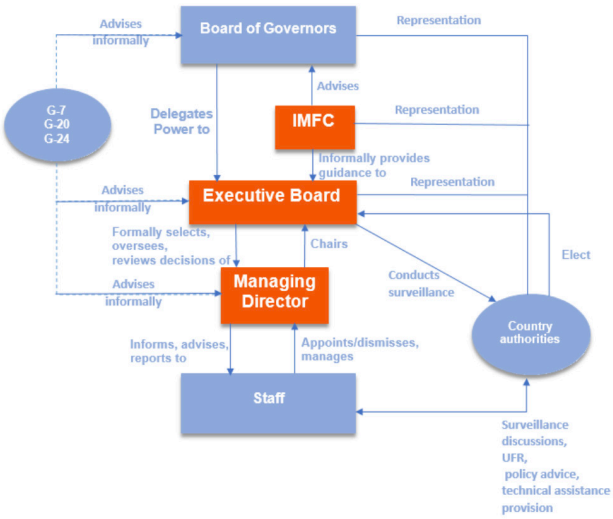

FIGURE (1):THE ORGANIZATIONAL STRUCTURE OF IMF

Source: IMF Governance Structure

URL: https://www.imf.org/external/about/govstruct.htm

Following the implementation of the Board Reform Amendment on January 2016 ,26, the Executive Board of the International Monetary Fund (IMF) has been comprised entirely of elected members since the subsequent election on November 2016 ,1. In the past, the five member countries with the highest quotas had the privilege of appointing an Executive Director each, while the remaining 19 seats were filled through elections conducted by the other member countries.

Also, many scholars believe that the industrialized countries, especially the European countries, are overrepresented in the Executive Board. The Board is comprised of 24 members, six directors are elected directly by their countries that own the largest share capital (USA, Japan, China, Germany, France, and the UK), and the remaining 19 directors are elected by groups of countries. This composition of the Executive Board has been criticized as unbalanced. (Tuman,2017)

The Executive Board is responsible for the overall management of the IMF›s operations and resources, including setting policies, approving financial assistance to member countries, and monitoring the implementation of IMF programs. The board meets regularly to discuss and make decisions on a range of issues, including economic developments in member countries, financial stability risks, and the IMF›s lending and technical assistance activities.

The decisions are made in the executive board, despite of the weighted voting system, based on consensus among its members. The International Monetary and Financial Committee (IMFC) is a third body that was mainly established to oversee the work of the Fund and make recommendations to the board of governors, the executive board, and the Fund's management. (Nahasin & Gupta, 2018).

3. Quota distribution of voting power at the IMF- according to some researchers- is outdated and reflects the world's economy situation at the conclusion of the Second World War (Lindbland,2010). Before going through the quota reforms, Belgium had a quota of 2.13 %, almost as much as Brazil and Mexico taken together (2.61 %) or even China (2.94 %).

   Quotas is central to the IMF operations and that shape the terms under which each member participates in the organization: reflect members' contribution to the Fund's operations; the amount of resources that member countries drawn from the IMF; identify the member's voting weight, in effect its political voice in the IMF's weighted voting system, and reveals the allocation of SDRs.A compromise solution was reached at the Bretton Woods Conference in 1944, between two approaches to determining voting power, one based on member contributions or quotas and the other relying on the legal principle of state equality. The compromise reached based voting rights on a combination of the two: each member country received one vote for every 250 basic votes plus a quota of 100,000 SDR (Buira, [4].(2002 The SDR is currently defined as a "basket currency" whose value is governed by a combination of the values of the U.S. dollar (43.4 %), the Euro (29.3 %), the Chinese Renminbi (12.28 %), the Japanese yen (7.59 %) and the Pound sterling ([5].(% 7.44

   Since 1969, the International Monetary Fund undertook four general and one special allocations of SDRs, giving amounts proportional to the countries quota system. However, the IMF's allocation on August 2021 ,23 of SDR 660.7 billion (equivalent to about US943$ billion) was considered to be the largest-ever allocation. This was most recent allocation was mainly to address the long-term global need for reserves, and assisting countries cope with the impact of the COVID19- pandemic

   The International Monetary Fund distributed nearly 400$ billion in allocations in 2021 to rich countries, 230$ billion to middle-income countries and 20$ billion to low-income countries. So far, seven countries in the region have used the SDRs allocated in 2021(Egypt, Iraq, Jordan, Lebanon Morocco, Tunisia and Yemen), Egypt used the largest part of these allocations to pay off some of its debts and to avoid its classification as the largest debtor to the IMF in the world after Argentina. (Shrok,2022)

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[4] Applying Westphalian conceptions of equal sovereign equality, (a one-country, one-vote rule), was not acceptable to the major powers contributing to the IMF's resources the most. Accordingly, each national member of the IMF has a quota (now expressed in Special Drawing Rights, or SDRs since 1969) that equates almost directly to its financial contribution to the organization, for more information : https://www.g24.org/wp-content/uploads/01/2016/The-Governance-of-the-IMF-in-a-Global-Economy.pdf

5 Weights determined in the 2022 review, url: https://www.imf.org/en/About/Factsheets/Sheets/2023/special-drawing-rights-sdr#:~:text=The20%SDR20%is20%an20%international,and20%the20%British20%pound20%sterling.

TABLE (1) IMF'S SDRS ALLOCATIONS TO THE MIDDLE EAST ON AUGUST 2021 (VALUE IN MILLIONS)

Country	Pre-Allocations	2021 Allocations	Total Allocations
Algeria	1,198	1,878	3,076
Bahrain	124	379	503
Egypt	898	1,952	2,581
Iran	1,134	3,419	4,845
Iraq	1,134	1,595	2,729
Israel	883	1,841	2,724
Jordan	162	329	491
Lebanon	193	607	800
Libya	1,073	1,508	2,581
Morroco	561	857	1,418
Oman	179	522	701
Qatar	251	705	956
Saudi Arabia	6,682	9,577	16,260
Syria	279	281	561
Tunisia	273	523	795
Turkey	1,701	4,465	5,536
UAE	568	2,215	2,784
Yemen	232	467	699
Middle East	17,817	33,120	50,937
World	204,213	456,485	660,698

https://www.imf.org/en/Topics/special-drawing-right/-2021SDR-Allocation

Saudi Arabia is considered to be the largest Arab country to obtain 9577.5 million SDRs, and its voting share is 2.1 percent. The United Arab Emirates comes in second place with 2125.2 million SDRs, and its voting share is 0.49 percent, while Egypt comes in third place with 1952.5 SDRs and its voting share is 0.43 %.(saudigazette. (2021, October 6).

As of 2012, the IMF has conducted fourteen general reviews of quotas based on the five-year cycle. Quotas are periodically reviewed but in the last 30 years, only two reviews resulted in a quota increase (However, despite these changes made by the IMF quota reviews, the basic pattern of the IM F's quota assignment - that developed countries have in aggregate much more quotas assigned to them than developing countries do - still has not changed(Jiang,2014).

Section 2: Review of the IMF Governance Reform in 2000s: Crisis as an Approach to Enhancing Governance Mechanisms

In this section, we will discuss What was achieved in the reforms introduced in the IMF governance system, giving an assessment to these reforms and answering the question of whether the recent reforms – related to membership quotas and voting power- enhanced the IMF's governance system or not.

2.1. IMF Governance Reforms in 2000s

The recent Financial Turmoil (2008), that preceded the East Asian Crisis (1997), exposed the International Monetary System›s (IMS) incompetence and inadequacy in dealing with such crises, in addition to causing massive financial and economic loss and great human suffering. It emphasized the long-felt need for the System to be restructured. This system reformation process was initiated primarily by the launch of the IMF Reform Packages in 2008 and 2010, and was supplemented by the formation of the Group20- (in 1999) and the strengthening of regulation and supervision of banking and financial institutions and practices at the national and international levels (Uddin, 2011).

In 2008, the IMF took an important first step towards governance reform by increasing voting share for 135 countries and emphasizing low-income countries' voting power and their participations in the IMF's activities. Two years later, in 2010, the IMF furthered the 2008 reform and approved a more far-reaching governance reform package. Both the 2008 reform and 2010 reform were recommended by the Executive Board in the form of proposing amendments to the IMF Articles of Agreement, since they were major governance structure reforms[6].(Jiang,2014). These changes were approved by 85 % majority of the total voting power. Also, a member's quota cannot be changed without its consent.

According to 2008 reforms, the relative size of the quotas are determined based on formula (down from a high of ten) based on GDP, the values and variability of receipts (exports), payments (imports), and reserves, Each member country's quota was assessed by a quota formula. The current formula is a weighted average of GDP[7] (weight of 50 %), openness (30 %), economic variability (15 %), and international reserves (5 percent) (IMF, 2022). This formula places most of the voting power in the hands of few powerful countries namely the United States, the United Kingdom, Japan, Germany, and France, which together control 40 % of the total voting power in the IMF.

The insufficiency of voting power is clearer, if we compare the emerging countries with developed countries. Ralph C. Bryant compares five emerging countries (China, India, Korea, Brazil, and Mexico) and five European countries (Italy, the Netherlands, Belgium, Sweden, and Switzerland). The five European countries have a significantly smaller share of world GDP, a somewhat greater share of the world total in the gross value of cross-border trade, a significantly smaller share of the variability of trade and capital flows, far smaller foreign-exchange reserves and a dramatically smaller population. However, the five European

[6] The 2008 reform focused on quotas and basic votes, including significantly increasing the quota for emerging market countries, tripling basic votes, and establishing a fixed ratio between basic votes and total votes. The 2010 reform includes more shift of voting power to emerging market countries, an Executive Board reform, and an increase in the IMF›s financial resources.

[7] GDP is measured through a mixture of GDP market-exchange rate (60 %) and on purchasing power parity (40 %).

countries have nearly the same vote share as the five emerging countries.[8]

The 14th General Review of Quotas took Place in 2010 and put into action in 2016. The reforms represented a major step toward better reflecting in the institution's governance structure the increasing role of dynamic emerging market and developing countries. These reforms resulted in 100 % increase in the total IMF quotas; shifted more than 6 % of quota shares from overrepresented countries like the United States and European Union to under-represented member countries namely India, China, Brazil, and Russia; doubled the quotas from approximately SDR 238.5 billion to SDR 477 billion; preserved the quota and voting share of the poorest member countries; increased India's voting share from 2.44 to 2.75 % and china's from 3.8 to 6 %; voting share of Russia and Brazil was also increased. (Uddin, 2011).Four BRICS countries are now among the top 10 shareholders in the IMF after the fourteenth quotas review.The 15th General Review of Quotas concluded in 2020 without increasing quotas and provided guidance for the 16th Review. The 16th Review is currently ongoing and expected to be completed by mid-December 2023. (IMF, 2022)

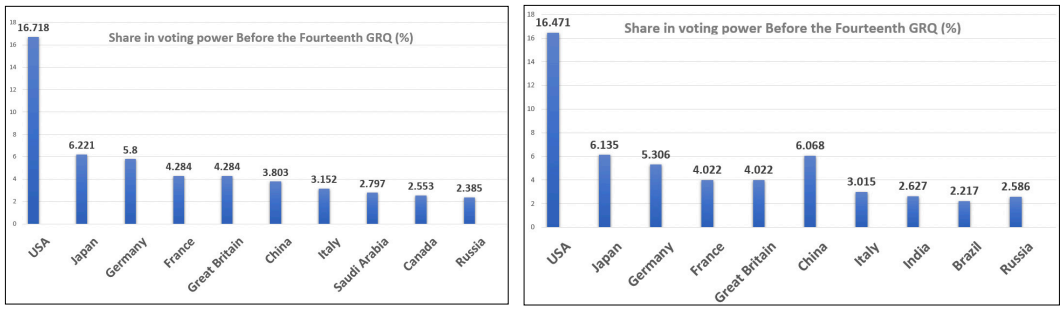

FIGURE (2): SHARE IN TOTAL VOTING POWER BEFORE AND AFTER ROQ IN 2010

Prepared by the author

Source: Gnjatovic, Dragana. (2015). Borrowing of the International Monetary Fund during the global financial and economic crisis. Bankarstvo. 10.5937 .61-40 .44/bankarstvo1504040G.

We found out in figure (2) that India and Brazil replaced Saudi Arabia and Canada to be on the top of 10 countries have the highest voting power, and the unprecedented increase in the voting power to China (3.8 % to 6.0.%) (AbdelHaleem,2012).

The IMF currently has 477 billion SDRs (651$ billion) of capital made up by members› quotas, due to an increase in their shares approved in the 14th general review of Quotas (G RQ); SDR 361 billion (521$ billion) in the New Arrangements to Borrow (NAB), represen ting a doubling of the former General Arrangements to Borrow (GAB) agreed upon in Jan uary 2021 and expiring in 2025; and SDR ;given the deteriorating geopolitical situation, man y developing countries, including the IMF, are urging an increase in quotas in the current 16t h GRQ , which is to be completed by December 2023 ,15., with a one-year extension if all participants agree , these calls in the light of boosting the IMF's own financial resources, par ticularly if the two other aforementioned borrowing arrangements expire without being re newed.

[8] *Although after 2010 reforms, the voting share has been shifted for the interest of the emerging and developing countries, the comparison between the voting power of both developing and developed countries in this example to clarify that the components of quota formula is not the only criteria for distributing the voting power among the countries at the IMF.*

If they are not renewed, the IMF›s lendable resources will be significantly reduced, making the organisation less able to support its members. (Tran,2022)

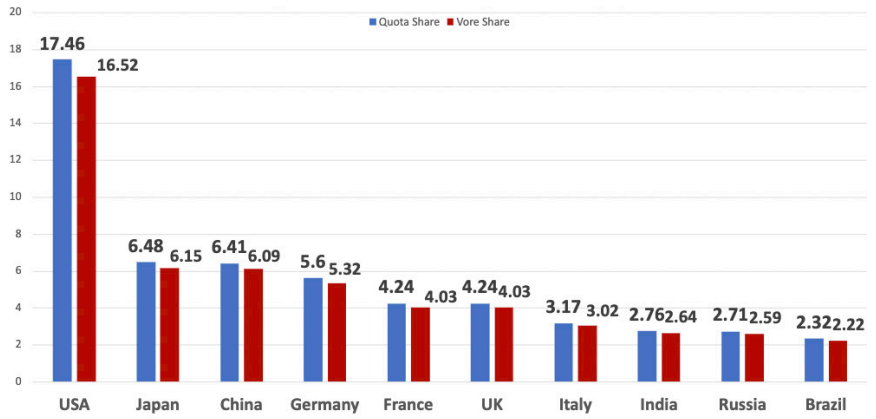

FIGURE (3): THE TOP TEN COUNTRIES BY QUOTAS (%)

Prepared by the author

Source: https://www.imf.org/en/About/executive-board/members-quotas

2.2 Assessing the IMF's Governance structure

An optimistic assessment, which is shared by official participants in the negotiations preceding the reforms, sees the package as a first small step in a larger series of reforms. Ex-Managing Director Strauss-Kahn, for example, has described the package as a critical first step that «will allow us to have a more legitimate Fund.» He has admitted that the step is insufficient on its own. «However, without this step, it would have been impossible to continue rebuilding the credibility of a multilateral institution like the Fund.» «It demonstrates that the institution is likely to evolve and adapt.» Also, these reforms have been called as «victory for developing countries. (Bryant,2008)

The other perspective thinks that the recent efforts, including the IMF Re packages (2008 and 2010) are insufficient despite some gains in the voting power of a few emerging economies, the IMF›s overall power structure remains the same. The United States effectively retains veto power at the IMF. Important issues concerning governance, legitimacy, neutrality, and accountability of the Institution, as well as conditions attached to support programs, have received insufficient attention in the Reforms. (Uddin,2011)

The IMF did not essentially alter the imbalance of representation, and thus continues to fall short of participation and accountability requirements. Even after the reforms, the fundamental pattern of developed countries having significantly more quotas than developing countries remains. The least developed countries would never have enough voting power under the current quota formula to actively participate in the IMF's decision-making process, also further quota transfers from developed countries would be difficult for the IMF. (Jiang,2014)

Although the basic votes were tripled, but doesn't reflect a real change as the basic votes was used to protect the least developed countries' interests. But as time went by, the 250 basic votes became almost worthless; over time, as more countries joined the IMF and their voting power increased, the percentage of basic votes decreased. The 2008 reform set the basic votes to a fixed ratio at 5.502 % of the aggregate sum of the total voting power. However, it is

still below the original 11.3 % of the total voting power when the basic votes were created in 1944.The reforms do not involve other aspects of the IMF(the Executive Board's structure) has not been reformed yet.

Also, many believe that the industrialized countries, especially the European countries, are overrepresented in the Executive Board.The Board is comprised of 24 members, six directors are elected directly by their countries that own the largest share capital (USA, Japan, China, Germany, France, and the UK), Russia and Saudi Arabia directly elect a member represents each, and the rest are elected for a period of two years by the member countries in their constituencies, which are made up of 16 elected constituencies; This composition of the Executive Board has been criticized as unbalanced. (Tuman,2017).

The selection of executive directors was neither based on geographic or regional considerations, and some groups are more homogenous than others. For instance, the group represented by Iran includes countries from North Africa (Algeria, Tunisia, Libya, and Morocco) and a country from West Africa (Ghana) as well as countries in Western and Southern Asia (Pakistan) while the group represented by Serbia includes countries from Central and Eastern Europe and Central Asia.

The Countries in the southern hemisphere, and in particular the 52 African member countries only got two executive director seats, in turn, while the European countries, which includes 40 countries own nine seats for executive directors.(Waleed,2021).From the researcher's point of view, Reforming IMF governance should be considered as a positive-sum game not a zero-sum game and the developing countries have to emphasize all the features of the reform that advance the collective interest of all members.

Finally, Improvement in IMF governance, particularly by including more developing countries in the decision-making process, can lead to better delivery of financial resources, as it ensures a more representative and accountable governance structure. When countries have a voice and influence in decision-making processes, they are more likely to advocate for their specific needs and priorities.This can result in financial resources being allocated more effectively and efficiently to address the development challenges of these countries.

As Developing countries often face unique challenges and circumstances that require tailored solutions. By having a greater say in decision-making, these countries can contribute their insights, experiences, and perspectives to shape policies and strategies that are more relevant to their specific contexts. This can lead to the better targeting and delivery of financial resources, which are aligned with the needs of the recipient countries.

When countries are actively involved in decision-making processes, they develop a sense of ownership and commitment to the policies and programs being implemented.This increased ownership enhances their willingness to implement the necessary reforms and policies to effectively utilize the financial resources provided by the IMF. As a result, the resources are more likely to be used efficiently and effectively, leading to better outcomes in terms of development and poverty reduction.

Section 3: Controversy of IMF Conditionality and Corruption Practices in the Borrower Countries

As stated in previous sections, the quota system is the cornerstone of the IMF governance system because it doesn't determine how decision-making power is assigned to the countries, but also affects the IMF's policies, such as countries' access to credit and how much will it cost. Each member country contributes proportionally to its quota to the IMF. The "quota-based subscriptions" considered as the IMF›s primary source of funding. The quota share also determines borrowing countries› access limits and fees.

Since the voting power defined simply by the size of countries› quotas, low- and middle-income countries, which are borrowing the most from the IMF and be subject to its terms, have the least influence over the IMF›s decisions. except in the case of emergency loans, IMF apply lending programs that attach conditionality and require borrowers to stick to the policies proposed. (Figure 4).

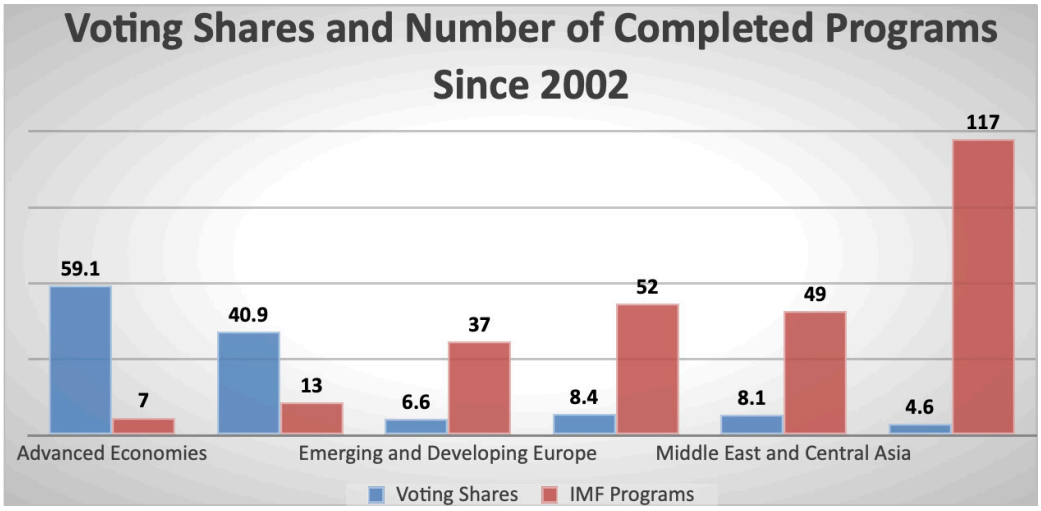

FIGURE (4): VOTING SHARES AT IMF AND NUMBER OF COMPLETED PROGRAMS

Source: Lara Merling, (2022)," No Voice for the Vulnerable CLIMATE CHANGE AND THE NEED FOR QUOTA REFORM AT THE IMF, GEGI WORKING PAPER 057, URL: https://www.bu.edu/gdp/files/10/2022 GEGI_WP_057_FIN.pdf

In this section, we will discuss How conditionality- as core issue in the IMF's governance - Evolved, whether there is a correlation between structural conditionality and corruption reduction in the borrower countries by referring to different case studies, and in which terms does this relationship help in increasing the IMF's legitimacy in the international monetary system

3.1 How Conditionality Evolved At the IMF

The conditionality of loans granted by the IMF was criticized. Conditionality refers to the process of granting credit to a country on the basis that the country meets strict policy conditions to deal with balance of payments issues. Recipient countries risk losing the organization›s financial support if they do not comply. Conditionality is primarily concerned with "fiscal and monetary policies, exchange rate policies, public sector reforms, trade liberalization, financial sector and labor market reforms". While the capitalist class benefits, the poorest members of society pay the most cost. .(Mckenna,2012)

IMF conditionality has developed in a gradual way. From 1947 until the mid1950-s, the fund allowed members to borrow without explicit conditions. In the 1950s and 1960s, the IMF initiated lending programs through short-term loans to developed countries. Belgium and Finland, in 1952, became the first countries to use IMF funding (Atta, 2021). The fund allows countries to draw from its resources based on the merits of each case. Conditionality was formally introduced in his early 1970s, but the 1970s were characterized by loose conditionality. At that time, partly because of the oil price shock, developing countries had unconditional access to abundant low-interest private market credit. (Bhasin and Gupta, 2017)

Due to the emergence of debt problems in some Latin American countries, the IMF expanded its policies and scope to include structural reforms and financial stability management of member countries (Sukar and Ahmed, 2017). The IMF continued to expand the reach of the program by getting into the development arena and establishing the Structural Adjustment Facility (SAF) and the Extended Structural Adjustment Facility (ESAF). (Welch, 1998). As a result of the increased demand for their funds, the IMF began imposing more conditions on their programs. In the 1970s, only 26 % of IMF spending was still conditional, but the Latin American debt crisis in the 1980s and the expansion of credit to Africa increased it to 66 % by the late 1980s. The terms contained in the program were not favored by borrowing governments on the grounds that such broad terms were not directly proportional to the small amounts of credit offered. (Bhasin and Gupta, 2017)

At the turn of the 21st century, the IMF was criticized by academia and world leaders for the invasive nature of structural conditionality and extensive conditional requirements in its lending agreements[9]. As a result, the IMF has made a number of changes to its conditionality practices and refocused itself on the organization›s core mission. The change was underlined in the so-called 'streamlining' of conditionality practices and promoting good governance with their lending requirements. Governance relates broadly to how government functions and is structured, including aspects like the types of regulations or policies a government imposes to oversee and enforce both public and private activities. (Ataman,2021)

3.2 The Relationship between the IMF's conditionality and Corruption Practices in the recipient country

In August 1997, the IMF for the first time released guidelines regarding its role in governance issues. The Guidance Note under the title of «The Role of the IMF in Governance Issues.»

[9] A number of economic reforms imposed by the IMF as prerequisites for providing loans, such as fiscal austerity, high interest rates, trade liberalization, privatization, and opening up of capital markets, have often had negative consequences for the economies they were intended to help and have been devastating for local populations.

To strengthen policy implementation, the IMF adopted a new Framework for Enhanced Engagement on Governance in 2018 that aims to promote more effective engagement with member countries on critical governance vulnerabilities, such as corruption, that affect macroeconomic performance. According to Ex-IMF Director Camdessus (2000-1997): "Every country that hopes to maintain market confidence must come to terms with the issues associated with good governance." So, the IMF announced plans to evaluate debtor countries' governance practices and to condition IMF loans on good governance. (Welch, 1998)

The extension of the IMF›s structural conditionality to several policy areas, such as labor markets, good governance and social welfare, has been widely criticized by researchers as mission creep. The IMF has become increasingly focused on macroeconomic issues that affect balances of payments and exchange rates, with credit-related conditionality invading various sectors of borrowing countries, it negatively affects the ability to control budgets and public finances. (Atta, 2021)

According to Yila Ataman›s thesis, IMF lending may perpetuate corruption in a borrowing country if certain pre-existing factors exist. Corruption-inducing factors include (Ataman, 2021):

- A high concentration of bureaucratic power.
- A significant role played by the government in the economy.
- Economies with powerful interest groups in the establishment of weak regulatory institutions
- The distribution of the financial lending institutions, as IMF lending to government recipients is generally highly centralized.

A group of scholars (Reinsberg et al. 2020) conducted an instrumental-variable regression analysis on IMF conditionality for up to 141 developing countries during the period of 1982 to 2014 and discovered that privatizing state-owned enterprises undermines a country›s control over corruption.

Another study found that the failure of effective conditionality in corrupt practices is due to the complexity and potential conflict arising from mission creep, as well as the distortions and inefficiencies arising from the government›s narrow focus to the exclusion of private actors and civil society. (Webb, Kapur, 2000)

A prime example is Argentina, which has had twenty-one IMF rescue programs, each lasting about twenty-four months, some scholars claim that the IMF's fragile stance on corruption has been manifested in the country›s financial decline, which led to the reduction of the flow of foreign capital to Argentina. (Linares, 2005). The IMF›s lenient stance on corruption confirms to Argentina›s leadership that unwillingness of the IMF to pursue significant corruption reforms. This encourages even more political corruption, making significant reform nearly impossible, The IMF›s failure in Argentina also sends a message to the IMF-negotiating borrower countries; that issues of corruption reform will be passed on to subsequent governments as long as profitable markets remain open. (Linares, 2005).

Critics of the World Bank and the IMF claim that they helped corrupt oligarchs in Russia and other eastern European states during the 1990s (Global Policy Forum, 2002). Despite receiving a detailed report on Mobutu Sese Seko's corruption, the IMF lent over 1$ billion

to Zaire›s corrupt leader. The IMF› lent 11$ billion loan to Russia in July 1998 supplemented a 10$ billion loan. Despite mounting evidence of corruption, the IMF extended loans to Russia as the country›s political and business elites reaped the benefits of IMF-mandated privatization schemes. (Welch,1999).

IMF›s conditionality programs often prioritize economic reforms and fiscal adjustments over addressing governance issues and corruption. The focus is primarily on achieving macroeconomic stability rather than tackling the root causes of corruption. The IMF relies on borrower countries to implement anti-corruption measures, but there is a lack of robust enforcement mechanisms to ensure compliance.

Transparency International recently launched Tracking the Trillions for Monitoring anti-corruption efforts at the IMF, including during COVID19-, to ensure funds reach the most vulnerable people. The request has been given from Human Rights Watch, Global Witness, and Transparency International to take urgent actions from the IMF in April 2020 to ensure that money given to member countries reaches vulnerable people, and help in saving their livelihoods.

The IMF has provided a tracker that includes the IMF's COVID19- financial assistance and debt service relief for member countries from March 2020 through March of 2022 at which borrowing countries vow to implement governance measures to promote accountable and transparent resource use.

Transparency International has analyzed 130 financial assistance agreements provided to countries preceding the outbreak of COVID19- Pandemic by tracking the available information of IMF emergency funding to countries, they set up a tracker by identifying the presence or absence of anti-corruption and transparency measures.

"Spend what you can but keep the receipts," Georgieva said, in a clear warning to countries that there might have the risk of losing 8$tn already committed as a result of corruption. "We don't want accountability and transparency to take a back seat." (The Gurdian,2020)

According to data published on the IMF's website, 80 % of total funds disbursed by the IMF following the pandemic went to ten countries: Chile, Peru, Colombia, Egypt, Ukraine, Nigeria, Pakistan, Jordan, Ghana, and Tunisia. However, only 58 % of all financial agreements encompass specific measures to ensure transparency and/or reduce the risks of corruption. (Berazategui,2020)

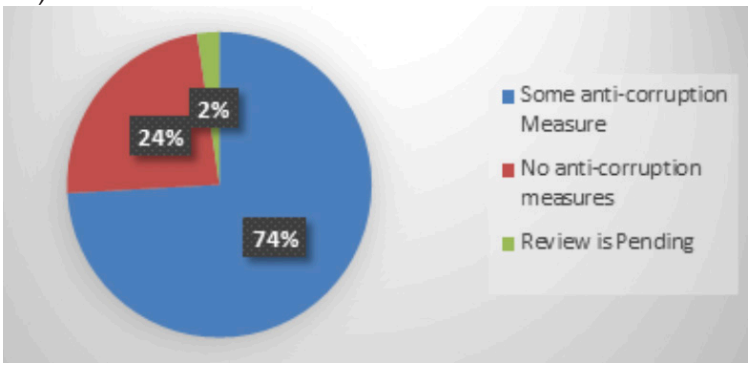

FIGURE (5): COUNTRIES WHO HAVE OR DON'T HAVE ANTI-CORRUPTION MEASURES AS PART OF COVID19- ASSISTANCE AND DEBT RELIEF FROM THE IMF

Source: Author's calculation, Transparency International, URL: https://www.transparency.org/en/imf-tracker

According to Transparency International, For having more effective monitoring of anti-corruption commitments, It should be specific, measurable, actionable and time-bound.

Staff urged authorities in Afghanistan, for example, to ensure full transparency and good governance in managing pandemic-related spending. Staff warned about the corruption risks associated with the rapid execution of unplanned spending and urged authorities to implement strong measures to ensure transparency and suppress corruption opportunities. The authorities have agreed to publish quarterly reports on pandemic-related spending, including beneficial ownership information for companies awarded procurement contracts. According to the authorities, close involvement and oversight of donors provides additional assurance about the quality of spending. (IMF Country Report No. 143,2020/20)

The case was not the same in all the countries that received financial assistance after the pandemic, some countries state their commitment in a vague way (The Dominican Republic government was an example by stating that the government will adhere to best practices in procuring and awarding contracts and publishing audited report on virus-related expenditures once the crisis is over, While Kosovo's financial agreement was considered as an expression of goodwill than a commitment).

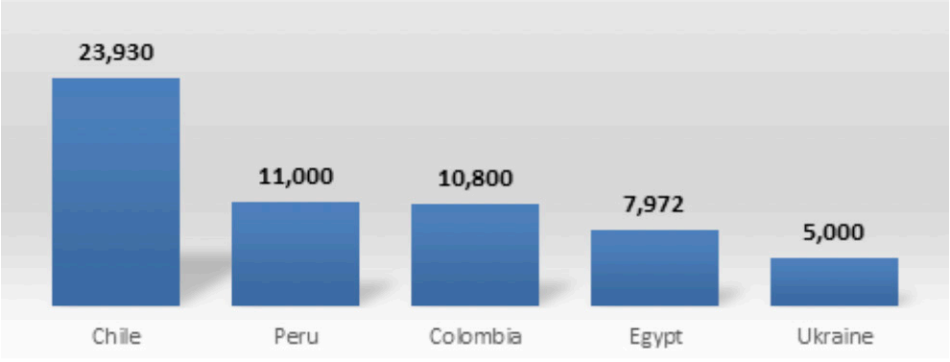

FIGURE (6): TOP 5 COUNTRY RECIPIENTS OF IMF- COVID19- FINANCIAL ASSISTANCE AND DEBT SERVICE RELIEF (VALUE IN US DOLLAR)

Source: https://www.transparency.org/en/blog/the-imf-covid-19-and-anti-corruption-the-story-so-far

As illustrated in figure (6), and according to Transparency International, Chile was on the top of the countries that received financial assistance and debt service relief with (no-anti corruption measures), while Columbia, Peru and Ukraine applied some anti-corruption measures, while the review was pending in the case of Egypt. (Berazategui,2020).

According to some scholars, the IMF should extend all the measures to all the countries and applying all the governance and anti-corruption safeguards equally to all Rapid Credit Facility and Rapid Financing Instrument; the thing that will not only allow the misuse of IMF fund, but also helping in handling the lack of consistency of anti-corruption measure in emergency financing.

Since the Civil society organizations have been playing an important role in supporting accountability and tracking the implementation of the commitments, there should be a collaboration between the IMF and The CSOs of the recipient country to identify the fields need the anti-corruption measures the most.

Section 4: Findings and Recommendations

The International Monetary Fund and the World Bank have defined the institutional architecture of the global economy and the Asia-Pacific region for the last seventy years. The role of the IMF has been changed in different occasions; for instance, the termination of the US dollar›s gold convertibility in 1971, the oil price shocks in the 1970s, the Latin American debt crisis in the late 1980s, and the Asian financial crisis 1997 and finally the international financial crises 2008, throughout these crises, the major shareholders of the IMF and World Bank have demonstrated their ability to cope with the changing global economic circumstances.

Emerging markets and developing countries have expressed their dissatisfaction with Western states› hegemony in the IMF and other international organizations; and the emerging BRICS cooperation always sends a clear signal to the West that they might escape the IMF umbrella and looking for other funding alternatives.

This research questioned the IMF's system of governance and how it affects its legitimacy as an international organization, and evaluated the recent reforms – related to quotas and voting power and its relationship with the IMF's governance system, and whether the IMF still needed broader and deeper reforms in its governance system, also the research posed a question about the correlation between structural conditionality and corruption reduction in the borrower countries.

The researcher adopted the Neo-Gramscian's perspective that stressed on the meaning of hegemony, in answering the previous questions, and reached the following findings:

Section one and Two Findings, that outlined the IMF's internal governance system are as follow:

- By identifying the basic principles of international organizations' good governance outlined by Naigre Woods' study,which are" participation,» «accountability,» and «fairness.»; we found out that the IMF show poor performance in setting standards for itself.
- The policies and decisions of the IMF are linked to the organization's governance structure, which underpins the decision-making system and power dynamics.
- Quota system is a cornerstone inside the IMF governance system, it determines the members› abilities to contribute to the Fund›s operations; the amount of resources that member countries can draw from the IMF; the member›s voting weight; in addition to the allocation of SDRs.
- The IMF has been criticized by developing and least-developed countries, over four critical issues: dominance, governance, loan conditionality, and the quota system. The financial crises and European debt crisis have triggered the IMF to apply some reforms.

- The IMF applied two main reforms in 2008 and 2010 related to quota-system. The 2008 reform concentrated on increasing the quota for emerging market countries (4 BRICS countries became from the top 10 in Quota share), tripling basic votes, and establishing a fixed ratio of basic votes to total votes, while the 2010 reform includes a greater shift of voting power to emerging market countries, an Executive Board reform, and increased financial resources for the IMF.
- According to 2008 reforms, the relative size of the quotas is determined based on formula weighted average of 50 % to GDP, 30 % goes to openness, economic variability occupies 15 %, and finally international reserves takes 5 %. This formula places most of the voting power under the control of few powerful countries (the United States, the United Kingdom, Japan, Germany, and France) which together owns 40 % of the total voting power in the IMF. Thus, it keeps almost power dynamics pertaining the hegemony in its internal structure.

Section Three Findings, that tackled the correlation between the IMF's conditionality and corruption in the borrower countries, are:

- Low- and middle-income countries that have the least influence over the IMF's decisions, are most likely to borrow from the IMF and be subject to its terms. The IMF's conditionality has been evolved over time, from no conditionality to lose till it reaches streamlining conditionality that aimed at promoting good governance with their lending requirements.
- According to previous literatures, It was found out that there are factors that make IMF lending contribute to corruption in a borrowing country, this may include, but to confined to, high concentration of bureaucratic power, when the government plays a hegemonic role in the economy, weak regulatory institutions in the recipient country, weak role of civil society organizations.
- After the IMF's lending facilities (During COVID 19 pandemic), it was determined that 80 % of total funds handed over by the IMF after the pandemic went to 10 countries: Chile; Peru; Colombia; Egypt; Ukraine; Nigeria; Pakistan; Jordan; Ghana; and Tunisia, only 58 % of all the financial agreements agreed by the IMF contain specific measures to ensure transparency and/ or reduce the risks of corruption

Recommendations: The Elements of Reforming Governance

The global economic structure has totally changed since the 1944 Bretton Woods Conference. China, India, Brazil, and Mexico have been among the world›s largest economies counted in real terms (Investopedia,2022), developing countries has a growing and promising share of global output and trade, thus the IMF needs a more representative and transparent decision-making process to increase its resources and enhance its democratic legitimacy.

Based on an analysis of the previously mentioned criticism, the following suggestions- that tackle mainly the internal governance system and conditionality related to governance practices in the borrowing countries- mentioned by different scholars for further reforming the IMF and for having more. (S.De Leon, Ernando,2011. Waleed,2021, Ataman,2021. Buira,2002. Jakob

Vestergaard and Robert H. Wade,2014. Devesh Kapur and Richard Webb ,2000)

- In quota formulas, The G24- has argued that GDP PPP should have a much higher weight (GDP estimates based on PPP[10]) Using PPP-based GDP estimates in formulas would avoid the current underestimation of developing and emerging market economies› economic size. This should also might mitigate their under-representation on the Board. According to purchasing power parity, China has 18.6 % of the global economy, more than the USA, has population 4.3 times than of the USA, but the latter has more than twice (exactly 2.6 times) the voting power of China, it was believed that increasing developing countries' stake in the IMF will significantly increase their contributions, consistent with their ability to contribute, and alleviate current creditor countries› concerns about the risk of IMF lending.
- The BRICS (Brazil, Russia, India, China, and South Africa) claims that «contributions to global growth» should be one of measures other than GDP, to determine quotas and voting shares.
- Restructure the Executive Board›s representation so that a corresponding decrease in the number of Directors representing industrial countries is matched with the number of Directors representing developing countries, the goal is to create a more inclusive and representative decision-making body that takes into account the perspectives and interests of both industrial and developing nations.
- The weight has to be given to the two components of voting power - the basic vote and quotas - in order to achieve the desired result. Basic votes should be increased to accepted proportion of total voting rights, and the increase should be proportionally to the total quotas in the future. (the share of basic votes to be least 10 %), so as to restore them to the same level as when the IMF was founded.
- Apply what was agreed upon in Brussels declaration of ASEM 8 (Asia- Europe Meeting Summit, where "open, transparent and merit-based" criteria should be applied in choosing the top executives.
- Adopt the "bloc voting system" (Economic and Regional blocs) at which the member countries would be divided into groups, or voting blocs, based on their shared interests. Each bloc would determine the most important items for its members and prioritize them, recalling the experience of International Fund for Agricultural Development (IFAD); where its membership is divided into three lists and three sub-lists based on geographic regions and member countries› economic status and also benefiting the IMF's practice of grouping in the executive board (as was previously mentioned that six member countries have their own Executive Directors representing their countries, while the rest of the IMF member countries form 19 constituencies to elect 19 Executive Directors, The member countries of voting blocs would be adjusted on a yearly basis to cope with the global economic pattern that is dynamic and constantly changing. adopting the bloc voting system would be a major change to the Articles of Agreement that would require

[10] This is a different way of comparing nominal GDP between countries. The currencies are adjusted and to be based on what basket of goods they could buy in those countries rather than currency exchange rates. This is a method takes cost of living into consideration.

different amendments. (i.e. the 85 % of the total voting power is required to quotas change; instead apply the same percentage in the voting blocs)

- There have been suggestions to move to ex post conditionality instead of ex ante conditionality. In this case, the IFIs are to reward countries based on a set of good policies that adopt them. Ex post conditionality would motivate the countries to perform well and reduce noncompliance. On the other hand, it would create a temporary lending problem because disbursements would be halted until countries established the required performance record.
- Replicate the IMF's practice of "COVID19- Financial Assistance and Debt Service Relief Tracker" in conditionalities in all IMF Lending, to ensure the effective use of resources in combating corruption.
- Comprehensively Assess the effects (the direct and indirect ones) of any adjustments on low-income people coping with the IMF›s 2019 social spending strategy, and make sure that these are mitigated in a proper way, such as through investment in properly designed social protection programs
- Social spending floor should be put as a performance criterion, and ensure that it mitigates any impacts of adjustments before they are implemented, as well as that it allows for investment in social protection to protect people›s economic rights.
- Reforms related to the independence of institutions should be included in the IMF's conditionality, such as the judiciary, attorney general, and making sure that the Allegations of Bribery are taken into account.
- The IMF should make use of the American Foreign Corrupt Act›s practices on accounting and recordkeeping provisions into its agreement policies, and to condition its loans on transparency and good governance over borrowed funds.

Prospects For Future Work:

- Further research can be undertaken to study the relationship between Well-governed IMF and Conditionality: One of the main criticisms of the IMF›s conditionality is its failure to account for the diverse economic, social, and political contexts of borrowing countries. The one-size-fits-all approach assumes that the same set of policy measures will work universally, disregarding the specific challenges and nuances of each country. This approach can overlook the complexities of local economies and lead to inadequate policy prescriptions. In case we have a more representative, well-governed Fund, will they apply a much more suitable conditionality? Alternatives to one size fits for all approach should be investigated.
- Track More case studies, not only Argentina, Russia and Zaire, that link IMF's lending to corrupted leaders to reach more Concrete result, and to determine the effectiveness of the IMF's involvement in good governance policies in the recipient countries.
- Since the global economic landscape has been evolving, with emerging economies gaining more prominence. As a result, countries such as China, Brazil, and India have sought to establish alternative lending sources, such as the New Development Bank (formerly known as the BRICS Development Bank) and the Asian Infrastructure Investment

Bank (AIIB). These institutions aim to provide financial assistance and infrastructure investment options outside the traditional Western-dominated institutions like the IMF. Special attention should be given to these alternatives. The influence of these emerging lending sources depends on various factors, including their financial capacity, governance structures, and the ability to build credibility and trust among borrowing countries

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RESEARCH PAPERS IN ENGLISH

Cross-sector Partnerships: How the Three Sectors Differ and How Collaboration Can Be Beneficial as Illustrated in the Emerging Field of Telehealth

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Most nations in the 21st century are organized into three sectors – public (government), private (for-profit companies), and social (non-profit or charitable organizations). The precise legal classification of an organization varies over time and geography. From a management perspective, there are many common practices that comprise effective management, regardless of sector, and some differences relating to the core mission of organizations in each sector. We find figure 1 useful in thinking about how societies are managed. We believe it also makes very clear why there is great potential for accomplishing important work through cross-sector partnerships.

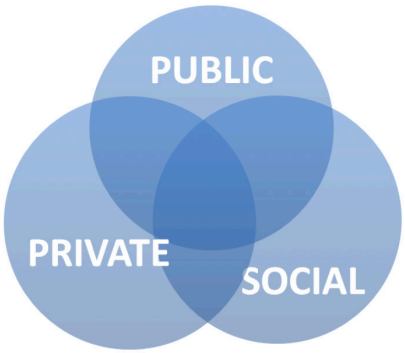

FIGURE (1): VENN DIAGRAM ILLUSTRATING SECTOR RELATIONSHIPS IN CROSS-SECTOR PARTNERSHIPS.

The nature of the purpose and responsibilities of organizations in each sector leads to particular expertise. The public sector—government—is the largest sector in many societies, with the power to tax, take private property, use force, make laws, and regulations and lay claim to representing the public interest. The private sector is focused on making money for its shareholders or owners, and therefore successful private sector organizations are driven to achieve the greatest level of economy and efficiency in their management operations, are focused on innovation to attract new customers and gain market share and can attract and keep the best employees, managers, and leaders with the superior salaries they can afford to provide. The social sector is mission-driven, laser-focused on helping people, other living creatures, and the planet itself to be sustainable and better for all, now and in the long term, and therefore, social sector organizations generally prioritize positive outcomes for those they serve above all else. The social sector attracts talented professionals, volunteers, and charitable contributions because of their noble mission and outcome obsession.

One sector is no better than the other. Each has its particular strengths and weaknesses. While many elements of effective management are the same, the constraints and capacities are different. At their best, cross-sector partnerships can draw on the best of each sector and avoid each sector's inherent limitations.

There are a number of specific reasons why senior managers of organizations from one sector might partner with an organization from the same or another sector. While contracts between organizations date back many hundreds of years, a more collaborative approach we call cross-sector partnerships began to take shape in the 20th century (most led by government) and has expanded rather rapidly in the 21st century.[1] Partnerships deliver

[1] *Steven A. Cohen, William B. Eimicke, and Tanya Heikkila, "Why Risk Taking Is Possible," essay, in The Effective Public Manager: Achieving Success in Government Organizations (San Francisco, CA: Jossey-Bass, 39–36 ,(2013.*

services, collect and analyze data, raise and deploy financial resources, create and manage capital plans and supervise disaster preparedness and emergency response among other activities. Some of the major reasons why organizations form partnerships for these activities are: to help more people; make more money; accomplish what would otherwise be impossible; be more efficient; access new skills and supplies; create a very specialized value chain; globalize quickly; reach new customers; share risks; and share costs.

More broadly, the increasing complexity and interconnected global economy in the 21st century presents challenges and opportunities that cross national and traditional sector boundaries. As a result, cross-sector partnerships have formed and succeeded in countries all over the world. They have been used to overcome challenges and achieve much higher levels of performance in providing water, handling wastewater, building and managing mass transit systems, providing energy, building large public arenas, revitalizing deteriorated urban areas, creating/rehabilitating public spaces for recreation, education, art, and public health, improving the quality and efficiency of public services, providing secure identification and access to public and private services, creating innovative telemedicine and internet-based mass education systems, building and maintaining affordable housing for low and moderate-income households, and providing more effective rehabilitation and reintegration of people who have been incarcerated.

This paper will explore the benefits and challenges of establishing cross-sector partnerships and identify powerful frameworks to ensure the health and success of these relationships. We will then examine two influential cross-sector partnerships in the telehealth industry, one from the U.S. Department of Veterans Affairs and another from India's Apollo Hospitals Group. Applying key takeaways from these case studies, this article will explore the issues facing telehealth in Egypt and provide recommendations for this industry's future success in the region.

How Did the Cross-sector Partnership Model Evolve?

Modern cross-sector partnerships evolved from the government-led public-private initiatives during the Great Depression and throughout the Second World War era. Faced with challenges beyond the capacity of any one sector, the New Deal of President Franklin Delano Roosevelt incentivized (and sometimes mandated) that private companies work with the government to provide jobs to the unemployed, guaranteed retirement income, modernize farming, electrify rural areas, build huge dams to generate low-cost power, provide low-interest, long term loans to increase homeownership, supply the Allied Forces with tanks, planes, ships, and other equipment and supplies, and even expand public art projects. Government had certainly facilitated private efforts for public benefit—the provision of public lands for private development enabling the private construction of a transcontinental railroad system, building the national telegraph and then telephone network and the national electric grid. What is different about the 20th-century initiatives is that organizations from the public and private sectors worked more closely together on the design and implementation of the activity.

After the Second World War, governments around the world took over what had previously been private activities, including public transportation, automobile, ship and airplane construction, port development and operation, health care, telephone and electric service, and even radio and television broadcasting and programming. In the United States, most of

these activities remained in the private sector. However, the US federal government initiated three major programs that partnered government with private companies, which served the public interest and were also profitable for the private "partners".

The National Interstate and Defense Highway Act of 1956 was financed initially by the federal and state government but was planned at the state and local levels, built primarily by private companies, and led to massive investments in private funds for economic development, housing, and infrastructure for decades to come. In the 1960's, the US government's decision to develop a space exploration program under a new agency, the National Aeronautics and Space Agency (NASA), sparked the creation of numerous partnerships between and among NASA and private companies to build the infrastructure to send vehicles and people into space and bring them back safely. And, similar to the highway program, these partnerships spurred other private investments and inventions that made money and served the public interest, from Teflon to Velcro to cell phones, satellite television, and microwaves, as just a few examples. Also, in the 1960's, government programs to provide health insurance for the poor and the aged partnered with private doctors and hospitals to accept the government funded insurance and provide health services.

Upon this foundation, modern public-private partnerships were built. Beginning in the 1980's and continuing to this day, public and private firms come together through a contract to carry out a mutually beneficial activity or project. Known widely as PPPs, or 3Ps, these partnerships have built bridges, desalination plants, roads, stadia, subways, pipelines, and virtually every other kind of infrastructure you can imagine, including the still amazing Eurotunnel. Cross-sector partnerships (CSPs) take PPPs one step further, including the social sector organizations as potential partners, and generally focus on extremely complicated projects to serve the public interest.

Defining and Structuring Cross-sector Partnerships

Partnerships emerge when one organization identifies an important goal, objective, product, service, or project that it is keen to accomplish or provide but either cannot do it alone or believes it can do it much better with one or more partners from another sector. Organizations work with other organizations all the time through contracts, outsourcing, and value chains. These collaborations occur within sectors (private/private; government/government; social/social), and these partnerships will continue to accomplish important work, measured by the degree to which they generate value for their stakeholders.

While there is much to gain from working with another organization, it makes the management of the activity significantly more complex. Standard operating procedures must be synchronized. Financial practices must not conflict. Human resources practices may require adjustment. Performance measures need coordination. Managing partnerships is hard, so the potential rewards should justify the significantly greater effort.

There is a long history of private firms working together through supply chains, mergers and acquisitions, and joint ventures. In the public sector, intergovernmental agreements are plentiful as well. In both cases, there is a complex legal and regulatory structure that has developed. Cross-sector partnerships are relatively new and are even more challenging because the individual partners frequently operate under significantly different legal and regulatory frameworks, and have different missions, standard operating procedures, and measures of success.

The use of cross-sector partnerships continues to expand despite these challenges because they have been successful in meeting challenges and accomplishing objectives that single organizations and conventional partnerships have not been willing or able to address. In this context, the definition of cross-sector partnerships we find most useful is "a voluntary collaboration between organizations from two or more sectors that leverage their respective teams and resources to achieve mutually agreed-upon and measurable goals."[2]

These partnerships are most likely to succeed when the partners' interests converge on the project, program, enterprise, or activity they share fairly, if not equally, the investment, effort, risks and rewards connected with the partnership. The most effective cross-sector partners make important decisions collaboratively. Perhaps most important, the partners communicate constantly and treat one another respectfully and as equal partners.

The structure of cross-sector partnerships varies widely, depending on the overall objective, anticipated scope of the endeavor, longevity, and location of operations. The roles that partners play in the partnership generally fit into one of three categories—funder, implementer, or stakeholder. Funders can come from all three sectors, be large or small, come in early, late, or throughout the process, and may or may not expect a return on their investment (or even expect to get their investment back at all—a grant or gift, for example). Implementers are the partners doing the work of the project and, potentially, all partners can be doing some of the implementation activities. Stakeholders can often be the largest group of partners and include those affected by the partnership action, including but not limited to recipients (customers, clients, patients, members), the local communities, neighborhoods, and places where the partnership operates and those affected by the partnership activities wherever they are located.

The structure of the activity carried out by the partnership varies widely. The activity can carry the name and operate in a physical or virtual location of one partner, a unitary structure through which the other partners provide funding and/or operational expertise. A conglomerate in the private sector or an authority in the public sector might be an example of a unitary structure. The activity can identify as a joint initiative, carrying the name and operations of multiple partners. A business improvement district, a partnership of local businesses to provide augmented services such as sanitation or security, could be considered a joint initiative.

Partners can choose to create a new identity operated by one or more of the partners with existing and/or new personnel and systems. Under this model, the two or more partners work together to create an organization focused on the partnership mission, entirely separate from their existing organizations. This structure enables the partners to operate as they had before the partnership and not have their management distracted from their independent responsibilities on a daily basis. A long-term franchise agreement to rehabilitate and operate a municipal water and wastewater system governed by a board with membership from each of the partners is an example of the new identity approach.

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[2] *Howard W. Buffett and William B. Eimicke, "The Process Framework: Effective Partnerships Across All Sectors," essay, in Social Value Investing (New York City, NY: Columbia University Press, 72-71 ,(2018. Many of the concepts and ideas in this paper are drawn from this work and from Steven A. Cohen and William B. Eimicke, The Responsible Contract Manager: Protecting the Public Interest in an Outsourced World (Washington, DC: Georgetown University Press, 2008). The article also draws from Steven A. Cohen and William B. Eimicke, Management Fundamentals (New York, NY: Columbia University Press, 2020). And from teaching notes from courses taught by Buffett, Cohen and Eimicke at the School of International and Public Affairs at Columbia University between 2004 and 2023.*

A third model is partial integration, whereby partners might choose to consolidate part or all of their separate administrative divisions, operations, legal, engineering, or technology/ back-office support. This model enables partners to preserve their independence and identity while also saving time and money and improving management focus by consolidating activities that all o of the partners consider support functions. Another version of partial integration is where each partner separates off a portion of their existing operation to create a new organization focused on the partnership mission.

An umbrella structure might function best when the partners come together to carry out partnership activities only periodically but frequently enough for work important enough that the umbrella vehicle must be separate, permanently staffed, and prepared to become operational on a moment's notice. An example is a local, regional, national, or even international emergency services organization which includes independent partners from all three sectors, often from multiple locations, that come together under an incident command structure to deal with a natural disaster, security crisis, or any other pre-determined event of significant consequence.

Challenges to Successful Cross-sector Partnerships

While cross-sector partnerships have numerous benefits, it is important to acknowledge and address potential risks and challenges associated with such collaborations. Partnerships involve diverse stakeholders with different priorities, interests, and objectives. Conflicting agendas can arise, leading to challenges in decision-making and collaboration. Misalignment of interests and goals among partners may hinder progress and compromise the effectiveness of the partnership. Power imbalances between partners can impact decision-making processes and resource allocation. If one sector dominates the partnership, it can limit the influence and contributions of other sectors, undermining the principles of inclusivity and equity. It is crucial to ensure equal representation and participation among partners to mitigate power imbalances.[3]

Establishing effective governance structures and mechanisms for accountability can be challenging in cross-sector partnerships. The absence of clear guidelines, roles, and responsibilities may lead to ambiguity, confusion, and conflicts. It is essential to establish transparent processes, define decision-making mechanisms, and allocate responsibilities to ensure accountability and effective management. Building and maintaining trust among partners is critical for successful collaborations. Lack of trust and effective communication can lead to misunderstandings, conflicts, and breakdowns in collaboration. Open and transparent communication channels, regular engagement, and building relationships based on trust are vital for overcoming these challenges.[4]

Cross-sector partnerships may need to navigate legal and regulatory frameworks that govern each sector. Different sectors may have varying rules, regulations, and compliance requirements that can create complexities and legal barriers. Partners need to ensure compliance with relevant laws and regulations and consider the legal implications of the partnership's activities.

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[3] Daniela Grudinschi et al., "Management Challenges in Cross-Sector Collaboration: Elderly Care Case Study," The Innovation Journal: The Public Sector Innovation Journal 18 (January 2013 ,1), https://doi.org/https://www.researchgate.net/publication/258455438_Management_Challenges_in_Cross-Sector_Collaboration_Elderly_Care_Case_Study.

[4] Kathy Babiak and Lucie Thibault, "Challenges in Multiple Cross-Sector Partnerships," Nonprofit and Voluntary Sector Quarterly 38, no. 1 (February 43–117 :(2009, https://doi.org/089976400831605 4/10.1177.

Successful cross-sector partnerships require adequate resources, including financial, human, and technical capacities. Inadequate resources can impede the effectiveness of the partnership and limit its ability to achieve sustainable outcomes. Partners need to assess and address resource gaps and develop strategies for resource mobilization and capacity-building to ensure the partnership›s success. These partnerships often have a specific timeframe or project focus. Sustaining the partnership›s impact and outcomes beyond the partnership›s duration can be challenging. Without proper planning and mechanisms for long-term sustainability, the achievements of the partnership may not be sustained once the partnership concludes. It is crucial to consider strategies for continuation or institutionalization of the partnership›s initiatives.[5]

Cross-sector partnerships made up of or including poor-quality institutions are especially prone the above issues. Poor quality institutions, characterized by corruption, weak governance, and a lack of transparency, erode trust among partners. When institutions are perceived as untrustworthy or unreliable, it becomes challenging for partners to collaborate effectively. The absence of trust can hinder open communication, sharing of information, and joint decision-making, undermining the partnership›s effectiveness and long-term sustainability.

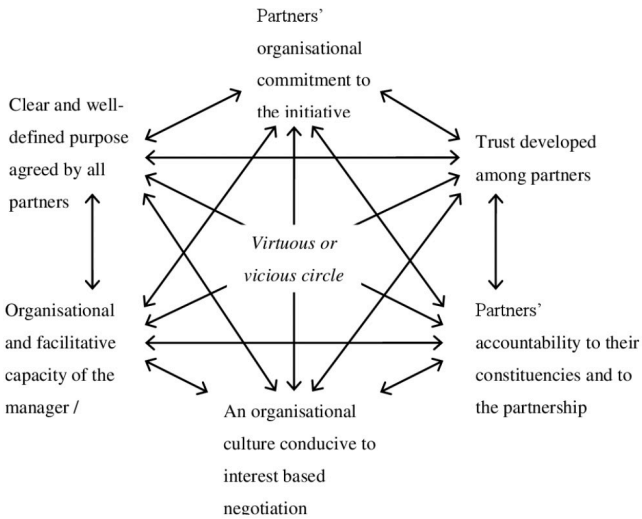

FIGURE (2): FLOW DIAGRAM ILLUSTRATING HOW ORGANIZATIONAL FACTORS POSITIVELY OR NEGATIVELY INFLUENCE CROSS-SECTOR PARTNERSHIPS[6]

Poor-quality institutions often result in ambiguous or inconsistent legal and regulatory frameworks. This can create uncertainty and complexity for cross-sector partnerships, as partners may encounter challenges in complying with laws and regulations. Inconsistent enforcement of rules and regulations can further exacerbate the risks and uncertainties faced by the partnership, leading to delays, disputes, and potential legal issues. These institutions

[5] *Kathy Babiak and Lucie Thibault, "Challenges in Multiple Cross-Sector Partnerships," Nonprofit and Voluntary Sector Quarterly 38, no. 1 (February 43–117 :(2009, https://doi.org/0899764008316054/10.1177.*

[6] *Ralph Hamann et al., Schematic Illustration of Possible Virtuous or Vicious Circle of Interaction between Diverse Partnership Success Factors, What Makes Cross-Sector Partnerships Successful? A Comparative Case Study Analysis of Diverse Partnership Types in an Emerging Economy Context (Investment Climate and Business Environment Research Fund, March 2011), https://www.semanticscholar.org/paper/What-Makes-Cross-Sector-Partnerships-Successful-A-Hamann-Kranz/5f5fa44951f8a635ae93e307b4748db50f49c479.*

often struggle with accountability and transparency. When institutions lack mechanisms for oversight and accountability, it becomes difficult to ensure that partners are fulfilling their commitments and responsibilities. Lack of transparency can also hinder effective resource management, as it becomes challenging to track the allocation and use of resources within the partnership. These issues create an environment conducive to corruption and unethical practices. In such contexts, there is a higher risk of misappropriation of funds, nepotism, favoritism, and other fraudulent activities. Corruption not only undermines the credibility and integrity of the partnership but also diverts resources away from intended beneficiaries and sustainable development goals. Insufficient human resources, technical expertise, and administrative capabilities can impede the partnership›s ability to plan, execute, and monitor activities. This can result in delays, inefficiencies, and inadequate project management, compromising the partnership›s overall effectiveness.[7]

Perhaps most challenging to address is the political instability and policy uncertainty associated with unsound institutions. Frequent changes in government, shifts in policy priorities, and unpredictable political environments can disrupt cross-sector partnerships. Uncertainty in policy frameworks and political support can undermine the partnership›s ability to plan and implement long-term initiatives, making it difficult to achieve sustainable outcomes. These challenges must often be addressed by larger political or social efforts and cannot be fully resolved within partnerships.[8]

To mitigate the threats associated with fragile institutions, it is crucial to address institutional weaknesses through capacity-building efforts, policy reforms, and support for good governance practices. Strengthening institutions by promoting transparency, accountability, and the rule of law can create an enabling environment for cross-sector partnerships to thrive. Engaging with relevant stakeholders, including government authorities, civil society organizations, and international bodies, can help advocate for institutional improvements and foster a more conducive ecosystem for collaborative partnerships. The next couple of sections will outline the key characteristics associated with healthy, successful, and sustainable cross-sector partnerships.[9]

Successful Partnerships are Built upon a Shared Strategy

Consensus on a mission and a detailed road map on how to achieve it is the foundation for a successful partnership. Once the mission and critical path to it are formalized, partners can then focus on the most effective management mechanisms to get the work accomplished. A benchmarking exercise can be a very useful first step, as there is much to be learned from how other partnerships or independent organizations have sought to meet similar challenges. Information on what others have done can help in mission definition and the process they used to develop their strategy. Benchmarking can also provide a framework to encourage engagement and participation among the partners and stimulate creative brainstorming to identify new ways of thinking about persistent problems.

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[7] *Shauna Petchel, Sherril Gelmon, and Bruce Goldberg, " The Organizational Risks Of Cross-Sector Partnerships: A Comparison Of Health And Human Services Perspectives," Health Affairs 39, no. 4 (April 81–574 :(2020, https://doi.org/10.1377/hlthaff.2019.01553.*

[8] *Shauna Petchel, Sherril Gelmon, and Bruce Goldberg, " The Organizational Risks Of Cross-Sector Partnerships: A Comparison Of Health And Human Services Perspectives," Health Affairs 39, no. 4 (April 81–574 :(2020, https://doi.org/10.1377/hlthaff.2019.01553.*

[9] *Steve Schmida, "How to Successfully Manage Cross-Sector Partnerships," Resonance Global, November 2021 ,3, https://www.resonanceglobal.com/blog/how-to-successfully-manage-cross-sector-partnerships.*

As important, potential partners should only consider a partnership as a management option after they have conducted their own strategic planning process. Once an organization has a clear vision of its current and future mission, an inventory of its core strengths, and an accurate assessment of its weaknesses, only then can it find the best partners to achieve maximum results.

Once the need for a partnership is determined and the appropriate partnership identified and convened, the partners can use a theory of change logic model to visually depict and determine their mutually desired outcomes and impacts.[10] Once those outcomes are identified, the partners can work backwards identify the road map to success, beginning with inputs, then necessary activities to measures of outputs that result in the desired outcomes and impacts. Once this analysis is complete, partners can begin to build a comprehensive strategic plan for the partnership.

A strategic plan for the partnership ensures proper analysis of the impact of the partnership activities on the existing independent operations of each partner. This analysis will look at the possible interactions between services and goods produced by each partner and the possible effect of both the partnership outputs, and where those services and goods are being sourced and provided. To map out and more accurately assess how the new activities might impact the process by which the partners have and will bring value to their customers, the partners should carry out a value chain analysis. A value chain analysis can assess not only the impact of the partnership on each partner's supply chain but also how it might positively impact its customers, new and existing, and the communities where the transactions take place.

Cross-sector partnerships generally make sense for larger-scale initiatives with an implementation timeline of three years or more. Therefore, a comprehensive strategic planning process will require rather extensive research and planning stages, particularly if the location (or locations) of the customer (and supply chain) are in challenging socioeconomic, political, or environmental sites. This pre-implementation work takes time and money but is essential to the success of a cross-sector partnership. This may seem obvious, but because of the initial investment of time and money, it is often not done, reducing the value created by the partnership as well as the probability of success.

Key Elements of Successful Cross-sector Partnership Management

Good management is essential to the success of any organization regardless of sector. Without exceptionally good management, the success of a cross-sector partnership is impossible. Key elements of good management are similar, but we see several management tools that are essential to effective cross-sector partnerships—collaborative leadership, diverse teams, innovative financing, quantifiable measures of success, and advanced communication and feedback mechanisms.

Effective leadership is a key to success in any organization, but for cross-sector partnerships, collaborative leadership is required. Collaborative leaders focus on communication. They are active listeners, articulate speakers, respectful of differences in culture, gender, ethnicity, beliefs, and professions, willing to delegate but also decisive decision-makers when necessary.

[10] Howard W. Buffett and William B. Eimicke, "The Process Framework: Effective Partnerships Across All Sectors," essay, in Social Value Investing (New York City, NY: Columbia University Press, 91-84 ,(2018.

Collaborative leaders use persuasion rather than power. Their authority comes from their expert knowledge, commitment to shared success and personal integrity.

A team management approach is essential for cross-sector partnerships, given the diverse set of skills and knowledge required to accomplish the complex objectives they are created to achieve. Teams should reflect the diversity of the organizations they represent, the customers they serve, and the communities in which they work. Team leaders should also lead collaboratively if they are to maximize the performance of diverse teams.

Innovative financing techniques are characteristic of successful cross-sector partnerships. These partnerships often form when conventional organizations using traditional financing methods are unable to meet important and complex challenges. Tiered financing structures are frequently required. Foundations, gifts, or government grants may come first to fund preliminary research and planning. This is high-risk and speculative funding, and it is best if these funds do not need to be repaid, as it is uncertain whether the project will go forward. Social Impact Bonds (SIBs) and program-related investments (PRIs) can fund the pilot phase. This activity is less risky, but these investors understand that if the pilot is not successful, they might lose their investment, but if it works, they will not only be repaid, they can get a competitive return as well. Partner organizations need to contribute funds, personnel, and in-kind assets. Once the activity is up and running, funding comes from customers (including any public funds that customers and service providers may be eligible to receive). Capital requirements may be met through a mix of public, private, and philanthropic sources.

Peter Drucker famously said, "you can't manage what you can't measure." Drucker's assessment is especially true for cross-sector partnerships. In these partnerships, two or more organizations come together with a pre-existing vision, mission, set of stakeholders, history, and a set of quantifiable measures of success. Now they are coming together, probably for the first time, to do something they probably have not done before, for a new set of stakeholders. It is crucial that the partners focus from the very first day on reaching a consensus on a definition of success for the partnership, how they will measure success, where they will get the data, how they will track and report the results, what targets they will use and how will those targets be adjusted over time, and how will the partners hold themselves accountable.

Metrics and measurement are not new to management theory and practice but using them to achieve success in a cross-sector partnership is new, and perhaps it is even unique.

All organizations need advanced communication and feedback mechanisms to survive, improve and succeed. These tools are crucial for cross-sector partnerships in that they bring together an extremely broad set of stakeholders, some with interests in the current activities of the individual partners and new stakeholders created by the partnership. Partnerships often attract and engage a broad range of diverse constituencies, existing and new customers and suppliers, multiple funders with very different interests, and impacted communities with both positive and negative predispositions regarding the partnership. Using technology, including social media, customized and generally accessible communications platforms, a bias toward maximum communications, and sincere and ongoing commitment to transparency can enable the partnership to obtain honest and independent feedback from customers, other stakeholders, and even opponents that are essential to improving performance. It is also crucial to establishing the credibility which is essential to continuing the flow of actionable feedback over time.

Cross-sector Partnerships and Sustainability

Cross-sector partnerships play a crucial role in facilitating sustainable development by leveraging the expertise, resources, and networks of different stakeholders, including governments, businesses, civil society organizations, and academia. Partnerships bring together diverse perspectives, knowledge, and expertise from various sectors. This collaboration fosters innovative approaches and problem-solving mechanisms to address complex sustainability challenges. By sharing best practices and lessons learned, partners can develop effective strategies and solutions for sustainable development. Cross-sector partnerships combine financial, technological, and human resources from different sectors. This collaboration enables the mobilization of funding, investment, and other resources required to implement sustainable development initiatives. By pooling resources, partners can achieve economies of scale, improve efficiency, and maximize the impact of their efforts.

Collaborative partnerships promote capacity-building efforts by sharing skills, training programs, and technical assistance. This exchange of knowledge and capacity-building activities strengthen the capabilities of all stakeholders involved, enabling them to better contribute to sustainable development. For example, businesses can offer expertise in renewable energy innovation and technology, while governments can provide policy guidance and regulatory frameworks. Partnerships encourage the development and transfer of innovative technologies, practices, and solutions. By collaborating, sectors can leverage each other›s strengths to accelerate the adoption and dissemination of sustainable technologies. This leads to improved efficiency, reduced environmental impact, and the creation of new business opportunities.

Cross-sector partnerships promote inclusive decision-making processes by engaging multiple stakeholders, including marginalized communities and civil society organizations. This participatory approach ensures that the diverse needs, perspectives, and interests of different groups are considered in sustainable development initiatives. It also helps build trust and fosters a sense of ownership among stakeholders, leading to more effective and sustainable outcomes. Partnerships allow for scaling up sustainable development initiatives by reaching broader audiences and implementing projects at a larger scale. The combined efforts and resources of multiple sectors enable the replication and expansion of successful models and interventions. This scalability contributes to the achievement of broader sustainable development goals.

Cross-sector partnerships can advocate for policy changes and influence governance structures to create an enabling environment for sustainable development. By working together, partners can leverage their collective influence and engage with policymakers to shape regulations, policies, and standards that support sustainability. One impressive example of cross-sector partnership for sustainable development is the Tropical Forest Alliance 2020. This partnership brings together governments, companies, indigenous communities, and civil society organizations to combat deforestation and promote sustainable land use in tropical forest regions. By aligning their efforts, the alliance aims to eliminate deforestation from commodity supply chains, promote sustainable agricultural practices, and protect biodiversity and ecosystem services.[11] Another example is Sustainable Energy for All (SEforALL) initiative, which brings together governments, businesses, and civil society organizations to

[11] *TFA, "Collective Action: A Framework and Collective Call to Action for the Tropical Forest Alliance Community to Catalyse a Forest-Positive Future Post2020-," Tropical Forest Alliance, 2023, https://www.tropicalforestalliance.org/en/collective-action-agenda/.*

promote universal access to affordable, reliable, and sustainable energy. SEforALL focuses on accelerating the adoption of renewable energy sources, improving energy efficiency, and expanding energy access in developing countries, thereby contributing to the achievement of the United Nations Sustainable Development Goal 7 on energy.[12]

The next sections of this paper will address the role of cross-sector partnerships in telehealth, or the use of telecommunications technology to provide healthcare remotely. Outside of its immense potential to expand access to quality healthcare, telehealth can also play a key role in promulgating a more sustainable healthcare system. Telehealth eliminates or reduces the need for patients and healthcare providers to travel to healthcare facilities, thereby reducing carbon emissions from transportation. This is particularly significant for rural or remote areas where accessing healthcare services often involves long-distance travel. By minimizing travel, telehealth helps mitigate the environmental impact associated with transportation and contributes to a more sustainable approach to healthcare delivery.[13] Telehealth optimizes the use of healthcare resources, such as medical equipment and facilities. Instead of requiring in-person consultations, many non-emergency healthcare services can be provided remotely through telehealth platforms. This reduces the need for physical infrastructure, minimizes equipment duplication, and allows healthcare facilities to allocate their resources more efficiently. It can also help address healthcare workforce shortages by enabling providers to reach a larger number of patients without geographical constraints.[14]

Telehealth improves access to healthcare services, particularly for individuals who face barriers to traditional in-person care. It allows patients in remote or underserved areas to connect with healthcare professionals located elsewhere, overcoming geographic limitations. Telehealth also benefits vulnerable populations, including those with limited mobility, individuals with disabilities, and elderly patients, by providing convenient access to healthcare from the comfort of their homes. By ensuring equitable access to healthcare services, telehealth supports sustainable development by promoting health and well-being for all. Telehealth plays a vital role in supporting public health initiatives, including disease prevention, monitoring, and management. It facilitates the delivery of preventive care, health education, and remote monitoring of chronic conditions.[15] During public health emergencies, telehealth enables the rapid dissemination of information, facilitates virtual triaging, and helps manage the surge in healthcare demand. By strengthening public health efforts, telehealth contributes to sustainable development by promoting population health and resilience.

Partnerships for Better Healthcare — The Cases of India and the United States

The 2021 National Health Interview Survey found that 37 % of participants had used telemedicine in the past year.[16] As of 2023, there are 1,387 telehealth service businesses

[12] SEforALL, "Our Work," Sustainable Energy for All, 2023, https://www.seforall.org/our-work.

[13] Kat Jercich, "Telehealth Can Play a Vital Role in Reducing Carbon Emissions," Healthcare IT News, March 2022 ,2, https://www.healthcareitnews.com/news/telehealth-can-play-vital-role-reducing-carbon-emissions.

[14] Green Business Bureau, "Sustainability in Healthcare: How Telemedicine and Virtual Meetings Reduce Emissions and Waste," Green Business Bureau, November 2021 ,3, https://greenbusinessbureau.com/industries/healthcare/sustainability-in-healthcare-how-telemedicine-and-virtual-meetings-reduce-emissions-and-waste/.

[15] Kat Jercich, "Telehealth Can Play a Vital Role in Reducing Carbon Emissions," Healthcare IT News, March 2022 ,2, https://www.healthcareitnews.com/news/telehealth-can-play-vital-role-reducing-carbon-emissions.

[16] Lucas Jacqueline and Villarroel Maria, "Telemedicine Use among Adults: United States, 2021," National Center for Health Statistics Brief, no. 445 (October 2022), https://doi.org/10.15620/cdc:121435.

in the United States, a 29 % increase from 2022.[17] While popular in the private sector, the Federal government is also a prominent partner for telehealth initiatives, with more than 20 federal agencies engaged in some aspect of telehealth. The U.S. Department of Veterans Affairs (VA), the largest US telehealth provider, greatly expanded its already robust telehealth services during and after the COVID19- pandemic to meet growing need (see figure 3). In 2022, the VA served 2.2 million veterans, more than tripling its user base of 677,000 from 2019.[18] Aside from the VA, the Centers for Medicare and Medicaid Services, the US Department of Defense, and the Indian Health Service all utilize telehealth services to reduce healthcare costs and increase program efficiency. The US Affordable Care Act incentivized telehealth advancement through the creation of agency-led private-public partnerships with local healthcare providers and non-profit organizations.[19]

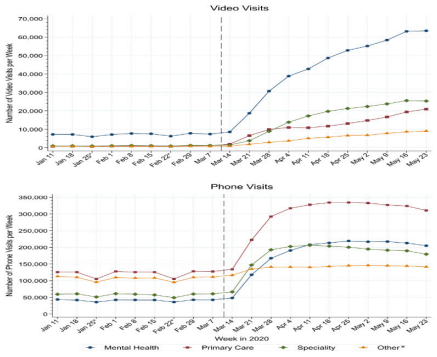

FIGURE (3): WEEKLY RATES OF HOME-BASED VIDEO AND TELEPHONE [VETERANS AFFAIRS HEALTH] VISITS ACROSS TYPES OF CARE, JANUARY THROUGH APRIL 2020[20]

In India, the Apollo Hospitals Group runs the Apollo Telemedicine Networking Foundation (ATNF), the nation's single largest telemedicine provider. Apollo also currently serves as the largest healthcare provider in Asia with a presence in over 13 countries, overseeing 10,000 beds across 73 hospitals and running over 5,000 pharmacies and 400 Primary Care and Diagnostics Clinics.[21] Since 1999, Apollo Hospitals has served as the primary provider of comprehensive telemedicine services to the rural poor in India. The US Department of Veterans Affairs (VA) provides similar telemedicine services to rural veterans that live more than 50 miles from a local VA hospital, Vet Center, or Community Based Outpatient Clinic (CBOC). Since 2003, the VA has adopted telemedicine programming to provide both mental health and primary care to populations of rural veterans.[22]

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[17] Marley Brocker, "US SPECIALIZED INDUSTRY REPORT OD5775: Telehealth Services in the US," IBISWorld, January 2023, https://my.ibisworld.com/us/en/industry-specialized/od5775/about.

[18] VANews, "VA Telehealth Used By More Than 2.2 Million Veterans," VA Connected Care, September 19, 2022, https://connectedcare.va.gov/whats-new/technology/va-telehealth-used-more-22-million-veterans#:~:text=%E9%80%2CMany2%C20%many20%Veterans20%are20%using,who20%receive20%care20%from20%VA.%E9%80%2D.

[19] Victoria L. Elliot, "Telehealth and Telemedicine: Description and Issues," Congressional Research Service, March 29, 2016, https://doi.org/https://sgp.fas.org/crs/misc/R44437.pdf.

[20] Leonie Heyworth et al., Weekly Rates of Home-Based Video and Telephone Visits across Types of Care, January through April of 2020, Expanding Access through Virtual Care: The VA's Early Experience with Covid19- (NEJM Catalyst, July 1, 2020), https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0327.

[21] "Multispeciality Hospitals in India: Apollo Hospitals for All Your Healthcare Needs," Multispeciality Hospitals in India | Apollo Hospitals for all Your Healthcare Needs - Apollo Hospitals, 2023, https://www.apollohospitals.com/.

[22] Veterans Health Administration: Office of Connected Care, Telehealth Fact Sheet – FY18 (FY17 Data) § (2018).

Apollo partners with the government of India to deliver healthcare services but has privately owned facilities and is fiscally independent.[23] As the nation's second largest bureaucracy, the VA is regulated and financed by the legislative and executive branches of government. To deliver quality telemedicine services to rural veterans, the VA partners with local healthcare systems through Community Care Contracts. These contracts allow the VA to either allow a local provider to deliver care or utilize the independent provider's location for telemedicine services. While Apollo partners with the government to obtain access to rural communities but utilizes their own facilities, the VA is the exact opposite – partnering with local providers to disseminate government regulated health care.[24]

As a privately-owned entity, Apollo's budget and operating practices are determined by the organization's leadership and shareholders. Unlike Apollo, the VA operates through Congressional legislative mandates – with the legislative and executive branches determining the agency's yearly budget and mandating many of its healthcare policies and practices.

The VA budget originates through the President and is reviewed by the federal Office of Management and Budget (OMB) before it is sent to Congress for approval and back to the President for signature. Through the Military Construction and Veterans Affairs (MILCON VA) funding package, the House and Senate Veterans Affairs Committees analyze the request from OMB and will appropriate the requested value or an amount higher or lower. The integration of telehealth into the VA started in 2003 through a Consolidated Appropriations Resolution and has since been furthered by the VA CHOICE Act of 2014 and the VA MISSION Act of 2018.[25]

To provide telemedicine services, the Apollo Hospitals Group founded the Apollo Telemedicine Networking Foundation (ATNF). ATNF is a not-for-profit organization that serves as a part of the Apollo Hospitals Group and is currently considered India›s single largest turnkey provider of telemedicine. To date, ATNF runs hundreds Telemedicine Centers in India, all of which provide specialty medical care to rural communities. At rural Apollo Telemedicine facilities, patients meet with a healthcare facilitator, like a physician›s assistant or nurse, who can communicate digitally with a wide variety of medical specialists.[26] The VA is a nationally administered program, employing over 371,000 health care professionals and support staff through 1,298 healthcare facilities, including but not limited to 1,113 Community-based Outpatient Clinics, 171 Medical Centers, and over 100 Community Living Centers throughout the 50 states, the US territories, and the Philippines.[27] Like Apollo, due to the enormous size of the VA, patients meet with a healthcare facilitator, like a physician›s assistant or nurse, who communicates digitally with the staff at either the local VA Medical center or clinic.[28]

Both Apollo and the VA faced specific policy challenges as they expanded their telemedicine programs in remote locations with limited direct access to first-rate medical facilities. To

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[23] M "Government, Apollo Hospitals Partner to Launch Telemedicine Services," The Economic Times: Industry, August ,23 2015, https://economictimes.indiatimes.com/industry/healthcare/biotech/healthcare/government-apollo-hospitals-partner-to-launch-telemedicine-services/articleshow/48639432.cms?from=mdr.

[24] Office of Budget, Department of Veterans Affairs – Budget in Brief § (2020).

[25] Office of Budget, Department of Veterans Affairs – Budget in Brief § (2020).

26 "About Us," ATNF, 2019, https://atnf.org/about.html.

27 "Veterans Health Administration: About VHA," U.S. Department of Veterans Affairs, 2023, https://www.va.gov/health/aboutvha.asp.

28 Ibid

remedy implementation issues, Apollo collaborated with the Indian government to share costs and create cost-effective treatments. Due to the size of the United States, the VA's largest challenge was delivering service via cell phone or smartphone without a medical center or clinic nearby. Despite the widespread popularity of broadband internet and cell phones domestically, the US continues to struggle to provide internet services to some citizens residing in rural areas (see figure 4). There is also a "digital divide" limiting internet access to the urban poor.

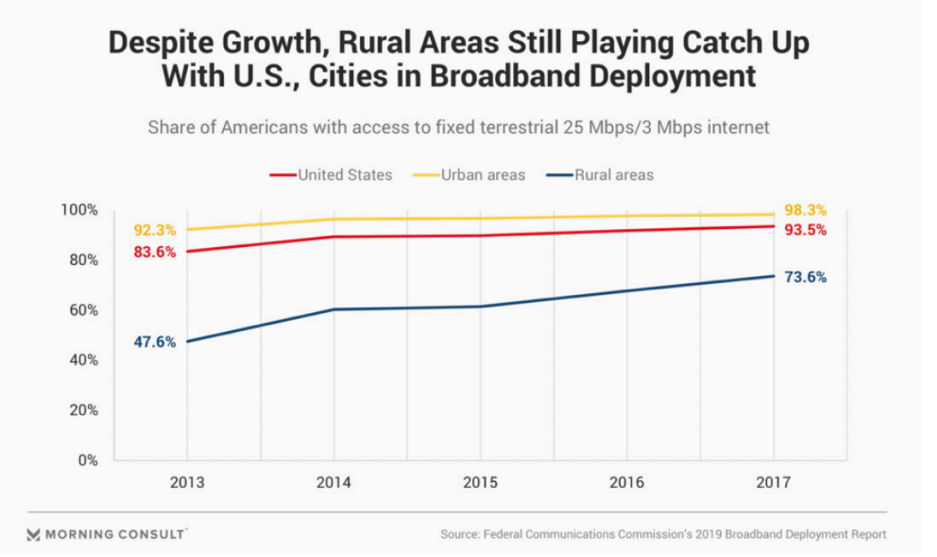

FIGURE (4): GRAPH ILLUSTRATING THE LAGGING GROWTH OF RURAL INTERNET ACCESS ACROSS THE U.S.[29]

Unlike the US, India is more advanced in providing rural internet. Beginning in 2014, Prime Minister Narendra Modi's Digital India initiative now enables telemedicine services to reach even the most rural constituents through nationally provided broadband services.

In 2015, the Indian government and Apollo expanded their partnership. Patients could visit the government's Department of Electronics and Information Technology's Common Services Centers (CSCs) to access consultations with Apollo Hospital doctors. The partnership included the Bureau of Pharma PSU of India, providing the 60,000 CSCs with generic drugs.[30] At the same time, they launched Ask Apollo, India's first mHealth program. Ask Apollo is a patient-centric smartphone application that allows users to consult a physician anywhere, at any time. Ask Apollo is one of the first services of its kind, allowing users to book appointments and obtain medical consultations without requiring any travel.[31]

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[29] *Sam Sabin, Despite Growth, Rural Areas Still Playing Catch-Up With U.S. Cities in Broadband Deployment, Experts: Efforts to Expand Telehealth in Pandemic Still Leaving Rural U.S. Behind (Morning Consult, March 2020 ,24), https://morningconsult.com/24/03/2020/telehealth-coronavirus-rural-america/.*

[30] *"Government, Apollo Hospitals Partner to Launch Telemedicine Services," The Economic Times: Industry, August ,23 2015, https://economictimes.indiatimes.com/industry/healthcare/biotech/healthcare/government-apollo-hospitals-partner-to-launch-telemedicine-services/articleshow/48639432.cms?from=mdr.*

[31] *Apollo Hospitals, "Apollo Hospitals Launches Ask Apollo – a First of Its Kind Medical Platform in the Country for Remote Patient Care," Apollo Hospitals, October 2015 ,15, https://www.apollohospitals.com/news/apollo-hospitals-launches-ask-apollo-a-first-of-its-kind-medical-platform.*

In the United States, the VA was one of the first adopters of telehealth services and was affordable enough to be widely implemented.[32] In 1997, the VA began investing in telehealth through start-up funding; however, the venture was not sustainable without full financial backing from Congress. Approximately four years after Apollo started utilizing telemedicine, the VA adopted telehealth services to expand its reach, reduce travel costs, and increase the level of care available to veterans. Funded through the 2003 Appropriations package, the VA started to receive federal funding to rollout telehealth practices across the country. Today, their growing telehealth initiatives have provided over 17.2 million telehealth visits since the start of the COVID19- pandemic.[33]

While ATNF has been able to expand rapidly as a for-profit business, the VA is dependent on funding from the US Congress. The initial funding through the Medicare Telehealth Validation Act of 2003 provided grants to organizations utilizing telehealth services to expand access to healthcare services for veterans in rural areas, frontier areas, and medically underserved areas.[34] Today, as the national veteran population continues to grow and requires specialized attention, the VA continues to rely on Congress for resources and updated regulations.

While thousands of bills related to reforming aspects of VA healthcare are proposed each Congress, very few receive as much national attention as The Veterans› Access to Care through Choice, Accountability, and Transparency Act of 2014, also known as the Veterans Choice Act. In response to the 2014 scandal over wait times at VA facilities, Congress passed the Veterans Choice Act, which revamped protocol at the Veterans Healthcare Administration by outsourcing specific healthcare services to increase access to care and decrease wait times. Specifically, the legislation required all mobile vet centers to have the capability to provide telemedicine services and improved overall access to telemedicine.[35]

Three years after the passage of the Veterans Choice Act, Congress passed the Veterans E-Health and Telemedicine Support Act of 2017, or the VETS Act, which permitted healthcare professionals to treat patients in other states via telemedicine.[36] The VA MISSION Act of 2018 requires the development of access and quality standards for medical services, including telemedicine.[37]

Strategic Planning Efforts

Over the past two decades, both the VA and Apollo Hospitals have made impressive strides in implementing telemedicine. India's partnership with the for-profit healthcare giant, Apollo Hospitals, has allowed for the nation to rapidly start to close the gap in healthcare services between rural and urban residents. Apollo's pre-existing infrastructure and name recognition

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[32] Veterans Health Administration: Office of Connected Care, TeleMental Health Operations Manual: Clinical Specialist Supplement § (2012).

[33] "Personal Connection: How Nurse Practitioners and IT Experts Met Soaring Telehealth Demand," DigitalVA, March ,23 2022, https://digital.va.gov/featured/personal-connection-how-nurse-practitioners-and-it-experts-met-soaring-telehealth-demand/.

[34] Education and the Workforce and Howard P. McKeon, bill, Fed Up Higher Education Technical Amendments Act of 2003 §, H.R.20) 12AD).

[35] Veterans' Affairs; Oversight and Government Reform; Budget and Ann Kirkpatrick, bill, Veterans' Access to Care through Choice, Accountability, and Transparency Act of 2014 §, H.R.2014) 4841).

[36] Veterans' Affairs and Glenn Thompson, bill, Veterans E-Health and Telemedicine Support Act of 2017 §, H.R.2123 2017)).

[37] Veterans' Affairs and Johnny Ikakson, bill, VA MISSION Act of 2018 §, S.2018) 2372).

have allowed the Indian government to move quickly to design and implement resources for citizens across the country (see figure 5). Alternatively, the VA has been slow to partner with non- and for-profit entities with the proper expertise for servicing the rural population.

FIGURE (5): TELEHEALTH GROWTH IN INDIA SINCE 2010 WITH INDUSTRY GROWTH PREDICTIONS THROUGH 2025[38]

Patients can travel to a nearby consultation center, health centers, or Common Service Centers (CSCs) and, through a healthcare facilitator, nurse, or physician, arrange for consultations with physicians at secondary care facilities or specialists at Apollo's major metropolitan hospitals. The consulting physician can prescribe medicines or offer a referral to another facility. The program is especially successful with primary care and continuing care for chronic illnesses. In some cases, with mHealth technology, patients can access services via their mobile devices.

The initial cost of capital investment for each consultation center is roughly 10,000$ USD.[39] The equipment necessary to outfit a rural health center as a teleconsultation hub includes a high-resolution polycam, scanner, modem, and PC, as well as medical equipment such as a microscope, ECG machine, X-ray machine, and electronic stethoscope. Software, hardware, broadband, and satellite connectivity are provided free of charge by the government via the Indian Space Research Organization, Departments of Communication, Science & Technology, and Information Technology. Installation of these items takes 7-2 days in consultation centers and approximately 20 days for specialty centers, though most already have many of the basic items.

Patients visiting consultancy centers are given unique health identification numbers (UHIDs) that specialty centers can use to look up digital records on software developed by General Electric. The software is also able to transmit medical imaging. Physicians that review the medical records are located at secondary centers across the country and are trained to the same standards as Apollo Hospitals' globally recognized hospitals in urban settings. The specialist updates the patient's online record, and depending on the severity of the case, the consultancy center delivers the results, or a teleconsultation is scheduled. The centralized database of the records is maintained by Apollo Telemedicine Enterprises.

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[38] Soumen Mandal, Why Telemedicine Is The Next Big Opportunity In Indian Healthtech (Inc 42, April 2020 ,16), https://inc42.com/datalab/telemedicine-market-opportunity-in-indian-healthtech/.

[39] Shengnan Chen, Alice Cheng, and Khanjan Mehta, "A Review of Telemedicine Business Models," Telemedicine and E-Health 19, no. 4 (April 97–287 :(2013, https://doi.org/10.1089/tmj.2012.0172.

Apollo Hospitals does make a profit from telemedicine but offsets them by offering several price structures. They charge 30-20$ USD for a full-price teleconsultation resulting in a 10$ profit.[40] Additional revenue sources are provided by servicing government employees. These profits enable Apollo to provide free consultations to financially disadvantaged individuals, especially those in rural areas.

ATNF continues to expand its resources for patients every year. Since 2013, they have sought to bring more of their services to patients without the need for consultancy centers by implementing several emerging healthcare technologies. For example, in 2015, they launched Ask Apollo, which in addition to allowing patients to access their medical records and schedule appointments, gives patients the ability to video-conference, call, or email with a doctor from anywhere, anytime, via their smartphone.

The US Department of Veterans Affairs operates the largest healthcare system in the country and faces a similar issue to India in how to provide care to rural areas. They have also expanded into telemedicine to reach these customers without needing to expand their physical plant. The government system has three major programs: Clinical Video telehealth, live-video consultations enabling health providers to diagnose, monitor, and treat veterans; Home telehealth technologies that monitor chronic conditions; and Store-and-Forward telehealth, which captures and stores clinical information for later evaluation.

To provide treatment across vast, sparsely populated rural areas, the VA partners with private organizations, for-profits, and community organizations to increase the effectiveness of telehealth programming. Through the creation of Community Care Contracts, the VA selects private healthcare providers to serve as the agency's proxy to administer services. These contracts require the VA to vet the selected provider, and in exchange, the provider will see the patient, share medical records and reports, and then will bill the VA directly. The VA then reimburses the provider, so the veteran receives care either free of charge or at a discounted rate.

These Community Care Contracts have allowed the VA to provide local healthcare services in rural areas, both through telemedicine and in-person, without having VA facilities or physicians within that geographic region.[41] Despite arguments that the expansion of the Community Care program is an attempt to privatize the VA, allowing veterans to receive healthcare from a local provider has increased the number of veterans enrolled in the VA healthcare system, and has provided the VA with a mechanism to disseminate quality, accessible and localized care for a majority of their rural veterans. As mentioned above, both the Veterans Choice and the VA MISSION Act prioritize the further expansion of VA Community Care, citing rates of higher system usage and efficiency.[42] Additionally, as all Community Care providers are vetted by the VA and reimbursed through the agency, there is a higher rate of oversight on care and providers than existed when veterans would use local providers instead of the VA.

The VA now partners with for-profits and community organizations to increase access to telehealth services. In December 2018, the VA hosted a summit to discuss how telehealth

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[40] Shengnan Chen, Alice Cheng, and Khanjan Mehta, "A Review of Telemedicine Business Models," Telemedicine and E-Health 19, no. 4 (April 97–287 :(2013, https://doi.org/10.1089/tmj.2012.0172.

[41] Veterans Health Administration, "Community Care Home," U.S. Department of Veterans Affairs, December 2023, https://www.va.gov/communitycare/.

[42] Sara Heath, "VA Community Care Program Raises Concerns in Senate, Gao," PatientEngagementHIT, April 2019 ,15, https://patientengagementhit.com/news/va-community-care-program-raises-concerns-in-senate-gao.

can drive innovation in American health care. Through that summit, they were able to arrange groundbreaking partnerships with Fortune 500 companies. Philips is providing 10 Veterans of Foreign Wars and American Legions with telehealth technology so Veterans can receive VA care via video-conferencing.[43] Additional partnerships have been started with T-Mobile, who is offering free VA Video Connect services to Veteran customers for no extra charge, regardless of their plan, and Walmart who will be dedicating space and technical support for appointments. Partnerships with non-profits have also been on the rise in local areas with universities, schools, shelters, and residential treatment facilities.

Collaborative Leadership with a Team Approach

Apollo's first telemedicine facility in India opened in 2000, and then US President Bill Clinton attended the opening, officially inaugurating the facility.[44] Apollo's telemedicine initiative is led by Dr. Prathap Reddy, Founder and Chairman, and Ms. Preetha Reddy, Vice Chairperson of Apollo Hospitals Enterprise, and a board of five Independent Directors.[45] Dr. Krishnan Ganapathy, a world-renowned neuro-surgeon, serves as the current President of the Apollo Telemedicine Networking Foundation.[46]

To succeed in building a telemedicine system, Apollo needed the Indian government as a partner. To secure government assistance, the Indian government was vital to Apollo's telemedicine expansion. Under the leadership of former President Shri Giani Zail Singh and current Prime Minister Modi, Apollo was able to partner with the public sector, becoming the largest provider of telemedicine services in India and one of the largest telemedicine networks in the world. [47]

Additionally, one key difference is that Apollo utilizes the government to increase access to rural populations while managing their own vehicles of care. The VA operates in the opposite fashion, relying on private providers to access rural veterans and disseminate care, while primarily using either VA services or private providers that have been designated as a federal proxy through a Community Care Contract.

For almost a decade, the US federal government has appropriated billions of dollars to telehealth programs[48]. Since 2014, over 20 federal agencies have been engaged in providing some component of telehealth services. To date, the US Department of Veterans Affairs (VA) operates the largest federally run telemedicine program – operating an annual budget of 4.8$ billion dollars[49], and providing millions of telehealth consultants to approximately 2.2 million

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[43] Veterans Health Administration, "VA Expands Telehealth by Allowing Health Care Providers to Treat Patients Across State Lines," U.S. Department of Veterans Affairs, May 2018 ,11, https://www.va.gov/opa/pressrel/pressrelease.cfm?id=4054.

[44] "The Apollo Growth Story," Apollo Hospitals, 2023, https://www.apollohospitals.com/corporate/company-overview/the-apollo-story/growth-story/1980s/.

[45] "Our Experienced Management Team," Apollo Hospitals, 2023, https://www.apollohospitals.com/corporate/apollo-management/.

[46] Matt, "Interview: Dr Krishnan Ganapathy," European Medical Journal, September 2020 ,17, https://www.emjreviews.com/innovations/article/interview-dr-krishnan-ganapathy/.

[47] "Apollo Telemedicine Networking Foundation (ATNF) Case Study," Apollo Case Study, 2011, https://healthmarketinnovations.org/sites/default/files/Apollo20%Case20%Study.pdf.

[48] "Grants & Programs," Health Resources & Services Administration, March 2022, https://www.hrsa.gov/rural-health/grants.

[49] Kate Polit, "House Appropriations Approves VA's FY22 IT Budget Request, Cuts EHR Request by 26$M," MeriTalk, July 2021 ,1, https://www.meritalk.com/articles/house-appropriations-approves-vas-fy-22it-budget-request-cuts-ehr-request-by-26m/.

veterans[50].

To date, VA telehealth programs are primarily focused on providing quality, accessible, and timely medical care to rural veterans, as well as those that require treatment for Post-Traumatic Stress Disorder (PTSD) and Traumatic Brain Injury (TBI). Of the 2.2 million veterans serviced each year with telemedicine, 45 percent are rural veterans. Through the work of the VA Office of Rural Health (ORH), the VA is establishing 23 private-sector partnership telehealth initiatives that enable veterans, regardless of location, to receive health services.

While the VA's rural telehealth partnerships are a small component of the agency's telemedicine program, these partnerships have reached more than 327,000 veterans across the country. Since 2009, the VA rural telehealth program has been available at 900 VA sites of care through VA Community Care Contracts, which allow the VA to vet a private provider, create a contract for specific services, and then reimburse the provider so service is free of charge to the veteran. The implementation of rural telehealth has been a widespread success, with telehealth visits between a veteran and a PCP increasing rapidly.

Created in 2007, the VA Office of Rural Health was tasked telehealth services[51]. In addition to program staff, the Office of Rural Health team is assisted by staff from the VA Veterans Rural Health Resource Centers. Those team members serve as either the Clinical Director or Director of the Rural Health Resource Centers in Iowa, Utah and Vermont, covering all rural areas in on the east and west coasts, as well as the middle of the country. These staff members receive support from staff at the VA Geospatial Outcomes Division, which collects data on rural regions and veteran populations.

This team reports directly to the Director of the Veterans Health Administration and has support from external experts on the Veterans Rural Health Advisory Committee (VRHAC). The VRHAC team works with the ORH to generate yearly reports on successes and failures and identify opportunities for increased partnerships. This report is available each year to leadership at the VA, members of Congress, and the public and serves as guidance for budgetary appropriations and guidelines for future ORH programming.[52]

Finally, the ORH budget and programming are determined by Congress, which is responsible for appropriations to the department during the MILCON VA funding package. Any requests for budget expansions need to be approved by both the spending package crafted by both the Veterans Affairs Committees in the US House and US Senate and ratified by each governing body. From there, the budget package is signed into law by the President. Aside from appropriating funds, Congress also crafts the laws under which the VA can provide healthcare to veterans. After the VA wait-time scandal of 2013, President Obama worked closely with Congress to pass the VA CHOICE Act, which prioritized Community Care contracts, as well as expanded funding for telemedicine resources to reach more veterans and provide healthcare to veterans living 45 miles or more from a VA hospital. In 2019, the VA started the implementation of the MISSION Act, which seeks to further expand access to healthcare for rural veterans through telemedicine, specifically those living over 45 minutes from a VA hospital.

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[50] VANews, "VA Telehealth Used By More Than 2.2 Million Veterans," VA Connected Care, September 2022 ,19,https://connectedcare.va.gov/whats-new/technology/va-telehealth-used-more-22-million-veterans#:~:text=%E9%80%2CMany2%C20%many20%Veterans20%are20%using,who20%receive20%care20%from20%VA.%E9%80%2D.

[51] "VA Research on Rural Health," Rural Health, 2023, https://www.research.va.gov/topics/rural_health.cfm.

[52] "Veterans Rural Health Advisory Committee," Secretary's Advisory Committee, 2023, https://www.ruralhealth.va.gov/aboutus/vrhac.asp.

Engaging Community Stakeholders

Apollo and VA telemedicine have different approaches to their use of place in their delivery of services. Apollo utilized the Common Service Centers (CSC) and later the eUrban Primary Health centers to leverage its place in the local community as they deliver telemedicine service.

In 2013, Apollo Medicine collaborated with the Indian government through the Common Service Centers (CSC) to deliver telemedicine services. Founded in 2006, CSCs were created to expand the availability of electronic government services to India's constituency. Utilizing the CSC concept, Apollo Medicine opened 164 eUrban Primary Health Centers last year. These new centers are staffed and managed by Apollo medicine, which is an improvement from CSC, which was a government-led organization.

The local stakeholders were engaged as the new system was rolled out in the CSC locations to have direct contact in the local community. The expansion of the services with the eUrban Primary Health centers has also enhanced the service delivery with a local-based trained medical professional to augment the telemedicine services. There were cooperative principles and clear roles and responsibilities established for the partners. With the use of the CSC, the Indian government was providing a place for telemedicine facilities, and there was a shared cost of the treatment. In 2018, eUrban Primary Health centers, the costs are being covered by the Indian government paid to Apollo medicine. The VA system has had more of a top-down approach, which has not involved as many cooperative principles.

As discussed previously, the VA is working with the Philips Corporation to equip Veterans of Foreign Wars (VFW) and American Legion Posts with telehealth technology via video-conferencing. Additional VA partnerships are with T-Mobile and Walmart for mobile and in-person telemedicine facilities. As a majority of VFW and Legion posts are centrally located within the veteran community and have a large membership of predominately older veterans, partnering with these organizations has the potential to increase usage and convenience.

Sharing the Costs

Apollo telemedicine is a part of Apollo Hospitals, a privately owned and financed for-profit organization. The Indian government partnered with Apollo telehealth to launch SEHAT (Social Endeavour for Health and Telemedicine), which connects the largest population of the rural community, irrespective of geographical location, on a common network to avail telehealth services. Since 80 % of the conditions do not require a doctor›s physical presence immediately, they can be dealt with through telemedicine. [53]

Most of the government's funding for telemedicine is directed to public-private partnerships. According to the Ministry of Health and Family Welfare, the necessary infrastructure in the form of satellite or broadband connectivity is already in place in large parts of the country.[54]

Along with private firms such as Apollo Telemedicine Networking Foundation (ATNF) in

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[53] Apollo Hospitals, "Government's New Health Initiative 'Sehat' Launched in Association with Apollo Hospitals," Apollo Hospitals, August 2015 ,31, https://www.apollohospitals.com/apollo-in-the-news/government-s-new-health-initiative-sehat-launched-in-association-with-apollo-hospitals/.

[54] Kristin Elisabeth Solberg, "Telemedicine Set to Grow in India over the next 5 Years," The Lancet 371, no. :(2008) 9606 18–17, https://doi.org/10.1016/s5-60052(08)6736-0140.

South Asia, Narayana Hrudayalaya, Bangalore, and Aravind Eye Hospital based in Madurai, Indian government, there are other major telemedicine service providers/supporters in India who have ventured in the initiative. The Indian Space Research Organization; Department of Technology, Ministry of Communication and Information Technology, Government of India; Ministry of Health and Family Welfare (GOI); State governments; All India Institute of Medical Sciences; C-DAC and Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGIMS) in Lucknow. This set a classic example of public-private partnership in accomplishing the goal ofhealthcare.

Developing a telemedicine public health service partnership primarily to serve India's rural poor is an ongoing challenge. Apollo wanted the enterprise to be a for-profit business with a positive social impact. The government's CSC leaders envisioned a free, public service. The partners agreed on a compromise — charge patients to pay a low fee of 100 rupees, 1.60$ for primary care and 14.40 rupees for specialties like Neuro and cardio services. The fees are then shared 40:40:20 among Apollo and the village-level entrepreneurs who run the facility locally and 20 % for government common service center.[55]

The Veterans Health Administration (VHA) is home to one of the United States' largest integrated healthcare systems, consisting of 167 medical centers, more than 1,400 community-based outpatient clinics, community living centers, Vet Centers, and Domiciliary. Financial support for the VHA is appropriated by the US Federal government. In the 2020 Executive budget, it was proposed that the VA would receive 220$ billion, of which 123.2 billion in mandatory funding and 97.0 billion in discretionary funding, with 84.7 billion allocated to VHA.

Measuring Performance

India would need to spend five billion USD annually to reach the World Health Organization's guidelines of one hospital bed per 1,000 people. As of 700 ,2011 million Indians did not have access to secondary and tertiary medical care. To meet this need, India has focused on working with Apollo Hospitals to be a global leader in telehealth. As of 2015, Apollo had provided more than 92,000 teleconsultations in 25 specialties, such as gynecology to neurosurgery, from up to 4,500 miles away.[56] The telemedicine market in BRIC countries is expanding to grow four times from 2020-2015 to a -1.2billion-dollar industry, and the Apollo/ India partnership should see similar growth.[57]

By partnering with Apollo Hospitals Group, India can capitalize on their existing billion-dollar network of 54 hospitals, 55 specialties, and 50,000 employees. Instead of creating and maintaining a healthcare network themselves, they can offer support through government services like satellite and broadband connections and in return, receive a negotiated rate for rural and impoverished peoples. The cost savings enabled them to shrink their gap in

[55] A Howard W Buffett and William B Eimicke, "The Process Case: The Digital Revolution and Telemedicine in India," essay, in Social Value Investing (New York City, NY: Columbia University Press, 65 ,(2018.

[56] "Apollo Telemedicine Networking Foundation (ATNF) Case Study," Apollo Case Study, 2011, https://healthmarketinnovations.org/sites/default/files/Apollo20%Case20%Study.pdf.

[57] "Research and Markets - Brazil, Russia, India, China (BRIC) Telemedicine Market 2020-2016 with Apollo Hospitals, AMD Telemedicine Technologies, GE Healthcare, Neosoft & SnapMD Dominating the 1.2$ Billion Industry," PR Newswire, April 2016 ,8, https://www.prnewswire.com/news-releases/research-and-markets—brazil-russia-india-china-bric-telemedicine-market-2020-2016-with-apollo-hospitals-amd-telemedicine-technologies-ge-healthcare-neosoft–snapmd-dominating-the--12billion-industry300248393-.html.

coverage of rural areas with minimal costs by putting the burden of implementation on a for-profit partner that has a goal of efficiency.

Apollo Hospitals continues to expand care via telemedicine services. In 2015, they launched Ask Apollo, a service that gives patients the ability to speak with a doctor anywhere, anytime via the Apollo website or mobile app. They can book appointments, speak with a family doctor, access diet and nutrition advice, or consult with a board specialist all virtually without the need to travel to a clinic.

The VA is seeing extremely high use of their telemedicine services, and they are increasing year after year. Over 780,000 Veterans accessed VA care via 2.29 million episodes of care through one or more of the telehealth services in FY18. Synchronous, or real-time video conferencing with a provider, whether at a VA hospital or another location, services have the highest growth rate year-after-year with an average increase of 27 percent.[58]

For those Veterans who can access care, approval rates are high. In FY18, satisfaction with VA telehealth services exceeded 88 percent positive ratings. Veterans enrolled in Home telehealth for non-institutional care and chronic care management had a -53percent decrease in VA bed days of care and a -33percent decrease in VA hospital admissions. Mental health services through TeleMental Health saw a similar decrease in admissions.[59]

Lessons from Apollo and the VA for Egyptian Telehealth

Apollo's partnership with the government of India has yielded quantifiable successes, with the organization providing 92,000 units of care in fifteen years. Through engagement with the public sector, Apollo's process, people, place, portfolio, and performance are perfect examples of a successful Social Value Investing style private-public partnership. Like Apollo, the VA uses a wide range of partnerships to provide telemedicine services to rural patients.

Unlike Apollo, the VA engages in partnerships with private partners to increase the quantity and quality of services. The VA's partnerships with both local medical centers and organizations like the American Legion have yielded quantifiable successes for the agency. Last year, the VA completed millions of telemedicine consultations, serving over 2.2 million veterans. Through engagement with the private sector, the VA's process, people, place, portfolio, and performance are perfect examples of a successful SVI private-public partnership.

While both Apollo and the VA are successful examples of private-public partnerships, both organizations have a long way to go if they are to meet the rapidly growing need for telehealth. In just one year, the VA was able to provide over ten times the number of telehealth consultations than Apollo has done in total over fifteen years[60]. Apollo should revise its process in order to make sure they are providing more accessible services to the rural poor without access to mobile phones or computer technology.

During the rollout of the VA Community Care Contracts, one key failure was the agency's inability to market community care as VA care. Over the past decade, discussions on the effectiveness of privatizing the VA has become a prominent partisan argument between

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[58] Veterans Health Administration and VHA, VHA Telehealth Services Fact Sheet § (2019).

[59] Ibid.

[60] "The Apollo Growth Story," Apollo Hospitals, 2023, https://www.apollohospitals.com/corporate/company-overview/the-apollo-story/growth-story/1980s/.

Democratic and Republican lawmakers. As a result, older veterans are staunch advocates for VA care and as a result, shy away from using external providers. Because of this, older veterans are hesitant to utilize telemedicine services through Community Care Contracts, as they view the service as non-VA care.

While the VA has had successful partnerships with service organizations like the American Legion and the Veterans of Foreign Wars (VFW), partnering in ten facilities is not enough. Today, the American Legion has 12,000 posts and two million members. The VFW has 6,200 posts across the country and an active membership of over 1.6 million veterans. By expanding this partnership to offer telemedicine services in more posts, the VA can reach a significantly larger number of rural veterans. Additionally, as larger organizations like the American Legion and the VFW start to decrease in membership size due to national causes, the VA should start to pursue similar partnerships with groups like Team Red, White and Blue and Iraq and Afghanistan Veterans of America to increase the VA's reach within the younger veteran community.[61]

As for lessons learned for Egypt, Apollo has provided a relatively low number of telemedicine consultations in comparison to the size of India's population. Unlike the VA, which is required to submit yearly metrics to Congress on program capacity, support, and growth, there is very limited data available on Apollo's telemedicine services. To grow telehealth in Egypt, we recommend the Egyptian government adopt reporting standards like the VA and release yearly metrics.

Unlike Apollo, the VA serves a unique population of individuals. Most VA users have specific combat-related injuries like Post-Traumatic Stress Disorder to Traumatic Brain Injuries and amputations. Because of the VA's specific user population, initiatives that are successful in civilian hospitals might not always be successful for VA users. For example, younger veterans don't want to use telehealth services because it reminds them of skyping with their families while overseas – making a mental health consultation via telemedicine more triggering than an in-person visitation. This trend has the potential for the VA to see a decrease in rates of usage as larger rates of younger veterans continue to enroll in the healthcare system, creating a portfolio problem for the agency. As Egypt considers telemedicine funding, it might consider a pilot program to identify potential users and their preferences, such as a program for younger users that would rather use a phone to text a provider instead of going to a telehealth visit.

Successful Telehealth Initiatives in the MENA Region

The MENA (Middle East and North Africa) region has seen several successful telehealth cross-sector partnerships that have made significant contributions to healthcare delivery.[62] These include Vodafone Qatar›s Telehealth Initiatives, the UAE's Inaya Medical Center Telehealth Program, Jordan's AlemHealth Telemedicine Platform, and Lebanon's Balsam Telemedicine Program.

One especially successful cross-sector telehealth partnership has been the Sehhaty platform,

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[61] *Beccy Tanner, "VFW Posts Rapidly Disappearing in Rural Kansas," The Wichita Eagle, June 2017 ,26, https://www.kansas.com/news/local/article158182499.html.*

[62] *"Telemedicine: The Future of Healthcare in MENA?," Mohammed Bin Rashed Al Maktoum Global Initiatives, March 2021 ,2, https://www.almaktouminitiatives.org/en/middle-east-exchange/story/telemedicine-the-future-of-healthcare-in-mena.*

which is a collaboration between the Saudi Arabian Ministry of Health and various technology partners.[63] It provides a range of telehealth services, including virtual consultations, remote monitoring, and electronic prescriptions. The platform has improved access to healthcare services, especially in remote areas, and increased efficiency in healthcare delivery. Individuals can register on the Sehhaty platform by creating an account using their national ID or residency permit. Once registered, users can access various telehealth services provided through the platform. Sehhaty offers virtual consultations, allowing patients to connect with healthcare providers remotely. Users can schedule appointments and choose from a list of available healthcare professionals. The consultations are conducted via secure video calls, allowing patients to discuss their health concerns, receive medical advice, and get prescriptions if necessary. Sehhaty also facilitates remote monitoring of patients› health conditions. Through connected devices and health apps, patients can track and share their vital signs, such as blood pressure, blood glucose levels, or heart rate, with healthcare providers. This allows healthcare professionals to remotely monitor patients› health status and provide necessary guidance or interventions.[64] Sehhaty provides individuals with access to their personal health records, including medical history, test results, and immunization records. Users can view and manage their health information, ensuring continuity of care and facilitating informed decision-making during consultations. The platform includes a comprehensive directory of healthcare facilities and professionals, making it easier for users to search and find appropriate healthcare providers based on their location and specialty. Sehhaty has a dedicated mobile application that offers the same features and functionalities as the web platform. The mobile app allows users to conveniently access telehealth services on their smartphones or tablets.[65]

The Saudi government plays a crucial role in supporting and facilitating Sehhaty's success. The Saudi Ministry of Health (MOH) is responsible for establishing and overseeing the Sehhaty platform. The government sets the vision, goals, and strategic direction for the platform›s development and implementation. The government formulates policies and regulations that govern telehealth services in Saudi Arabia. These policies provide the framework for the operation of the Sehhaty platform, ensuring patient safety, privacy, and the quality of healthcare services delivered through the platform[66]. Governmental support has allowed telemedicine to significantly expand in Saudi Arabia over the past decade (see figure 6).

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[63] *Ministry of Health Saudi Arabia, "'Sehhaty' Platform," Ministry Of Health Saudi Arabia, 2023, https://www.moh.gov.sa/en/eServices/Sehhaty/Pages/default.aspx.*

[64] *Ministry of Health Saudi Arabia, "'Sehhaty' Platform," Ministry Of Health Saudi Arabia, 2023, https://www.moh.gov.sa/en/eServices/Sehhaty/Pages/default.aspx.*

[65] *Ibid.*

[66] *Zawya, "Sehhaty App Becomes National E-Platform for Healthcare Services in Saudi Arabia," Zawya, September ,2 2022, https://www.zawya.com/en/business/healthcare/sehhaty-app-becomes-national-e-platform-for-healthcare-services-in-saudi-arabia-pa8v8r06.*

FIGURE (6): TELEHEALTH GROWTH IN SAUDI ARABIA SINCE 2017 WITH INDUSTRY GROWTH PREDICTIONS THROUGH 2027[67]

Initially, the regulatory landscape in Saudi Arabia needed to be adapted to accommodate telehealth practices. The MOH, in collaboration with relevant stakeholders, worked on developing regulations and guidelines specific to telehealth services. This involved engaging cross-sector partners such as legal experts, healthcare professionals, and technology companies to ensure compliance, patient safety, and privacy.[68]

In Saudi Arabia, expanding the necessary infrastructure, including broadband connectivity and digital platforms, was essential. The government collaborated with telecommunications companies and technology partners to invest in and improve the technical infrastructure. The Saudi government has allocated financial resources to support the development, maintenance, and expansion of the Sehhaty platform. This includes expanding internet connectivity, particularly in underserved areas, to enable seamless and reliable telehealth services across the country. This includes expanding internet connectivity, particularly in underserved areas, to enable seamless and reliable telehealth services across the country. The government promotes interoperability and data exchange standards to facilitate the seamless flow of health information within the Sehhaty platform. This allows healthcare providers to access patients' medical records, test results, and other relevant information, ensuring continuity of care and informed decision-making. Government funding ensures the sustainability of the platform and its ability to provide accessible and affordable telehealth services to the population. The government collaborates with private sector entities, including technology companies and healthcare providers, to establish and operate the Sehhaty platform. This public-private partnership model brings together the government›s regulatory and healthcare expertise with the private sector›s technological capabilities and resources.[69]

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[67] *Saudi Arabia Telemedicine Market Size, By Region, By Value, 2027-2017F, Saudi Arabia Telemedicine Market By Component (TechSi Research, 2021), https://www.techsciresearch.com/report/saudi-arabia-telemedicine-market/7710.html.*

[68] *"Saudi Arabia Telehealth Sector," International Trade Administration, December 2021 ,22, https://www.trade.gov/market-intelligence/saudi-arabia-telehealth-sector.*

[69] *"Government Support Drives Telehealth in Saudi Arabia," Omnia Health Insights, October 2022 ,10, https://insights.omnia-health.com/saudi-arabia/government-support-drives-telehealth-saudi-arabia.*

Telehealth requires healthcare professionals to adapt their practice to the virtual care model. Ensuring that healthcare providers are adequately trained in telehealth practices was a challenge initially. To address this, the government collaborated with medical universities, professional associations, and telehealth service providers to develop training programs and guidelines for healthcare professionals. Cross-sector partnerships helped in delivering comprehensive training programs and increasing the adoption of telehealth practices among healthcare providers.[70]

Building public trust and awareness regarding telehealth services was crucial for their widespread adoption. The government collaborated with media outlets, community organizations, and educational institutions to disseminate information about the benefits and usage of telehealth. Cross-sector partnerships helped in launching public awareness campaigns, providing accurate information, and addressing concerns related to telehealth, thereby fostering acceptance and utilization among the population[71]. To promote telehealth engagement, the MOH has conducted public awareness campaigns to educate the population about the benefits and usage of the Sehhaty platform. These campaigns aim to increase public trust in telehealth services, promote adoption, and enhance digital health literacy among individuals.

Sehhaty played a crucial role in helping patients during the COVID19- pandemic by offering virtual consultations, providing accurate information, facilitating testing and vaccination processes, managing prescriptions, supporting remote monitoring, and addressing mental health needs. The platform›s digital capabilities and cross-sector collaborations were instrumental in ensuring healthcare access, continuity, and safety for patients during this challenging time.[72] The MOH has embraced technology as a means to address the crisis. According to 2022 statistics, the Sehhaty Application, has benefited over 24 million individuals. The Sehhaty Application offered various COVID-specific services related to medicine search, vital sign monitoring, test booking, and receiving COVID19- vaccines. Ministry officials have worked to implement new e-services in line with the evolving needs of the users as part of their future plans. According MOH data in 2022, the application facilitated over 3.8 million appointment bookings, provided 1.5 million medical consultations, and generated more than 9.5 million medical reports and leave certificates. The number of administered vaccine doses leading into 2022 exceeded 59 million.[73]

The Saudi government has launched and supported similar telehealth platforms to address the COVID19- pandemic and expand quality healthcare access throughout the state. These include the MOH's Mawid platform and the Saudi Data and Artificial Intelligence Authority's (SDAIA) Tawakkalna program and Tabaud app.[74] By actively supporting telehealth initiatives through regulatory frameworks, infrastructure investments, funding, partnerships, and policy support, the Saudi Arabian government has created an enabling environment for the growth and success of telehealth services in the country. These efforts have expanded access to

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[70] *Jeremy Goff and Jonathan Christensen, "Middle East & North Africa (MENA): A 2020 Regional Telehealth Guidebook," KLAS Research, August 2020 ,6, https://klasresearch.com/report/middle-east-and-north-africa-mena-a-2020-regional-telehealth-guidebook/1783.*

[71] *Ibid*

[72] *"Digital Applications in Saudi Arabia Constitute Successful Means to Alleviate COVID19- Impacts,"* وكالة الأنباء السعودية*, February 2022 ,14, https://www.spa.gov.sa/w1691157.*

[73] *Ibid*

[74] *Ibid*

healthcare, improved patient outcomes, and facilitated the delivery of healthcare services, particularly in remote or underserved areas. [75]

Challenges and Solutions for Telehealth Expansion in Egypt

The Egyptian government has historically engaged in various forms of cooperation with the private sector, whether local or foreign. However, the 1952 revolution led to the implementation of nationalization laws, which significantly reduced the participation of the private sector in the Egyptian economy. State-owned enterprises gained dominance during this period. This trend persisted until the mid1970-s when the government introduced open-door policies, known as «Infetah,» shifting the economic policy towards capitalism instead of socialism. This shift resulted in remarkable economic growth until 1986 when Egypt faced a significant budget deficit of 14 % of the Gross Domestic Product (GDP). In 1990, the budget deficit further increased to 17.2 % of the GDP, accompanied by a balance of payment deficit and high inflation rates. [76]

To address these economic challenges, the Egyptian government initiated discussions with the International Monetary Fund (IMF) and introduced the Economic Reform and Structural Adjustment Program in 1991. This program, developed in collaboration with the IMF and the World Bank, aimed to increase Egypt›s creditworthiness and transform the economy into a market-based system. Privatization became a prominent policy approach during this period, despite facing public opposition. In 2006, the government established the Public Private Partnership Central Unit (PPPCU) as part of the Ministry of Finance to explore and implement public-private partnership models.[77]

In accordance with international trends and in efforts to address the healthcare challenges posed by the COVID19- pandemic, telehealth in Egypt has been steadily growing and gaining traction in recent years. The Egyptian government has recognized the potential of telehealth and has taken steps to support its implementation. The Ministry of Health and Population (MOHP) has initiated programs and partnerships to promote telehealth services, enhance infrastructure, and develop regulations and guidelines for telehealth practice. The Egyptian government reaffirmed its commitment to increasing healthcare access through rural areas in 2022, making telemedicine a significant component of the new government service platform, Digital Egypt.[78]

Despite significant industry progress, telehealth in Egypt still faces challenges. Regulatory inefficiency and transparency issues have hindered Egypt's ability to efficiently and effectively implement stronger healthcare and telehealth services. Limited awareness and acceptance among certain segments of the population, variations in internet access and connectivity across different regions, and the need for further infrastructure development to support

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[75] Jeremy Goff and Jonathan Christensen, "Middle East & North Africa (MENA): A 2020 Regional Telehealth Guidebook," KLAS Research, August 2020 ,6, https://klasresearch.com/report/middle-east-and-north-africa-mena-a-2020-regional-telehealth-guidebook/1783.

[76] Regional Bureau for Education in the Arab States and Ahmed El-Ashmawi, Enhancing Institutionalized Partnerships between TVET Institutions and the World of Work in Egypt § (2019).

[77] Regional Bureau for Education in the Arab States and Ahmed El-Ashmawi, Enhancing Institutionalized Partnerships between TVET Institutions and the World of Work in Egypt § (2019).

[78] Nada Nader, "Egypt Follows up on Telemedicine Initiative, Part of Digital Transformation Plan - Society - Egypt," Ahram Online, August 2022 ,22, https://english.ahram.org.eg/NewsContent/473607/2/1/Egypt/Society/Egypt-follows-up-on-telemedicine-initiative,-part-.aspx.

reliable telehealth services. The Egyptian government faces significant financial challenges, which have inevitably influenced telehealth's national success. Larger problems concerning political corruption and civil disturbances have had a widespread impact on Egyptian PPPs as a whole.[79]

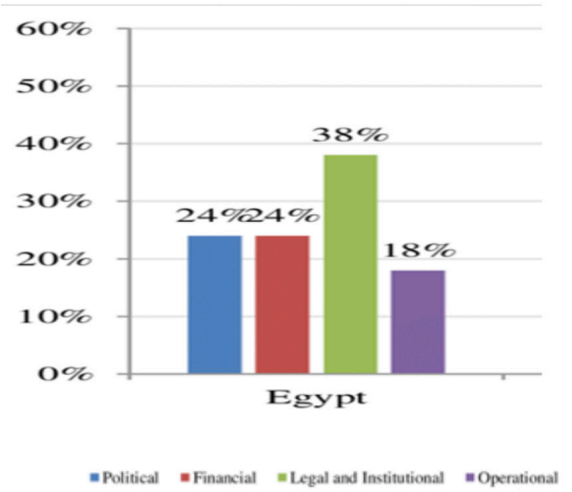

FIGURE (7): PRIMARY RISK FACTORS FOR PPPS IN EGYPT[80]

Egypt's Law No. 67 is responsible for the regulation of "Partnership with the Private Sector in Infrastructure Projects, Services and Public Utilities", and it is the principal law that supports and regulates cross-sector partnerships. Enacted in 2010, Law No. 67 ensures legal investment protection and affirms government commitment to healthy cross-sector partnerships. The statute, however, overlaps with other existing legislation and has made cross-sector partnerships more challenging than need be.[81] Egypt has a complex bureaucratic system with numerous regulations and administrative procedures, which can slow down the process of establishing partnerships. Obtaining permits, licenses, and approvals from various government agencies can be time-consuming and burdensome. The absence of a well-defined legal structure can create uncertainties and increase the risks for private sector entities. These legal inefficiencies must be streamlined to efficiently expand telemedicine services across the state.

The widespread adoption of telehealth requires a robust and reliable telecommunication infrastructure, including high-speed internet connectivity. In certain regions of Egypt, particularly rural areas, there may be inadequate infrastructure, which can hinder the effective implementation of telehealth initiatives. Disparities in access to technology and digital literacy are widespread across the state. Not everyone has equal access to smartphones, computers, or the necessary skills to engage with telehealth platforms. To expand telehealth nationally, Egypt must effectively bridge this "digital divide" and improving accessibility for all segments of the population.

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[79] *Andrew Fitzpatrick, Véronique Zovaro, and Sabri Draia, Public-Private Partnerships in the Middle East and North Africa: A Handbook for Policy Makers, ed. Vanessa Vallée (Paris, France: European Union: OECD, 2019).*

[80] *Jinan Hassan, Risk Factors to PPP in Egypt, Jordan, Morocco, and Tunisia, An Evaluation of Barriers Obstructing the Applicability of Public Private Partnership (PPP) in Infrastructure Development (Civil Engineering Journal, December 2019), https://www.researchgate.net/publication/338161836_An_Evaluation_of_Barriers_obstructing_the_Applicability_of_Public_Private_Partnership_PPP_in_Infrastructure_Development.*

[81] *Ibid.*

To address these issues, efforts should focus on expanding and improving internet connectivity, especially in remote areas, and ensuring that telehealth platforms are accessible on various devices, including smartphones with reliable network coverage. Telehealth services also typically necessitate the exchange of health data and information between different healthcare systems and providers. Ensuring interoperability and standardization of telehealth platforms, electronic health records, and data formats is crucial for seamless communication and continuity of care. Developing and implementing national standards and interoperability frameworks can be challenging but necessary for successful telehealth partnerships. Though the Law No. 67 has generally expanded PPPs throughout the state, the healthcare sector in Egypt is predominantly publicly funded and operated, with limited private sector involvement. Encouraging private sector participation in healthcare partnerships requires creating an enabling environment that incentivizes private sector investment and addresses concerns about profitability and return on investment.[82]

The Egyptian government faces budgetary constraints and limited financial resources, which can hinder its ability to provide sufficient funding or incentives for public-private partnerships. This limitation may affect the feasibility and attractiveness of partnership projects. Healthcare projects often require significant investment, and financing can be a challenge. Under these circumstances, aligning the financial interests of both public and private partners, ensuring affordability and accessibility of healthcare services, and establishing sustainable funding models become all the more crucial to telehealth's success. The affordability of services for the general population, especially those in low-income brackets, must be carefully and consistently considered.

Cultural factors, including preferences for in-person consultations and reliance on traditional healthcare models, can influence patient acceptance of telehealth. Limited awareness and understanding of telehealth in Egypt exacerbate these issues. Building trust, addressing cultural concerns, and educating patients about the benefits and safety of telehealth are ongoing challenges. These obstacles may be less pronounced than once thought, as research identified positive trends in healthcare provider and prospective patient attitudes. A 2022 study in Egypt found that among the healthcare providers they surveyed, almost all had a very positive outlook towards telemedicine and the potential for its dissemination state-wide. Though the study found that 64 % of patients surveyed had never used telemedicine, the authors noted that a positive attitude among healthcare providers is one of the most important factors in successfully implementing telemedicine programs.[83] To expand awareness on telehealth, the MOHP can launch widespread educational campaigns to highlight the benefits and potential of telehealth. This can involve public health initiatives, media campaigns, and collaborations with healthcare professionals and community leaders to promote telehealth services. The government should also consider involving non-profit organizations concerned with providing equal access to healthcare in Egypt (or internationally). Local NGOs and groups may be especially helpful in forming trust with those living in more rural areas or initially averse to telemedicine.[84]

Political instability and economic fluctuations that can negatively impact the development

[82] *Andrew Fitzpatrick, Véronique Zovaro, and Sabri Draia, Public-Private Partnerships in the Middle East and North Africa: A Handbook for Policy Makers, ed. Vanessa Vallée (Paris, France: European Union: OECD, 2019).*

[83] *Andrew Fitzpatrick, Véronique Zovaro, and Sabri Draia, Public-Private Partnerships in the Middle East and North Africa: A Handbook for Policy Makers, ed. Vanessa Vallée (Paris, France: European Union: OECD, 2019).*

[84] *Ibid.*

and sustainability of public-private partnerships, though these issues are largely outside of a PPP's scope of influence. Uncertainty regarding government policies, changes in regulations, or economic downturns can deter private sector investment and participation. While precise data detailing the impacts of these issues on telehealth is scarce, general issues that affect infrastructural development will likely apply, in some part, to telemedicine. First and foremost, political & civil disturbance pose the greatest challenges to implementing telemedicine more widely. This issue is a far larger problem for Egypt and cannot be addressed directly to serve the Digital Egypt platform's growth. Other significant challenges, however, can be resolved with good management and relationship-building between private companies and the government. Private entities must also be ensured that their sovereignty will not be compromised. Partnerships must be mutually beneficial and require trust in governmental bodies, but private entities must also be willing to make compromises. Corruption, another relevant issue, breaks down these relationships, so it must become a priority to implement collaborative management and encourage advanced communication and feedback.[85]

Regionally or internationally established telehealth platforms have been expanding operations into Egypt. For example, Vezeeta, a telehealth program founded in the UAE, began providing care in Egypt and other MENA countries in 2012. Egypt can capitalize on the expertise, influence, and infrastructure of Vezeeta and other similar platforms to expand Egyptian telehealth access.[86] Government incentives for private healthcare and telemedicine companies can attract more telehealth platforms to establish operations in Egypt.

By implementing the positive PPP frameworks we have outlined in this paper, adopting Apollo and the VA's effective telehealth strategies, and learning from Saudi Arabia's telehealth successes, Egypt can overcome many of the challenges facing its telehealth industry and significantly expand access to quality healthcare nationwide.

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[85] *Ibid.*

[86] *Tom Jackson, "Hot Startup of the Month: Egypt's Vezeeta - Connecting Africa," Connecting Africa, January 2021 ,29, https://www.connectingafrica.com/author.asp?doc_id=767008.*

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RESEARCH PAPERS IN ENGLISH

Developing an Urban Sustainability Indicator System-A Participatory Approach

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Introduction

The Brundtland Report defines sustainability (or sustainable development) as "development that meets the needs of the present generation without compromising the ability of future generation to meet their own need" (Brundtland, 1987). Among the many definitions of sustainable development, the Brundtland version is perhaps the most popular which centers around intergenerational justice, and it contends that in essence, the goal for the current generation is to respect planetary boundaries, which if breached can lead to diminished resources and opportunities for the next generation in achieving their own development aspirations.

In the 1990s, sustainability was criticized as a concept that is too vague and lacks operationality (Parris & Kates; Bithas & Christofakis, 2006). For example, what is to be sustained is not clear. As a result, there are studies which started to focus on the quantification of sustainability, such as the use of performance indicators to guide policymaking and to assess progress. Ever since the adoption of Agenda 21 at the 1992 United Nations Earth Summit, there has been a consistent call for the development of sustainable development indicators by governments and organizations to assist decision making at all levels, as well as an effort to harmonize the efforts (UNCED, 1992). Despite significant effort, progress has been hampered by the ambiguity in the definition of sustainability—how it is defined informs what is material and should be measured, hence wide disagreements on indicator selection and their theoretical underpinning. This call culminated in the formulation of the Sustainable Development Goals (SDGs) by the UN in 2015 (to be achieved in 2030), a framework that can potentially inform city-level governments to develop indicators to guide sustainability policymaking and track progress.

In response to the SDGs, the Egypt Government launched the Egypt Vision 2030, a national sustainable development strategy in line with the SDGs and aims to guide the country to achieve SDGs by 2030. By 2022, according to the Sustainable Development Report (Sachs et al., 2022), Egypt ranked 87 out of 193 countries in terms of their progress toward SDGs, ahead of MENA region countries such as Qatar and Saudi Arabia and many developing countries in Sub-Saharan Africa and Latin America. With an SDG Index Score of 68.7, Egypt has achieved almost 70 % of the SDG targets so far. Despite the progress, Egypt still faces major challenges on further improvement in seven of the SDGs, including Goal 2 (zero hunger), Goal 3 (good health and well-being), Goal 5 (gender equality), Goal 8 (decent work and economic growth), Goal 14 (life below water), Goal 15 (life on land), and Goal 16 (peace, justice and strong institutions).

As many of these difficult goals are related to social and economic development, the economic reform implemented by the Egyptian government in recent years was also intended to address these developmental challenges. In addition to the widespread economic reform, the government has carried out specific programs targeting social and economic development while generating co-benefits. For instance, the "Takaful" program, a conditional cash transfer initiated in 2015, was intended to improve educational attainment, investment in human capital, as well as empowering women and promoting gender equality. Later, the "Forsa" program further assisted "Takaful" beneficiaries with employment services, trainings and asset transfers. Another program, "Sakan Kareem", targeted rural areas and aimed at improving the basic infrastructure such as housing, sanitation, and clean water for the vulnerable population.

Similarly, the "Haya Karima" was implemented in 2019 as a comprehensive program to improve the wellbeing of residents in poor rural villages through systemic support for health, education, housing, infrastructure and microfinance (Ramadan, 2022).

While we acknowledge that issues as complex as human behavior and their interactions with nature cannot be readily simplified or quantified, it is common parlance that what cannot be measured cannot be effectively managed. For something as complex as the myriad dimensions of sustainability and their interactions, one has to attempt to construct indicators and systems around the issues that have been identified to be material to sustainability, and the issues that are not measured cannot be easily improved (Böhringer & Jochem, 2007). Therefore, the goal of this paper is to highlight the development of a holistic urban indicator system that can track the sustainability performances of cities, especially in developing countries.

Our focus on cities stems from the fact that despite the global nature of environmental problems, many of them have a local origin (Mori & Christodoulou, 2012). Cities in this context are increasingly being viewed as the driver of global environmental change (Parnell, 2016). On the other hand, awareness is increasing among city dwellers that environmental problems while they transcend political boundaries, often manifest locally, such as in cities (Campbell, 1996; Finco & Nijkamp, 2001; Camagni, 2002; Guo et al., 2018). Furthermore, the majority of the world population reside in dense urban centers, and the urbanization rate is predicted to reach 68 % by 2050 (UN, 2018). As a result of its dense population, environmental impacts are magnified in the cities. While serving as innovation and cultural hubs, the ecological footprint of cities exceeds far beyond city boundaries. Overall, there is an increasing consensus that cities hold the key to sustainable development—reducing environmental impacts while improving economic prosperity and social inclusion for current and future generations.

Developing countries in Asia, Africa, and Latin-America have most of the world's megacities with more than 10 million inhabitants. Out of the 33 megacities, 27 are located in less-developed regions, including six in China alone (UNDESA, 2018). In Egypt, 43.1 % of the population live in urban areas. Urban population grows at approximately 1.87 % each year. More than half (56 %) of Egypt's urban population currently live in the Greater Cairo Region and the Alexandria Governorate. The Greater Cairo Region is not only the vibrant economic, cultural and political center of Egypt, but also the largest metropolitan area in Africa (United Nations Human Settlements Programme, n.d.). These cities located in developing regions may face vastly different urban challenges and priorities than their more developed counterparts (Ameen & Mourshed, 2019).

After a careful review of the existing indicator systems designed for cities, especially in a developing country context, we have discovered that most of these systems follow a top-down approach, one that is based on expert opinions in the selection of indicators, weight assignment, and standardization methodologies. As a result, the process of building sustainability indicator systems is mostly arbitrary and lacks consensus. Therefore, in this paper, we attempt to introduce an indicator framework that has been implemented for more than seven years in China, and to demonstrate a statistical weighting methodology that is more scientific in its approach than earlier attempts. We aim to show that the methodology for standardizing and assigning indicator weight needs not to always discriminate against smaller cities, and at the same time can promote long-term and sustainable policy change, as well as minimize data inaccuracies that are prevalent in sustainability data.

In addition, what is often measured in myriad urban sustainability frameworks may not always reflect what the public views as important sustainability issues. Despite the many attempts at developing indicator systems and selecting indicators, few received much public attention. One of the major reasons is the top-down design approach, which is not always aligned with local development priorities and do not reflect what the local communities view as important (Reed, Fraser, & Dougill, 2006). Therefore, in this paper, we also aim to outline a novel approach that can successfully integrate top-down opinions with bottom-up inputs from local residents. It is worth noting that top level participation not only includes that of government agencies and academic experts, but also industry and business leaders, in what King (2016) termed as leadership and organized stakeholders. Many indicator systems conduct stakeholder interviews in building consensus indicators, what has been missing is any community input, inputs from urban residents.

The China Sustainable Development Indicator System

The novel and participatory approach we will propose in the next section is based on the China Sustainable Development Indicator System (CSDIS) – a sustainability metrics framework jointly developed by Columbia University's Earth Institute and the China Center for International Economic Exchanges in 2015. The project was later supported by AliResearch (the research branch of the technology conglomerate Alibaba), and Philips China. After going through the initial design and piloting in 2015, the CSDIS had been used to measure and rank the sustainability performance of more than 100 Chinese cities since 2016, and on an annual basis. The framework consists of 24 indicators across five sustainable development domains: Economic Development, Social Welfare & Livelihood, Consumptions & Emissions, Environmental Resources, and Environmental Governance (see Table 1). These five domains are operationalized from the "Triple Bottom Line" approach to account for environmental sustainability and social inclusion, in addition to economic growth. The CSDIS framework also follows the DPSIR (Driver-Pressure-State-Impact-Response) approach in outlining interactions between the society and environment, and further divides the environment dimension into the "stock" of the environment, which is categorized as environmental resources, "flow" of the environment, which is categorized as consumptions and emissions, and environmental governance.

Sample of Cities

The CSDIS ranking in the 2022 iteration includes 101 cities in China. This sample is created to be representative of cities and their residents throughout China, so they are chosen from all 27 provincial-level regions (including five autonomous regions and four municipalities) in mainland China. To be representative, the number of cities chosen from each province depends on the province's population as a percentage of the national total. For instance, Hebei Province accounts for approximately 5 % of the total population from the 27 provinces, therefore five cities from Hebei Province are included in the ranking. The five cities are then selected from Hebei based on population size, strategic importance to their province, level of economic development, and officially recognized efforts on sustainability. The four municipalities under the direct supervision from the central government, Beijing, Tianjin, Shanghai, and Chongqing are automatically included as they are among the most populous cities in China. Additionally, every province is to have at least two cities in the ranking, even if its population is below 2 % of the national average.

Indicator Selection

The selection of sustainability indicators is an arbitrary process, usually led by experts from its respective fields. We have determined that when selecting indicators, especially for the purpose of constructing a composite indicator or an index, one should follow two basic rules, comprehensiveness and distinctiveness. One has to make sure that the indicators have breadth, meaning all aspects of sustainability that is conceived by its designer need to be covered. Then, because of the interconnections—or in the statistics jargon, multicolliearity among the many indicators, one has to eliminate the indicators that may be covering—to a large extent—the same element of sustainability. This process of elimination, either through a statistical analysis or expert deduction will lead to a set of sustainability indicators that is both comprehensive in its breadth, and parsimonious in quantity. A smaller set of indicators is easier to manage, and can also imply an easier process of operationalization than a system with hundreds of indicators to track and compare.

In addition, preference may be given to output measures over input measures for the same sustainability dimension. For instance, when Student-to-Teacher Ratio, an output measure and Per-Student Educational Expenditure, an input measure are both available to measure education quality, the former is preferable because input measures, in dollar spending can be inherently related to the level of economic development of cities. More economically developed cities will have more resources and capacity to invest in various areas of sustainability compared to the less developed cities, both in absolute and relative terms. Therefore, input measures would inevitably reward the economic leaders while penalizing the underdeveloped cities, exacerbating the economic gap. We will discuss the necessity to account for pre-existing variations in developmental levels in more detail in the later section on indicator weightings.

The selection of indicators for the CSDIS began in 2015 with a pool of over 100 city-level indicators. After the initial screening on data availability, the research team narrowed the list down to 87 indicators. Then, a panel of experts was convened to evaluate the indicator set and further examine the materiality of the indicators. The panel included experts from academia, as well as representatives from government, industries to further narrow down the list. This secondary screening resulted in the final set of 22 indicators. All the indicators are routinely released by local governments through their Statistical Yearbooks, except one indicator on housing affordability, which had to be calculated with data from China Index Academy, a private data provider, especially on the real estate industry in China. In order to maintain comparability over years, the indicators in principle will stay fixed for 5 years. The latest iteration from 2022 had 24 indicators, with new additions including physician availability and proportion of population between 0 and 14 years old. The former was included in response to the increased awareness on the importance of healthcare access in cities after COVID. The latter was included to highlight the challenges associated with an aging population and its implication for the urban workforce and social welfare. Both indicators were included as part of the social welfare and livelihood dimension. The latest CSDIS framework contains 24 indicators across five major domains of sustainability, as shown in Table 1 below.

TABLE (1): CSDIS DOMAINS AND INDICATORS

Category	Indicator
Economic Development	GDP p.c.
	Service Sector Added Value as a % of GDP
	Unemployment Rate
	Science and Technology Expenditure as a % of GDP
	GDP Growth %
Social Welfare & Livelihood	Housing-to-income Ratio
	Physician Availability
	Number of Beds per Thousand People in Medical and Health Institutions
	Social Security Expenditure p.c.
	Teacher Student Ratio in Middle and Elementary Schools
	Urban Road Area per Capita + Peak Congestion Delay Index
	Proportion of Residents Between Age 0 to 14
Environmental Resources	Water Resources p.c.
	Urban Green Space p.c.
	Average Air Quality Index
Consumption and Emissions	Water Consumption per Unit of GDP
	Energy Consumption per Unit of GDP
	Added Value of Secondary and Tertiary Industries per Unit Built-Up Land
	Sulfur Dioxide Emissions per ¥ Value Added
	Wastewater Emissions per ¥ Value Added
Environmental Management	Domestic Sewage Treatment Rate
	Environmental Protection Expenditure as a % of GDP
	Industrial Solid Waste Utilization Rate
	Household Waste Harmless Treatment Rate

The five domains of the CSDIS framework as outlined above match with the themes and dimensions of comparable urban sustainability frameworks. For instance, the City Prosperity Index (CPI) developed by the United Nations Human Settlements Programme (UN-Habitat), which has measures for 32 Egyptian cities in 2016, evaluates urban sustainability over 25 indicators classified into six dimensions: Productivity, Infrastructure Development, Quality of Life, Equity and Social Inclusion, Environmental Sustainability, and Urban Governance and Legislation (UN-Habitat, 2020). The Productivity dimension is related to the Economic Development domain of the CSDIS, while Infrastructure Development, Quality of Life, Equity and Social Inclusion dimensions of the CPI framework correspond to the Social Welfare and Livelihood category of CSDIS, with overlapping indicators on housing, physician density, road infrastructure, education, and urban green space. Furthermore, CPI's Environmental Sustainability is comparable to CSDIS' Environmental Resources and Consumption and Emissions domains in that both frameworks include indicators on emissions and waste treatment.

One major difference between the CPI and the CSDIS is that the emission indicators in the latter are scaled by economic output to account for the large variation in development levels among cities in developing countries. The only CPI dimension that is not covered by CSDIS is Urban Governance and Legislation. The only governance related measure in the CSDIS is on environmental management, by way of "Environmental Protection Expenditure as a % of GDP". Although the CPI has more indicators than the CSDIS overall, many CPI indicators in the same dimension are highly correlated, such as "City Product per capita" and "Mean Household Income", "Employment to Population Ratio" and "Unemployment Rate", and "Intersection Density" and "Street Density". As previously discussed, an indicator set should be parsimonious so that the same concept is not measured twice; highly correlated indicators are avoided in the CSDIS to prevent multicollinearity.

Compared to country-level sustainability frameworks, the CSDIS shares many common indicators in the social and, particularly, the economic dimensions. For example, the United Nations Commission on Sustainable Development's (CSD) Indicators of Sustainable Development conceptualize sustainability into social, environmental, economic, and institutional dimensions (Commission on Sustainable Development, 2001). Within the social and economic dimensions, several indicators on per capita GDP, unemployment, energy intensity, industrial and municipal solid waste have matching indicators in the CSDIS. However, the CSD has more extensive indicators in these two dimensions, by including for instance indicators on balance of trade, GINI coefficient, adult literacy rate, nutrition and immunization of children. Part of the reason for the CSD to include more social and economic indicators than the CSDIS is the latter's emphasis on building a parsimonious indicator system that minimizes multicollinearity. It is also due to the fact that many of CSD's indicators are not available in China at a city level, and that some indicators are particularly national measures, such as the balance of trade. In the environmental dimension, the CSD also has a wider range of indicators compared to the CSDIS. This is largely because the CSD's geographic and jurisdictional scope is much broader which justifies its inclusion of measures on biodiversity, agriculture, forests, desertification, and coastal ecosystems. These indicators are often not the focus of urban frameworks.

Finally, as perhaps the most widely recognized country-level sustainability framework, the Sustainable Development Goals Index (SDG Index) includes 120 indicators mapped to the 17 SDGs (Sachs et al., 2022). Our indicators are mostly relevant to Goals 11 ,9 ,8 ,6 ,4, and 12, with common or highly correlated indicators such as wastewater treatment rate, GDP growth rate, unemployment rate, government expenditure on research and development, PM2.5 concentrations, production-based SO2 emission, and municipal solid waste.

Standardization of Indicators

Prior to aggregating the indicators into an index, the construction of a composite indicator requires the component indicators to be standardized. During this process, the indicators are converted to the same scale and unit of analysis. When standardizing the indicators, there are two widely used methods: statistical standardization and normalization. The former involves converting the raw value of an indicator to a z-score, by subtracting the mean and dividing the difference by its standard deviation. The resulting z score is expressed as the number of standard deviations above (or below) the mean. This standardization approach assumes the underlying data follows a normal distribution. In case the data does not follow a normal

distribution, a normalization procedure is often performed, where the raw value is rescaled by subtracting the minimum value and dividing the difference by the range (maximum value - the minimum value). The resulting value will be between 0 and 1, which can be converted to 0 and 100.

Despite being popular approaches, the statistical standardization and normalization procedures outlined above are subjected to a common caveat of being vulnerable to the impact of outliers or extreme values, as both methods are sensitive to the dispersion of the data. Imagine having a city with extremely poor air quality (high Air Quality Index), then compared to this city, all the other cities will have very low Air Quality Index, concentrating them in the lower end of the range. In effect, the differences among most of the cities are depressed and less relevant. Because of this issue, the CSDIS adopted a different approach, one that is based on the ranking (from high to low) of city values for each indicator. It sorts the original values of the indicator in a descending (or ascending) order, and uses the rank as the standardized value. This method reduces the overall sensitivity to the extreme values, which are less impactful because the differences in the rank-standardized values are ordinal, not cardinal.

The CSDIS standardizes all its indicators using their respective rankings for each city. The advantage of this approach is that they are not affected by any extreme values since rankings only demonstrate the relative positions among the observations, not by how much. Regardless of how much better or worse the top and bottom cities perform, respectively, they are ranked first and last, and the difference would not have mattered in the final positioning. In addition, their rankings would not distort the rankings of others. Furthermore, rankings are simple to calculate and understand by the public. This simplicity is essential in practice, particularly with respect to sustainability management where metrics of lower comprehensibility may be difficult to gain traction among policymakers and decisionmakers in organizations.

On the other hand, since rankings emphasize on relative positioning, one cannot learn by "how much" one city may be outperforming the other. Therefore, for measurement systems that intend to pinpoint or highlight the "actual" differences, not just relative differences in performance, a ranking-based standardization approach may not be appropriate. For measurement systems in which the amount of difference in performance is immaterial, a ranking-based standardization approach may be a preferable option to adopt for standardization purposes. In the case of measuring urban sustainability, we believe there is a need to suppress performance differences because a few big cities may have values that are far apart from the ones for the abundance of small cities.

Cities are inherently different in terms of their natural endowment, geographical location, and development stages. The last point is particularly relevant for cities from developing countries, where uneven development among cities is common. For instance, coastal cities in China tend to be more economically developed, either due to their advantageous geographical location which enables maritime trade, or in some cases due to preferential policies from the central government in the early stages of China's Opening Reform that started in the late 1970s.

Similarly, in Egypt, cities such as Cairo and Alexandria are more developed economically than other inland cities as a result of their maritime locations and historical significance. In contrast, traffic congestion, housing affordability, and urban green space are inevitably less appealing in the major cities, especially when compared to smaller cities, such as Ismailia

and Hurghada that are located in more open regions with richer natural resources. These inherent characteristics of the cities determine their relative performance more than local policy interventions can do. Sustainability metrics that simply illustrate or overly emphasize endowment characteristics would be too static and penalize cities with inherent disadvantages that are hard to overcome with policy changes.

Therefore, an urban sustainability measurement system, one that is similar to the CSDIS framework would need to be dynamic, and enables local governments to develop sustainable policies that can address the issues on which they are seen to be behind similar cities. By focusing on indicator rankings, rather than indicator values or parametric standardization, we are able to narrow the gaps between cities with extremely good and poor performances, reduce any oversized influences of inherent characteristics on the final ranking, and thereby providing local governments with a measure that is more reflective of their efforts and motivates them to commit to making consistent and long-term improvements.

Evidence-Based Weighting of Indicators

Similar to the selection of indicators, the weighting of indicators also tends to be an arbitrary process, one that usually bases upon the opinions of experts. The CSDIS framework implemented a novel weighting strategy, which is outlined in this section. Our proposed methodology in the next section is also an extension of the CSDIS weighting scheme. However, before we outline the CSDIS approach in weighting the urban sustainability indicators, this sections first describes some of the most commonly used weighting strategies for constructing indices.

The simplest and most straightforward weighting strategy is perhaps to assign an equal weight to all indicators or unweight them. Unweighted aggregation refers to the practice of either not applying any weight or distributing the weight evenly. This typically assumes that each component of sustainability has an equal contribution or equally important to one's overall conception of sustainability. For example, this strategy is commonly used to measure the overall learning achievement of a student (total test score or GPA) with the assumption that all subjects are equally important, or the learning achievement of a group of students (in a class, a school, or a country) assuming each student's performance contribute equally to the overall measure.

This seemingly objective and unbiased strategy may raise some issues in practice, especially in sustainability measurement. First of all, while the weight of each sustainability indicator is the same, the overall weights for the domains may not be identical, depending on the number of indicators in each domain. The more indicators a domain has, the larger weight and influence it carries in determining overall sustainability. While equal weights among the major dimensions of sustainability is not a requirement, the often-referenced triple bottom line does call for a balance between economic growth, and social inclusion and environmental sustainability.

Second, the assumption of equal contribution may not be flexible enough to allow prioritization of certain indicators, such as ones on the environment, which may be viewed as more important for countries and cities that have been experiencing deteriorating air quality. In other cases, some indicators capture a wider range of sustainability performance. For instance, while GDP per capita itself cannot represent sustainability, it is related to

income, wealth, consumption, and affordability of various social services (health, education, and housing). In this case, a higher weight assigned to per capita GDP may be merited, than a measure that is "isolated", such as household waste treatment rate. As an analogy, in measuring learning achievements, one would expect higher points to be allocated to the questions that are difficult and complex, hence would require more time and skill to solve. Standardized tests may be designed in a way that all questions are of comparable difficulty or complexity to justify an equal allocation of points. However, developers of sustainability measurement systems do not have the luxury or ability of fine-tuning the indicators so that each of them represented an equal amount of progression toward overall sustainability.

Lastly, equal weights for sustainability indicators may not reflect the perception of the general public toward sustainable development. The public and local residents may view certain areas of urban sustainability as more important than others. Neither could equal weights reflect the sustainable development priorities of the government. In developing regions, such as Africa, governments as well as the public often prioritize the "economic development" component of sustainable development because many critical sustainability challenges, such as food security, population growth, urbanization, and employment are contingent on a high and sustainable economic growth rate.

Despite its shortcomings, this approach of averaging across indicators is frequently used as it is easy to comprehend, and more complex models do not seem to provide any additional benefits to the interpretation or usefulness of the index. Additionally, this methodology avoids the challenge of having to thoroughly justify any assessments of the indicators› relative importance (Guo et al., 2015).

Whether they are unweighted or otherwise weighted, expert opinions are often solicited in designing indicator weights. This is what we refer to as a top-down approach, since the weights are set based on arbitrary judgements by a few selected experts. The experts typically come from academia, industries as well as government agencies. In practice, there are many ways to acquire opinions from experts. This can be done through taking simple averages of the weights assigned by each expert on an independent score card (see Table 2 as an example). A focus group discussion may also be conducted, where experts can interact with one another and reach a consensus on the weights.

TABLE (2): EXAMPLE INDEPENDENT SCORE CARD FOR EXPERT OPINION ON SUSTAINABILITY INDICATOR WEIGHTS

Domains	Categories	Indicators	Domain Weights (Please fill in)	Indicator Weights (Please fill in)
Environment	Pollution	Water consumption		
		Solid wastes		
		Energy consumption		
		Air quality		
	Protection	Environmental expenditure		
		Sustainable land use		
		Sewage treatment		
Economy	Economy	GDP per capita		
		Growth		
		Service sector		
Social Development	Social services	Public transportation		
		Senior care		
		Access to Internet		
	Cultural	Cultural venues		
		Cultural activities		
	Resources	Energy		
		Water		
		Education		
		Public health		
	Security	Public safety		
		Poverty protection		
		Unemployment protection		
		Housing protection		
Governance	Governance	Transparency		
		Efficiency		
		Institutional equity		
		Civil participation		

Note. Each expert will complete the score card independently by filling out the last two columns (domain and indicator weights, in percentages). The "Indicators" each are a composite measure of several sub-indicators. For example, under the "Governance" category, Transparency is measured by "the number of government information disclosure per permanent resident", Efficiency is measured by "administrative expenditure as % of GDP" and "foreign investment utilized as % of GDP", Institutional equity is measured by "proportion of urban employment in total employment (including rural area)" and "average wage gap between state-owned enterprises and private enterprises", and Civil participation comprises of "petitions for government information disclosure per permanent resident" and "number of complaints handled by unions". Experts need to ensure the total weights sum up to 100 %, and take into account the balance of weights among all domains. The final weights will be calculated by taking the average of the weights on all report cards for each indicator.

One of the major benefits of using expert opinions is that the experts would have the ability to align their weights with the overall development agenda of any given jurisdiction. This approach can also offer flexibility in the initial selection of indicators, as the number of indicators will not largely affect the balance of weights among the major dimensions of sustainability as in an unweighted scenario. Additionally, the top-down approach is relatively straightforward to conduct in practice, which requires only a survey of a select number of experts whose opinions are then averaged. The disadvantage is that regardless of the expertise and claimed objectivity of the experts, the weights are still going to be subjected to the arbitrary judgements of the individuals selected. Despite any attempt to diversify the background of the experts, their opinions still may not sufficiently represent the views of the general public toward sustainability.

An alternative to the top-down approach is one that is led or at least incorporate the opinions of the public on what they believe to be material to urban sustainability. This is a participatory and bottom-up approach, which is rarely used in practice due to its complexity in surveying a large sample of the public that needs to be representative as well. The public perceptions on the importance of various areas of sustainability are typically obtained from surveys or interviews, the results of which are then cleaned, analyzed, and assigned as weights for the corresponding indicators.

The advantage of the bottom-up approach is the weights that are derived from the public opinion survey would reflect the priorities of the public, whose behaviors, decisions, and lifestyles may contribute significantly to overall urban sustainability. On the other hand, public opinions may be influenced or even shaped. For instance, if air quality has become a salient issue in the newspapers, on TV and on the internet, then a survey of the public perception of sustainability would find air quality a very important factor. In practice, public opinion surveys are complicated to conduct. Representativeness is always a challenge; ensuring the opinions of the individuals in the sample represent the whole population in all characteristics, including gender, location of residence, race, socio-economic status and so on is a major undertaking. For instance, online surveys tend to underrepresent senior citizens who use less internet, or citizens in remote areas with limited internet access.

In addition, some indices weight their indicators based on initial statistical calculations, such as Principal Components Analysis (PCA) and Factor Analysis (FA), to reflect the indicators› relative contribution to explaining the variance associated with changes over time (Guo et al., 2015). PCA converts a set of potentially correlated variables into a set of linearly uncorrelated

variables (principal components), while FA seeks to identify unobserved variables (factors) that are reflected by observed variables to a greater extent. Both statistical methods can help identify key indicators and their relative importance or contribution, but they are only useful for weighting purposes when correcting for overlapping information carried by correlated indicators, and cannot show the theoretical or policy importance of those indicators. Therefore, when computing several indicators into a composite sub-dimension score, PCA and FA can be used to provide weights.

For the CSDIS framework, we developed a statistical method in order to account for missing and unreliable data, a problem prevalent in sustainability. In this methodology, neither indicators nor categories of indicators were assigned any weights. Indicator weights were determined by utilizing a -5year history of indicator performance to estimate the cross-sectional and longitudinal variability of each indicator. Indicators that tended to be stable over time or displayed low cross-sectional variability were assigned statistically-determined high weights since these indicators are statistically consistent and have high power to identify changes in rankings among cities. Indicators that tended to be stable over time but that nevertheless demonstrated significant cross-sectional variation (i.e. fairly low ability to identify changes in rankings) were given lower weight in the index composition; these indicators measure characteristics of sustainability which are difficult for any particular city to change. A ranking that overweighs such indicators would unfairly penalize cities with fixed characteristics. The weighting algorithm searches for indicators where cross-sectional rank fluctuation is possible but difficult, and shifts weight onto indicators which have high longitudinal variability within a city, provide discriminatory power, and are demonstrably possible to change for any given city.

In effect, this evidence-based approach would place an emphasis on sustainable, long-term policy change, which is consistent with our view on urban sustainability. Our weighting strategy is innovative in that the initial weights were computed with respect to the indicator's stability across cities and years. Stability is defined as low volatility with regards to a city's ranking for any given indicator across time. That is, indicators with smaller standard deviation of ranks over five years are less prone to data errors. Therefore, these indicators are more likely to be accurate representations of a city's sustainability performance. For instance, urban green space per capita had the smallest standard deviation of 3, which implies that for each city, in general, the change in ranking on urban green space per capita is relatively small over the -5year period. Our weighting system assigns higher eights to indicators with less volatility. This method makes the ranking more comparable among cities and makes it easier to track their sustainable development.

First, the standard deviations for every indicator ranking over 5 years are calculated, as follows:

$$\sigma_{ci} = \sqrt{\frac{\sum_{j=1}^{5} (R_{cij} - \mu_{ci})^2}{5}}$$

Where σ_{ci} denotes the rank standard deviation of a city c (c = 1 to 100 for cities) and indicator i, R_{cij} denotes the rank of city c, for indicator i, and year j (j = 1 to 5), and μ_{ci} denotes the -5year average ranking of indicator i by city c. Next, the indicator standard deviation σ_i , measured as the average -5year standard deviation across all cities, is calculated:

$$\sigma_i = \frac{\sum_{c=1}^{100} \sigma_{ci}}{100}$$

This is also the average longitudinal variation across 100 cities. A higher σ_i implies higher fluctuations of an indicator across years and cities. Lastly, the weight of each indicator W_i , is calculated by taking the inverse of its standard deviation σ_i and dividing it by the sum of the all inversed standard deviations:

$$W_i = \frac{1/\sigma_i}{\sum_{i=1}^{24} 1/\sigma_i}$$

Less volatile indicators are therefore rewarded with higher weights.

Placing higher weights on more stable indicators helps achieve several design goals. First, it ensures the statistical reliability of the indicators. High volatility of an indicator's ranking over years may be caused by data errors. In these cases, the lower weights given to these indicators effectively reduce the impact on the overall system from any possible error in collecting, reporting, and coding of data.

Second, high volatility of ranking over years may be the result of ranking cities on very small differences. For instance, the majority of the cities' growth rates lie in a narrow range of 2.5% - 4.5% in 2020, as Figure 1 illustrates (Zhang et al., 2022). Within this narrow range, a tenth of a percentage change for a city can lead to significant change in its ranking as well as the rankings of its closest competitors. Similar cases can be found in indicators such as "percentage of household waste harmless treatment", where virtually all cities are situated between 85% and 95%, so small movement in this indicator can change a city's relative position dramatically. The fluctuation in rankings may reflect idiosyncratic events that can result in immediate changes in indicator values, rather than consistent improvement in sustainability performance driven by long-term policy initiatives. Therefore, an indicator is not as revealing when it is ranked on very small differences, especially on sustainability.

An interesting analogy may be drawn from this weighting approach, which is that sustainable development is not a sprint, but a marathon. In a sprint race, athletes are separated in their final positions by tiny differences, which sometimes require slow motion replays to observe. While these differences are important on the race track and potentially life-changing for the involved athletes, they cannot serve as meaningful indicators of general level of physical fitness or benchmarks for human evolvement because these differences can easily change during the next race and are not sustainable. On the other hand, indicator has lower yearly variation, hence higher weight when ranked on large city-level differences. Similar to a marathon, where the differences in finishing times are much greater. The gap can be more meaningful and will need significant and sustained effort to overcome. The latter is consistent with our conception of the sustainability challenges facing our cities, where sustainable policy change and long-term efforts are championed over short-term ad hoc interventions.

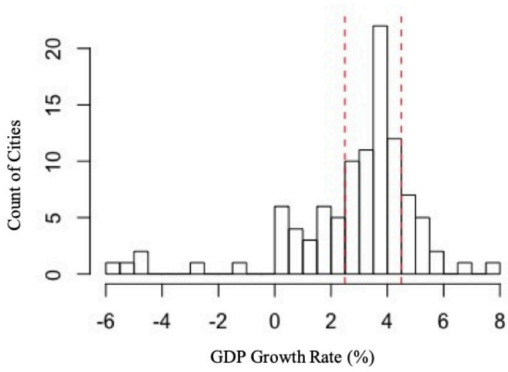

FIGURE (1): DISTRIBUTION OF GDP GROWTH RATE AMONG 101 CHINESE CITIES, 2020

Aggregation of Indicators

The final step in constructing an index is to perform a mathematical operation to combine the weighted (or unweighted) indicators into a single value. The most common approaches of aggregation are using arithmetic and geometric means, which involve adding or multiplying the indicator values, respectively.

$$Arithmetic\ Mean\ =\ \frac{x_1 + x_2 + \ldots x_n}{n}$$

$$Geometric\ Mean\ =\ \sqrt[n]{x_1 \cdot x_2 \cdot \ldots x_n}$$

When indicators are related to each other, or are exponential, when for example computing growth, profit return, and population, a geometric mean is usually advocated to account for the compounding effect. For instance, the construction of the Human Development Index (HDI) used the product of its sub-indicators of health, education, and income in its aggregation.

An Alternative Weighting Strategy

A shortcoming of the evidence-based approach outlined above is that the indicator weights are not flexible, and they may not be able to reflect the sustainable development agenda of China or the Chinese cities. Neither can they reflect the priorities in the sustainable development agenda from the perspective of the public. To remedy this issue, we propose an integrated approach, one that combines expert opinion with public opinion, as well as the evidence-based weights that are generated from actual data.

For a pilot of this integrated approach, we partnered with Henan University to conduct a public opinion survey that sought the advice from over 3,000 individuals in the province of Henan, China on what they believed to be the most pressing sustainability issues facing their cities. The surveys were administered in person by researchers and graduate students from Henan University in three cities, which are chosen on their differed levels of economic development, demographics and geographic characteristics. In each city, street surveys were

conducted at 100 randomly selected locations. The survey asked city residents to rank the importance of a number of sustainability areas on a Likert Scale. Then higher weights are given to indicators which are viewed as more important by local residents. The weights of 29 indicators calculated based on public opinions in the approach outlined above are displayed in Column 3 of Table 3.

The framework in Table 3 is intended to be implemented only for the province of Henan in central China. It is a province with closely to 100 million population. In order to incorporate opinions from other stakeholders of urban sustainability, the project invited 15 sustainability experts from the government, universities, the private sector to complete a score card similar to the one shown in Table 2, where they directly allocate weights for each category and its indicators according to their own understanding of the relative importance of each indicator. The "Stability" weights in Table 3 correspond to weights calculated using the evidence-based approach outlined in the previous section. The average weight, included in the last column, is the mean of the three alternative weights. In other words, the final weights to each indicator is a result from an equal measure of expert opinion, public opinion, and the data.

TABLE (3): WEIGHTS OF URBAN SUSTAINABILITY INDICATORS FROM AN INTEGRATED APPROACH

INDICATOR	Expert opinion	Public opinion	Stability	Average Weights
Fresh Water Consumption	4.50%	4.80%	3.58%	4.29%
Solid Waste	3.75%	5.04%	2.90%	3.90%
Engery Consumption	4.25%	4.82%	6.95%	5.34%
Air Quality	4.25%	8.35%	2.51%	5.04%
Environmental Protection Expenditure	3.75%	4.49%	1.05%	3.10%
Sustainable Land Use	4.00%	2.83%	6.10%	4.31%
Waste Water Treatment	3.50%	3.50%	1.21%	2.73%
Economic Development	5.75%	5.50%	5.23%	5.49%
Economic growth	5.50%	5.46%	10.33%	7.10%
Service Sector Added Value	4.75%	3.94%	1.45%	3.38%
Industrial Sector Added Value	5.00%	4.66%	4.22%	4.63%
Per Capita Capital Stock	4.75%	3.98%	5.86%	4.86%
Transportation	1.75%	2.71%	5.34%	3.27%
Senior Care	2.13%	3.79%	1.21%	2.37%
Acess to Telecommunications Faciliteis	2.13%	2.47%	3.77%	2.79%
Cultural Facilities	1.75%	1.66%	7.65%	3.69%
Cultiural Activities	1.75%	1.49%	1.22%	1.49%
Acess to Energy	2.13%	0.72%	3.59%	2.15%
Acess to Water Resource	2.13%	1.01%	1.00%	1.38%
Education	2.50%	2.14%	2.30%	2.31%
Health Care	2.50%	1.09%	1.41%	1.67%
Security	1.63%	1.60%	2.11%	1.78%
Poverty Relieve	2.25%	0.83%	0.98%	1.35%
Employment	1.75%	1.10%	1.81%	1.55%
Housing Security	1.63%	0.91%	0.95%	1.16%
Government Transparency	5.50%	5.21%	1.20%	3.97%
Government Efficiency	4.75%	6.07%	8.58%	6.47%
Institutional Equity	5.00%	6.07%	2.02%	4.36%
Civic Participation	5.00%	3.76%	3.46%	4.07%

Note: This metric framework was developed for a pilot study involving 18 cities in the Henan Province, China. Expert opinion weights were aggregated from 15 experts' score cards. Public opinion weights were aggregated from 3,024 opinion surveys conducted in three representative cities in Henan. Stability weights were calculated using the CSDIS methodology that is based on the stability of each indicator's ranking among the 18 cities over five years. Average Weights is the arithmetic average of the three alternative weights, and represents the comprehensive weights of the indicators. Shaded weights are the highest weights under each weighting strategy.

Results from Table 3 show that compared with the other two strategies, expert opinion generates weights with the smallest variation. None of the indicators is given a weight higher than 6 % or lower than 1.5 % by the experts. The results also suggest that the public opinion weights may reflect media influence as previously discussed, as air pollution, government efficiency, and social justice are among topics that were frequently reported by the media at the time. The weights assigned to these indicators were significantly higher than the ones given by experts. Despite these differences, there are areas of consensus. For instance, the three approaches tend to agree on the relative importance of the economic development indicators. The importance of government efficiency (measured by the share of administrative expenditure in GDP, and utilization of foreign investment as a percentage of GDP), emphasized by the public tends to be confirmed by the evidenced-based approach.

Conclusion

Cities hold the key in the global transition to sustainability. In order to manage this transition, we need metrics that can guide us in making sustainable policies. Metrics are also crucial for cities to track their sustainability progress and compare them against their peers. In this paper, we presented a framework of urban sustainability metrics, CSDIS, that is applicable to Chinese cities. It is our belief that this framework and its underlying methodology can be adapted to measure sustainability progress in other contexts. The CSDIS indicators obtain their information from official government sources, which are regularly produced by local governments. In developing countries, without the prevalence of non-governmental organization, consultancy agencies, and research institutes collecting and reporting on sustainability-related data, government sources become the only accessible data points for sustainability indicators. The rank-based standardization approach in accounting for pre-existing regional disparities can highlight the impacts of sustainable local policies. The evidenced-based weighting strategy ensures that the more reliable and consistent indicators are given higher weights. This weighting strategy safeguards data quality and minimizes the influence of speculative policy interventions.

In this paper, we also presented an approach that expands the evidence-based weighting strategy to include expert and public opinions. This combination of top-down inputs with bottom-up opinions is a novel approach in holistically weighting the priorities of different stakeholders. While the expert opinions provide alignment with top-down sustainability agenda, the public opinions incorporate important considerations from the perspective of a city's most critical stakeholders—its local residents. The statistical treatment from the evidenced-based weighting methodology provides a check on data quality, that is generally neglected in any design of sustainability indicators. The resulting weights is comprehensive

and robust, and this integrated approach can serve as a model for future development of sustainability indicator systems.

The methodology we pioneered in creating the CSDIS metrics framework may be adapted to cities and governorates in Egypt. Similar to China, Egypt is undergoing rapid urbanization, with the urban population growing close to 2 % each year (United Nations Human Settlements Programme, n.d.). The pace of Egypt's urbanization has put tremendous pressure on urban planning, infrastructure building, and the creation of work opportunities to keep up with a growing urban population. It has also fuelled concerns of inequality, public health, urban poverty, housing affordability, traffic congestion, pollution, loss of arable land and biodiversity. These are issues prevalent in developing cities. In fact, many of the challenges Egypt is facing in achieving the SDGs and are outlined in the Egypt Vision 2030 are embedded in cities or metropolitan areas, especially as urbanization continues. An urban sustainability measurement system can provide policymakers, residents, and other stakeholders with critical information to identify areas of improvement and evaluate the effectiveness of their sustainability initiatives. Furthermore, although the CSDIS is an urban sustainability metrics framework, its application is not restricted to urban centers or core areas of cities, but rather is effectively more in line with metropolitan areas or what the Organisation for Economic Co-operation and Development (OECD) refers to as "urban functional units" which includes both the densely inhabited city (core) and its surrounding area (commuting zone) whose labor market is highly integrated with the city. This is because in China, the municipal jurisdiction comprises of municipal districts (city core) as well as the surrounding suburban and rural areas (counties, towns, and villages). Therefore, the application of CSDIS on Chinese cities is in fact more comparable to applying it on governorates in Egypt. In addition, the CSDIS has a sister framework for measuring the sustainability performance of Chinese provinces, which are comprised of multiple cities. The province-level framework has a number of different indicators because of the difference in scope, but follows the same philosophy and methodology as the CSDIS.

In Egypt, the Central Agency for Public Mobilization and Statistics (CAPMAS) is the official statistical agency that collects and releases important statistical information at the national, governorate and city levels. CAPMAS is also a key monitoring body for the Egypt Vision 2030 strategy and is already working to keep track of more than 150 key performance indicators in areas of economic development, energy, innovation and research, governance, social justice, health, education, culture, environment, and urban development. While there are areas for potential improvement in continue to build capacity in data collection, accessibility and transparency (Hassan and Amin, 2022), CAPMAS can potentially support an urban sustainability metrics system with its existing data.

Measuring sustainability is an indispensable effort for all entities to achieve sustainable development. Most of the future improvements in global sustainability will likely to take place in developing and less developed countries, where a significant proportion of the population are still fighting against poverty. Therefore, a participatory approach in incorporating the opinions of the people are particularly important to ensure the development agenda and sustainability initiatives are commensurate with the people's development aspirations. The participatory approach we propose in this paper weighs public opinions on the relative importance of various sustainability issues in designing the weight scheme. An alternative approach is to incorporate "perception-based" data, or using indicators that are based directly on surveys

of the public's perception of certain sustainability issues. This is particularly relevant for social and governance dimensions, which instead of measuring the monetary or physical inputs by governments, can measure the actual impact felt by the public. Taken further, it may be possible to combine both approaches so that the sustainability issues or their indicators that are deemed most important by the public can be measured using perception-based data.

Because of the relatively low capacity in many of the data collection agencies in these regions, more support is also needed from government, international organizations to help fund and train a critical mass of data personnel. For a successful transition toward sustainability, we require sustainability metrics and the underlying data to allow us to make informed policy and management decisions.

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RESEARCH PAPERS IN ENGLISH

Exploring Role of GeoAI in Urban Governance Towards Supporting Sustainable Development

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Abstract

Governance refers to the structures and processes that are designed to ensure accountability, transparency, responsiveness, rule of law, stability, equity and inclusiveness, empowerment, and broad-based participation. Urban governance is the procedure through which stakeholders, including local, regional, and national governments, choose how to plan, fund, and manage urban regions In many countries, urban governance systems are currently unfit for purpose and need critical reforms to enable sustainable and inclusive urban development. Urbanization is a global phenomenon, although it develops even more rapidly in developing nations like Egypt. Unplanned growth, rising immigration, and a quickly growing population are the key drivers of urbanization. One of the most significant issues confronting developing countries is the problem of urban sprawl in agricultural areas, which has an environmental impact on several levels This paper introduces innovative approach to manage, monitor, and control urban sprawl on agricultural lands using spatial artificial intelligence GeoAI. Tasa village was selected as study area, which located in Sahel Slim center, Assiut governorate, Egypt. Three satellite images were employed for the study area to monitor change detection from 1998 to 2020.

Keywords: Sustainable development – Governance – Artificial Intelligence (AI) – GeoAI

استكشاف دور الذكاء الاصطناعي المكاني في الحوكمة الحضرية لتحقيق التنمية المستدامة

مستخلص:

تشير الحوكمة إلى الهياكل والعمليات المصممة لضمان المساءلة والشفافية والاستجابة وسيادة القانون والاستقرار والإنصاف والشمولية والتمكين والمشاركة واسعة النطاق. الحوكمة الحضرية هي الإجراء الذي يختار من خلاله أصحاب المصلحة، بما في ذلك الحكومات المحلية والإقليمية والوطنية، كيفية تخطيط المناطق الحضرية وتمويلها وإدارتها في العديد من البلدان، حيث ان أنظمة الإدارة الحضرية غير صالحة حاليا للغرض وتحتاج إلى إصلاحات حاسمة لتمكين التنمية الحضرية المستدامة والشاملة. ويعد النمو الحضري ظاهرة عالمية، على الرغم من أنه يتطور بسرعة أكبر في الدول النامية مثل مصر. النمو غير المخطط له، والهجرة المتزايدة، والنمو السكاني السريع هي الدوافع الرئيسية للنمو الحضري. من أهم القضايا التي تواجه الدول النامية مشكلة الزحف العمراني في المناطق الزراعية والتي لها تأثير بيئي على عدة مستويات تقدم هذه الورقة نهجا مبتكرا لإدارة ومراقبة الزحف العمراني على الأراضي الزراعية باستخدام الذكاء الاصطناعي المكاني GeoAI. تم اختيار قرية تاسا كمنطقة دراسة، والتي تقع في مركز ساحل سليم، محافظة أسيوط، مصر. تم استخدام ثلاث صور أقمار صناعية للدراسة لمراقبة اكتشاف التغيير من عام ١٩٩٨ إلى عام ٢٠٢٠.

الكلمات المفتاحية: التنمية المستدامة-الحوكمة-الذكاء الاصطناعي-الذكاء الاصطناعي المكاني

1- Introduction

Nowadays, the world increasingly encountering environmental challenges because of industrialization, urbanization, and globalization. This include climate change, freshwater shortage, desertification, contamination of land, air, and water from hazardous waste, biodiversity loss, and several more issues that are impeding sustainable development (Jianping et al., 2014). As a result, environmental analyses are currently becoming more important in urban planning procedures all over the world. Rapid urbanization is accompanied by enormous population growth and construction projects, which cause exceptional losses in urban green spaces and an expansion of the impervious region (Dou et al., 2020). One of the primary factors contributing to environmental deterioration that results in encroachments on fertile lands is unplanned urbanization. According to Bren d'Amour research in 2016, between 1.8 and 2.4 percent of agricultural areas worldwide would be lost under urban sprawl by 2030. In 3 ,2000 to 4 % of the world›s total agricultural production was produced on these regions. They are also 1.77 times more productive than normal agricultural fields throughout the world. In addition, 80 percent of these land losses are concentrated in Asia and Africa, where productivity is thought to be more than twice that of their national averages. Cropland sprawl often poses a danger to livelihood and is associated with other sustainability problems. Along with urban development follows the rapid expansion of informal settlements, where numerous residents wastefully squander the resources that are available and cannot access basic requirements and services (Bren d'Amour et al., 2017). Urban governance is generally acknowledged for its strategic value towards more sustainable future since urban development constructs a potential for more sustainable development (De Guimarães et al., 2020). As Egypt 2030 agenda for sustainable development emphasized the local level for meeting sustainability challenges, by calling for the embracing of an institutionalized participatory approach to sustainable urban development and the establishment of the capacity of local governing frames to cope with sustainability challenges (Lewis et al., 2030). Urban planning has continuously shifted towards urban governance procedures over the time. Analyzing diverse sustainability strategy types is necessary to increase knowledge of urban government and its consequences (Zhang et al., 2020).

Hence, preservation of the environment is one of the key components of sustainable development, and urbanization may pose an imminent threat to both food security and the ecosystem in general. Otherwise, the unexpected growth in informal settlements promotes a demographic transition, resulting a lack of basic services.

Monitoring the growth of urban sprawl on agricultural areas is one of the most important urban governance tools, as it provides an accurate and comprehensive depiction of the rate of decreasing agricultural land and population growth in the study area.

Spatial data has long been used to manage urban expansion on agricultural lands. While satellite images have been employed in prior studies to track how land uses have changed through time (Hepinstall et al., 2013); (Dupras & Alam, 2015); (Huang et al., 2019); (Salem et al., 2020); (Shao et al., 2021)

This paper introduces an innovative approach integrating spatial data with artificial intelligence GeoAI for monitoring and management of growth of urban sprawl on agricultural land in Tasa village, Assiut, Egypt with total area 6.38 km2. Three satellites were deployed to monitor the

encroachment of urbanization on agricultural areas between 1998 and 2020. For each image independently, the number of buildings was assessed using artificial intelligence algorithms to determine the percentage of agricultural land decrease over time.

2- GeoAI Overview

Geospatial studies have already been integrated with AI since 1963, Significant advances in AI were made because of theoretical speculations in the 1950s and 1960s (Natale & Ballatore, 2020). As a result of artificial intelligence, geospatial science is currently experiencing both enormous new potential and challenges. Theoretical advancement, large data, computer hardware, and high-performance computing platforms are what are enabling its major development since they make it possible to design, train, and deploy AI models more quickly (Xu et al., 2020). In recent years, there have seen significant advancements in both academia and business for geospatial artificial intelligence (GeoAI), which blends geospatial research with AI, including deep learning and machine learning techniques. GeoAI is capable of being utilized to create intelligent computer programmes that mimic human perception, spatial reasoning, and discovery of geographic phenomena and dynamics. It can also be used to address problems in human environmental systems and their interactions with a focus on spatial contexts and roots in geography or geographic information science (Nguyen et al., 2023).

GeoAI investigation would therefore involve understanding of AI theory, programming, and computing techniques, as well as geographic domain expertise integrating remote sensing, physical environment, and human civilization, with expanding incorporation between different data analysis techniques (Li, & Hsu, 2022). It is essential to establish a few key terms linked to geospatial and artificial intelligence given the nature of the discipline and the overlap between artificial intelligence and many other scientific fields and disciplines; as shown in figure 1. Artificial Intelligence is known as the establishment of computational techniques and tools capable of performing tasks that typically demand for human intelligence, such as reasoning, learning, and anticipation that allows it to act appropriately in its context (Pramanik et al., 2018). Machine Learning is a branch of AI that leverages mathematics or statistical optimization approaches to model data without explicitly scripting each model parameter or computation step (Angermueller et al.,2016). Deep Learning is A specific approach of machine learning where artificial neural networks, and algorithms inspired by the human brain, identify the patterns and the guidelines for prediction from a large volume of data (Janiesch et al.,2021). GeoAI is a developing scientific discipline that integrates innovations in spatial science with AI/ML methods (e.g., deep learning), data mining, and powerful analysis to acquire information from spatial big data (Alastal & Shaqfa., 2022).

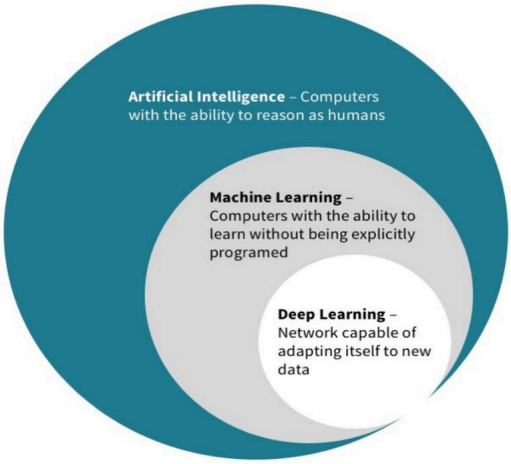

FIGURE (1): RELATION INSIDE AI.

Artificial intelligence (AI) and machine learning (ML), presents additional approaches for efficient monitoring, interpretation and predicting the development of urban areas. ML approaches are data-driven as relevant information extracted from data processing. The term ‹learning› refers to how well an algorithm performs in a certain task (Gonzales et al.,2022). There are two categories of machine learning algorithms: supervised and unsupervised learning. Supervised learning employs a training set of examples with appropriate responses. On the other hand, in unsupervised learning, there are no appropriate responses provided. Instead, the algorithms attempt to discover and categorize similarities between inputs and group them (Nasteski, 2017), as shown in figure 2.

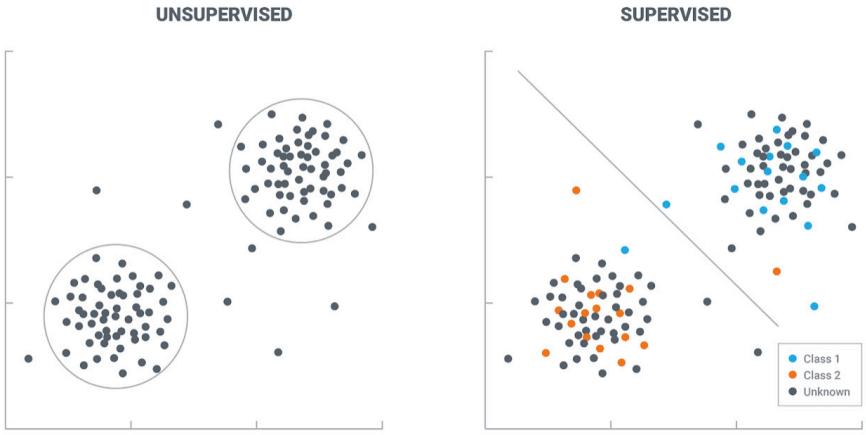

FIGURE (2): SUPERVISED VS UNSUPERVISED LEARNING

3- History of GeoAI

Although there is no institutional start timeline for GeoAI, the initial GeoAI instances were estimated by detecting significant events in GIS utilising statistics. Danie Krige created the first spatial predictive model in 1951, which was later modified and implemented by Matheron in 1963. This technique is known as ‹kriging,› and it is one of the most significant approaches in geostatistics. Anglo-Canadian Roger Tomlinson developed the concept of GIS in the same year (1963) (Li et al., 2014). Afterwards, Howard Fisher at Northwestern University developed the first GIS operational software in 1946 (Carlsson, 2013). With the advancement of spatial prediction technologies and the GIS paradigm. Therefore, GeoAI originated to the mid1960-s, merely decade after Alan Turing developed his famous AI Test (Taulli, 2019). With the basics of GeoAI constructed, the following question is how GeoAI has developed over time. To address this question, a timeline involving four generations of GeoAI developments is explored, defined by changes in eight major key dependent drivers. Each of these drivers is briefly elaborated within each generation. as shown in figure 3.

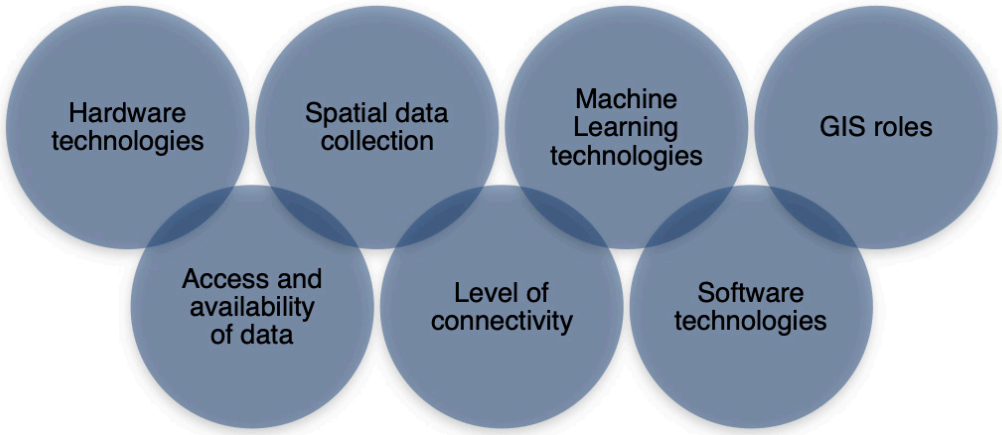

FIGURE (3): KEY DEPENDENT DRIVER OF GEOAI

3.1. 1st Generation of GeoAI (mid1960-s to late1990-s): Limited Local Intelligence

Most of the components that composed the first generation (1G) of GeoAI were confined to a single computer, and insufficiently integrated. As a result, the term "limited local intelligence." This generation was characterized by computational limited bandwidth and data availability and accessibility limitations, which limited the full application of machine learning techniques. Furthermore, AI «winters,» or periods of neglect, appeared during the 1970s and 1990s because of earlier developers exaggerated claims, and unexpectedly high demands from end users. As a result, the first generation of GeoAI remained stable for three decades.

3.2. 2nd Generation of GeoAI (2000 to late2000-s): Early Enterprise & Web Era

The extensive use of the Internet and personal computers (PCs) characterizes 2G GeoAI. Compared to 1G, enhanced data accessibility and availability, upgraded GIS applications, and the utilization of enterprise geodatabases. Thus, compared to 1G, 2G GeoAI has a longer lifespan and is identified by the beginning of the Web era and the early adoption of enterprise solutions.

3.3. 3rd Generation of GeoAI (2019 – 2010): The "Big" Leap

3G GeoAI was evolved in accordance with the increasing adoption of the Internet and personal network devices (i.e. smartphones), key advancements in GIS, ML, techniques for computing and storage, and flexible data accessibility and availability. In addition to AI, 3G GeoAI has observed an enormous growth in adoption by government organizations, corporations, NGOs, and academics to address spatial problems in the real world. These significant milestones, achieved in a short time frame, have changed the perspective of GeoAI into a new generation (3G), which is defined as the "big" leap in GIS, with "big" here referring to the growth of big data.

3.4. 4th Generation of GeoAI (2020 - ?): The Frontier of Intelligence

Since 3G GeoAI impacted the GIS ecosystem, there are upcoming new technology and applications that could lead to more massive improvements in GeoAI. Drones and Internet of Things (IoT) technology, for instance, are the latest frontiers in «big» data collection. Deep learning and data science approaches will be augmented with real-time data, which will also lead to new use cases and analytics, such as interpretation and smart cities. With these components, GeoAI have been transited from a time span of collecting and analyzing «big» data to procedures for automated, informed decision-making that are guided by «intelligent» technologies and involve little to no human interference. This is what would be considered as a more "intelligent" ML platform (resources.esri.ca).

4- Application of Deep Learning for Mapping

A significant application of deep learning is to generating digital maps by automatic road network extraction from satellite imagery; and building footprints. DL has the ability of attempting a trained deep learning model on an extended geographic area and producing a map containing all the local roads, furthermore the capacity to produce driving directions using this detected road network. This can be particularly helpful for developing countries that do not have high quality digital maps or in areas where newer development has taken place (Campbell et al., 2019).

5- Case Study: Tasa Village, Assiut, Egypt

Asuit Governorate is one of the Egyptian governorates. It stretches across a section of the Nile River. The rate of poverty in Assiut is more than 60 %. The governorate is divided into municipal divisions, with a total estimated population of 4,407,335, as of July 2017 according to the Central Agency for Public Mobilization and Statistics (CAPMAS). Tasa Village is One of

the settlements in Sahel Selim center - Assiut Governorate -Egypt with total area 6.38 km2; figure 4.

FIGURE (4): TASA VILLAGE, ASUIT GOVERNORATE

In 2017, Sahel selim had a population of 180,996 inhabitants (CAPMAS). Sahel Salim is located at the East coast of the Nile at a 24 km distance south from the city of Assiut. It is characterized by its fruit gardens, some of its fruit production is exported abroad. The village of Tasa was chosen as the study area for monitoring the development of urban expansion on agriculture lands.

Mapping villages and small communities has historically involved a lot of time and effort, especially when establishing the cases of buildings and roads required field surveys. This demands a lot of time, effort on stakeholders and decision makers in addition to extra cost. Decision makers can automate most of mapping by building a deep learning model and training dataset with GIS, experiencing immediate benefits in terms of time and cost savings as well as increasing the data accuracy. GeoAI Machine learning model allows decision makers to automatically update tasa village base maps with streets and buildings, as shown in Figure 5. As deep learning models that were developed and trained over time produced findings that were ever more accurate.

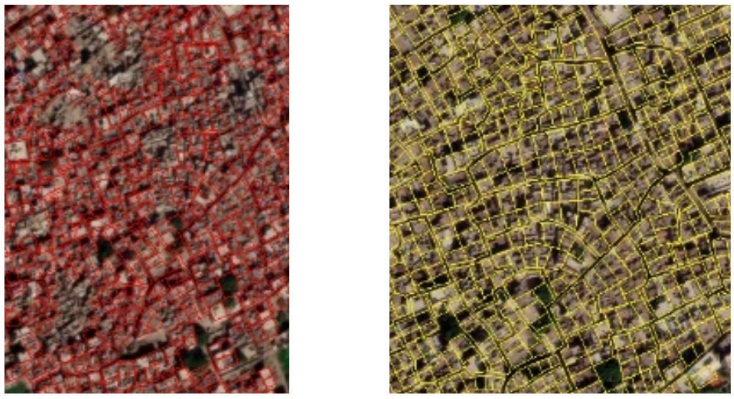

FIGURE (5): BUILDING FOOTPRINTS DIGITIZED MANUALLY ON THE LEFT COMPARED TO THE DEEP LEARNING (ALGORITHM OUTPUTS ON THE RIGHT)

Three satellite images were employed to detect urban expansion change from 1998 to 2020 utilizing GeoAI for building detection, it was found that in 1998 the total number of buildings were 458 buildings while there were 1146 buildings in 2014 and 1648 buildings in 2020 and agriculture area have been reduced to 88.4 % from the total area of Tasa village, as shown in table 1.

TABLE (1): CHANGE DETECTED FROM 1998 TO 2020 UTILIZING GEOAI

Observation year	Total No of Buildings	Population	Agriculture land area (%)	Urban area (%)
1998	458	3664	96.8%	3.2%
2014	1146	9168	91.9%	8.1%
2020	1648	13184	88.4%	11.6%

Traditionally, GIS projects required several years to finish projects using traditional techniques of creating and analyzing spatial data, as well as a considerable number of work and quality control teams to complete projects in the appropriate form and time. it is anticipated that GeoAI will provide a breakthrough in the field of Spatial projects, where the process of automatic detection of the necessary data takes several hours to produce data, and the quality control process takes a few days to complete. In 1998 it took 6 month of field survey and quality control to directly survey and mapping buildings on the study area, while in 2014 it took about one month of on-screen digitizing and field quality control on mapping data due to advanced approaches of mapping and GIS software as well as the availability of high-resolution satellite imageries as shown in figure 6.

1998 2014 2020

FIGURE (6): CHANGE DETECTION FROM 1998 TO 2020, TASA VILLAGE, ASSIUT, EGYPT

While it took 40 hours of manual digitization and quality control in 2020 to perform the task as required with less quality and more effort, the area under study was processed using GeoAI in 30 minutes. The task was a bit more complex as it required the computer to tell it about anything new across the entire study area. It was necessary to establish a common geospatial framework that would encompass the existing database. GeoAI platform was able to train using 30 objects of data to provide input for the model to scan 1684 objects in

the satellite imagery, consequently, the algorithm performs efficiently and successfully, even identifying changes that human intuition would miss. Additionally, the model provided a more accurate representation of the roads in the study area.

Although more effective GeoAI applications are being introduced, AI is still in the early stages of development. It's still unclear how interoperable and dependable machine learning algorithms are. Due to a lack of understanding in the algorithms used and the scope of the finding's generalization, the level of overall confidence in machine learning outcomes across the geospatial community remains moderate. The continued reliance on cloud storage raises additional questions about data integrity. Within the next five to ten years, it's expected that change detection and pattern identification will be completely automated in geospatial production.

6- Conclusion

Over the next ten years, artificial intelligence, particularly image analysis and information extraction, will present some of the biggest potential for geospatial information management. Machine learning is used in the field of artificial intelligence known as geospatial artificial intelligence (GeoAI) to extract knowledge from spatial data. Automation is essential for enabling the efficient processing of an exponentially growing amount of sensed data from the Internet of Things and remote sources. This is necessary to realize the objective of real-time data. Machine learning will be necessary in the long run to handle the expanding demands of a connected world. One of the initial steps in putting artificial intelligence (AI) solutions into practice is automation.

Three factors can be used to summarize the technological developments enabling advances in geospatial artificial intelligence (GeoAI): an increase in low-cost cloud computing, the accessibility of inexpensive sensor technology, the ongoing expansion of geospatial information, and the creation of new algorithms that can leverage multiple data sources. In order to achieve the goals of sustainable development and Egypt›s vision 2030, the deep learning algorithm was employed in this study to detect buildings and streets for the village of Tasa in the Sahel Selim Center, Assiut Governorate. The results showed a promising model for automating the production of maps.

Comparing the use of conventional methods for producing spatial maps, which required 40 working hours, with leveraging GeoAI, which produced spatial maps for the same area in 30 minutes with higher precision and with less working and quality control time, of Tasa village with an area of 6.38 square kilometers, it was found that GeoAI introduces innovative and promising technique for automatic objects detection and mapping for the determination of development priorities.

The potential use of the technology will eventually benefit a larger range of geospatial applications, even though the current implementations of machine learning for geospatial data concentrate on object extraction and change detection. Digital twins, driverless vehicles, sustainable smart city management, enhanced structures, and energy management are some examples of application areas.

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