

**GOVERNANCE, FIRM ENGAGEMENTS AND UNITED NATIONS
SUSTAINABLE DEVELOPMENT GOALS IN AFRICA**

KNUST

By

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A Thesis Submitted to Department of Accounting and Finance,
Kwame Nkrumah University of Science and Technology, Kumasi
In Partial fulfillment of the Requirement for the Degree Of

**DOCTOR OF PHILOSOPHY BUSINESS AND MANAGEMENT
(ACCOUNTING OPTION)**

School of Business
College of Humanities and Social Sciences

September, 2023

DECLARATION

I hereby declare that this submission is the result of my own work towards the Doctor of Philosophy Business and Management (Accounting Option) programme and that to the best of my knowledge, this study contains no materials previously published by no person or submitted for the award of any other degree of the University, except where acknowledgement has been duly made in the text.

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DEDICATION

To my love Daisybel and cherished children, Nana Poku and Ama Adoma

ACKNOWLEDGEMENTS

I am exceedingly grateful to the Almighty God for blessing me with life, abundant grace, and talent to achieve this academic excellence.

I am monumentally indebted to my supervisor and or mentor Prof. Kingsley Opoku Appiah, whose unflinching support has since catapulted me to the limelight of impeccable academic excellence. Many thanks for your workshops and the opportunities you created for me to get feedback, and the opportunity to collaborate with you on several academic projects. I would also like to thank Dr. Kwadjo Appiagyei (Second Supervisor), for his courteous and encouraging demeanour towards me and for guiding me towards the completion of the thesis. I am equally grateful to Dr. Richard Owusu-Afriyie, for his continuous interest in my academic progress.

I wish to also acknowledge the financial support of the Ghana Education Trust Fund (GETFund) and my employer (Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development), without which this journey would have been a great challenge if not impossible. Again, I thank the Management of AAMUSTED for granting me part-time study leave to pursue this Ph.D. I am particularly grateful to all the officials who facilitated my request for part-time study leave, especially the ViceChancellor, Professor Frederick Kwaku Sarfo, the Pro-Vice Chancellor, Professor Isaac Boateng, and my former Head of Department, Mrs. Richmell A. Amanamah. I am grateful for believing in me. I equally owe a debt of appreciation to all the teaching and

non-teaching staff at the Faculty of Business Education for all the support and best wishes extended to me during my studies.

Again, the enormous support of, Mr. Agyemang Badu, Hon. Aikins Addai Poku, Hon. Hon. Simon Osei Mensah, and Hon. Dr. Yaw Osei Adutwum are worthy of appreciation.

A friend in need is truly a friend indeed. My heart and hearty appreciation go to you my love Daisybel Appiah, Mr. Etse Nkukpornu, Dr. Atsu

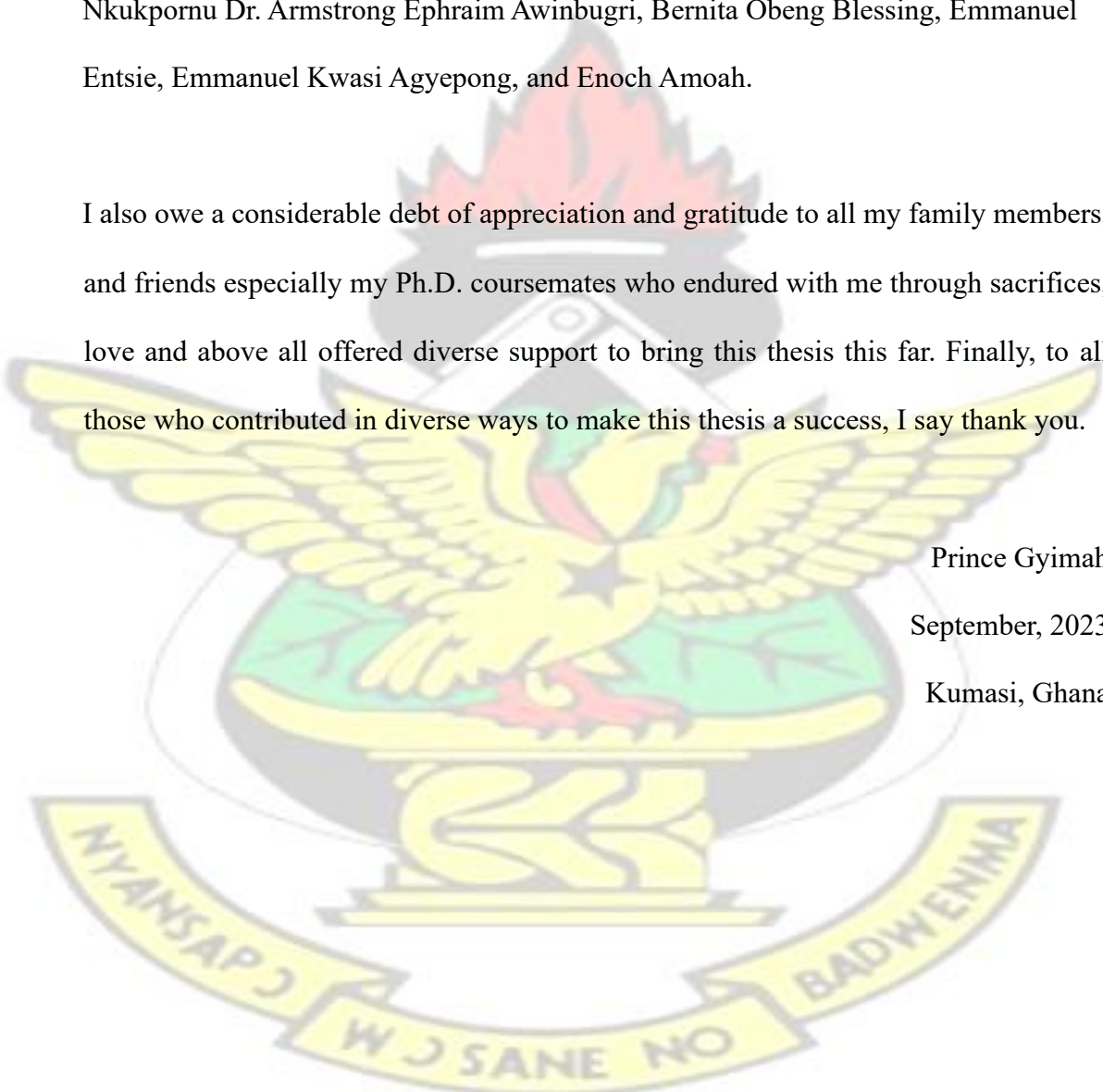
Nkukpornu Dr. Armstrong Ephraim Awinbugri, Bernita Obeng Blessing, Emmanuel Entsie, Emmanuel Kwasi Agyepong, and Enoch Amoah.

I also owe a considerable debt of appreciation and gratitude to all my family members, and friends especially my Ph.D. coursemates who endured with me through sacrifices, love and above all offered diverse support to bring this thesis this far. Finally, to all those who contributed in diverse ways to make this thesis a success, I say thank you.

Prince Gyimah

September, 2023

Kumasi, Ghana



LIST OF STUDIES

This thesis consists of the following four studies:

1. Business Contributions on Sustainable Development Goals: Seven years bibliometric and systematic literature review analysis. **Under Review** in *Sustainability Accounting Management and Policy Journal*.
2. Seven years of United Nations' Sustainable Development Goals in Africa: A bibliometric and systematic methodological review. **Published** in *Journal of Cleaner Production*, Volume 395, 136422.
3. Governance and United Nations' Sustainable Development Goals: Falling Behind Or Getting Ahead in Africa? **Under Review** in *Corporate Governance: An International Review*
4. Moving the Sustainable Development Goals Forward? Firm's Contributions in Africa. **Under Review** in *Africa Journal of Management*.

ABSTRACT

Over the past seven years, the advancement of Sustainable Development Goals (SDGs) is gaining increasing attention in the African context. Consistent with this effort, the first paper reviews the existing literature systematically and further ascertains whether governance and firm engagement drive SDGs. Using the 2020 PRISMA of 583 usable papers retrieved from Scopus, WOS, and seven recognized publishers and digital libraries for analysis, the study identifies nine clusters where the advancing of the SDGs in Africa was not progressing. The study then conducts a second paper using the *R Studio software* to analyze 200 papers on SDGs in Africa. The results reveal that SDGs literature in Africa is an imminent study area, and there are two main strands of literature advancing SDGs in Africa including governance and firm engagement. The third paper thus, analyzes 46 African countries using multivariate analysis and an ordered probit model to examine the nexus between governance and the SDGs. The study reports a significant and positive relationship between governance and the scores of SDGs indicating that Africans are getting ahead and tend to exhibit enhanced environmental, social, and economic sustainability. Additional evidence supports the significance of governance in promoting SDGs in Africa focusing on quality education (SDG 4), gender equality (SDG 5), climate mitigation efforts (SDG 13), and partnership for the goals (SDG 17). Finally, the last paper shows how firms in Africa are also advancing the 17 SDGs. The comprehensive content analysis of 223 corporate reports shows that firms in Africa are also advancing quality education (SDG 4), industry, innovation and infrastructure (SDG 9), reduced inequality (SDG 10), responsible consumption and production (SDG 12), and partnership for the goals (SDG 17). Implications for theory and practice are discussed in each paper.

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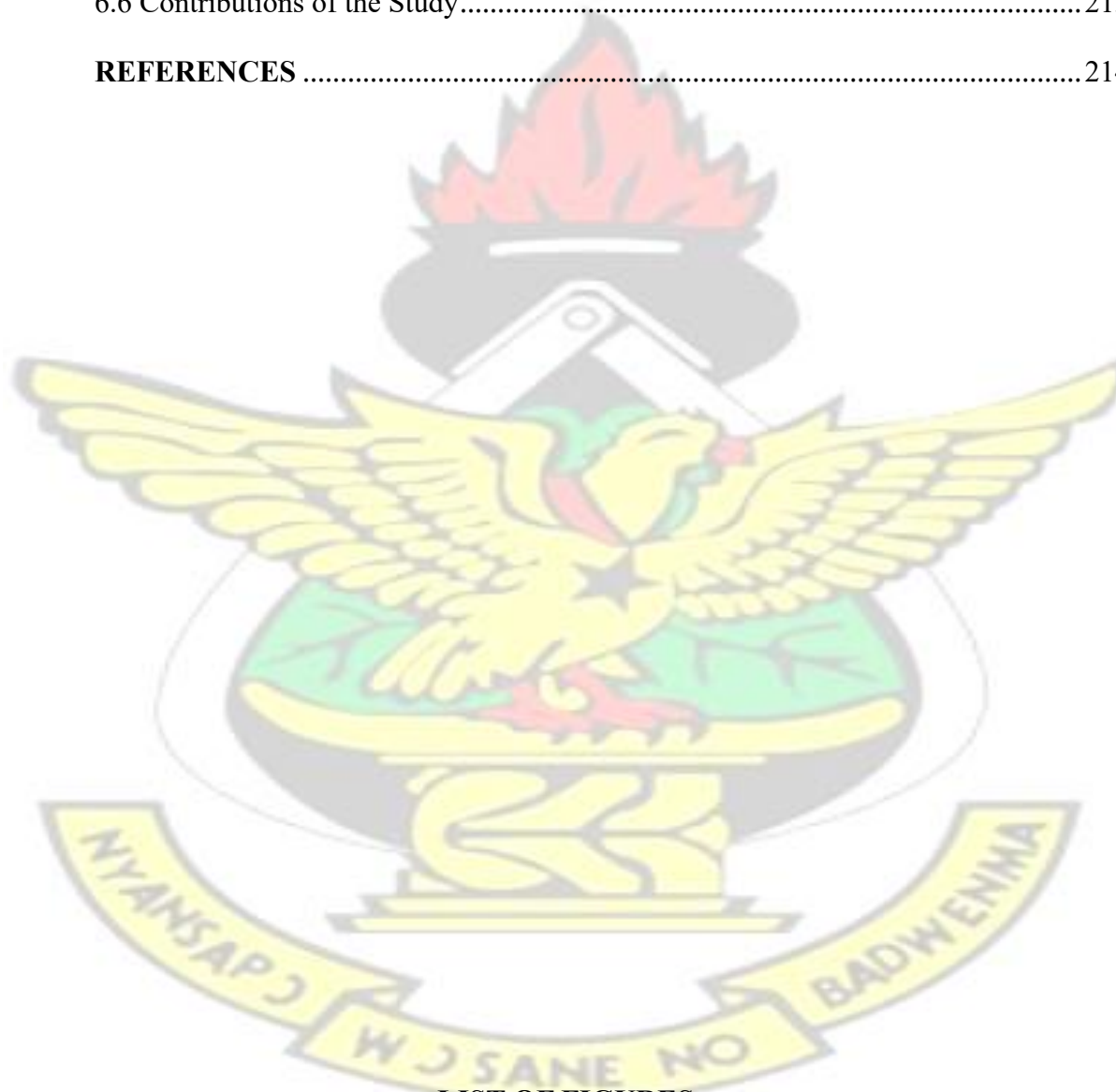
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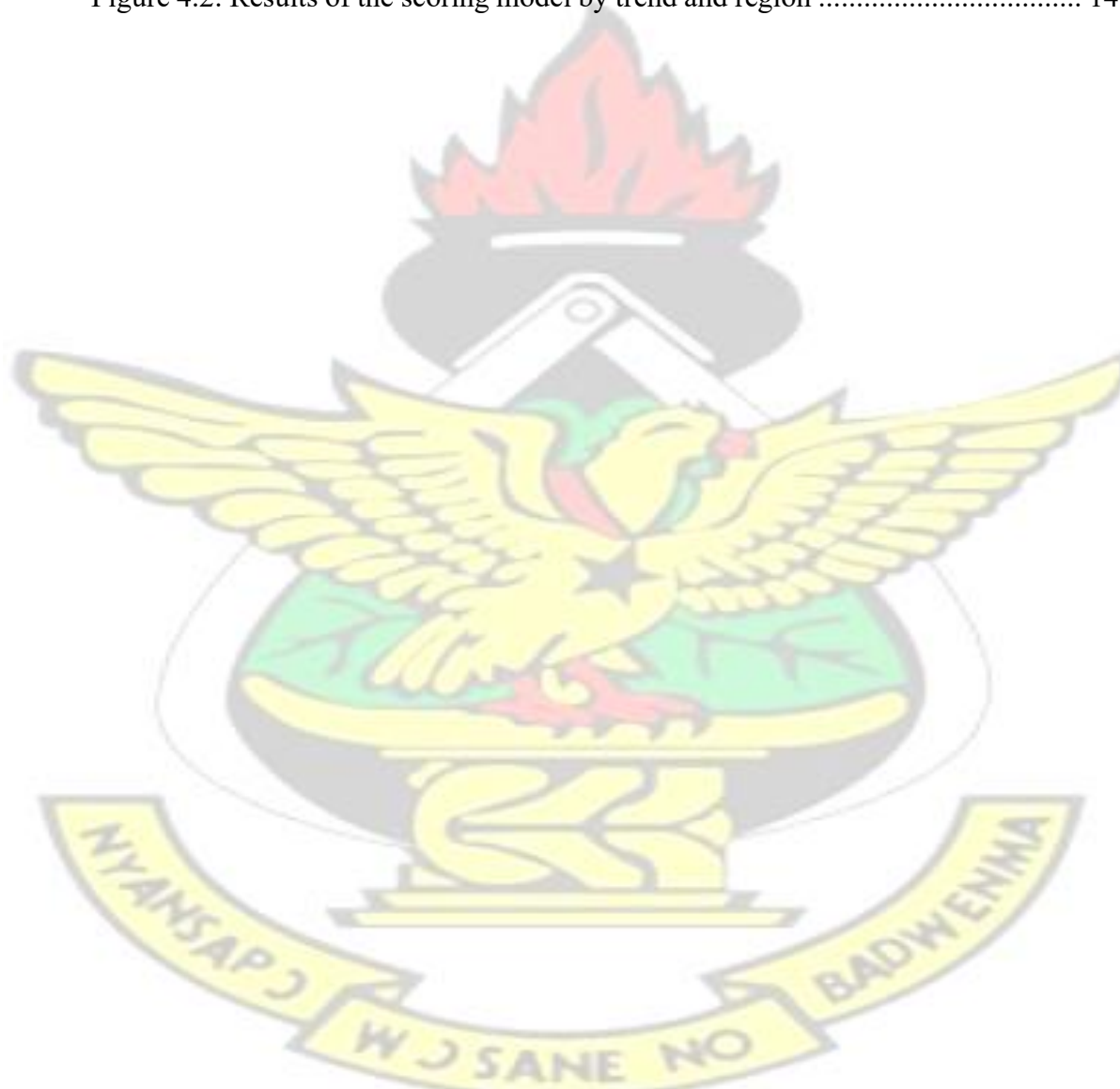
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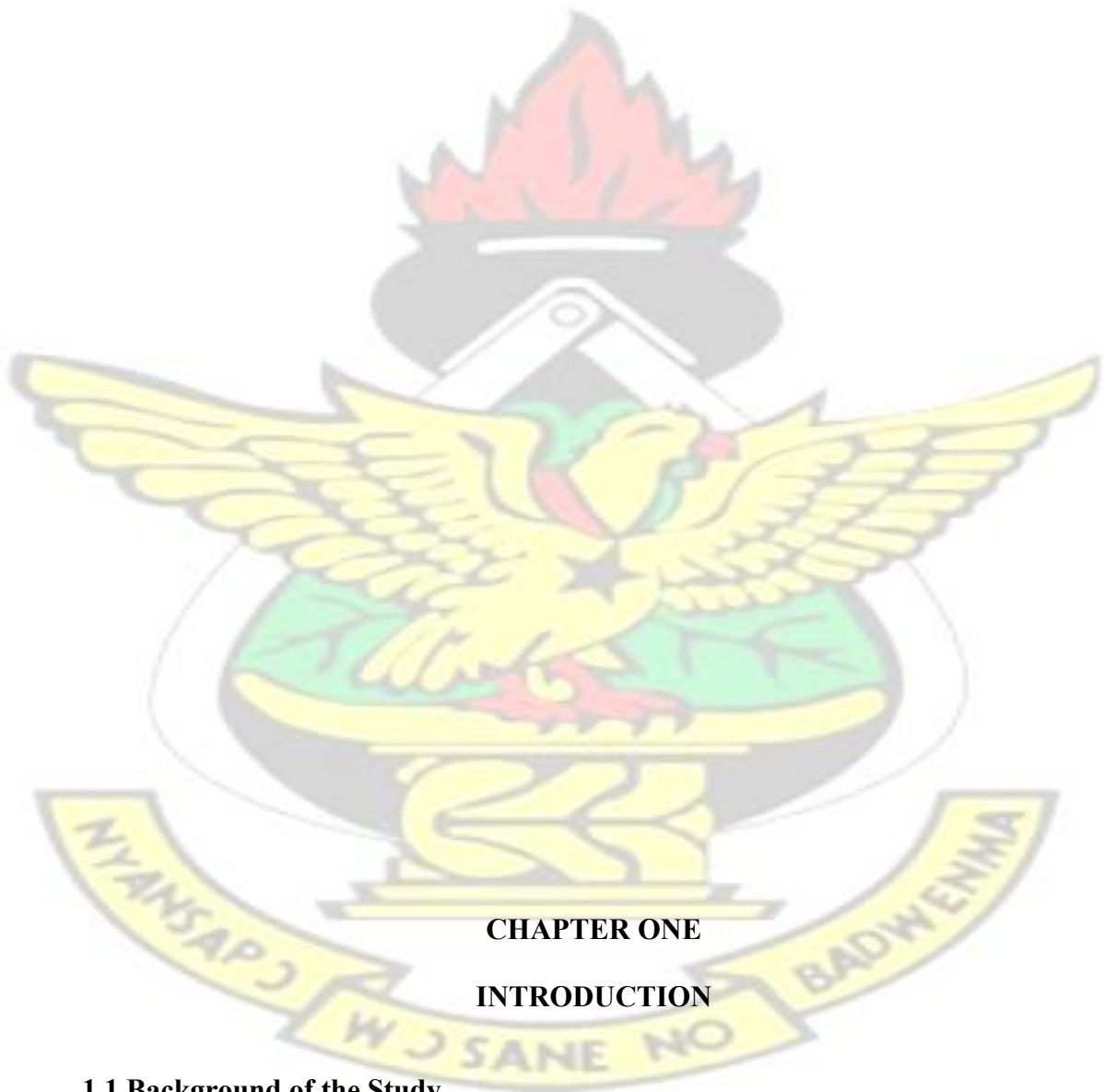
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CHAPTER ONE

KNULIST INTRODUCTION



CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The 193 United Nations (UN) established 17 Sustainable Development Goals (SDGs) in 2016 to advance better life across the globe by 2030 (Abhayawansa, Adams, and

Neesham, 2021; Arena et al., 2023; Malan, 2023; Mangena, Sorour and Mathuva, 2023).

These SDGs have gained attention and endorsement among stakeholders, especially firms worldwide, such as the professional accounting bodies that train high-quality individuals and develop policies that initiate this global aim (Bebbington and Unerman, 2020). Professional accounting bodies are inevitable partners in achieving the SDGs (Abhayawansa et al., 2020). The SDGs follow the Millennium Development Goals (MDGs) which represent the first effort in creating policies to advance the development of emerging nations (Pizzi et al., 2020). On the contrary, the MDGs lead to poor outcomes due to disparity among countries (Pizzi et al., 2020). Thus, the introduction of the SDGs needs ex-ante estimation to come out with innovative strategies to achieve its purpose (Abhayawansa et al., 2021; Kühnen *et al.*, 2019; Amorós Molina et al., 2023). Scholarly papers have unable to provide strategies that can help provide reliable implications for achieving the SDGs, and currently, there is no theory (Gyimah *et al.*, 2023).

Moreover, these SDGs have gained attention and endorsement among stakeholders, especially firms worldwide, such as the business, management, and accounting bodies that train high-quality individuals and develop policies that initiate this global aim (Bebbington and Unerman, 2020; Hörisch, 2021). Business, management, and accounting bodies are inevitable partners in achieving the SDGs (Ordonez-Ponce et al., 2021). Surprisingly, the need to assess and understand the SDGs using appropriate methods remains unaddressed (Schaltegger et al., 2018; Saenz, 2023). Most extant literature focuses on developed countries, neglecting developing countries with different economic, cultural, and governance systems (Rosati and Faria, 2019). Including advanced nations in the global agenda challenges unified strategies or methods due to

varied stakeholders' prospects concerning firms' activities. Hence, there again is the need to conduct research focusing on developing nations to develop precise SDGs strategies (Saenz, 2023).

The recent UN 2020 report asserts that developing countries have not achieved about a quarter of the SDGs. What can be the cause of this? Extant literature has not delved into why African countries cannot achieve most SDGs. Zheng et al. (2021) argue that this unaddressed issue can be adapted from developed countries and the inability to review in-depth trends of SDGs focusing on only developing countries. Also, recent studies that have empirically tested the SDGs focus on the relationship between business and SDGs (Mio et al., 2020), management and SDGs (Pizzi *et al.*, 2020), accounting and SDGs (Bebbington and Unerman, 2020), policy integration and SDGs (Bornemann and Weiland, 2021), and financial performance and SDGs (Muhmad and Muhamad, 2021). Most of the other extant literature on SDGs focuses on developed countries (see O'Dwyer and Unerman, 2020; Schaltegger et al., 2017; Khan and Gray, 2016; Makarenko and Plastun, 2017; Kaur and Lodhia, 2019; Tsalis et al., 2020; Jones, Hillier, and Comfort, 2016; Patuelli and Saracco, 2023; Pineda-Escobar, 2019; Yiu and Saner, 2017; Redman, 2018), neglecting the developing countries where legal and political systems, labour systems, micro-and-macro economies, culture, and education are different developed economies (Rosati and Faria, 2019). Here, implications and models towards SDGs may not be applicable in developing and other emerging countries (Dressler and Bucher, 2018). Contemporary scholars are calling for more research to be conducted in Africa due to the complexity and diversity of cultures, ethnic compositions, currencies and geography variations, and varied typologies of political and economic institutions that undergird the processes of political

transformation and economic development. Thus, there is the need to conduct another study focusing on only Africa to understand better the trends, gaps, and future directions towards the achievement of the SDGs.

Moreover, past and present extant literature on SDGs fails to inquire about an allinclusive assessment of unsustainability indicators such as governance and firm engagement (Gyimah et al., 2023). The issue of governance and Sustainable Development Goals (SDGs) is an important empirical question that demands investigation because it helps us understand how governance practices can contribute to achieving the SDGs. Good governance is crucial for effective implementation and monitoring of the SDGs, as it ensures transparency, accountability, and participation. Investigating the relationship between governance and SDGs can provide insights into the factors that enable or hinder progress towards sustainable development. This knowledge can inform policy-making, guide interventions, and help create strategies that promote inclusive and sustainable development for all. Additionally, studying firm engagement on SDGs from the context of Africa is important because it helps us understand the unique challenges and opportunities faced by African businesses in contributing to sustainable development. Africa is a diverse continent with varying socio-economic conditions, and studying firm engagement can shed light on the specific ways in which African companies can align their operations with the SDGs.

This research can provide insights into innovative business models, partnerships, and strategies that can drive sustainable development in Africa, while also addressing local needs and priorities. By understanding firm engagement in Africa, we can foster inclusive and impactful approaches to achieving the SDGs on the continent. Thus, this

this thesis addresses the aforementioned gaps to address the extent to which neglected issues such as governance and firm engagement are advancing the SDGs in Africa.

1.2 Problem Statement

1.2.1 Governance and United Nations Sustainable Development Goals

Scholarly research has highlighted the significance of good governance in advancing the SDGs. According to a study by Kroll et al. (2019), countries with strong institutions and transparent decision-making processes are more likely to make progress towards sustainable development. This is because effective governance ensures accountability, promotes citizen participation, and fosters stakeholder cooperation. Furthermore, scholars have emphasized the need for inclusive governance structures involving all societal segments (Gyimah et al., 2023). Additionally, research has shown that good governance practices contribute to economic growth and social well-being, essential to SDGs (Bäckstrand et al., 2020). Acemoglu and Robinson (2012) argue that countries with strong institutions and effective governance mechanisms are more likely to achieve the SDGs. Likewise, Kaufmann et al. (2009) find that good governance, including transparency, accountability, and rule of law, is positively associated with progress towards SDGs.

Meanwhile, Knack and Keefer (1995) justify that governance indicators such as corruption control and economic growth do not drive sustainable development.

Regarding each of the 17 SDGs, Vinayagathan and Ramesh (2022) record that weak governance structures and corruption lead to ineffective poverty reduction programs, hindering progress towards eradicating poverty (SDG 1 – No poverty). Similarly, Johnson (2019) argues that poor governance practices, such as a lack of transparency in

agricultural policies, contribute to food insecurity and hinder efforts to achieve zero hunger (SDG 2 – Zero Hunger). Chen et al. (2020) demonstrate that inadequate governance systems result in limited access to healthcare services, compromising efforts to improve health outcomes for all (SDG 3 - Good Health and Well-being). Lee and Kim (2017) also highlight how weak governance structures in education systems lead to unequal access to quality education, undermining progress towards achieving inclusive education for all (SDG 4 – Quality education). Moreover, Smithson and Hertzog (2016) show that gender-biased governance practices perpetuate gender inequalities, hindering progress towards achieving gender equality (SDG 5 – Gender equality).

Additionally, studies (see World Bank Group, 2022) show that weak governance negatively impacts several goals, including clean water and sanitation (SDG 6), affordable and clean energy (SDG 7), decent work and economic growth (SDG 8), industry, innovation and infrastructure (SDG 9), reduced inequalities (SDG 10), sustainable cities and communities (SDG 11), responsible consumption and production (SDG12), climate action (SDG 13), life below water (SDG 14), life on land (SDG 15), peace, justice and strong institutions(SDG 16) and partnerships for the goals (SDG 17). Addressing these governance challenges is crucial to ensure progress towards a sustainable future in Africa (Gyimah et al., 2023).

The above studies show there is an extensive investigation on how governance affects the SDGs or sustainable development or growth; however, fewer studies are conducted focusing on the nexus of governance and the 17 SDGs in Africa with their key pillars such as environmental, social and economic issues. Thus, the implementation of SDGs

requires a dedicated effort at several levels, including the development of collaborative alliances across nations and stakeholders. These entities need to work together to successfully attain the desired objectives and targets (Aust et al., 2020). The pursuit of these objectives poses several problems for governments as they strive to combat extreme poverty while simultaneously promoting sustainable development in economic, environmental, and social domains (Gyimah et al., 2023; Mangena et al., 2023). To accomplish these objectives, it is incumbent upon each country to ensure effective governance mechanisms and foster novel collaborations between the private and public sectors (Glass et al., 2023). This study adds to the extant literature by examining the effect of governance on the achievement of the SDGs in a comprehensive manner using the network theory of governance.

1.2.2 Firm Engagements and United Nations Sustainable Development Goals

Firm engagement in Africa is vital for achieving the SDGs and fostering sustainable development (Adam et al., 2020; Arena et al., 2023; Van Hoang, Pham and Nguyen, 2023). By driving economic growth, promoting social progress, and embracing environmental sustainability, firms can become catalysts for positive change (Bebbington and Unerman, 2020). Governments, civil society organizations, and international institutions must collaborate with firms to create an enabling environment that incentivizes responsible business practices (Hörisch, 2021).

Moreover, firms should prioritize stakeholder engagement, transparency, and accountability to ensure their activities align with the SDGs (Bebbington and Unerman, 2020; Hörisch, 2021). One of the critical issues is to comprehensively evaluate reports of firms and the extent to which they are contributing to the SDGs.

There is a growing trend among firms to not only include references to actions linked to the SDGs in their yearly reports but also to produce dedicated reports, such as corporate sustainability reports, to address these goals (Arena et al., 2023). Examining sustainability reports is an established approach for assessing a company's sustainability initiatives (Nylund et al., 2022). The assessment of SDG implementation from an external perspective is contingent upon the degree of transparency shown by the organisations under examination. The disclosure has undergone enhancements over time, resulting in increased reliability of the reports as a data source for analysing the extent to which firms are involved in the SDGs (Arena et al., 2023; Amorós Molina et al., 2023). The use of enhanced sustainability reporting is expected to provide improvements in the outcomes of content analyses conducted on sustainability reports (Subramaniam et al., 2023).

This research seeks to examine how businesses are now addressing the SDGs, given the existing gap in our comprehension of company involvement with these goals. Currently, there is a lack of research examining firm reports on the sustainable practices used to attain the SDGs. Previous research has mostly focused on the examination of sustainability reports to get insights into organisations' comprehension of sustainability and to analyse their implementation of sustainable practices (Nylund et al., 2022). However, there is a lack of consideration for examining sustainability reports concerning the execution of sustainable initiatives to attain SDGs (Arena et al., 2023). This study investigates the digital publication of corporate sustainability reports, specifically focusing on the sustainable practices implemented by firms and their alignment with the SDGs.

1.3 Research Objectives

In this thesis, the objective relates to the implications of the developments on SDGs, particularly regarding governance and firm engagement in Africa. Each of the specific objectives is investigated in each paper. Thus, the study is in essays. The specific objectives are:

1. To identify accounting research or literature gaps concerning the SDGs.

This objective led to the first paper titled, —Business contributions on sustainable development goals: seven years bibliometric and systematic literature review analysisl.

2. To investigate business research and methodological gaps in Africa

The second objective also led to the second paper titled, —Seven years of United Nations' Sustainable Development Goals in Africa: A bibliometric and systematic methodological reviewl.

3. To assess the effect of governance mechanisms on UN Sustainable Development Goals.

Regarding the third objective, paper three titled, —Governance And United Nations' Sustainable Development Goals: Falling behind or getting ahead in Africa?l, is used to achieve the objective.

4. To assess how firms are involved or engaged towards the achievement of the SDGs in Africa.

The final paper titled, —Moving the Sustainable Development Goals forward? Firms Contributions in Africall, is used to achieve this objective.

In the first paper, a bibliometric and systematic review is conducted to develop innovative research strategies and innovation that can advance the five critical areas of

importance of the SDGs (people, planet, prosperity, peace, and partnership) by 2030. In terms of the People, the SDGs aim to improve the lives of people by addressing issues such as hunger, gender equality, and inclusive societies. The planet dimension of the SDGs emphasizes the importance of environmental sustainability. It aims to protect our planet by addressing climate change, conserving natural resources, promoting sustainable consumption and production, and preserving biodiversity. Prosperity within the SDGs refers to economic growth that is inclusive, sustainable, and reduces inequalities. It focuses on creating decent work opportunities, promoting entrepreneurship, ensuring access to financial services, and fostering innovation and sustainable industrialization. Peace is a crucial aspect of the SDGs, as it recognizes the importance of peaceful and inclusive societies. It aims to promote justice, reduce violence, strengthen institutions, and foster peaceful and inclusive decision-making processes. Finally, the partnership is a cross-cutting dimension that underpins the achievement of all the SDGs. It emphasizes the need for collaboration and cooperation among governments, businesses, civil society, and other stakeholders to mobilize resources, share knowledge, and implement sustainable development initiatives. The study focuses on accounting, business, or management papers retrieved from Scopus, Web of Science, and other seven recognized publishers and digital libraries for analysis. Specifically, the bibliometric analysis reveals the outstanding authors, countries, journals, papers, most linked references, bibliographic coupling, and themes advancing the SDGs. The SLR also reviews six taxonomies regarding research jurisdiction, organizations or institutions, geographical settings, SDGs studies, methods, and models contributing to the SDGs.

The second essay is a bibliometric and systematic methodological review of Africa to ascertain gaps that need to be filled in Africa to achieve the SDGs before or in 2030. Put differently, the second paper systematizes scientific knowledge created over the business, management, and accounting research debates to develop new inquiries, research questions, research themes, or trends using bibliometric and SLR analysis and documents from Africa. Of the 15 research questions identified, the second study finds that the nexus governance mechanisms, firm engagement and SDGs are unexamined in Africa, and this leads to papers three and four.

Thus, the third study examines whether governance drives the SDGs in Africa. Governance in Africa has long been challenging, hindering the progress towards achieving the SDGs due to rampant corruption, weak institutions and unaccountability, ethnic diversity and political instability, and limited access to quality education and healthcare (Barbier and Burgess, 2021). Through governance, the government is able to establish accounting standards and regulations that to ensure transparency, accuracy, and consistency in financial reporting. This helps to maintain the integrity of financial information and promotes trust in the economy. Additionally, national governance bodies may oversee auditing practices and enforce compliance with accounting standards to ensure accountability and protect the interests of stakeholders. Even though, governance plays a crucial role in achieving the SDGs; however, contradictory research findings have emerged regarding the effect of governance on the achievement of SDGs (Doyran, 2022). Some studies argue that good governance positively impacts the attainment of SDGs, while others suggest a weak correlation or even a negative relationship (Doyran, 2022). The third study, thus, examines whether effective governance advances the SDGs in Africa.

The final study focuses on firm engagement towards the SDGs. The study employs comprehensive content analysis using the Responsible Research and Innovation (RRI) perspective to ascertain innovation approaches firms in Africa have employed or engaged to accomplish the SDGs. RRI encourages organizations to consider ethical, social, and environmental aspects when conducting research and innovation activities. This broader perspective can influence accounting practices by promoting the inclusion of non-financial information in reporting, such as sustainability metrics or social impact assessments. By incorporating RRI principles, accounting can contribute to a more holistic understanding of an organization's performance and its impact on society. The final study, thus, comprehensively examine the corporate reports of 223 firms to find out their contribution towards the achievement of the SDGs in Africa.

1.4 Research Questions

The specific research questions are:

1. What are the accounting literatures gaps concerning the SDGs?
2. What are the business research and methodological gaps in Africa?
3. Do governance mechanisms drive UN Sustainable Development Goals in Africa?
4. How do firms involved or engaged towards the achievement of the SDGs in Africa?

1.5 Significance of the Study

The study makes significant theoretical and empirical contributions to the literature, in many respects. It provides further evidence on the debate on governance mechanisms drive United Nation's Sustainable Development Goals (SDGs) in Ghana. This study also adds to accounting literature by examining the key drivers of firms' contributions towards the UN SDGs from a developing country context. Thus, the study would

provide benchmarks to provide framework and regulations for financial reporting in Africa. Additionally, the study also extends the network theory of governance by whether governance advances SDGs in Africa. This study is the first to examine this nexus in Africa by incorporating all 17 SDGs, and the study also extends the debates of finding how firms in Africa contribute to the achievement of the SDGs. Moreover, this study also uses unique methods using bibliometric and systematic literature and methodological reviews to identify theoretical and empirical gaps for future studies in Africa toward the achievement of the SDGs.

Furthermore, the study provides managerial and policy implications relevant to stakeholders. For instance, the study would highlight the critical drivers of the SDGs in a developing country context. Government agencies or policymakers would use the study's findings to develop policies and developmental strategies. Likewise, government would be able to know the SDGs that are falling behind in order to provide relevant strategies to achieve them. Moreover, new and prevailing firms can also use the outcomes of the study to adjust their productive activities towards the SDGs. In addition, consultants and educators would base on the findings to advise their clients on the drivers of SDGs. Finally, society can profit indirectly and directly through the distribution of scarce resources, such as government aid towards the SDGs.

1.6. Theoretical Framework

1.6.1 Network Theory of Governance

The Sustainable Development Goals (SDGs) are a set of global objectives aimed at addressing pressing social, economic, and environmental challenges (Gyimah et al.,

2023). Achieving these goals requires effective governance mechanisms that can facilitate collaboration, coordination, and collective action among diverse stakeholders (Nylund et al., 2022). Network theory of governance provides a valuable framework to analyze and understand the dynamics of multi-stakeholder partnerships in the pursuit of the SDGs (Provan and Kenis, 2009).

The network theory of governance focuses on the relationships and interactions among actors within a governance network (Provan and Kenis, 2009). It emphasizes the importance of connective structures, information flows, and social capital in shaping collective decision-making and action. According to this theory, effective governance networks exhibit characteristics such as reciprocity, trust, shared goals, and distributed leadership (Bäckstrand and Lövbrand, 2016). One of the main challenges in achieving the SDGs is the need for collaboration and coordination among diverse stakeholders, including governments, civil society organizations, businesses, and academia (Adam et al., 2020). Network theory provides insights into how governance networks can facilitate cooperation and address collective action problems (Hörisch, 2021). By creating platforms for dialogue, knowledge exchange, and joint problem-solving, these networks can harness the collective wisdom and resources of stakeholders towards achieving the SDGs.

The network theory of governance offers valuable insights into the dynamics of multistakeholder collaborations and their contribution to achieving the SDGs (Bäckstrand and Lövbrand, 2016). By promoting collaboration, information sharing, trustbuilding, and resource mobilization, governance networks can enhance the effectiveness of efforts towards sustainable development (Provan and Kenis, 2009). To

realize the full potential of network governance, it is essential to foster inclusive and participatory processes that engage all relevant stakeholders and strengthen the connectivity and resilience of governance networks in Africa.

1.6.2 Institutional Theory

The institutional theory originated from the field of sociology, particularly through the contributions of Meyer and Rowan (1977), and expanded by DiMaggio and Powell (1983) and Scott (2008). The concept of legitimacy, in the context of institutional theory, is primarily concerned with general acceptability or adherence to established patterns and structures (Chen and Roberts, 2010). Firms, in their pursuit of legitimacy, opt for structures and practises that have previously gained social acceptance (Meyer and Rowan, 1977; Tetteh, Agyenim-Boateng and Simpson, 2023). The concept of institutional theory centres on the examination of the various pressures and limitations imposed by the institutional environment, which encompasses regulatory frameworks, political entities, legal systems, judicial bodies, and professional organisations (Scott, 2013).

The theoretical framework is based on the fundamental assumption that organisations possess the ability to exert influence on, as well as be influenced by, the various societal institutions (such as economic, political, social, and cultural standards) in which they are situated. Previous scholars in the field of institutional theory, such as Meyer and Rowan (1977), have directed their attention towards examining the influence of external factors on organisations. Specifically, they have explored how organisations are influenced by societal institutions, which encompass established economic, political, social, and cultural norms, and the expectations associated with them. These institutions

are frequently regarded as acceptable and authoritative within society, making it crucial to adhere to them to secure survival (Tetteh et al., 2023). In essence, the legitimacy of organisations is derived from their adherence to prevailing norms and standards within the socio-political economic context (Kondra and Hinings, 1998).

The notion of institutional isomorphism was initially presented by DiMaggio and Powell (1983) as a means of elucidating the impact of the institutionalised environment on organisations. The authors initially identified the concepts of competitive isomorphism and institutional isomorphism. Following this, Scott (2013) expanded upon the original classification by categorising it into three dimensions: coercive isomorphism, normative isomorphism, and mimetic isomorphism. The following section provides a brief discussion of the three forms of isomorphism. The coercive aspect of institutional isomorphism, referred to as power isomorphism, arises from the implementation of rules and regulations by societal institutions to enforce business behaviour that aligns with social norms (Meyer and Rowan, 1977). The rules and regulations referred to in this context encompass several legal frameworks, including but not limited to sustainability reports. Compliance with these regulations is expected from the key stakeholders in society (Scott, 2008).

The concept of normative isomorphic pressure pertains to the influence exerted by societal norms that are commonly seen as optimal practises and professional norms that establish the accepted "rules of the game." The apparent professionalism and adherence to best practises serve as a compelling factor that attracts additional actors, resulting in a type of normative pressure. The concept of mimetic pressure refers to the act of

imitating practises observed in organisations or countries that are perceived to be more successful or advanced (Rodrigues and Craig, 2007).

The impact of institutional theory on organisational and national conformity and isomorphism has led scholars to utilise the theoretical framework to analyse the worldwide adoption of SDGs. This has been demonstrated in studies conducted by Nylund et al. (2022), Adam et al. (2020), Gyimah et al. (2023), and Aust et al. (2020). In general, these studies have emphasised that the worldwide adoption of SDGs is influenced by the coercive, normative, or mimetic pressures of institutional isomorphism.

The impact of sustainability reporting on corporations may vary depending on the quality of institutional processes in the countries where they operate (Subramaniam et al., 2023). This is because organisations are influenced by the institutional environment and norms of their operating nations (Nylund et al. (2022). Achieving the SDGs in Africa has been ascribed to coercive influences, specifically the provision of financial and technical aid by global organisations such as the United Nations (Aust et al., 2020).

1.7 Research Design

Research design is the plans, procedures, and structures deployed to explore a study to answer research questions (Bryman and Bell, 2022). The research design for the study is in five main research themes: the purpose, approach, time dimension, strategy, and paradigm. In terms of the study's intention, the study uses explanatory research to conduct the investigation. The explanatory research's primary purpose is to examine the

relationship between the factors or determinants of governance, firm engagement and the SDGs.

For the research strategy, the study employs a similar experiment strategy used by extant scholarly researchers (for example, Aust et al., 2020). The experiment strategy helps test the hypothesis to ascertain the nexus between governance, firm engagement and the achievement of the SDGs. In terms of the research approach, the study uses mixed approaches to achieve the study's objectives. Saunders et al. (2009) argue that mixed approaches seek to ascertain an in-depth understanding of variables to achieve the objectives of the study.

Moreover, the study is quantitative research since it deals with numerical data using descriptive and inferential statistics. Descriptive and inferential statistics including Ordered Probit Regressions are used for the study. The justification for which the quantitative is considered suitable for this study is the features of the approach to be more reliable and objective, use statistics to generalize findings, test the hypothesis and look at the relationships between governance and SDGs in Africa. Also, the time dimension of this study adopts the longitudinal time series. Aust et al. (2020) use a similar approach to examine the FDI and the SDGs. The statistical analysis aim is to find answers to the research questions and the hypotheses of the study.

Finally, this study considers objectivity concepts, and therefore, the study uses a positivist paradigm. The positivist paradigm believes that there is only one truth irrespective of the outcome adopted. This explanation means that the study seeks to

objectively investigate the nexus between governance, firm engagement, and the UN SDGs in Africa using procedures and approaches with replication in mind.

1.8. Structure of the Thesis

The research is in five chapters. The first chapter introduces the study and provides the purpose of conducting the research. The introduction chapter comprises the introduction, research objectives, stylized facts on governance and SDGs, firm engagement and SDGs, theoretical framework, research design, and structure of the thesis. Chapter two provides the first review paper using bibliometric and systematic literature review to conduct research gaps related to the 17 SDGs in multidisciplinary business, management, or accounting fields between 2015 and 2022. Chapter three looks at the second review paper which systematically explores through bibliometric literature and systematic method reviews about authors, countries, cited papers, journals, author's keywords, topic dendrogram, and methodological choices of papers associated with Africa SDGs scholars. Chapter four provides the third paper which examines the extent to which governance contributes to the attainment of the UN SDGs in the African context. The final chapter provides the last paper that comprehensively examines corporate reports of 223 firms to find out their contribution towards the achievement of the SDGs in Africa.

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CHAPTER TWO

PAPER ONE

BUSINESS CONTRIBUTIONS ON SUSTAINABLE DEVELOPMENT GOALS: SEVEN YEARS BIBLIOMETRIC AND SYSTEMATIC LITERATURE REVIEW ANALYSIS

CHAPTER TWO

BUSINESS CONTRIBUTIONS ON SUSTAINABLE DEVELOPMENT GOALS: SEVEN YEARS BIBLIOMETRIC AND SYSTEMATIC

LITERATURE REVIEW ANALYSIS

Abstract

This review presents a bibliometric performance and systematic literature review (SLR) of research publications related to the 17 SDGs in multidisciplinary business, management, or accounting fields between 2015 and 2022. The 2020 updated Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) is used to ascertain 583 usable papers retrieved from Scopus, Web of Science, and seven recognized publishers and digital libraries for analysis. The identified 583 papers on SDGs, authored by 1,610 scholars and published in 207 peer-reviewed sources, are analyzed using *VOSviewer* and *R Studio software*. The analysis reveals the existence of nine independent clusters of SDGs business research: artificial intelligence and digitalization (red cluster), business collaboration (green cluster), corporate sustainability (blue cluster), circular economy and corporate social responsibility (yellow cluster), entrepreneurship and innovation (purple cluster), education for developing countries (aqua cluster), climate change and tourism (orange cluster), Africa perspectives (brown cluster), and sustainable investment (black cluster). Main insights into the bibliometric performance and literature taxonomies (research jurisdiction, organizations, geographical settings, SDGs studies, research methods, and SDGs models) are discussed, and further research directions are provided. This review highlights the foundation for multidisciplinary business, management, or accounting studies debate linked to the advancement of the SDGs after seven years of its adoption by United Nations. The findings are vital for stakeholders leading the SDGs initiatives, research, and innovation that deepen the understanding of business debates and contributions of the 17 SDGs. To the best of our knowledge, this study is the first to conduct a seven-year detailed bibliometric and SLR that systematizes scientific

knowledge generated from the business, management, or accounting studies after the post-adoption of the SDGs using data from Scopus, WoS, and other digitally recognized libraries.

Keywords: UN sustainable development goals (SDGs), Agenda 2030, systematic review, PRISMA, business research

2.1. Introduction

Over the past seven years, the advancement of the 17 United Nations (UN) Sustainable Development Goals (SDGs) has gained increasing attention across every nation due to its critical importance towards humanity and the planet (Arena *et al.*, 2023; Lauwo *et al.*, 2022; Malan, 2023). There is a global partnership between all countries and stakeholders to achieve the SDGs before 2030 (Agrawal *et al.*, 2022; Patuelli and Saracco, 2023; Subramaniam *et al.*, 2023). The 17 SDGs established in 2015 by 193 UN member states after the eight Millennium Development Goals (MDGs) intended to combat hunger, poverty, disease, environmental degradation, illiteracy, and discrimination against women (Mangena *et al.*, 2023; Saenz, 2023; Tetteh, Agyenim-Boateng and Simpson, 2023). Economic disparity and research have been identified as the main reasons for the non-achievement of the MDGs by most countries before the end of 2015 (Lauwo *et al.*, 2022). Hence, global partners and stakeholders anticipate that intensive business research on SDGs could be a panacea for countries to achieve them before 2030 (Arena *et al.*, 2023; Amorós Molina *et al.*, 2023; Bebbington and Unerman, 2020; Van Hoang, Pham and Nguyen, 2023). In view of this, business scholars are calling for more innovative research strategies that can advance the five critical areas of importance of the SDGs (people, planet, prosperity, peace, and partnership). Accordingly, Mio *et al.* (2020) argue that business systematic

literature review (SLR) research provides reliable information to help countries strategize to accomplish the SDGs.

Business review papers on the SDGs have already been recognized in the extant literature (Gyimah et al., 2023). However, bibliometric performance and SLR analysis explicitly using extant literature on business, management, or accounting, and SDGs between 2015 to date are sparse with segregated outcomes. For instance, Pizzi *et al.* (2020) analyzed 266 papers from the Scopus database that focused on keywords, titles, and abstracts containing either —sustainable development goal* or —sdg*. The authors' approach, therefore, neglects other important papers focusing on other SDGs' names such as the global agenda, sustainable development agenda, 2030 agenda, or UN global goals. Additionally, Pizzi *et al.*'s (2020) review includes papers from 2012 to 2014 published before the SDGs' official adoption in 2015. In a post SDG adoption review, Mio *et al.* (2020) used 101 papers between 2015 and 2020. However, their study was limited to papers focusing on the strategic role of businesses. Other recent review studies are also limited in several aspects. For instance, Voola *et al.* (2022) review 58 B2B marketing scholarships and SDGs, and Aravindaraj *et al.* (2022) review 63 papers related to industry 4.0, warehouse management, and SDGs including papers that date back to 1978 and 2008. Agrawal *et al.* (2022) focus only on supply chain practices and business strategies, neglecting other business themes. Overall, an all-inclusive business review study on SDGs postadoption by UN member states seems to be missing. This suggests that the generality of outcomes by extant reviews within the SDGs context may be challenging. Our paper, therefore, attempts to fill this gap by adopting bibliometric analysis and SLR of SDGs publications from multidisciplinary business, management,

or accounting fields between 2015 and 2022. In addressing its research objectives (RO), this study:

- RO1. Identifies the outstanding authors, countries, journals, papers, most linked references, and bibliographic coupling of business, management, or accounting studies contributing to the SDGs;
- RO2. Uncovers independent research clusters or themes to deepen the understanding and knowledge within the academic business, management, and accounting community about the SDGs after the post-adoption; and
- RO3. Examines research taxonomies such as jurisdictions, organizations, geographical settings, SDGs studies, methodologies, and frameworks or models advancing the SDGs for further research directions.

This current paper varies in scope from extant reviews in several ways. First, the paper relies on Scopus and Web of Science databases and includes other crossvalidation data from seven recognized publishers and digital libraries of papers published after the post-adoption of the SDGs. Second, it includes articles with keywords, titles, and abstracts containing other terminologies that describe SDGs, such as global agenda, sustainable development agenda, 2030 agenda, or UN global goals. Third, the paper does not centre solely on explicit literature streams or industry themes. Instead, it includes contemporary interdisciplinary business, management, or accounting fields advancing the 17 SDGs. Thus, the paper systematizes scientific knowledge generated from the business, management, or accounting studies advancing the 17 SDGs to provide relevant information on literature and methodological gaps that can be of interest to scholars and

practitioners to advance new inquiry to advance the attainment of the global goals before 2030.

The paper follows the following structure: Section 2 provides the research approach, data, inclusion and exclusion criteria, and analyzed documents. Sections 3 and 4 provide bibliometric analysis and thematic analysis, and SLR analysis results, respectively. Section 5 concludes.

2.2 Methods

2.2.1 Research Approach

This study maps knowledge stimulated by scholarly business, management, and accounting authors using different research methodologies to advance the 17 SDGs. We do this by employing bibliometric and SLR approaches using in-depth content and topics techniques (systematic qualitative review) and quantitative bibliometric tools. We follow the steps of the 2020 updated Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) by Page *et al.* (2021) to describe the review methods (See Figure 2.1).

We begin with a comprehensive literature search using two recognized databases as well as seven other recognized publishers and digital libraries. The two databases included in the search are Elsevier's Scopus and Thomson Reuters' Web of Science (WoS). Scopus and WoS are the most extensive literature sources covering diverse interdisciplinary scientific fields (Singh *et al.*, 2021). Though most published business papers may be found either in Scopus or WoS, new and emerging journals with less than five years in existence but making vast contributions to the SDGs may be excluded from

these databases. Thus, to ascertain all business-related literature perspectives on the SDGs, we expand our search to seven recognized publishers using the advanced search engine of these journal publishing companies and digital libraries from 2015 to 2022: Journal Storage (JSTOR), Springer Publishing Company, Taylor and Francis Company, Emerald Publishing Limited, Wiley Online Library, SAGE Publishing Company, and Inderscience Publishers.

2.2.2 Data Search

The scope and retrieval of all SDG literature focused on business, management, and accounting perspectives from 2015 to 2022. The study broadens the scope and retrieves all relevant SDG papers by searching similar phrases such as the "Global Agenda," "sustainable development agenda," "2030 Agenda", or UN Global goals that are the same as SDGs. The study, therefore, uses the following search Boolean string to generate the first set of data (or papers): "sustainable development goal*" OR "SDG*" OR "Global Agenda" OR —sustainable development agenda" OR "2030 Agenda" OR "UN Global goal*".

2.2.3 Sample, Inclusion, and Exclusion Criteria

Focusing on the literature of business, management, and accounting perspective, a total of 45,089 papers are retrieved from Scopus, WoS, and the other seven digital libraries or publishes (Scopus, n = 22,054, WoS, n = 16,542, JSTOR, n = 550, Springer, n = 387, Taylor and Francis, n = 860, Emerald, n = 3,265, Wiley Online, n = 597, SAGE, n = 416, and Inderscience, n = 418), focusing on the papers published in English. Following the PRISMA framework (see Figure 2.1), the study first screened the entire retrieved documents (n = 45,059) and excluded papers (n = 11,587) that are

abstracts, editorials, conferences, reviews, books, book series, book chapters, forthcoming articles, and papers in press, which reduces the papers to 33,502. We identified and removed 31,115 duplicates explained by our inclusion of other search engines, leaving 2,387 papers. We then screen the title, abstract, and keywords to remove an additional 1,584 papers that are unrelated to the SDGs. To ensure essential substantive suitability, the authors read the remaining 803 papers to select final documents aligned with the study's objectives or research perspectives. Mio *et al.* (2020) use this inclusive approach to determine final papers. Hence, a usable sample of 583 papers is retained for the bibliometric analysis and SLR, the highest sample so far on SDGs review papers.

2.2.4 Sample Analysis

The data retrieved from the databases and digital libraries are entered in Microsoft Excel. The usable sample ($n = 583$) is converted to BibTex and CSV Excel for Biblioshiny in R and VOSviewer software, respectively. The Biblioshiny in R software and VOSviewer are used to report bibliometric descriptive and basic inferential statistics on the sample information, publication per year, country scientific production, top-cited journals or sources, and prolific authors. Also, the R and VOSviewer report on the bibliometric analysis, such as the bibliographic coupling of articles, journals, authors, keywords, and themes on SDGs. The study presents the results in tables and visualization (diagrams or figures) for discussion and interpretation. Regarding the SLR, the study performs manual content scrutiny by reading each paper consistent with the best practice of qualitative analysis of SLR (Pizzi *et al.*, 2020). Following Pizzi *et al.* (2020), the papers are coded and grouped according to five taxonomies (see Table 2.1).

Figure 2.1: Screening and Selection Procedures

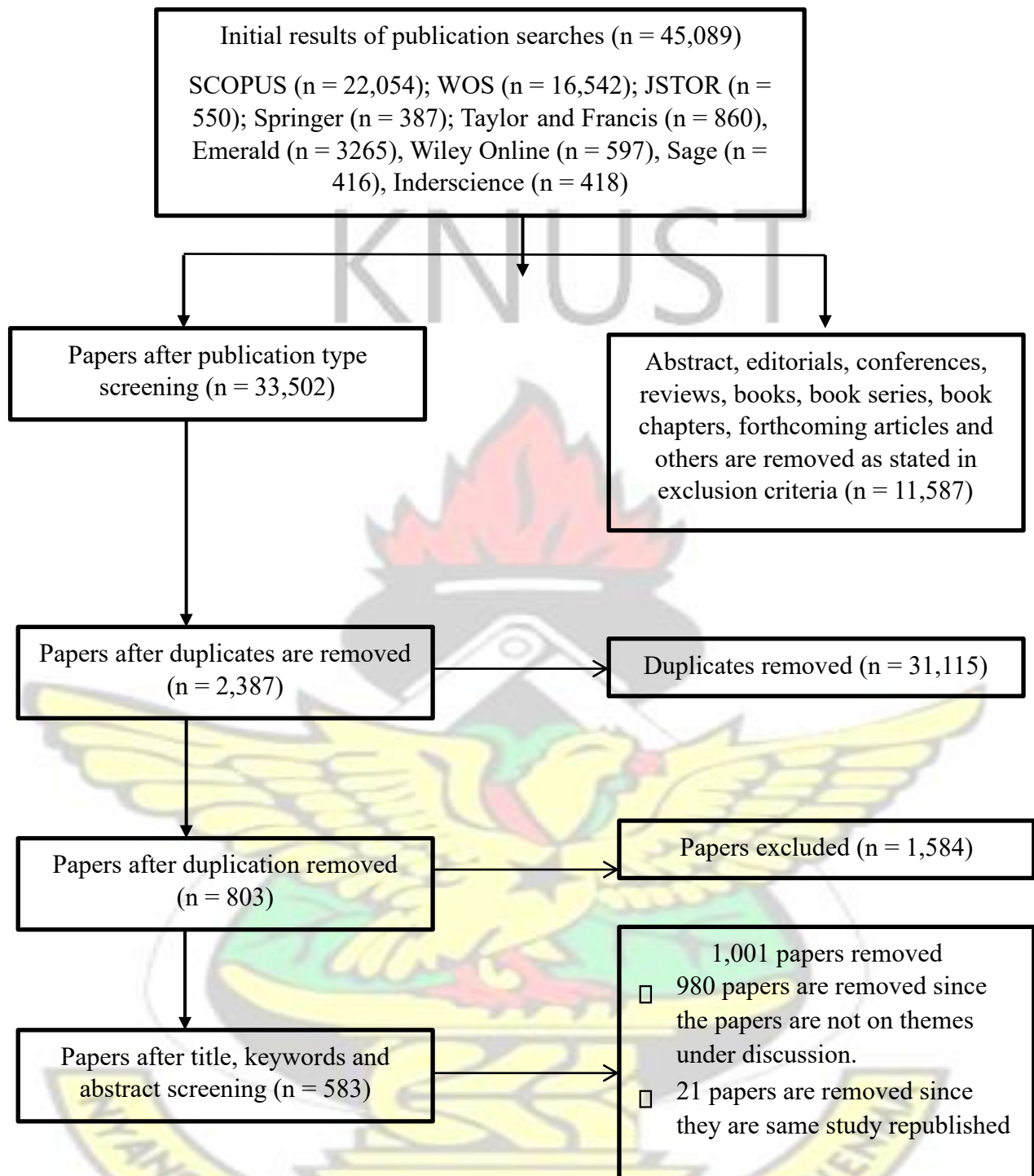


Table 2.1: Classification System for analyzing SDG articles

Taxonomies	Specific Taxonomies
1. Jurisdiction	a. Multinational/Global/Comparative
	i. General
	ii. Industry
	iii. Organizational

- b. Nationwide
 - i. General
 - ii. Organizational
- c. One institution/business/organization

2. Organizations

- a. Private Sector - Multinational or Global Organization
- b. Private Sector - Small and Medium-Scale Businesses
- c. Cities
- d. Public Sector Organization
- e. Not-for-Profit Organizations (NPO)
- f. Training Institutions/Colleges
- g. General/Others

3. SDGs Literature Focus

- a. Financial Reporting
- b. Non-Financial Reporting
- c. Policy-focused
- d. Business-focused Strategy
- e. Performance Dimension
- f. General/Others

4. Research Methods

- a. Narrative/Interview/Case/Field Studies
- b. Content Analysis
- c. Questionnaire/Survey
- d. Normative/Commentary Studies
- e. Secondary/Archival Studies
- f. Theoretical: Literature/Empirical Reviews

5. Frameworks/Models

- a. Proposes No Model(s)
- b. Uses Existing Model(s)
- c. Proposes New Model(s)

Source: Adapted from Pizzi *et al.* (2020)

2.3. Bibliometric Analysis Results

The bibliometric investigation uncovers emerging trends on how accounting, business, and management scholars contribute to the advancement of the SDGs. The following

sub-section discusses the descriptive and basic inferential statistics on the sample information, publication per year, country scientific production, top-cited journals or sources, prolific or top-cited authors, bibliographic coupling of articles, journals, authors, keywords, and themes on SDGs.

2.3.1 Sample Statistics

The descriptive statistics in Table 2.2 show that the mean citation per paper is 11.94, suggesting that SDGs papers from accounting, management, or business perspectives have an approximate average of 12 citations for each paper published from 2015 to 2022. The sample also shows that authors of 1,610 accounting, management, or business scholars have contributed to SDG advancement. Out of the 1,610 scholars, only 5.6% ($n = 90$) are sole authors, and 94.4% ($n = 1,520$) have published with other authors (multi-authored) advancing the SDGs. The study records a collaboration index of 3.11, indicating a high collaboration or team publications among scholars researching SDGs. Regarding paper per author, authors per paper, and co-authors per paper, the study records average scores of 0.362, 2.76, and 3.05, respectively.

Also, there is an astronomical annual growth rate of 57.46% for the 7-year period from 2015 to 2022, suggesting the ever-increasing business studies towards the SDGs. Based on the selection and inclusion criteria, the data shows that one paper was published when the UN member states enacted and signed the SDGs in 2015. Six papers are published in 2016, followed by 24 papers (2017), 43 papers (2018), 78 papers (2019), 114 papers (2020), 153 papers (2021), and 164 papers in 2022. The publication trend suggests that interest in SDG research continues to grow. It is promising that scholars continue to

advance knowledge on the SDGs by providing frameworks, policies, and implications for the achievement before the 2030 deadline.

Table 2.2: Sample Statistics (N = 583)

Description	Results
Citations per paper (mean)	11.94
Authors	1,610
Author appearances	1,781
	90
Authors of single-authored papers	
Authors of multi-authored papers	1,520
Paper per author	0.362
Authors per paper	2.76
	3.05
Co-authors per paper	
Collaboration index	3.11
Annual growth rate (%)	57.46

2.3.2 Most Prolific Authors

Table 2.3 presents the most productive authors (top five) advancing the global SDGs. Andrea Venturelli, the fifth prolific author, is an associate professor at the University of Salento (Italy) with five papers contributing to SDGs literature with 95 total citations, 19.0 mean citations, and 1.58 articles fractionalized. Pizzi Simone, a researcher at the University of Salento (Italy), occupies the fourth position with five papers, 96 citations, 19.2 mean citations, and 1.58 fractionalized articles. The third most productive business author advancing the SDGs across the globe is a female named Regina Scheyvens, a full professor at Massey University (New Zealand) with five papers with total citations of 169 and a mean citation of 33.8 and an article fractionalized of 2.17. Leal Filho Walker, a professor at Hamburg University of Applied Sciences (Germany), is the second most

prolific business author advancing the SDGs with six papers with total highest citations of 282, mean citations of 47, and article fractionalized of 0.98. The result shows that Sinha Avik, an associate professor at Goa Institute of Management (India), is the topmost prolific author with seven papers on SDGs, a total (mean) citations of 276(39.4), and an article fractionalized of 1.87. Sinha Avik, in particular, has contributed to the SDGs by designing and proposing SDG frameworks and policies to improve information and technology, green financing, and environmental and social responsibility (Sinha *et al.*, 2020; 2021).

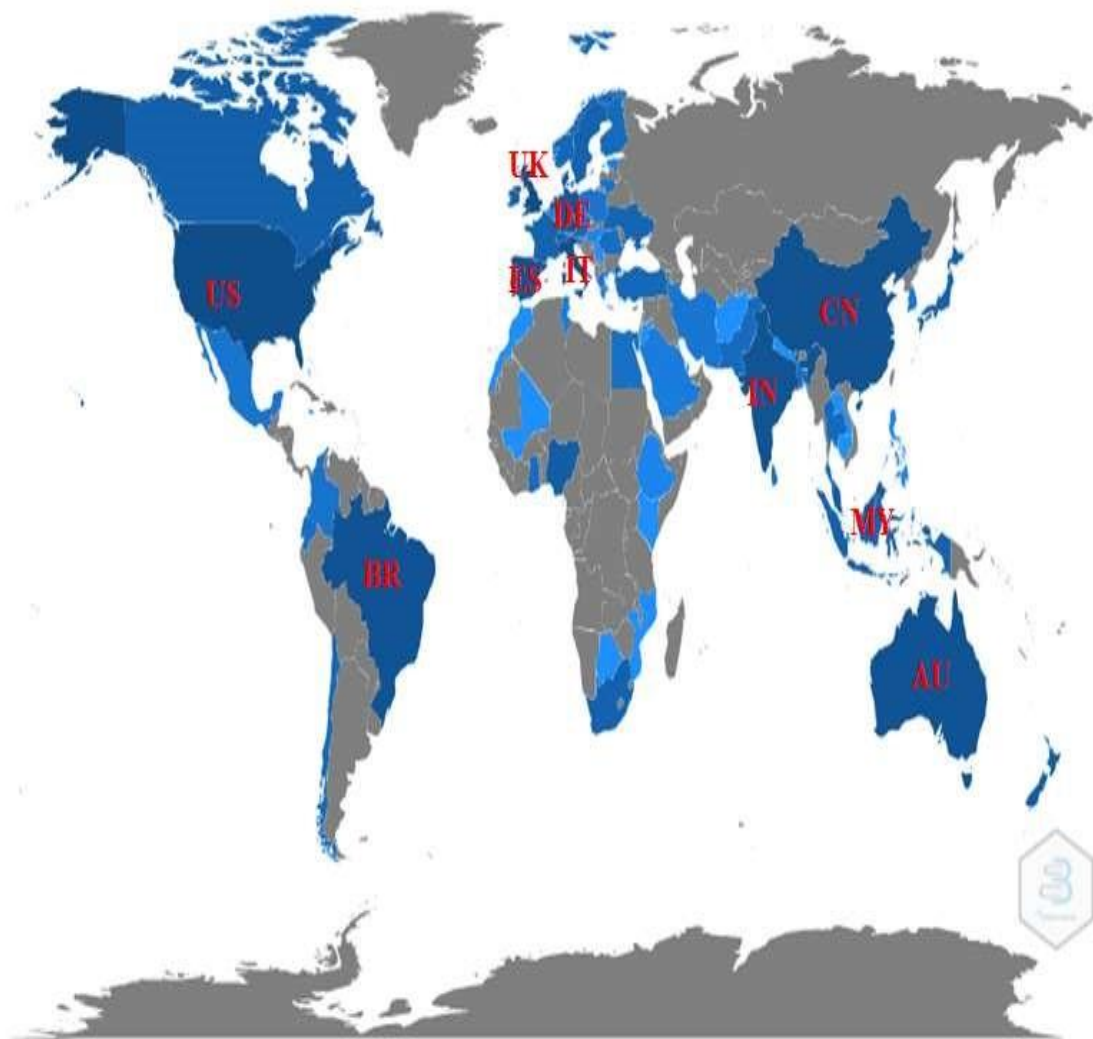
Table 2.3: Top 5 prolific cited authors

Authors	Articles	Citations	Mean Citations	Article Fractionalized
Leal Filho Walter	7	292	41.7	0.99
Sinha Avik	7	276	39.4	1.87
Scheyvens Regina	5	169	33.8	2.17
Pizzi Simone	5	96	19.2	1.58
Venturelli Andrea	5	95	19.0	1.58

2.3.3 Most Productive Country

The ten topmost productive countries with the highest number of papers on SDGs from the business perspective are the United States of America (n = 144), the United Kingdom (n = 143), Italy (n = 109), China (n = 98), Brazil (n = 96), Australia (n = 90), India (n = 86), Spain (n = 84), Germany (n = 65), and Malaysia (n = 49). Surprisingly, no African country is among the top ten most prolific countries advancing SDGs. Contemporary researchers are calling for more studies to be conducted in Africa. International bodies or policy think-tank institutions need to provide research funds to support scholars,

especially the developing nations in Africa, in contributing knowledge to achieving the SDGs. In Figure 2.2, the most productive countries are in dark blue. The light blue represents other countries contributing knowledge to the SDGs, and those in the dark colour are countries that do not have research advancing SDGs.



CODE	US	UK	IT	CN	BR	AU	IN	ES	DE	MY
Country	USA	UK	Italy	China	Brazil	Australia	India	Spain	Germany	Malaysia
Papers	144	143	109	98	96	90	86	84	65	49

Figure 2.2. Productive Countries

Table 2.4: Top 20 Productive Journals

Journals	Articles	Citations	Mean Citations	ABS Ranking	ABDC Ranking	AREA CODE	Articles Ranking	Citations Ranking
Journal of Cleaner Production	108	2096	19.41	2	A	SEC	1	1
International Journal of Management Education	27	551	20.41	1	C	MGT	2	2
Journal of Sustainable Tourism	16	475	29.69	3	A*	SEC	6	3
Technological Forecasting and Social Change	23	386	16.78	3	A	INV	3	4
Accounting, Auditing, and Accountability Journal	5	283	56.6	3	A*	ACC	16	5
Business Strategy and the Environment	13	206	15.85	3	A	SOC	7	6
Journal of International Business Policy	6	161	26.83	-	-	RPE	9	7
Annals of Tourism Research	5	142	28.40	4	A*	SEC	16	8
Cities	5	142	28.40	2	-	RPE	16	9
Corporate Social Responsibility and Environmental Management	6	136	22.67	1	C	RPE	9	10
Business Strategy and Development	17	102	6.00	-	-	RPE	5	11
Journal of Business Research	9	85	9.44	3	A	ETH	8	12
Futures	6	80	13.33	2	B	SOC	9	13
Corporate Governance (Bingley)	6	79	13.17	2	A	FIN	9	14
Sustainability Accounting, Management and Policy Jour	6	31	5.17	2	B	ACC	9	15
Organization and Environment	5	27	5.40	3	-	ORG	16	16
Statistical Journal of the Iaos	4	25	6.25	-	C	STA	20	17
Marketing Intelligence and Planning	6	24	4.00	1	-	MKT	9	18
Worldwide Hospitality and Tourism Themes	19	23	1.21	1	C	SEC	4	19
Tourism Management Perspective	6	21	3.50	2	A	SEC	9	20

Note: SEC = Sector, MGT = Management, INV = Innovation, ACC = Accounting, SOC = Social Science, RPE = Regional Studies, Planning and Environment, ETH = Ethics – Corporate Social Responsibility (CSR) Management, FIN = Finance, ORG = Organizational Studies, STA = Statistics, MKT = Marketing



2.3.4 Most Productive Journals

Table 2.4 presents the 20 most productive sources (journals) advancing the SDGs.

The top five journals with the highest published papers are the Journal of Cleaner Production (n = 108), International Journal of Management Education (n = 27), Technological Forecasting and Social Change (n = 23), Worldwide Hospitality and Tourism Themes (n = 19), and Business Strategy and Development (n = 17).

However, in terms of most-cited journals, the Journal of Cleaner Production leads with 2096 citations, followed by the International Journal of Management Education (citations = 551), Journal of Sustainable Tourism (citations = 475), Technological Forecasting and Social Change (citations = 386), and Accounting, Auditing, and Accountability Journal (citations = 283). These descriptive statistics show that the most productive source advancing or discussing the SDGs is the Journal of Cleaner Production. In particular, the Journal of Cleaner Production is a global transdisciplinary journal contributing to SDGs research focusing on sustainability and environmental assessments, sustainable cleaner production and consumption, education, governance, legislative policies, and corporate social responsibility practices.

Further analysis in Table 2.4 shows that most SDG business studies published papers in journals focusing on the sector's perspective. 25% of papers are published in sector areas, 20% on regional studies, planning, and environment, and 10% in accounting journals. Other areas such as finance, marketing, statistics, ethics or corporate social responsibilities, social science, and organizational studies record 5% of published papers. In terms of the journal rankings, 45% of the top 20 papers are published in top-tier journals (A or A*, n = 9) based on the Australian Business Deans Council

(ABDC), and 35% in above three stars (3*, 4, or 4* = 7) of the Chartered Association Business Schools journal ranking.

2.3.5 Most cited papers

Table 2.5 presents the most cited papers of authors advancing the SDGs. The paper titled “*Three frames for innovation policy: RandD, systems of innovation and transformative change*” by Schot and Steinmueller (2018) is the most cited paper, with 351 citations. Schot and Steinmueller (2018) argue that the SDGs are unattainable unless public policies are reframed to focus on participation, experimentation, anticipation, and the directionality of individuals and industries. They also argue that researchers need to investigate innovative policies widely to transform and achieve the SDGs.

Bebbington and Unerman’s (2018) paper “*Achieving the United Nations Sustainable Development Goals: An enabling role for accounting research*” follows with 239 citations. Their study explores the significant roles of the academic accounting community toward the achievement of the SDGs. Bebbington and Unerman (2018) use extant accounting studies on environmental, social, and sustainable development to propose new accounting frameworks for the attainment of the SDGs.

The third most cited paper, with 169 citations, is “*Constructing sustainable tourism development: The 2030 agenda and the managerial ecology of sustainable tourism*” by Hall (2019). Hall (2019) adds that achieving the SDGs by 2030 extensively also depends on the tourism sector which is a valuable solution to the global predicaments.

Hall (2019) also argues that tourism is the —sector of hope and advocates of the SDGs need to focus on paradigm shift of instituting policies that commits humanity towards the achievement of the SDGs.

Salvia *et al.*'s (2019) paper titled "*Assessing research trends related to Sustainable Development Goals: local and global issues*" occupies the fourth position with 137 citations. Their study reveals that it is becoming challenging for Africa countries to fight against SDGs linking to reduction of inequalities, alleviation of poverty and hunger, and improvement to sanitation and access to water. However, the Europeans focus on SDGs related issues such as sustainable production, quality education, innovation and infrastructure. Finally, Houvila *et al.* (2019) paper titled "*Comparative analysis of standardized indicators for Smart sustainable cities: What indicators and standards to use and when?*" with 134 citations is the fifth cited paper. Their contribution outlines the benchmarks for policymakers in selecting the appropriate indicators and standards for the global goals.

Table 2.5: Top 10 Most Cited Papers

Title	Year	Citations
Three frames for innovation policy: RandD, systems of innovation and transformative change	2018	351
Achieving the United Nations Sustainable Development Goals: An enabling role for accounting research	2018	239
Constructing sustainable tourism development: The 2030 agenda and the managerial ecology of sustainable tourism	2019	168
Assessing research trends related to Sustainable Development Goals: local and global issues	2019	137

2.3.6 Bibliographic Coupling

Bibliographic coupling is a valuable technique used to determine the popularity and significance of existing studies. It shows the nexus among aggregations of authors or research works researched on the same topic (Appiah *et al.*, 2022). Further, it examines whether two extant studies repeatedly cite the same studies or cite the same third study (Appiah *et al.*, 2022). The following subsections discuss the outcome of the bibliographic coupling on papers, journals or sources, and scholarly researchers.

2.3.6.1 Papers

The bibliographic coupling analysis on the units of published papers is to understand its theoretical foundations (Pizzi *et al.*, 2020). Following Pizzi *et al.* (2020), the analysis limited the coupling of papers to minimum citations of 2 for the 583 sampled papers. The result shows that 61.6% (n = 359) are linked together, and the top five most strongly-linked papers are the studies of Pizzi *et al.* (2020a), Mio *et al.* (2020), Modgil *et al.* (2020), and Van Zanten and Van Tulder (2021). However, in terms of the density connections, Figure 2.3 shows that Schot and Steinmueller's (2018) and Bebbington and Unerman's (2018) papers are extensively cited and considered in accounting, management, or business studies literature on SDGs. Further, the result indicates 15 different clusters providing diverse research arenas about SDGs.

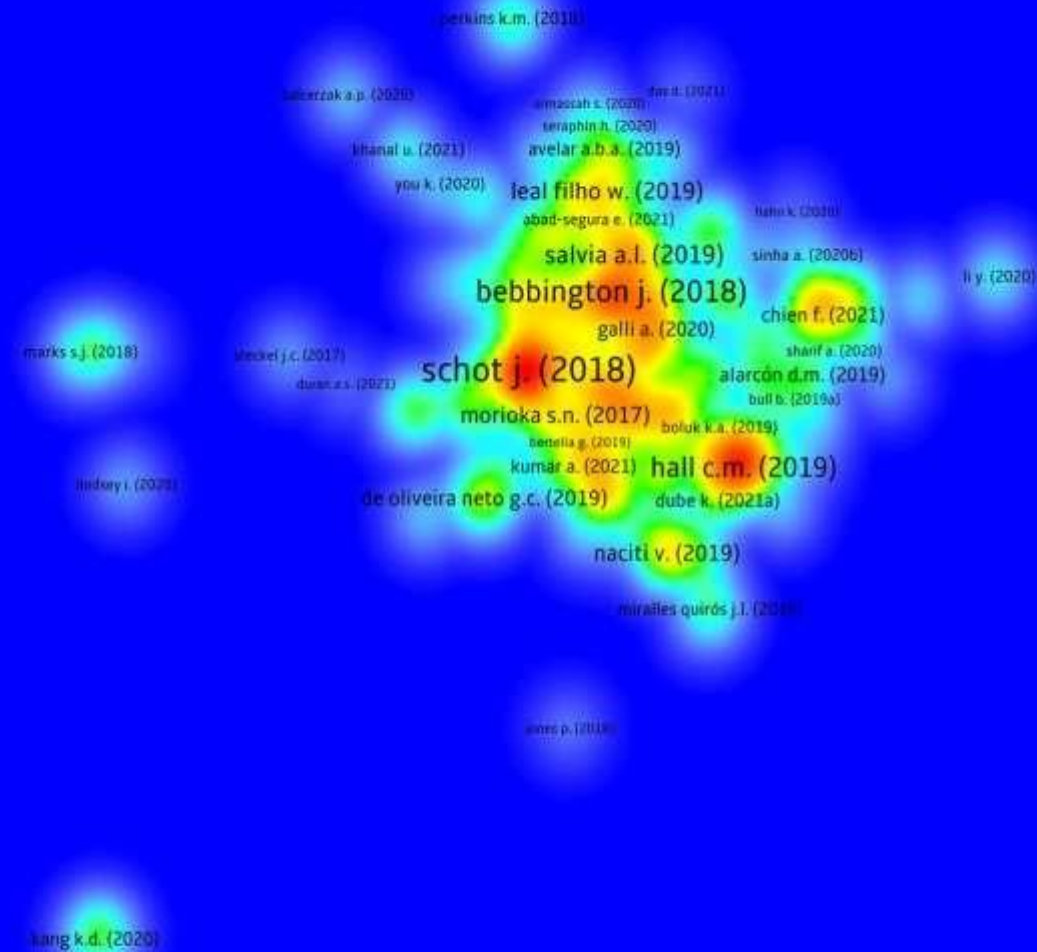


Figure 2.3: Bibliographic Coupling of Papers

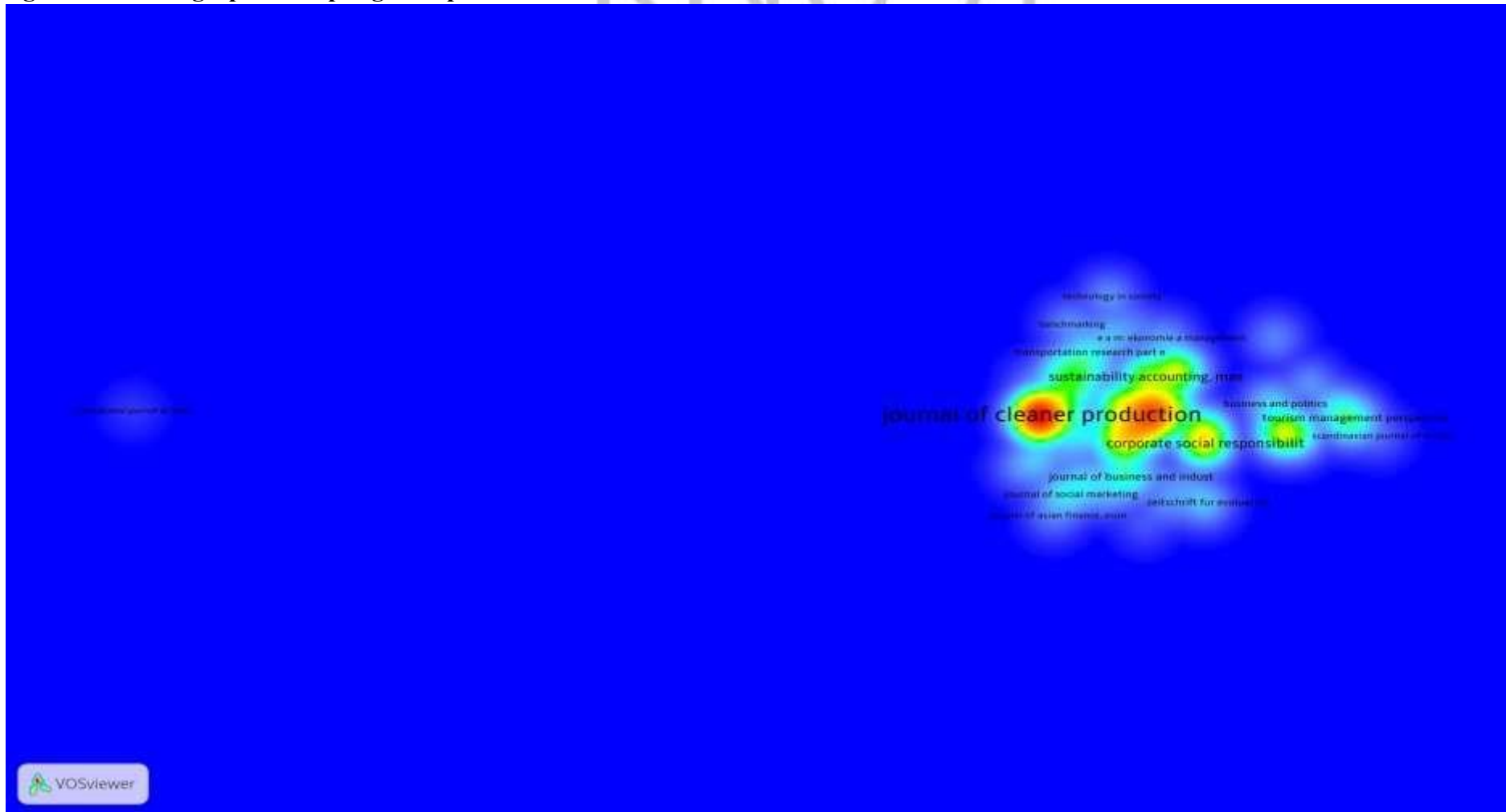


Figure 2.4: Bibliographic Coupling of Journals

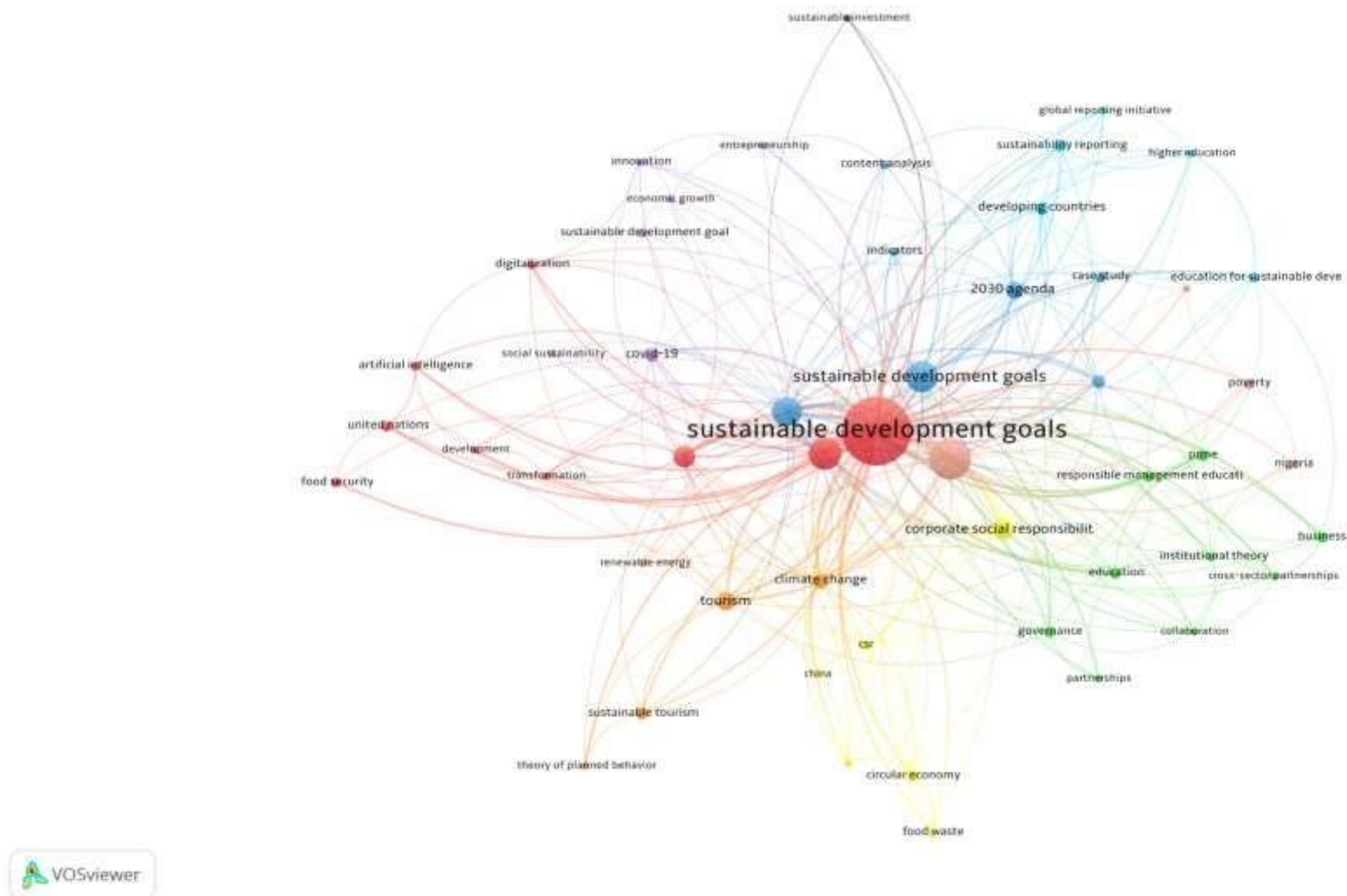


Figure 2.5: Co-occurrences of Author's Keywords

2.3.6.2 Journals/Sources

Regarding the bibliographic coupling on the sources of journals, the study sets a minimum number of documents per source to two (Pizzi *et al.*, 2020), and 69 journals out of 201 journals met the threshold. Figure 2.4 indicates that the Journal of Cleaner Production, Business Strategy and Environment, Business Strategy and Development, Technological Forecasting and Social Change, and the International Journal of Management Education are among the top five indexed bibliographic coupling of journals advancing the SDGs. Also, Figure 2.5 indicates that Sustainability Accounting, Management and Policy Journal, and Corporate Social Responsibility and Environmental Accounting are other central accounting journals advancing the achievement of the SDGs by 2030. These findings suggest that academic and professional accounting contributions are inevitable partners in research advocating the SDGs.

2.3.6.3 Scholarly Authors/Researchers

Out of the 1,620 scholarly authors, 7.7% (n = 126), 1.5% (n = 24), 0.56% (n = 9), and 0.31% (n = 5) authors have published 2, 3, 4, and 5 papers, respectively. The authors: Venturelli, Pizzi, Leal Filho, Sinha, and Rosati are the five scholars with the top bibliographic coupling indices. The crowded network of researchers confirms a high collaboration or team publications among authors investigating the SDGs.

2.3.7 Keywords Analysis

The keywords analysis is to ascertain the vital words that designate the core SDGs research promulgated by scholarly authors from the accounting, business, or management perspective (Kumar *et al.*, 2022). Pizzi *et al.* (2020) argue that keyword

analysis does not suffer intrinsic bias like bibliometric citation analysis, which is skewed towards older papers. This study investigates the author's keywords to discover the key clusters, trends, or topics advancing the SDGs. The study uses the VOSviewer to analyze the co-occurrence (analysis type) to analyze the unit of the author's keywords.

Using the full counting method and the minimum number of occurrences of five keywords, 52 out of 1908 keywords meet the threshold. Out of the 52 keywords, the most commonly related keywords are sustainable development goals, SDGs, sustainability, sustainable development, and corporate social responsibility. These keywords suggest that most authors in the accounting, business, or management perspective are putting much effort into contributing to knowledge geared toward the SDGs before the 2030 deadline. In Figure 2.5, the keywords analysis records 9 clusters, namely:

- Red cluster: Artificial intelligence and digitalization.
- Green cluster: Business collaboration.
- Blue cluster: Corporate sustainability
- Yellow cluster: Circular economy and corporate social responsibility (CSR).
- Purple cluster: Entrepreneurship and innovation.
- Aqua cluster: Education for developing countries.
- Orange cluster: Climate change and tourism.
- Brown cluster: Africa perspectives.
- Black cluster: Sustainable investment.

Red Cluster

The red cluster keywords comprise papers focusing on the roles of artificial intelligence, digitalization, and transformation toward achieving food security, sustainability, and sustainable development among the United Nations regions. For instance, Goralski and Tan's (2020) study examines how artificial intelligence using robotics and machines drives the sustainability or sustainable development of society, government, or business toward attaining the SDGs. Similarly, studies advancing the SDGs are connected to roles of digital automation and transformation (Lichtenthaler, 2021), information support systems (Modgil *et al.*, 2020), big data, internet, and 5G communication systems (Walshe *et al.*, 2020), and blockchain technology and food security (Mangla *et al.*, 2021).

Green Cluster

The green cluster focuses on the role of business collaboration, such as cross-sector partnership or partnership, responsible management, governance, and education to accomplish the SDGs. Weybrecht's (2022) study explores how business education embraces the SDGs, and Hauser and Ryan (2021) investigate the nexus of education and partnership toward the SDGs. As stated earlier, accounting, management, and business contribution are vital partners in achieving the SDGs (Abhayawansa *et al.*, 2021). Extant literature stresses how business operations are advancing the SDGs (López-Duarte and Vidal-Suárez, 2021; Ordonez-Ponce *et al.*, 2021; Pizzi *et al.*, 2021) through multi-stakeholders and institutional partnership (Eweje *et al.*, 2020), responsible managers, and collaborative actions (Mintrom and Thomas, 2018).

Blue Cluster

The blue cluster indicates that the achievement of the 2030 agenda or the SDGs through research can be done by focusing on corporate sustainability indicators using content analysis and case study approaches. Calabrese *et al.* (2021), Cling *et al.* (2020), and Pfeiffer *et al.* (2017) studies are phenomenal in advancing the SDGs or the Agenda 2030 using sustainability indicators. Calabrese *et al.* (2021) use sustainability reporting indicators to develop a framework to achieve the SDGs using firm disclosures. Similarly, Cling *et al.* (2020) explore how the SDG indicators interconnect the differentials of European nations providing social and economic implications for the Agenda 2030. Pfeiffer *et al.* (2017) also used the 169 SDGs target indicators to advance the SDGs highlighting striving commitment and practical policies toward the 2030 Agenda. In terms of case studies and context analysis, Pineda-Escobar (2019) adds to extant literature using a case study approach across borders, providing insightful alternatives for moving the 2030 agenda forward. Further, using a case study at the operational and national level, Battaglia *et al.* (2020) provide viable systems and business orientation on embedding sustainability actively enhances the SDGs. Vildåsen's (2018) exploratory case study uses inductive reasoning to provide significant social and environmental concerns about corporate sustainability and the Agenda 2030.

Yellow Cluster

Yellow cluster focus on connected papers from circular economy like China and issues on corporate social responsibility (CSR), food waste, and hospitality contributing to achieving the SDGs. Business scholars in China are averting from the perspective of green finance and industry (Yuan *et al.*, 2020), health, environment, climate change,

and tourism (Sharif *et al.*, 2020) to biodiversity, financial globalization, technology and innovation (Zhang *et al.*, 2022) towards achieving the Agenda 2030. Circular economy studies have taken a new SDG research arena where accounting, management, and business scholars use big data, innovative and industrial 4.0 revolutions (Dwivedi *et al.*, 2022) to achieve the 2030 Agenda. Stombelli (2020) also has advanced SDGs studies focusing on corporate social responsibilities (CSR), hospitality, and food waste in circular economies.

Purple Cluster

The purple cluster composes connected papers based on economic growth, entrepreneurship, innovation, social sustainability, and the emergence of pandemics (covid-19). Entrepreneurship and innovation are inevitable in achieving economic growth, sustainability, and the SDGs (Gyimah *et al.*, 2021). Macht *et al.* (2020) discuss how business research can contribute to SDG achievement during and after the global pandemic (Covid-19). They argued that the factual prospect of recovery from Covid-19 rapidly strengthens entrepreneurship, innovative businesses, and social firms since they are the backbone of every economy.

Hörisch (2021) further stipulates that the global pandemic (Covid-19) has jeopardized economic growth, entrepreneurial sustainability, and the 2030 Agenda, and there is a likelihood that nations may be unable to achieve the SDGs even after 2030. Chen (2021) provides some insightful sustainability innovative strategies for digital businesses or technological industries to recover from Covid-19 to contribute their quota towards the SDGs. Studies in the purple clusters are developing conceptual models or frameworks

for firms to capitalize on gains or increase profitability after the global COVID-19 pandemic that will eventually positively affect sustainability, economic growth, and SDGs.

Aqua Cluster

The Aqua cluster comprises studies on developing countries, education, global reporting initiative, and sustainability reporting. Accounting, management, and business scholars are making strides toward the 2030 Agenda in developing countries. Biglari *et al.* (2022) conclude that most developing countries cannot advance the 2030 Agenda due to stakeholders' conflict, lack of credible evaluation tools, sanctions, environmental issues, and regional conflicts. Rosati and Faria (2019) highlight how businesses can contribute to developing countries using organizational drivers and SDGs reports.

Further, Kazemikhasragh *et al.* (2021) highlight some factors contributing to implementing the SDGs in developing countries. Also, regarding the Aqua cluster, the connected papers delved into higher education by integrating competencies, transformation learning, and principles for responsible management education (PRME) through collaborative phenomenon and SDGs innovative reporting (Assumpção and Neto, 2020; Caputo *et al.*, 2021; Cottafava *et al.*, 2019; Amorós Molina *et al.*, 2023).

Orange Cluster

The bulk of Orange Clusters focused on climate change, renewable energy, and tourism.

Regarding climate change, most of the connected studies explore SDG 13

(Climate change) by focusing on renewable energy, smart cities, automotive vehicles, reduction of air pollution, and innovative mobility paradigms for sustainable climate (Grindsted *et al.*, 2022). Additional attention-grabbing papers in the orange cluster relate to sustainable tourism. Pizzi *et al.* (2020) argued that sustainable tourism could eradicate poverty and provide indigenous communities with social and financial benefits. For instance, Bianchi and de Man (2021) explore how tourism can contribute to decent work and inclusive development in an economy. Pasanchay and Schott (2021) provide community-based tourism strategies using a holistic, sustainable living viewpoint to advance the 2030 Agenda. Likewise, other tourism studies offer promising frameworks for the tourism sector as contributing drivers to attaining the SDGs (Hall, 2019).

Brown Cluster

For the brown clusters, the papers link the SDGs to Africa. The SDGs follow the Millennium Development Goals (MDGs) that characterize the first effort in creating policies to advance Africa's development. Studies in Africa examine the contribution of FDI (Aust *et al.*, 2020), tourism (Maingi, 2021; Siakwah *et al.*, 2020), education (Peeters, 2021), and technological gaps (You *et al.* (2020) towards attaining the SDGs. Scholars in Nigeria have been phenomenal in propagating SDGs research focusing on the contribution of agriculture (Aderemi *et al.*, 2021) and small businesses (Adeola *et al.*, 2021) in alleviating poverty that positively enhances the

2030 Agenda.

Black Cluster

The black cluster is the final cluster linking sustainable investment to the SDGs.

Unlike other clusters, most papers investigating the relationship between sustainable investment and SDGs employ empirical analysis. For instance, Ikram *et al.* (2021) empirically assess how green technology affects sustainable investments in achieving the SDGs in an emerging country. Similarly, Arner *et al.* (2020) highlight the contributions of financial technology and inclusion and sustainability for achieving the SDGs. Furthermore, other studies use financial performance and sustainability analysis to provide a framework for sustainable investment to accomplish the SDGs (Nerlinger, 2020).

2.4 Literature review

Table 2.6 discusses the taxonomies – jurisdiction, organization, geographical setting, SDGs literature, research methods, and frameworks or models of connected papers advancing the SDGs research to identify gaps and further studies.

Table 2.6: Research Taxonomies

Specific Taxonomy	Papers	Cited	Papers (%)	Citation (%)
Jurisdiction				
General – Multinationals/Global/Comparative	162	1928	27.79	27.70
Industry – Multinationals/Global/Comparative	97	1153	16.64	16.57

Organizational Multinationals/Global/Comparative	–	158	1889	27.10	27.14
General – Nationwide		75	897	12.86	12.89
Organizational – Nationwide		79	934	13.55	13.42
One Institution/Business/Organization		12	159	2.06	2.28

Organizations

Private Sector – Multinational/Global Organization		124	1253	21.27	18.00
Private Sector – SMEs		37	656	6.35	9.43
Cities		98	994	16.81	14.28
Public Sector Organization		93	955	15.95	13.72
Not-For-Profit Organizations (NPO)		9	258	1.54	3.71
Training Institutions/Colleges/Universities		67	818	11.49	11.75
General/Other		155	2026	26.58	29.11

SDG Literature Review

Financial Reporting		15	199	2.57	2.86
Non-Financial Reporting		63	537	10.81	7.72
Policy-Focused		102	1571	17.50	22.57
Business-Focused Strategy		87	1074	14.92	15.43
Performance Dimension		29	378	4.97	5.43
General/Others		287	3201	49.23	45.99

Research Methods

Interview/Case/Field/Narrative Studies	136	1466	23.33	21.06
Content Analysis	88	1054	15.09	15.14
Questionnaire/Survey	102	1132	17.50	16.26
Normative/Commentary Studies	87	920	17.92	13.22
Secondary/Archival Studies	52	736	8.92	10.58
Theoretical: Literature/Empirical Reviews	118	1652	20.24	23.74

Framework				
No Model(s) Proposed	381	3760	65.35	54.02
Uses existing Model(s)	96	1177	16.47	16.91
Proposes New Model(s)	106	2023	18.18	29.07

2.4.1 Jurisdiction

Studies on general multinational, global, or comparative perspectives record 162 papers (27.79% of 583 papers) with total citations of 1,928 (27.70% of 6,960). The organizational-focused papers using multinational global data that compares two or more organizations follow with 27.1% of the total sample and 1,153 citations (27.14%). The industry-focused papers of supranational, international, or comparative studies consist of 97 papers (16.64%) and 1,153 citations (16.57%). For local or national studies, 13.55% (n = 79 papers) with 934 citations (13.42%) focused on organizations, whereas 12.86% (n = 75 papers) with 897 citations (12.89%) focused on general issues advancing the SDGs. Few studies (n = 12 papers, 2.06%) have focused on sole organizations championing the SDGs, and this is an avenue for further research.

2.4.2 Organizations

The result shows that most studies on general organizations (n = 155, 26.58%) mostly cluster private corporations operating in similar industries. The analysis indicates that multinational firms or blue-chip organizations (n = 124, 21.27%) rank second in organizations making huge strides toward Agenda 2030. Multinational organizations are inevitable partners in advancing the SDGs by incorporating CSR policies and critical strategies for humanity and the planet (Pizzi *et al.*, 2020). Another network of papers considers the cities (n = 98, 16.81%) towards urbanization and globalization in accelerating global goals. Government institutions' research (n = 93, 15.95%) strives to provide public policies that stimulate actions toward environmental, social, and economic dimensions geared toward the SDGs. The result indicates that accounting, business, or management scholars have provided some magnificent insights into how universities (n = 67, 11.49%) have contributed to the SDGs.

Appallingly, SDGs research is limited to SMEs (n = 37, 6.35%) and NGOs (n = 9, 1.54%). These organizations are also critical contributors to Agenda 2030, and accounting, business, or management scholars must focus on these neglected organizations. Small and Medium-scale firms are the backbone of every nation, and contemporary researchers are calling for more research on sustainable entrepreneurial practices contributing to the Agenda 2030 (Adeola *et al.*, 2021; Gyimah *et al.*, 2020). Finally, NGOs provide local and foreign advocacy policies related to the global agenda, and such overriding organizations should not be neglected in SDGs research.

2.4.3 SDGs Literature Review

Seven years after 193 UN member states unanimously adopted the SDGs, most business studies focus on general perspectives ($n = 287$, 49.23%) such as sustainability, sustainable economic development or growth, and a broad spectrum of sectorial, regional, planning, and environmental studies. The studies of Bebbington and Unerman (2018), Rosati and Faria (2019), and Salvia *et al.* (2019) are instrumental in advancing general perspectives of sustainability and business contributions toward the Agenda 2030. Returning to Table 2.1X, the SDGs debate centred on policies ($n = 102$, 17.50%) and business strategy ($n = 87$, 14.92%) of the total sampled papers. Pizzi *et al.* (2020) argued that accounting, management, and business researchers observed that the achievement of the SDGs depends on business strategies, models, or policies. Thus, most SDGs studies integrate policies and strategies toward the Agenda 2030.

In addition, contemporary accounting, management, or business scholars use the nonfinancial reporting index ($n = 63$, 10.81%) and performance measures ($n = 29$, 4.97) to advance the SDGs. Khan *et al.* (2021) use integrated non-financial reporting to explore how green innovation drives a firm's performance and the SDGs. Similarly, Diaz-Sarachaga (2021) uses non-financial reports to monetize the economic contributions of Agenda 2030. Also, Pizzi *et al.* (2021b) employed the SDG nonreporting or qualitative scores to ascertain the determinants of business indicators affecting the SDGs. However, there is scarce literature on using the financial reporting index ($n = 15$, 2.57%) due to unavailable data. Currently, accounting scholars can use existing financial reports and macroeconomic measures from the World Bank, United Nations, and Continental SDGs to explore the determinants advancing the SDGs.

2.4.4 Research Methods

Most SDGs business studies employ a qualitative approach using cases, fields studies, interviews, or narrative studies (n = 136, 23.33%), followed by theoretical analysis (n = 118, 20.24%), survey or questionnaire empirical studies (n = 102, 17.5%), content analysis (n = 88, 15.09%), normative or commentary methods (n = 87, 14.92%), and quantitative studies using secondary data (n = 52, 8.92%). Achieving the 2030 Agenda needs multiple ex-ante estimates to derive innovative strategies, viewpoints, and implications, and thus, innovative SDGs studies depend on reliable and valid methods to conduct the research (Soaita *et al.*, 2020). Table X suggests that SDGs studies use heterogeneous or multidisciplinary research methodologies to develop policies, practices, and empirical and theoretical implications that advance the 2030 Agenda.

2.4.5 Theoretical Models

The theoretical framework result shows that there is no unified model(s) or framework(s) advancing SDGs from an accounting, management, or business perspective. The lack of composite model(s) or framework(s) used in SDGs studies is one of the major hindrances for accounting, management, or business academics, and it has remained pragmatic through several scholars in their studies (Pizzi *et al.*, 2020). However, the accounting profession, such as the International Federation of Accountants (IFAC), has developed a roadmap or framework focusing on only eight of the SDGs and also neglects an all-inclusive assessment of (UN) sustainability indicators (Liu *et al.*, 2020). Also, Goyal *et al.* (2018) and Schaltegger (2018) developed state-of-the-art SDG models within one jurisdiction focusing on sustainability. Their models

may not be applicable in other contexts with varied cultural, educational, micro-and-macro environmental conditions and legal and political systems.

Recent academic works have failed to develop a model or framework using data across or within the 192 member states that adopted the SDGs. Returning to Table XI, 65.35% (n = 381 papers) propose no models or frameworks, and 18.18% (n = 106) propose new models. Studies that employ previous models (n = 96, 16.47%) depend mainly on the SDGs indicators or targets. Currently, there is no consolidated framework(s) developed by accounting, management, or business scholars due to varied connections between businesses, countries, and SDGs within or across continents. Adam *et al.* (2020) and Bebbington and Unerman (2018) particularly posit that having a unified theoretical model(s) or framework(s) from accounting, management, or business researchers can aid stakeholders in policy or decision making toward the achievement of the 2030 Agenda.

2.5 Conclusion

This study uses bibliometric analysis and SLR of 583 papers to determine literature advancing the SDGs. The bibliometric analyses focus on the trends of prolific authors, countries, journals, papers, most linked references, bibliographic coupling, and keywords analysis highlighting current SDGs research themes. The SLR reviews five taxonomies regarding research jurisdiction, organizations or institutions, geographical settings, SDG studies, methods, and frameworks driving SDG research.

The bibliometric analysis identifies Leal Filho Walter and Sinha Avik as the authors with the highest publications (seven papers) contributing to the SDGs research. Sinha

Avik's contributions focus on green finance, ICT, social responsibility, and models towards the achievement of the SDGs, whereas Walter Leal Filho SDGs studies focus on climate change, new technologies, investment, environment, governance, and social values. Studies from the USA (144 publications), UK (143 publications), Italy (109 publications), China (98 publications), Brazil (96 publications), Australia (90 publications), India (86 publications), Spain (84 publications), Germany (65 publications), and Malaysia (49 publications) dominate SDG research. Most of these countries have tried to promote the SDGs through various business dynamic themes and models to help business owners, private and public firms, government, and local and global policymakers contribute towards the SDGs before 2030. The USA, in particular, contributed to sustainable development and sustainability studies for several years before adopting the SDGs. Our analyses show that no African nation is ranked among the top 10 countries advancing the SDG business studies, and there is a need for more collaboration between countries toward achieving the 17 SDGs before 2030. Future studies could also identify why there are limited studies in some parts of the world, and comparative SDG analysis can be conducted between active and inactive countries.

From the productive journal's point of view, the Journal of Cleaner Production tops with 108 publications, followed by the International Journal of Management Education with 27 publications, Technological Forecasting and Social Change with 23 publications, Worldwide Hospitality and Tourism Themes with 19 publications, and Business Strategy and Development with 17 publications. In the Journal of Cleaner Production, the contributions focus on sustainable development and cleaner production,

covering sustainability and environmental issues in regions, societies, businesses, governments, and educational institutions. In the International Journal of Management Education, the papers deal with theories and innovative pedagogies of business and management toward achieving the SDGs. The publications for Technological Forecasting and Social Change consist of the proposed models and new technologies for implementing the SDGs. As the name suggests, Worldwide Hospitality and Tourism Themes encompass theoretical and practical publications highlighting the significance of hospitality and tourism in advancing the SDGs worldwide. Finally, the contributions of Business Strategy and Development are among the new journals envisioned to address the significant roles of business in promoting sustainable development.

In the case of most cited papers, the three frames for innovation policy of Schot and Steinmueller (2018) have the highest citations; however, Bebbington and Unerman (2018) have the most linked references highlighting the enabling role of accounting research advancing the SDGs. The analysis reveals nine groups of contributions toward the SDGs in terms of the keywords used. The first group emphasizes the contributions of artificial intelligence, digitalization, transformation, food security, and sustainability toward achieving the SDGs. The second group of publications deals with how collaborations among businesses, partnerships, responsible management, governance, institutions, and education contribute to the SDGs. The third group analyses case studies, content or indicators for corporate sustainability, and the SDGs. The fourth group focuses on the circular economy like China, CSR, food waste, and hospitality. The fifth group showcases the significant contributions of entrepreneurship, innovation,

and sustainability in achieving economic growth and sustainable development during and after the global pandemic. The sixth group concentrates on how education, sustainability reporting, and global reporting initiatives are advancing the SDGs in developing countries. The seventh group advances business SDG research focusing on climate change, renewable energy, and tourism. The eighth group of SDG research provides strategies to alleviate poverty in all forms in Africa, and the final group of business SDG research argues that the remedy for achieving the SDGs depends on sustainable investment available in every country. The groups above or clusters of studies reveal unexplored topics such as culture or preservation of cultural heritage, religiosity, responsible leadership ethics, language-sensitive research, national value chain systems, economic dimensions drivers on each of the 17 SDGs, MSMEs and rural entrepreneurship, sustainable supply-chain strategies, global sustainable marketing strategies, green human resources, and organizational behavioural strategies need to be explored in further studies.

Regarding the taxonomies of the literature review, the jurisdiction indicates that most business SDG literature focuses on general multinationals, comparative or global regions, with few studies concentrating on one institution. Due to the diverse institutional culture and systems among multinationals or corporate entities, the study recommends that future SDG business research use a single institutional jurisdiction to come out of innovative findings that can be used as a benchmark for similar institutions or sectors. In the case of organizations, business SDG research again concentrates on general and private multinational or global firms and few studies on NPOs or private

SMEs. SMEs are among the critical players that can advance SDGs, and it is dissuading that recent SDG studies are not focusing on entrepreneurship or SMEs. Business scholars urgently need to conduct more research on small firms to provide theoretical and practical contributions toward the 2030 Agenda. The literature analysis further reveals that most business SDG studies do not explore financial reporting on firms. A firm's financial reporting gives transparency and understanding of a firm's financial position and operations. Thus, business scholars need to delve into firms' financial and integrating reporting to develop unique strategies that can advance the SDGs. Regarding the methods used in business SDG research, the analysis reveals that studies using interview, cases, field, narrative, content analysis, normative, survey, and reviews continues to dominate, and few others use secondary or archival data to conduct SDG studies. SDG studies are heterogeneous and require a mixed research approach, and the study recommends that future SDG research use the mixed research method to examine diverse viewpoints and uncover remedies to achieve the SDGs before 2030.

In conclusion, there is currently an absence of precise analyses on the 17 SDGs in business, management, or accounting studies. With less than a decade towards the end of the 2030 Agenda, no global unified theory or framework has been formulated to aid in policy formulation or decisions toward the SDGs. Further studies in these directions can advance SDGs research.

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CHAPTER THREE

PAPER TWO

SEVEN YEARS OF UNITED NATIONS' SUSTAINABLE DEVELOPMENT GOALS IN AFRICA: A BIBLIOMETRIC AND SYSTEMATIC METHODOLOGICAL REVIEW

CHAPTER THREE SEVEN YEARS OF UNITED NATIONS' SUSTAINABLE DEVELOPMENT

GOALS IN AFRICA: A BIBLIOMETRIC AND SYSTEMATIC METHODOLOGICAL REVIEW

Abstract

Over the past seven years, the advancement of Sustainable Development Goals (SDGs) is gaining increasing attention in the African context. Consistent with this effort, the present study aims to review the existing literature systematically to document contribution and methodological gaps. Specifically, the review systematically explores, through bibliometric literature and systematic method reviews, authors, countries, cited papers, journals, author's keywords, topic dendrogram, and methodological choices of papers associated with African SDGs scholars. The *R Studio software* is used to analyze 200 papers on SDGs, authored by 606 scholars and published in 102 peer-reviewed leading sources between 2015 and 2022. The results reveal that SDGs literature in Africa is an imminent study area, and there are two main strands of literature advancing SDGs in Africa: (1) business growth, entrepreneurship, and poverty reduction, and (2) renewable energy, tourism, and ICT. Key findings from the analysis of the papers are discussed, and implications for future research directions consisting of research questions, research methods and designs, and SDGs research are provided.

Keywords: Sustainability, sustainable development education, Agenda 2030, literature review, Africa, *R Studio software*

3.1. Introduction

The advancement of the 17 United Nations (UN) sustainable development goals

(SDGs) is gaining increased attention from business scholars and policymakers. The 17 SDGs established in 2015 by the UN member states aimed to advance better life globally by 2030 (Adams *et al.*, 2020; Arena *et al.*, 2023; Abhayawansa *et al.*, 2021). The SDGs follow the Millennium Development Goals (MDGs), representing the first effort to create policies to advance emerging nations' development (Pizzi *et al.*, 2020). On the contrary, the MDGs lead to poor outcomes due to disparity among countries ((Pizzi *et al.*, 2020). Thus, introducing the SDGs needs ex-ante estimation to develop innovative strategies to achieve its purpose (Abhayawansa *et al.*, 2021; Kühnen *et al.*, 2019). Scholarly papers or viewpoints (research and innovation) are the strategies that can help provide reliable implications or strategies for achieving the SDGs (Mio *et al.*, 2020). Innovative studies or scholarly papers depend mainly on the methods employed to conduct the research (Soaita *et al.*, 2020). Weak methodological choices can lead to biased research outcomes that affect credibility, compromising reliable strategies for attaining the SDGs. Therefore, scholars (Pizzi *et al.*, 2020; Mio *et al.*, 2020) are calling for more systematic reviews to develop innovative research strategies and advance the SDGs.

Moreover, these SDGs have gained attention and endorsement among stakeholders, especially firms worldwide, such as the business, management, and accounting bodies that train high-quality individuals and develop policies that initiate this global aim (Bebbington and Unerman, 2020; Gomes *et al.*, 2020; Hörisch, 2021). Business, management, and accounting bodies are inevitable partners in achieving the SDGs (Ordonez-Ponce *et al.*, 2021). Surprisingly, the need to assess and understand the SDGs using appropriate methods remains unaddressed (Schaltegger *et al.*, 2018). Most extant literature focuses on developed countries, neglecting developing countries with

different economic, cultural, and governance systems (Rosati and Faria, 2019). Moreover, the concept of sustainable development is nascent and remains complex for developing countries, given their economic situation. Hence, there again is the need to conduct reviews focusing on developing nations to develop precise SDGs strategies.

The recent UN 2021 report asserts that developing countries have not achieved about a quarter of the SDGs. What can be the cause of this? Extant literature has not delved into why African countries cannot achieve most SDGs. Zheng *et al.* (2021) argue that this unaddressed issue can be adapted from developed countries and the inability to review in-depth trends of SDGs focusing on only developing countries. Also, recent studies that have empirically conducted systematic literature on the SDGs focus on the relationship between business and SDGs (Mio *et al.*, 2020), management and SDGs (Pizzi *et al.*, 2020), accounting and SDGs (Bebbington and Unerman, 2020), policy integration and SDGs (Bornemann and Weiland, 2021), and financial performance and SDGs (Muhmad and Muhamad, 2021). These recent studies combine advanced and developing countries' documents, causing extreme difficulties in understanding SDG trends across continents. A developing continent like Africa has complexity and diversity of cultures, ethnic compositions, currencies and geographies variations, and varied political and economic institutional typologies that undergird political transformation and economic development processes. Thus, there is a need to conduct other reviews focusing on Africa to understand better the trends, gaps, and future directions toward achieving the SDGs. Thus, this study provides a state-of-the-art systematic review through bibliometric, thematic, and methodological procedures to identify evolving trends, research themes, methodological choices, and gaps in advancing SDGs from the perspective of Africa. To the best of our knowledge, our study

is the first to conduct bibliometric and detailed systematic methodological reviews to identify methodological choices and gaps in the SDGs literature in the context of Africa.

The significance of this paper is threefold. First, the systematic literature review (SLR) within SDGs studies focusing on Africa is relatively rare, especially in the growing SDG scholarships using different methods. To exemplify, the study uses fine-tuning 200 African scholarly SDGs papers authored by 606 scholars, published in 102 peer-reviewed sources in the past eight years (2015 to 2022). This paper demonstrates one technique of creating a sense of the increasing scholarship on SDGs and contributes to a critical SLR to inform scholarly debates, professional practice, and policy decision-making. Again, the study fills the methodological gap by revealing new methods gaps, choices, and assumptions on SDG studies. Second, the paper systematizes scientific knowledge created over the business, management, and accounting research debates to develop new inquiries, research questions, research themes, or trends using bibliometric and SLR analysis and documents from Africa. The paper, thus, advances previous studies combining two approaches (bibliometric and SLR) using *R Studio software* to review new insights on SDGs in Africa. Finally, business, management, and accounting researchers can use the findings to fill neglected gaps in the literature and methodological choices in advancing the SDGs in Africa. The results are vital for those leading SDGs initiatives, research, and innovation to modify and strengthen methodological strategies and options for the achievement of the 17 goals in Africa

The paper follows the following structure: Section 2 presents the method. Sections 3 and 4 report the results of the bibliometric analysis and systematic review analysis

results, respectively. Section 5 provides the future research agenda, and Section 6 concludes.

3.2. Methods and data completion

3.2.1 Research Approach

The study employs bibliometric and SLR to map the best practices to achieve the study's objectives using in-depth content and topics techniques (systematic qualitative review) and quantitative bibliometric tools (Pizzi *et al.*, 2020). We followed Mio *et al.*'s (2020) stages to collect data for the bibliometric analysis. The first stage is the study's introduction (see Section 1), highlighting the purpose and objectives, and the second stage conducts the review process and identifies, selects, evaluates, and synthesizes valid thematic issues. The final stage reports and discusses descriptive results and the thematic areas of the study.

3.2.2 Data

Data for the bibliometric analysis is collected by a search of key terms related to SDGs in Scopus. Scopus is one of the largest recognized databases for conducting bibliometrics and systematic reviews (Pizzi *et al.*, 2020). The study uses the following search Boolean string to generate the first set of data (or papers): "sustainable development goal*" OR "SDG*" OR "Global Agenda" OR "sustainable development agenda" OR "2030 Agenda" OR "UN Global goal*." The study performed a search string on September 30, 2022, and retrieved a total of 78,450 papers, focusing on the paper's title, abstract, and keywords.

3.2.3 Inclusion and exclusion criteria

For the inclusion and exclusion criteria, the study follows the below five steps to ascertain the final data or sample for the analysis.

Step 1 The search string focuses on papers from September 2015 to September 2022 because 2015 is the year the United Nations General Assembly inaugurated SDGs. The study uses Appiah *et al.*'s (2022) search approach to retrieve data from Scopus, Google Scholar, and international outlets databases to have broader access to quality papers relating to Africa. Step 1 limited the initial search to 37,584 documents.

Step 2

Again, the study focuses on finding the methodological choices and gaps in SDGs research focusing on business, management, or accounting perspectives. Thus, this limits the search to business, management, and accounting studies written in English, thereby reducing the papers to 3,128.

Step 3 Similar to studies such as Sivarajah *et al.* (2017) and Mio *et al.* (2020), the search for the papers or documents for the study excludes conferences, books, book series or chapters, trade publications, editorials, reviews, and forthcoming articles to enhance quality control. However, SDG studies in Africa published through alternative outlets such as working papers by international institutions, chapters in edited works, and peer-reviewed conference papers focusing on Africa are included. Again, this search reduces the documents to 1,636.

Step 4 Papers that do not consider African perspectives are also excluded. As stated earlier, this study investigates method choices, approaches, or statistics in Africa to ascertain gaps in methodological options that can be used to advance or achieve the SDGs by 2030. Hence, the search in the Scopus database is limited to publications that use African data, and this exclusion criterion reduces the number of papers to 211.¹

Step 5 In ensuring essential substantive suitability, the first author reads the 211 papers to select final documents that align with the study's objectives or research perspectives and remove duplications. Mio *et al.* (2020) and Sivarajah *et al.* (2017) use this inclusive approach to determine final papers. This leads to the final sample of 200 papers for analysis.

3.2.4 Sample analysis

The study uses the Biblioshiny in *R Studio software* to report bibliometric descriptive statistics such as the top prolific authors, contributing sources, most productive countries, top-cited papers, and evolving keywords in the underlying field. Also, the study performs traditional detailed content analysis of the 200 papers to identify unexplored research gaps and methodological choices or strategies to guide future studies.

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The final search in Scopus uses this string to get the 200 documents. TITLE-ABS-KEY ("sustainable development goal*" OR "sdg*" OR "global agenda" OR "sustainable development agenda" OR "2030 agenda" OR "un global goal*") AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015)) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (SUBJAREA , "busi")) AND (LIMIT-TO (LANGUAGE , "english")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (AFFILCOUNTRY , "south africa") OR LIMIT-TO (AFFILCOUNTRY , "nigeria") OR LIMIT-TO (AFFILCOUNTRY , "ghana") OR LIMIT-TO (AFFILCOUNTRY , "egypt") OR LIMIT-TO (AFFILCOUNTRY , "kenya") OR LIMIT-TO (AFFILCOUNTRY , "cameroon") OR LIMIT-TO (AFFILCOUNTRY , "tunisia") OR LIMIT-TO (AFFILCOUNTRY , "algeria") OR LIMIT-TO (AFFILCOUNTRY , "ethiopia") OR LIMIT-TO (AFFILCOUNTRY , "mauritius") OR LIMIT-TO (AFFILCOUNTRY , "tanzania") OR LIMIT-TO (AFFILCOUNTRY , "uganda") OR LIMIT-TO (AFFILCOUNTRY , "botswana") OR LIMIT-TO (AFFILCOUNTRY , "cote d'ivoire") OR LIMIT-TO (AFFILCOUNTRY , "gambia") OR LIMIT-TO (AFFILCOUNTRY , "mali") OR LIMIT-TO (AFFILCOUNTRY , "morocco") OR LIMIT-TO (AFFILCOUNTRY , "mozambique") OR LIMIT-TO (AFFILCOUNTRY , "namibia") OR LIMIT-TO (AFFILCOUNTRY , "papua new guinea") OR LIMIT-TO (AFFILCOUNTRY , "rwanda") OR LIMIT-TO (AFFILCOUNTRY , "sudan") OR LIMIT-TO (AFFILCOUNTRY , "zimbabwe"))

3.3. Bibliometric Analysis

3.3.1 Sample statistics

Table 3.1 shows the sample comprises 200 papers from 2015 to 2022, spread across 102 sources, with 730 author's keywords, 686 author's appearances, 3.869 average citations per year per paper, and an average of 9.685 citations per paper. Also, 606 authors have published papers advancing SDGs in Africa, where 30 (4.95%) are sole authors, and 576 (95.05%) are multi-authored. This information indicates a high collaboration or team publications (about 3.23) among African researchers researching SDGs. Of the 200 papers, no paper was published in 2015 and 2016, with five papers published in 2017, followed by eight papers in 2018, 24 in 2019, 43 in 2020, and 60 papers each for 2021 and 2022. The increasing trends (annual growth rate) of SDGs studies stands at 0.6438, indicating that studies on SDGs using data from Africa increase by 64% annually, implying an astronomical growth.

Table 3.1: Sample statistics

Description	Results
Papers	200
Period	2015 to 2022
Sources	102
Years from publication (average)	1.38
Citations per year per paper (average)	3.869
References	13,123
Citations per paper (average)	9.685
Author's Keywords	730
Authors	606
Author appearances	686
Authors of single-authored papers	30
Authors of multi-authored papers	576
Collaboration index	3.41

Moreover, a three-field plot is conducted to show the summary content of the sample, indicating the literature streams used for the study. Fig. 1 shows the result with ten items for keywords, sources, and authors in the middle, right and left fields, respectively. From the author's (AU) field, Simplice A. Asongu is the most outstanding author who explored keywords such as sustainable development focusing on sub-Saharan Africa or developing countries. Most of his works neglected keywords investigating the indicators of sustainable development goals (SDGs), creating valuable gaps in the literature that need to be examined in future studies.

In the middle field, extant literature can be classified under six major keywords (DE): SDGs, sustainable development, sustainability, tourism, sub-Saharan Africa, and developing countries. Finally, on the sources (SO), the *Journal of Cleaner Production* is the major producer contributing significantly by publishing papers advocating the SDGs. Most studies in the *Journal of Cleaner Production* center on sustainability and sustainable development, and only a few are pertinent to the SDGs.

3.3.2 Top contributing authors

Table 3.2 shows that Simplice A. Asongu, from the *University of South Africa*, is the most productive author with ten papers. Most of his papers that advance the SDGs or sustainable development in Africa center on inclusive human development, education, information technology, renewable energy consumption, taxation, governance, and inclusive finance. Philip K. Adom (from *Ghana Institute of Management and Public Administration*), Kaitano Dube (*Vaal University of Technology, South Africa*), Vanessa GB Gowreesunkar (*University of Africa, Nigeria*), Regis Musavengane

(*University of Johannesburg, South Africa*), and Godwell Nhamo (*Vaal University of Technology, South Africa*) have published four studies mainly on exploring how tourism, aviation industry energy efficiency, national well-being, climate change contribute to SDGs in Africa. Other productive co-authors conducting related SDGs literature include David Chikodzi (*Institute for Corporate Citizenship, South Africa*), Colin Michael Hall (*University of Johannesburg, South Africa*), Romanus Osabohien (*Covenant University, Nigeria*), and Samuel Adams (*Ghana Institute of Management and Public Administration, Ghana*).



VNI ICT

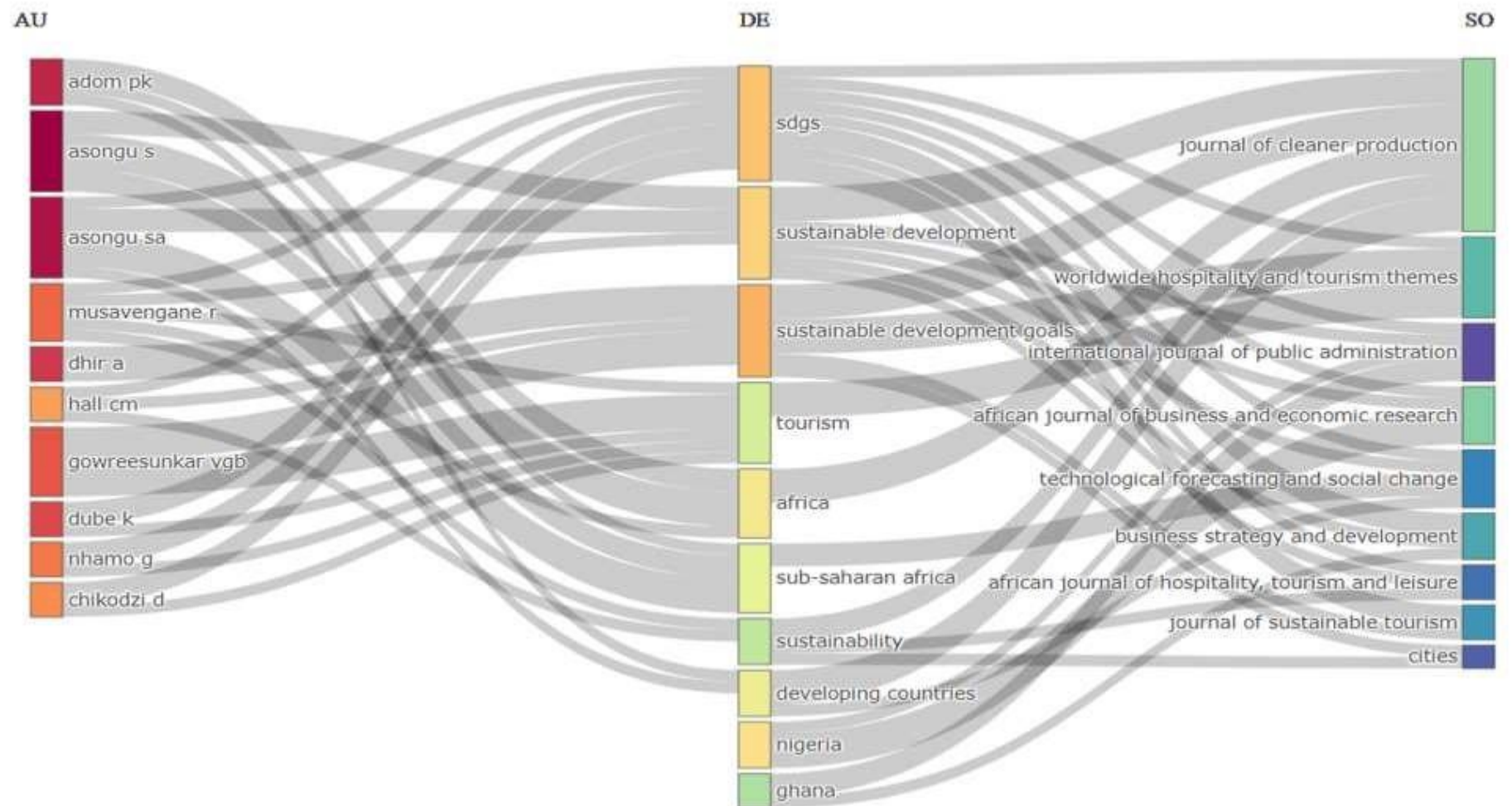


Figure 3.1: Three-field plots



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Table 3.2: Top contributing authors

Authors	Articles	Percentage %	Articles Fractionalized	Rank based on %
Simplice A. Asongu	10	5.00	4.66	1 st
Philip K. Adom	4	2.00	1.37	2 nd
Kaitano Dube	4	2.00	1.50	2 nd
Vanessa G.B. Gowreesunkar	4	2.00	1.67	2 nd
Regis Musavengane	4	2.00	2.67	2 nd
Godwell Nhamo	4	2.00	1.50	2 nd
David Chikodzi	3	1.50	1.00	7 th
Colin Michael Hall	3	1.50	0.92	7 th
Romanus Osabohien	3	1.50	0.64	7 th
Samuel Adams	2	1.00	0.75	10 th

3.3.3 Top contributing journals

Table 3.3 provides the top productive journals regarding the papers published per year in the SDGs in Africa. *Journal of Cleaner Production* is the topmost journal contributing SDGs research in Africa with 21 research papers, followed by the *African Journal of Business and Economic Research* with seven papers, *Humanities and Social Sciences Communications* with seven papers, and *Worldwide Hospitality and Tourism Themes* with seven papers. *Business Strategy and Development*, *Journal of Sustainable Tourism*, and *Technological Forecasting and Social Change* followed with five papers; and *African Journal of Hospitality, Tourism and Leisure*, *Cities*, and *International Journal of Public Administration* had four papers.

Journal of Cleaner Production is one of the consistent journals contributing to sustainability, sustainable development, or SDGs. The data also shows that journals such as *Business Strategy and Development*, *Journal of Sustainable Tourism*,

Technological Forecasting, and Social Change, African Journal of Hospitality, Tourism and Leisure, Cities, and International Journal of Public Administration, indicate the emergent and progressing literature in the field in Africa.

Out of the top 10 contributing journals, only 2 have publishers from Africa (*African Journal of Business and Economic Research, and African Journal of Hospitality, Tourism and Leisure*).

Table 3.3: Top 10 contributing journals

Year	JCP	AJBER	HSSC	WHTT	BSD	JST	TFSC	AJHTL	CT	IJPA
2015									2016	
2017							1			
2018							1	1		
								2		
2019							2	1		1
								2	1	
2020							5	1		4
									1	4
2021							8	6	2	3
								2		1
									1	
2022							5	1	5	
									5	2
									1	
Total	21	7	7	7	5	5	5	4	4	4

Notes: JCP - Journal of Cleaner Production, AJBER - African Journal of Business and Economic Research, HSSC - Humanities and Social Sciences Communications, WHTT - Worldwide Hospitality and

3.3.4 Most productive countries

Table 3.4 shows the statistics of the top 10 productive countries based on the total papers of corresponding authors. South Africa tops the most contributing corresponding author's countries with 34 papers and 258 citations, followed by Nigeria with 28 papers and 245 citations, Ghana with 14 papers and 146 citations, Egypt with nine papers and 84 citations, Kenya with four papers and nine citations, and Uganda with two papers and one citation. Rwanda, Zimbabwe, Mauritius, and Algeria had one paper with citations of 12, 11, 2, and 1, respectively.

East African countries dominate the list; however, their totals of 9 papers and 35 citations are less than the northern region, with ten papers and 85 citations, as well as the dominant region. Central Africa regions have no countries among the top 10 productive countries advancing SDGs literature in Africa, indicating the need for collaborative research across African regions to advance SDGs literature.

Table 3.4: Most productive countries

Country	Articles	Freq.	Total Citations	African Region
South Africa	34	0.21795	258	Southern
Nigeria	28	0.17949	245	Western
Ghana	14	0.08974	146	Western
Egypt	9	0.05769	84	Northern
Kenya	4	0.02564	9	Eastern
Uganda	2	0.01282	1	Eastern

Rwanda	1	0.00641	12	Eastern
Zimbabwe	1	0.00641	11	Eastern
Mauritius	1	0.00641	2	Eastern
Algeria	1	0.00641	1	Northern

3.3.5 Top cited-papers

Table 3.5 provides the most cited-research papers advancing SDGs in Africa. With 318 total citations, the paper titled "On big data, artificial intelligence, and smart cities, authored by Allam and Dhunny (2019), is the topmost cited article advancing sustainable cities and communities (SDG 11). "Enhancing ICT for inclusive human development in Sub-Saharan Africa, authored by Asongu and Roux (2017), follows with 155 total citations.

Of the ten top-cited research papers, five are published in the *Journal of Cleaner Production*, indicating their immense contribution towards achieving sustainable development in Africa. 80% of SDG literature among the top-cited papers focuses on achieving affordable and clean energy (SDG 7) and decent work and economic growth (SDG 8) in Africa.

3.3.6 Author's keywords

The author's keywords analysis helps to investigate the prevailing research trends to identify gaps or stimulate research areas for discussion. Table 3.5 provides the top 10 keywords used by business scholars advancing SDGs in Africa. The top ranking is based on the following: *sustainable development goals, sustainable development, Nigeria, Africa, and developing countries*. However, important keywords such as

subSaharan Africa, tourism, sustainability, and governance are other pertinent trends business scholars are focusing on to contribute to SDGs literature in Africa.

Figure 2 (TreeMap) depicts the potential 20 keywords advancing the SDGs in Africa. Excluding the above keywords in Table 3.5, other contributing keywords used by African business scholars to explore SDGs include *South Africa, Ghana, entrepreneurship, poverty, renewable energy, ICT, gender, institutional theory, economic growth, and others.*

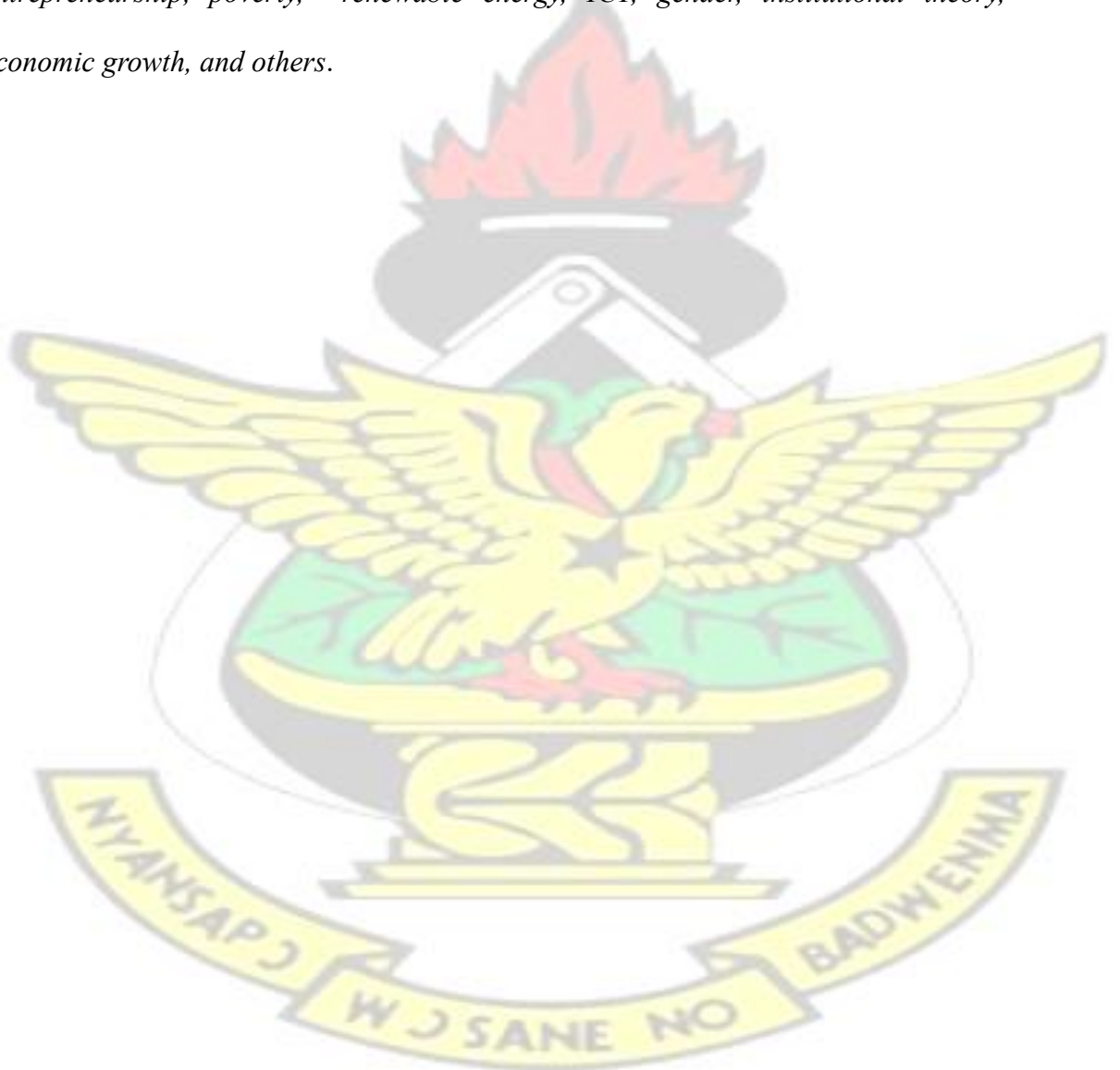


Table 3.5: Top 10 cited-research papers

Authors	Paper Title	Journal	Total Citations	Total citations per Year	SDGs
Allam and Dhunny (2019)	On big data, artificial intelligence and smart cities	<i>Cities</i>	318	79.5	11
Asongu and Roux (2017)	Enhancing ICT for inclusive human development in Sub-Saharan Africa	<i>Technological Forecasting and Social Change</i>	155	25.833	1, 2, 3, 4, 8, 10
Dube <i>et al.</i> (2021)	COVID-19 pandemic and prospects for recovery of the global aviation industry	<i>Journal of Air Transport Management,</i>	94	47	7, 13
Nyeche and Diemuodeke (2020)	Modelling and optimisation of a hybrid PV-wind turbine-pumped hydro storage energy system for mini-grid application in coastline communities	<i>Journal of Cleaner Production</i>	69	23	7
Nathaniel and Adeleye (2021)	Environmental preservation amidst carbon emissions, energy consumption, and urbanization in selected African countries: Implication for sustainability	<i>Journal of Cleaner Production</i>	65	32.5	7, 8, 9, 13, 17
Mangla <i>et al.</i> (2020)	A step to clean energy - Sustainability in energy system management in an emerging economy context	<i>Journal of Cleaner Production</i>	63	21	7
Siakwah <i>et al.</i> (2020)	Tourism Governance and Attainment of the Sustainable Development Goals in Africa	<i>Tourism Planning Development</i>	58	19.333	8, 12, 15, 16
Akinsemolu (2018)	The role of microorganisms in achieving the sustainable development goals	<i>Journal of Cleaner Production</i>	43	8.6	All the 17 goals
Dwivedi <i>et al.</i> (2022)	Climate change and COP26: Are digital technologies and information management part of the problem or the solution? An editorial reflection and call to action	<i>International Journal of Information Management</i>	42	42	6, 7, 14
Ikram <i>et al.</i> (2021)	Assessing green technology indicators for cleaner production and sustainable investments in a developing country context	<i>Journal of Cleaner Production</i>	41	20.5	7, 15

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Tree



Figure 3.2: TreeMap of keywords



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Table 3.6: Top 10 author's keywords

Keywords	Occurrences
Sustainable development goals	35
SDGs	26
Sustainable development	20
Nigeria	12
Africa	11
Developing countries	10
Sub-Saharan Africa	10
Tourism	10
Sustainability	9
Governance	6

3.3.7 SDGs thematic analysis

The study conducts a cluster or thematic analysis to identify relevant research ideas and coupling themes to enable further debate or a deeper understanding of SDGs in Africa. The study finds two main strands or clusters of studies from the topic dendrogram diagram (see Fig. 3). We conducted a deeper analysis of the classified strands to create valuable research gaps in the literature that need to be investigated in future studies.

3.3.7.1 Blue strand: Economic growth, entrepreneurship, and poverty reduction

The first strand centers on economic growth, and its subdivisions focus on innovation and entrepreneurship. The first strand indicates that most business studies advocating for achieving the SDGs in Africa focus on innovation and entrepreneurship. For instance, Awijen *et al.* (2022) advocate that achieving SDG 7 depends on ICT and technology usage innovation. Quagrainie *et al.* (2021) also argue

that achieving SDG 1 (no poverty) in Africa depends on the advancement of entrepreneurship. For instance, Quagrainie *et al.* (2021) investigated how microentrepreneur activities reduce poverty (SDG 1) and found that the performance of micro-women entrepreneurship depends on economic resources and earning incomes that contribute to the advancement of SDG 1.

Also, Dhahri *et al.* (2021) explore how the activities of entrepreneurs contribute to the achievement of the SDGs and found that early-stage entrepreneurship advances environmental (SDGs 6, 13, 14, and 15) and economic (SDGs 7, 8, 9, 11 and 12) dimensions. They further found that opportunity entrepreneurship granger causes social sustainability (SDGs 1, 2, 3, 4, 5, and 10), as well as environmental and economic sustainability. Entrepreneurship drives poverty reduction, economic growth, and employment, and over 90 percent of businesses in Africa are small businesses (Adeola *et al.*, 2021; Gyimah *et al.*, 2020, Gyimah and Lussier, 2021). Therefore, it has become imperative that contemporary researchers call for more research to ascertain the success of entrepreneurs because their sustainability advances the SDGs (Gyimah and Ogechi, 2021).

3.3.7.2 Red strand: Contributions of renewable energy, tourism, and ICT

The second strand centers on governance that has other sub-divisions. One subdivision has keywords such as Ghana, institutional theory, Nigeria, and poverty, indicating that SDGs studies advocate that achieving the SDGs depends on the social products of firms and institutional practices (see Erin and Bamigboye, 2022). Another sub-division focuses on Africa, gender, and SDGs. For instance, Asongu and Odhiambo (2021) add to SDGs literature by mitigating how inclusive gender education can enhance gender

economic inclusion in Africa. The last sub-division of the second main strand centers on how renewable energy, tourism, and ICT contribute to sustainable development or sustainability in developing countries or sub-Saharan

Africa.

Regarding renewable energy, Asongu and Odhiambo (2022) examine how governance affects environmental SDGs focusing on renewable energy. They found that institutional and political governance systems adversely affect the achievement of environmental SDGs in sub-Saharan Africa and argue that governments in sub-Saharan Africa should ensure corruption-free and the rule of law (institutional governance), voice and accountability, and no violence in order to achieve environmental SDGs before 2030.

Regarding tourism studies and SDGs, Folarin and Adeniyi (2020) and Seraphin and Gowreesunkar (2021) outline how tourism contributes to the SDGs using African cases. They argue that tourism alleviates poverty (SDG 1) by creating sustainable employment and wealth, accelerates responsible consumption and production (SDG 12), climate action (SDG 13), peace and justice (SDG 16), and can strengthen partnerships among stakeholders across the continent (SDG 17). Notwithstanding these significant tourism contributions, countries in Africa have no unified tourism implementation strategies for sustainable tourism industry in the pre-and-post era of the global covid-19 pandemic that negatively affects the tourism industry. Contemporary scholars are advocating the need to have sustainable tourism implementation strategies through inclusive tourism governance (Siakwah *et al.*, 2020), agritourism (Ghidouche *et al.*, 2021), women

empowerment (Abou-Shouk *et al.*, 2021; McCall and Mearns, 2021), and tourism education (Agboeze and

Nwankwo, 2018).

For ICTs and SDGs, Vyas-Doorgapersad (2022) used extant literature and the opinions of researchers to demonstrate how ICT contributes to SDGs in Africa. The study reports that ICT usage and its effect on SDGs is not constantly high and suggests that there should be technological advancement at the individual, unit, institutional, and government or policy levels to implement and achieve the SDGs.

These findings suggest a gap in the literature, and future studies need to explore how the role of technological advancement at these levels can help the SDGs in Africa. Asongu and Le Roux (2017) further suggest an enhancement of ICT for inclusive human development to achieve the SDGs in Africa. They argue that the penetration of the internet, telephone, or mobile phone can increase human development in Africa towards Agenda 2030. N'dri *et al.* (2021) and Asongu *et al.* (2018) argue that the penetration of ICTs can have detrimental effects on environmental SDGs 6, 13, 14, and 15.

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Topic Dendrogram

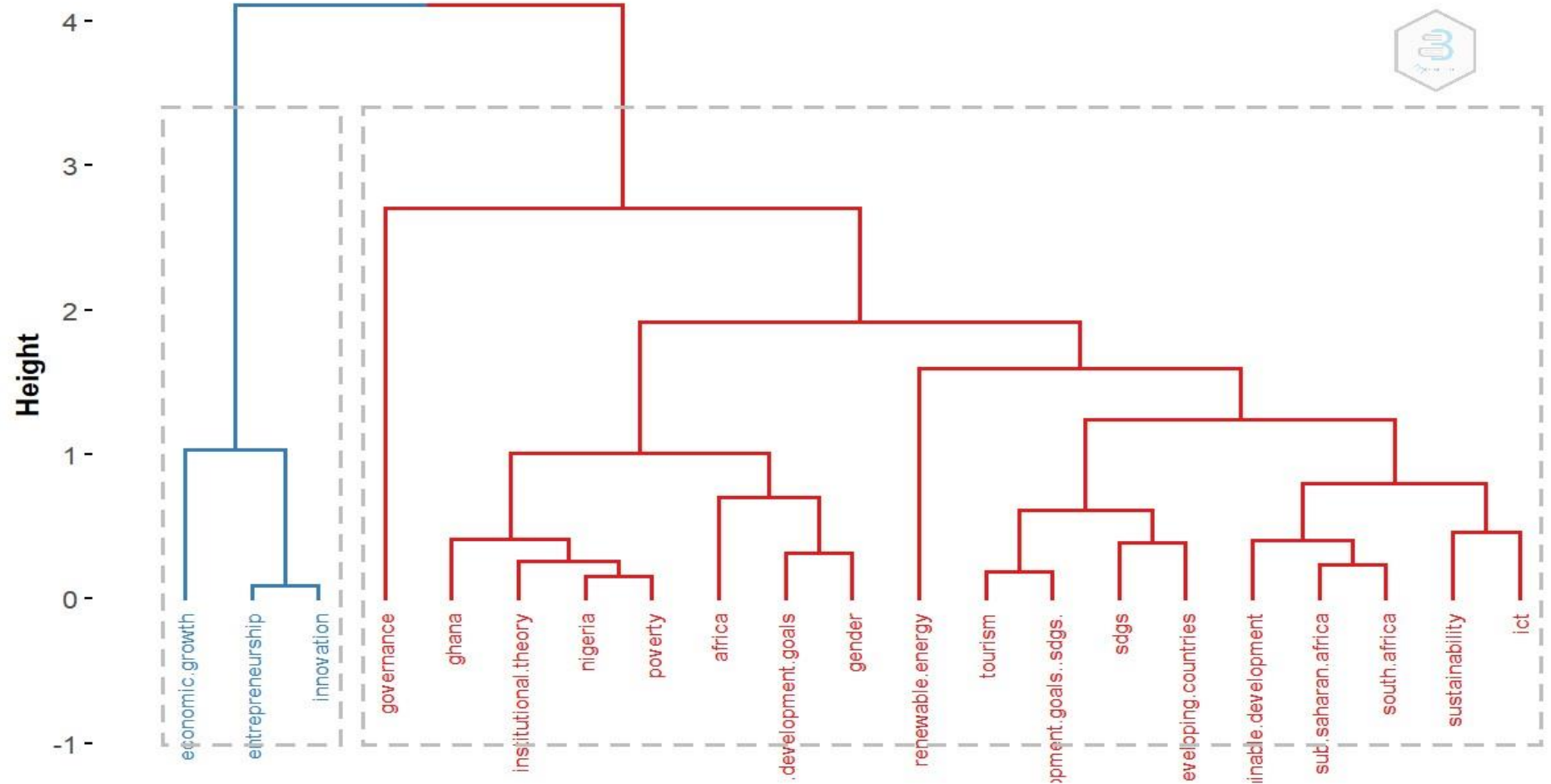


Figure 3.3. Topic dendrogram

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3.4 Methodological choices

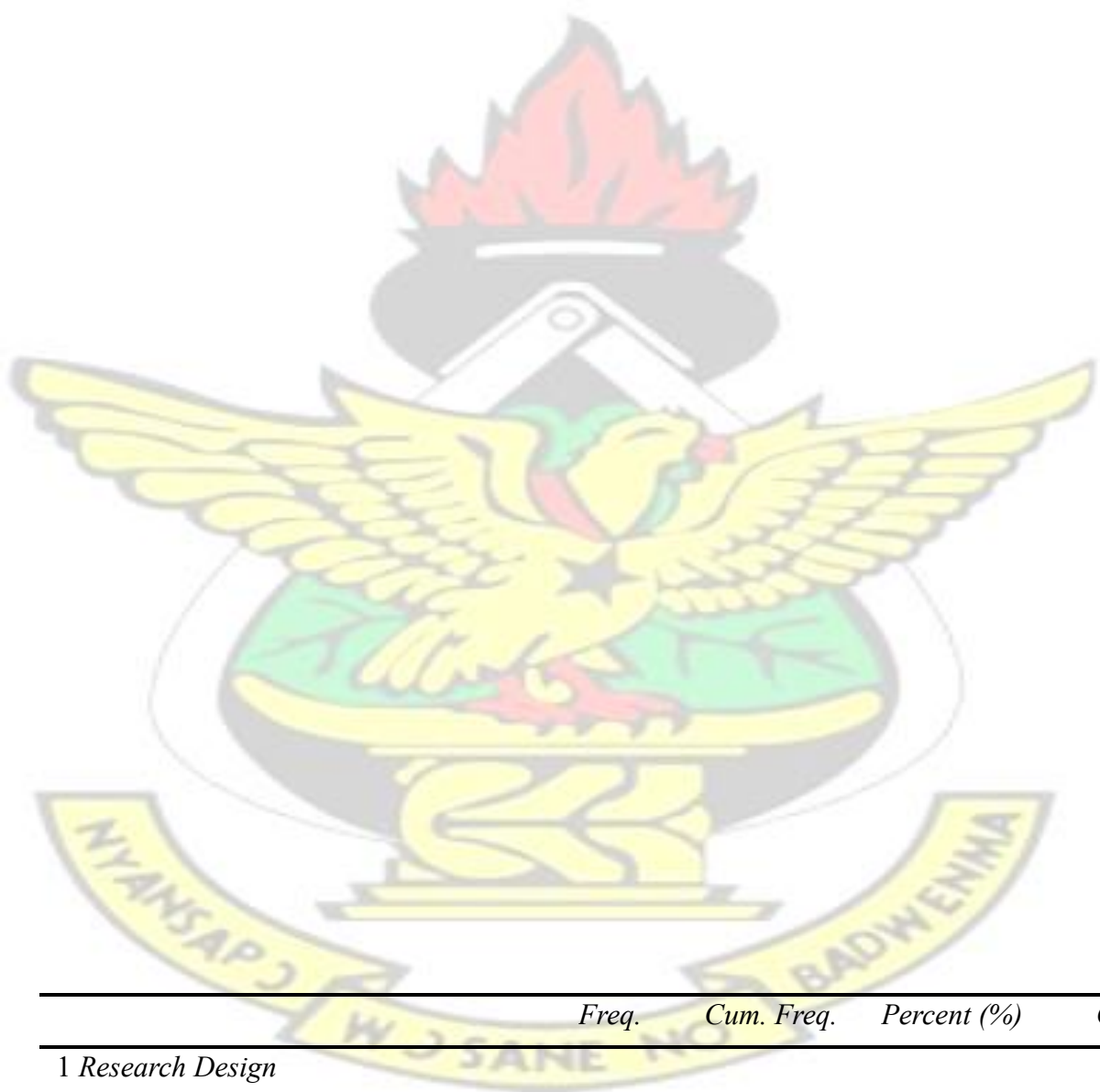
The study identified methodological choices in SDGs literature by applying a traditional in-depth content analysis of the papers to identify unexplored methods to guide future studies (Appiah *et al.*, 2022). We focused on the main methodological themes used to conduct research, such as research design, sample and sampling techniques, data sources and instruments, and analytical tools.

3.4.1 Research design

Results in Table 3.7 indicate most SDGs business studies in Africa employ a qualitative approach ($n = 97$, 48.5%) to conduct research, followed by a quantitative approach ($n = 62$, 31%) and a mixed-method approach ($n = 41$, 20.5%). Based on the stated approaches, most SDG business-related studies explore ($n = 99$, 49.5) to find answers to research questions that have not been studied in-depth. The exploratory SDGs research commonly uses content analysis or interviews to ascertain contributing determinants of SDGs in Africa (see Allam and Dhunny, 2019; Dube *et al.*, 2021; Siakwah *et al.*, 2020; Cottafova *et al.*, 2022; Erin *et al.*, 2022; Vyas-Doorgapersad, 2022). Moreover, 56 studies (28%) used explanatory to explain and understand problems, phenomena, or situations in Africa toward achieving the Agenda 2030. Also, 38 studies (19%) systematically used descriptive research to describe SDGs problems in Africa; however, only a few studies ($n = 7$, 3.5%) used two or more explanatory, descriptive, or exploratory research to conduct the SDGs studies in Africa.

In terms of the time dimension, longitudinal and other studies, including panel, cohort, and time-series studies, record the highest number of papers ($n = 111$, 55.5%), and the remaining

sample used cross-sectional method (n = 89, 45.5%), where Africa scholars collect information from a sample drawn from a population at one point in time to conduct the SDGs research. These results indicate that most African research is cross-sectional and panel-longitudinal studies to examine problems, phenomena, or situations that contribute to or advance the SDGs' achievement.



	<i>Freq.</i>	<i>Cum. Freq.</i>	<i>Percent (%)</i>	<i>Cum. %</i>
1 Research Design				
<i>Approach</i>				
Quantitative	62	62	31.0	31.0
Qualitative	97	159	48.5	79.5

Mixed	41	200	20.5	100.0
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For the research strategy, most studies do not focus on action research (n = 2, 1%) and ethnography (0%) to conduct the research. The content analysis indicates that none of the sample papers employed methods that centered on knowing the global phenomenon of the SDGs from the perspective of its cultural dimensions or social relations. However, 37 studies (18.5%) have used grounded theory by trying to develop a framework or theory to advance the SDGs literature in Africa. Most SDGs research works or papers use a survey strategy (n = 53, 26.5%) to question individuals and then describe their responses for discussion relating to the SDGs. Case studies papers also record 18 papers (9%) where scholars used one or more micro-level perspectives to explore a problem, phenomenon, or critical situation in achieving the SDGs. Lastly, 41 papers (20.5%) have used historical or archival datasets to research SDGs in Africa (see Awijen *et al.*, 2022, Erin *et al.*, 2022; Siakwah *et al.*, 2020; Vyas-Doorgapersad, 2022).

Table 3.7: Methodological Choices (N = 200)

<i>Purpose</i>				
Explanatory	56	56	28.0	28.0
Descriptive	38	94	19.0	47.0
Exploratory	99	193	49.5	96.5
Mixed	7	200	3.5	100.0
<i>Time Dimension</i>				
Cross-Sectional	89	89	44.5	44.5
Longitudinal	111	200	55.5	100.00
<i>Strategy</i>				
Experiment	53	53	26.5	26.5
Survey	49	102	24.5	50.0
Case Study	18	120	9.0	59.0
Archival	41	161	20.5	69.5

Ethnography, phenomenology, Narrative	0	161	0.0	69.5
Grounded Theory	37	198	18.5	99.0
Action Research	2	200	1.0	100.0
2 Sample				
<i>Techniques</i>				
Probability	93	93	46.5	46.5
Non-Probability	107	200	53.5	100.0
<i>Size/African countries</i>				
1-10	156	156	78.0	78.0
11-20	5	161	2.5	80.5
21-30	10	171	5.0	85.5
31-40	23	194	11.5	97.0
Above 40	6	200	3.0	100.0
3 Data Sources and Instrument				
<i>Source</i>				
Hand-collected or primary	87	87	43.5	43.5
<i>Secondary source</i>				
Literature	18	105	9.0	52.5
World Bank/ international databases	60	165	30.0	82.5
Policy/Institutional reports	35	200	17.5	100.0
<i>Instrument</i>				
Questionnaire	68	68	34.0	31.0
Interview	29	97	14.5	48.5
Observation	0	97	0.0	48.5
Archives, reports and mixed	103	200	51.5	100.0
4 Analytical Methods				
Qualitative, Content/thematic analysis	99	99	49.5	49.5
Correlation analysis, univariate, and bivariate	11	110	5.5	55.0
Data mining and machine learning analysis	3	113	1.5	56.5
<i>Regression</i>				
OLS	18	131	9.0	65.5
Logistic	13	144	6.5	72.0
GMM	12	156	6.0	78.0

PCA	4	160	2.0	80.0
Panel/time series/others	40	200	20	100.0

3.4.2 Sample

The result shows that most African SDGs studies use non-probability sampling techniques (n = 107, 53.5%) to select samples for data analysis. Business-related studies advancing SDGs usually select convenience (50%), judgemental and selfselection (35%), or quota (15%) sampling due to unavailable data from African regions. For probability sampling (n = 93, 46.5%), authors tend to use simple random (40%), stratified (25%), cluster (20%), systematic, and multi-stage (15%) probability sampling techniques to conduct SDGs studies in Africa.

The sample size is an essential feature of research that makes inferences about a population from a sample. We used the number of countries to represent the sample size used by scholars in conducting SDG business-related studies in Africa. Papers that are used between one to ten African countries are 156, representing 78%. Papers with a sample size from 11 to 20 record five papers representing 2.5%. Sample sizes range from 21 to 30, 31 to 40, and above 40 countries consisting of ten (11.5%), 23 (11.5%), and 6 (3%) papers, respectively. These results suggest that most SDG studies use few samples within ten countries to examine or explore a problem, situation, or phenomenon contributing to or advancing SDGs in Africa.

3.4.3 Data sources and instruments

Table 3.7 also includes sources of data and collection instruments used to collect data for SDGs studies in Africa. The result shows that 87 papers representing 43.5%, used

hand-collected or primary (raw) data. These studies used a questionnaire (n = 68, 34%) and interview (n = 29, 14.5%) to collect the raw data. However, most SDGs studies in Africa use the secondary or archival source (n = 103) to retrieve existing data to advance the SDGs. Specifically, 60 papers (30%) from African business scholars used data from World Bank and other international databases to conduct SDGs research. Also, 35 papers (17.5%) used policy or internal institutional documents or reports to conduct the research, and 18 (9%) used extant literature to identify SDG research gaps.

3.4.4 Analytical methods

3.4.4.1 Qualitative, Content, and thematic analysis

The content analysis employs descriptive methods to code data and discusses quantitative computations of the codes. Equally, the thematic analysis offers a purely qualitative, comprehensive, and distinct interpretation of data. Based on an extensive review of the sample, 99 papers representing 49.5% used purely qualitative analysis, content and/or thematic analysis to explore existing literature, policy documents, firm's reports, and stakeholders' views to advance SDGs research in Africa.

Contemporary scholars such as Allam and Dhunny (2019), Dube *et al.* (2021), Siakwah *et al.* (2020), Cottafava *et al.* (2022), Erin *et al.* (2022), and VyasDoorgapersad (2022) used existing literature and policy documents to identify unexplored research themes and gaps that need to fill to help countries in Africa achieve the SDGs on or before 2030.

3.4.4.2 Univariate and bivariate analysis

Most quantitative studies report univariate or bivariate correlations to explain the relationship, trends, behavior, averages, percentages, and collinearity of variables. Typically, univariate analyses such as frequency, percentage, mean, standard deviation,

minimum and maximum values, pie charts, and bar charts are reported for descriptive or exploratory analysis with no stochastic assumptions. Of the 200 papers, 11 papers (5.5%) employed only correlation, univariate, or bivariate such as correlation cross-tabulation, t-test, analysis of variance (ANOVA), chi-square, MannWhitney test, Wilcoxon test, and Kruskal-Wallis to estimate the significant drivers contributing to SDGs in Africa.

3.4.4.3 Regression

Regression is the commonest method used in social sciences studies to examine the nexus among variables (Maravelakis, 2019). Most studies ($n = 47$, 38.5%) use multivariate regression to determine the strength (positive or negative) relationship between variables using a cross-sectional dataset. The result shows that 18 studies used ordinary least squares (OLS) in their analysis, and 13 papers used logistic regression, where 4, 5, and 4 articles employed binary, probit, and tobit regression, respectively. Twelve articles also used the generalized method of moment (GMM) and principal component analysis, with four papers to analyze the data for discussion. Other studies also used longitudinal panel or time series data to advance African SDG research. Forty papers of the sample have used this approach in advancing the SDGs in Africa. Eighteen articles use the autoregressive models, and each of the autoregressive moving average models, autoregressive conditional heteroskedasticity, panel smooth transition models, and clustering models consist of five papers advancing SDGs business-related research in Africa. However, of the sample, two papers employed the generalized autoregressive conditional heteroskedasticity models to advance SDGs in Africa.

3.4.4.4 Data mining and machine learning algorithms

Data mining is a highly effective approach to analyzing big data or artificial intelligence phenomena (Maravelakis, 2019). The data collection techniques find dataset patterns, and data mining helps find meaningful relationships among related variables in a large dataset to answer the research question(s). So far, only three papers have used this approach to understand or predict critical patterns or solutions toward achieving the SDGs.

3.5. Discussion and future research agenda

3.5.1 Research questions: future directions

The review identifies that the increasing number of SDG studies in Africa focuses on entrepreneurship, economic growth, poverty alleviation, tourism, renewable energy, information technology, and sustainability. We note a gap in the literature, and inspired by the extant studies; we proposed 15 specific research directions to advance SDGs. We follow Appiah *et al.* (2022) using four-stage procedures to develop a further study agenda using bibliometrics, methodological choices, and content analysis. The first stage is that we perused and reviewed the top-cited papers (refer to Table 3.5) advancing the SDGs research. In the second stage, we reviewed the 20 most contributing authors trending topic dendrogram (Fig. 3). In the third stage, we examined the remaining papers in the sample to prevent citation bias. For the final stage, we exempted research questions that scholars have already addressed and changed potential further studies agenda into research questions (RQs). The fourstage procedures lead to 15 future RQs outlined in Table 3.8.

To better understand the outcome of SDGs, we encourage researchers to investigate the challenges averting the achievement of the 17 SDGs. Additionally, We do not advise just replicating prior studies and examining variations among nations; we recommend

that future research benefit from the distinct institutional factors in Africa, such as culture, governance, legislation, and policy mechanisms that connect the advancement of the SDGs. Future studies should explore sustainable business practices and institutional roles advancing the SDGs. Future studies need to expand education for sustainable development that specifically showcase how innovation, sustainable business practices, and technological advancements (such as blockchain technology, artificial intelligence, social media, and robotics) contribute to the SDGs in Africa and beyond.

Table 3.8: Future studies agenda

RQs	Research Questions	Reference
1	What are the grand challenges inhibiting the achievement of the SDGs in Africa before 2030?	Erin et al. (2022)
2	What are the micro, meso, and macro factors driving each of the 17 SDGs using country-specific targets?	Khaled et al. (2021)
3	Do different cultural dimensions in African nations mediate economic development and SDGs?	Quagraine et al. (2021)
4	What are the sustainable business practices advancing SDGs in Africa?	Adeola et al. (2021)
5	What is the role of alternative organizational governance firms and SDGs?	Asongu and Odhiambo (2021)
6	What is the nexus between innovation, corporate performance, and SDGs: Is it a mediated or direct nexus?	Awijen et al. (2022)
7	How can institutional engagements affect firms' approaches to advancing the SDGs?	Erin et al. (2022)

- 8 Does the culture and performance of firms influence the SDGs? Is it a mediated or direct nexus? Dhahri et al. (2021)
- 9 What is the effect of governance on SDGs in Africa? Do social capital, institutional justice, local community engagement, and inclusiveness matter? Siakwah et al. (2020)
- 10 What recovery plan strategies induce the achievement of the SDGs in Africa during an era of financial or pandemic crises? Zhao et al. (2022)
- 11 Can technological advancements such as blockchain technology, artificial intelligence, social media, and robotics contribute to the SDGs in Africa? Vyas-Dourgapersad (2022)
Allan and Dhunny (2019)
- 12 What are the innovative teaching practices of higher learning institutions that advance the SDGs? Or How do universities bridge research and teaching practices or curricula towards the Agenda 2030? Cottafava et al. (2022)
- 13 Can the SDGs contribute to African Agenda 2063? Karuri-Sebina (2020)
- 14 What is the level of support from various stakeholders (international bodies, local governance, private firms, civic society, and consumers) for corporate firms to engage with the SDGs? Khaled et al. (2021)
- 15 What is the role of formal and informal institutions in regionalization, and what implications for SDGs? Rateiwa and Azinkpono (2017)

3.5.2 Research methods and designs: future direction

The study also identifies a methodological gap where recent studies do not use data mining and machine learning algorithms to enhance SDG research in Africa. Thus, future studies should employ data mining, machine learning algorithms, or predictive models to provide in-depth insights and interactive, and comprehensive contributions of the SDGs targets and indicators estimation for each African country.

Moreover, most SDG studies in Africa used ordinary least squares (OLS), logistic regression, generalized method of moments (GMM), principal component analysis (PCA), autoregressive models, clustering models, and generalized autoregressive conditional heteroskedasticity models to advance SDG studies in Africa. Future studies can also consider predictive regression models such as structural equation models

(SEM), multinomial logistic regression, structural breaking models, threshold analysis, lasso, ridge, or Bayesian linear regression to advance the intertwined relationships among the 17 SDGs in Africa. Also, we encourage scholars to employ non-linear regression, such as polynomial and quantile models, to analyze non-monotonic relationships.

Few studies in our review used action or case studies, narrative, ethnography, grounded theory, and phenomenology (see Table 3.7). Future studies should consider these designs to unveil the black box of antecedents contributing to the Agenda 2030. Another important issue is the use of large sample size or quantification, which is a key element to theory building (Bob-Milliar, 2022). Africa has complex and diverse cultures, ethnic compositions, currencies and geographies variations, and varied political and economic institutional typologies that limit quantification. Africanists scholars should focus on heterodox research methodologies to resolve Africa's complexity and diversity in SDGs research. Indeed, the integral complexity in Africa limiting quantification can be resolved through innovative heterodox research methodologies or interdisciplinary research methods to improve quantitative and qualitative indicators and motivate more SDGs research.

3.5.3 SDGs research: future directions

Returning to Table 3.5 (top-cited papers), the in-depth content analysis conducted, we observed that most of the studies targeted SDGs 7 (affordable and clean energy) and 8 (decent work and economic growth). Few studies are advancing other SDGs, especially SDGs 1 (no poverty), 2 (zero hunger), 3 (good health and well-being), 4 (quality education), and 5 (gender equality), which are pressing needs in Africa. Thus, there is

an urgent call to action for business scholars in Africa to address the five critical areas of importance (people, planet, prosperity, peace, and partnership) by 2030 to accumulate holistic and complete details of the antecedents advancing the SDGs in Africa. Further, we call on UN agencies and policymakers to create a unified SDG framework for Africans to help government, policymakers, firms, and other stakeholders advance the SDGs by 2030. Future studies must address the critical drivers advancing each of the 17 SDGs in Africa and emphasize each goal.

3.6 Conclusion and implications

Since the establishment of the 17 SDGs in 2015, there have been growing studies by business, management, and accounting scholars advancing the SDGs in Africa. Surprisingly, most of these study concept areas are investigated from policymaking instead of a scholarly perspective. Henceforth, there are possible future challenges in research on the SDGs analysis focusing on academic perspective to come out with clear-cut implications towards achieving the SDGs in Africa. For this purpose, we conducted a comprehensive review to map out business-related literature advancing the SDGs in Africa. We employ a bibliometric, thematic, and methodological systematic review of 200 papers, authored by 606 scholars published in 102 peerreviewed sources in the past eight years (2015 to 2022), relating to cutting-edge SDG studies in Africa. Using the *R Studio software*, our bibliometric analysis unveils the top prolific authors, top contributing sources, most productive countries, top-cited papers, and evolving keywords in advancing SDGs literature streams in Africa. Also, a topic dendrogram is performed to identify major thematic patterns in the underlying contributing SDGs literature in Africa for theory and practice. Additionally, to the best of our knowledge, our study is the first to conduct a traditional detailed content analysis to identify

methodological choices and gaps in SDGs literature. Further, our study is the first to conduct bibliometrics and SLR of more than 200 SDG papers focusing on Africa.

The bibliometric analysis shows that SDGs literature in Africa is an imminent study area that contributes to greater prospects for the future scope of studies due to the sudden upsurge in publications. Also notwithstanding, our results indicate that the most productive authors and countries are from South Africa, Nigeria, and Ghana, indicating that there is scant substantial input in SDGs literature. Thus, there is an urgent need for scholars from these and other African nations to contribute to the underlying stream of literature. Thematic analysis using the topic dendrogram leads to two main strands of literature; (1) business growth, entrepreneurship, and poverty reduction, and (2) renewable energy, tourism, and ICT. Based on the detailed content analysis on these strands of papers, we have proposed 15 research questions for future studies as outlined in the study.

Additionally, the content methodology review suggests the use of other quantitative analytical tools or models such as data mining and machine learning algorithms, polynomial regressions, SEM, multinomial logistic regression, structural breaking models, threshold analysis, lasso regression, ridge regression, Bayesian linear, and non-linear regression models to provide a comprehensive understanding of the complexity of the SDGs targets and indicators estimation for African regions. Neglected qualitative methods such as discourse analysis, narrative analysis, or ethnography strategies should be used to research SDGs to understand Africa's diverse cultures, ethnic compositions, currencies, geography variations, and political and institutional typologies.

Our theoretical implication concerns the need to further explore the contributions of business, management, or accounting toward the SDGs. Although our analysis reveals the existence of two primary streams of studies, business, management, or accounting scholars have not yet fully examined the scientific debate on the subject. Currently, there is no unified framework connecting the business sector and SDGs. Our results confirm the proposition of Pizzi et al. (2020), arguing that the complexity of business and the SDGs cause difficulty in developing a framework connecting business activities and the SDGs. However, our findings show that an increasing number of academics have started to build a scholarly discussion over specific themes, such as entrepreneurship, renewable energy, and technology. Thus, business, management, or accounting researchers could begin to find theoretical models that connect the SDGs.

The current paper is valuable to local and global organizations, policymakers, government, and scholars dealing with business-related issues towards the SDGs. Notably, this paper help scholars with unexplored business research areas and methodological choices that contribute to sustainability, sustainable development, or the SDGs. Also, local and global organizations or agencies understand the business impact of the SDGs in the African context and can assist in policy directions and the development of innovative strategies. This review also offers the practice community insights into how business research contributes to the SDGs. Thus, our bibliometric and systematic review provides an opportunity for practitioners, applied scholars, and stakeholders leading the SDGs initiatives to understand the business research trends in sustainable development in Africa.

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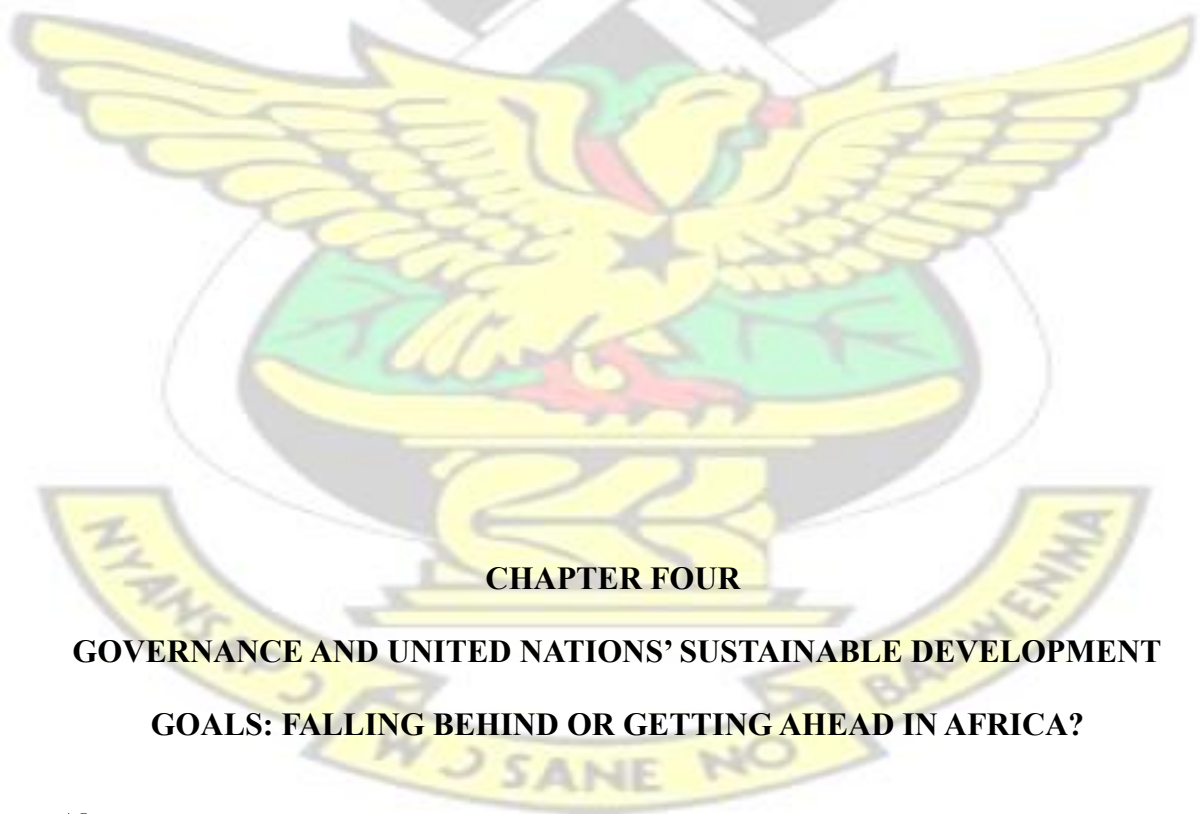
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CHAPTER FOUR

PAPER THREE

GOVERNANCE AND UNITED NATIONS’ SUSTAINABLE DEVELOPMENT GOALS: FALLING BEHIND OR GETTING AHEAD IN AFRICA?



CHAPTER FOUR

GOVERNANCE AND UNITED NATIONS’ SUSTAINABLE DEVELOPMENT GOALS: FALLING BEHIND OR GETTING AHEAD IN AFRICA?

Abstract

The study examines the extent to which governance contributes to the attainment of the United Nations (UN) Sustainable Development Goals (SDGs) in the African context.

In this study, we analyze a sample of 46 African countries, focusing on their SDG scores. To examine the relationship between various factors, we employ both multivariate analysis and an ordered probit model. The findings indicate that effective governance is crucial in facilitating this accomplishment in African nations. The positive effect between the governance and the scores of SDGs is significant, as African nations are getting ahead and with higher levels of stability tend to exhibit enhanced environmental, social, and economic sustainability. Moreover, we present empirical evidence supporting the favourable impact of foreign direct investment (FDI), gross domestic product (GDP), and freedom index on the SDGs. The findings of our study provide additional evidence supporting the significance of governance in promoting SDGs in developing nations, particularly in the areas of quality education (SDG 4), gender equality (SDG 5), climate mitigation efforts (SDG 13), and partnership for the goals (SDG 17). The study acknowledges that African nations focusing on governance mechanisms can result in to decrease in responsible consumption and production (SDG 12). The study records negative nexus governance and the likelihood of attaining SDG 12 which pertains to responsible consumption and production. This study is a valuable contribution to the existing body of literature on sustainable development. Our findings have practical implications for decisionmakers involved in formulating governance systems aimed at facilitating the attainment of SDGs.

Keywords: Governance, sustainability, SDGs, Ordered Probit, Africa

4.1 Introduction

The seventeen (17) Sustainable Development Goals (SDGs) established by the United Nations (UN) in 2015 are of critical importance to humanity and the planet (Amorós

Molina et al., 2023; Arena et al., 2023; Liu et al., 2022; Malan, 2023; Patuelli and Saracco, 2023). These goals encompass various objectives, including eradicating poverty, preserving the natural environment, and promoting inclusive, equitable, and peaceful societies that foster prosperity for all (Gyimah et al., 2023; Mangena et al., 2023; Subramaniam et al., 2023). The UN emphasises the importance of forming partnerships prioritising human well-being and environmental sustainability (Moyo and Dhliwayo, 2019; Tetteh, Agyenim-Boateng and Simpson, 2023). Implementing the 17 SDGs would need significant inclusive governance, posing several obstacles for the global society (Glass et al., 2023; Saenz, 2023). The involvement of the public sector is crucial in facilitating the mobilisation of resources for the achievement of the SDGs, especially governance, and also serves as a significant driver, particularly for Africa (Gyimah et al., 2023). Governance in Africa has long been challenging, hindering the progress towards achieving the SDGs due to rampant corruption, weak institutions and unaccountability, ethnic diversity and political instability, and limited access to quality education and healthcare (Barbier and Burgess, 2021).

However, Moyo and Dhliwayo (2019) argue that countries with better governance systems are more likely to allocate resources efficiently towards achieving the SDGs.

For instance, Ghana has made significant progress towards SDG 4 (Quality Education) by implementing policies that prioritize education spending and improve access to quality education for all children. Oxfam (2019) adds that countries with participatory decision-making processes tend to have lower levels of income inequality. Rwanda's commitment to gender equality is a prime example of how inclusive governance can contribute to SDG 5 (Gender Equality). The country has implemented policies that promote women's empowerment, resulting in increased female representation in

political positions. Furthermore, strong institutions are essential for the effective implementation of the SDGs (Van Hoang, Pham and Nguyen, 2023; Tetteh et al., 2023). According to UNDP (2020), countries with robust institutional frameworks are more likely to achieve sustainable development outcomes. Botswana's success in managing its natural resources aligns with SDG 15 (Life on Land). The country has established strong institutions that regulate mining activities and protect biodiversity. Thus, by fostering good governance practices, African countries can address poverty, inequality, and environmental degradation - key challenges outlined in the SDGs. Furthermore, strong governance systems enable effective collaboration between governments, civil society organisations, and international partners to work towards sustainable development in Africa.

Even though, governance plays a crucial role in achieving the SDGs; however, contradictory research findings have emerged regarding the effect of governance on the achievement of SDGs (Doyran, 2022). Some studies argue that good governance positively impacts the attainment of SDGs, while others suggest a weak correlation or even a negative relationship (Doyran, 2022). For instance, Acemoglu and Robinson (2012) find that inclusive institutions and governance are essential for sustainable development. They argue that countries with strong institutions and effective governance mechanisms are more likely to achieve the SDGs. Similarly, Kaufmann et al. (2009) find that good governance, including transparency, accountability, and rule of law, is positively associated with progress towards SDGs. On the contrary, Knack and Keefer (1995) argue that there is no significant relationship between governance indicators such as corruption control and economic growth, and Foa et al.'s (2018) study on 128 countries concludes that progress on SDGs on education and health may hinder progress in areas such as environmental

sustainability due to short-term policy preferences. Thus, this study endeavours to address the need for a more comprehensive comprehension of the capacity to attain SDGs in Africa. Africa is significantly lagging behind the bulk of the global community regarding socioeconomic growth and achieving SDGs (Gyimah et al., 2023). The impact of governance in these nations has been a significant catalyst for the economic expansion of Africa (Gyimah et al., 2023). Hence, the research aids international bodies, governments, and policymakers in comprehending the potential impact of governance on the attainment of SDGs in Africa.

Given the rationales above, this research aims to fill these existing gaps and provide empirical findings about the impact of governance on the attainment of SDGs in Africa. Furthermore, this study aims to explore potential variations in this effect across the 17 SDGs. In order to achieve this objective, we analyse the Sustainable Development Goal (SDG) scores and trends of 46 African nations, categorised by region. Multivariate studies are performed to examine the impact of Foreign Direct Investment (FDI) on attaining Sustainable Development Goals (SDGs). In the subsequent phase, we use an ordered probit model to investigate the impact of foreign direct investment (FDI) on the propensity to attain each Sustainable Development Goal (SDG).

The structure of the study is as follows: firstly, a comprehensive review of the relevant literature is conducted; secondly, the methods used to conduct the study are discussed; thirdly, the empirical findings of the descriptive statistics and multivariate analysis are presented and discussed, along with their implications for future research.

Finally, the study concludes based on the findings.

4.2 Literature Review

4.2.1 SDGs in Africa

The 17 SDGs have gained significant attention worldwide as a framework for addressing global challenges. Africa, with its diverse range of social, economic, and environmental issues, stands to benefit greatly from the implementation of these goals. One area where SDGs have made a positive impact in Africa is poverty reduction (Mangena et al., 2023). According to a study by Hamad et al. (2023), countries that have integrated SDGs into their national development plans have experienced a decline in poverty rates. For instance, Rwanda has successfully reduced its poverty rate from 57% in 2006 to 38% in 2017 through targeted interventions aligned with SDG 1 (No Poverty). Also, Mekonnen et al. (2019) conclude that poverty rates have been decreasing in many African countries due to targeted interventions and economic growth.

However, there is still a long way to go as millions of Africans continue to live below the poverty line. Furthermore, SDGs have also played a crucial role in promoting gender equality and women empowerment in Africa. Susan and Natu (2023) report that countries that prioritize gender equality as part of their SDG agenda have witnessed an increase in women's participation in decision-making processes and access to education and healthcare. Additionally, the African Union's Agenda 2063 emphasizes gender equality as a critical driver of sustainable development.

Efforts have been made to increase women's participation in decision-making processes at all levels (Kabeer et al. (2019). Another crucial goal is ensuring quality education for all Africans. Nkomo et al. (2020) highlight that access to education has improved significantly over the years but challenges remain regarding quality and inclusivity.

Moreover, addressing climate change is another critical SDG for Africa. The Intergovernmental Panel on Climate Change (IPCC) report emphasizes that climate change disproportionately affects vulnerable communities in Africa due to their dependence on agriculture and limited adaptive capacity. In addition, Aust et al. (2020) argue that the achievement of the SDGs in Africa depends on higher FDI that reduces poverty, provides affordable clean energy, and promotes industrialization, innovation and infrastructure development. Dartey-Baah (2014) also report that effective leadership leads to sustainable development in Africa. They suggest the presence of competent and efficient leadership leads to the SDGs. Enhancing leadership efficacy in Africa necessitates addressing many deficiencies within the political and administrative frameworks (Dartey-Baah, 2014).

In 2022, 46 African nations are assessed based on 169 targets and 247 indicators of 17 SDGs. These indicators measure the performance of each country on a scale ranging from 0 to 100, with 0 being the lowest score and 100 representing the highest score. North African nations lead the SDGs Dashboard where Tunisia, Morocco, Algeria, Egypt, and Mauritius record 72.50, 70.87, 70.83, 69.62, and 67.98, respectively (UN SDGs Report, 2023). North Africa is making great progress in advancing the SDGs due to various factors such as strong political commitment, investment in infrastructure, and effective implementation of policies. The region has been actively working towards poverty reduction, improving education, promoting gender equality, and ensuring access to clean energy. These efforts, along with collaboration between governments, organizations, and communities, have contributed to North Africa's leadership in the SDGs. It's inspiring to see the positive impact they are making. The approximate figure

for Morocco being 71 indicates that the country has progressed around 71% towards attaining its SDGs. The Africa SDG dashboard employs a colour-coded system, ranging from green to red, to elucidate the scores associated with the Sustainable Development Goals (SDGs). The colour green signifies the successful attainment of the goals, while the colour red indicates significant obstacles and difficulties encountered in achieving the SDGs.

Additionally, the Africa SDG report has a trend analysis that relies on time series data and employs a colour scheme consistent with the dashboard (Aust et al., 2020). On average, it can be seen that nations are exhibiting stagnant tendencies, indicating limited advancements in the pursuit of the SDGs. The issue that emerges pertains to the major difficulties faced by African nations. In African nations, there exists a dearth of high-quality data, insufficient civic, governmental, and political cooperation, as well as inadequate service and assistance. Thus, the primary obstacle in Africa lies in the absence of political backing and inclusive governance (Gyimah et al., 2023).

Thus, contemporary scholars are calling for more studies to delve into the nexus of governance and attainment of the 17 SDGs and this paper intends to fill this void.

Table 4.1: Summary of 17 SDGs

<i>No.</i>	<i>Name</i>	<i>Purpose/Aim</i>
1	No Poverty	Working towards eradicating extreme poverty and ensuring equal access to resources.
2	Zero Hunger	Focusing on ending hunger, achieving food security, and promoting sustainable agriculture.
3	Good Health and Well-being	Improving healthcare access, reducing mortality rates, and promoting well-being for all.
4	Quality Education	Ensuring inclusive and equitable education opportunities for everyone.
5	Gender Equality	Promoting equal rights and opportunities for all genders.

6	Clean Water and Sanitation	Ensuring access to clean water and proper sanitation for all.
7	Affordable and Clean Energy	Promoting renewable energy sources and ensuring access to affordable and sustainable energy
8	Decent Work and Economic Growth	Fostering inclusive economic growth and promoting decent work for all.
9	Industry, Innovation, and Infrastructure	Encouraging sustainable industrialization and promoting innovation and infrastructure development.
10	Reduced Inequalities	Working towards reducing inequalities within and among countries.
11	Sustainable Cities and Communities	Creating inclusive, safe, resilient, and sustainable cities and communities
12	Responsible Consumption and Production	Promoting sustainable consumption and production patterns.
13	Climate Action	Taking urgent action to combat climate change and its impacts.
14	Life Below Water	Conserve and sustainably use marine resources to protect oceans and marine life.
15	Life on Land	Protecting, restoring, and promoting sustainable use of terrestrial ecosystems and biodiversity.
16	Peace, Justice, and Strong Institutions	Promoting peaceful and inclusive societies and ensuring access to justice for all
17	Partnerships for the Goals	Strengthening global partnerships to achieve the SDGs.



Figure 4.1: The 17 SDGs (Source: UN, 2023)

4.2.2 Governance in Africa

World Bank (1992) defines governance as how authority is exercised in the administration of a nation's economic and social assets for sustainable development.

The provided definition emphasizes the wider dimensions of governance that extend beyond the realm of political institutions, including economic administration and societal progress (Sou and Vinnicombe, 2023). Moreover, Pierre (2000) contends that the scope of governance beyond formal institutions encompasses informal networks and interactions, and contends that the establishment of efficient governance systems is contingent upon the collaborative efforts of state actors, non-state actors (including civil society groups), and private enterprises. UNDP (1997, pp. 2–3) defines governance as *“the exercise of economic, political and administrative authority to manage a country’s*

affairs at all levels. It comprises mechanisms, processes and institutions, through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences”. In a comprehensive sense, these definitions elucidate that governance pertains to how power is employed to administer and manage a country’s societal resources to achieve sustainable development (Azam, 2022).

Governance in Africa is a complex and diverse topic. There are various challenges and opportunities in African governance, and efforts are being made to promote transparency, accountability, and good governance practices across the continent. It is important to recognize the progress that has been made and continue working towards inclusive and effective governance for the benefit of all Africans. The progress of governance in Africa has been a mixed bag, but there have been positive developments. Many countries have made efforts to improve transparency, accountability, and democratic practices. However, challenges remain, and there is still work to be done to ensure inclusive and effective governance across the continent. It's encouraging to see the commitment to change and the potential for further progress in the future

This study focuses on the averages of the six (6) dimensions of governance as provided by the World Bank: accountability, transparency, participation, predictability, effectiveness, and equity. These dimensions provide a framework for understanding the complex nature of governance and its impact on society. Accountability is a fundamental dimension of governance that ensures those in power is answerable for their actions and decisions. It involves mechanisms such as elections, audits, and public hearings to hold leaders accountable to the people they serve (World Bank 2017).

Transparency complements accountability by ensuring that information is accessible to all stakeholders. This includes making government budgets and policies publicly available and promoting open dialogue between citizens and decision-makers (United Nations Development Programme 2018).

Participation is another crucial dimension that emphasizes the involvement of all stakeholders in decision-making processes. It recognizes that inclusive governance leads to better outcomes by incorporating diverse perspectives (United Nations Development Programme, 2018). Predictability refers to the stability and consistency of government policies and regulations. It provides certainty for businesses and investors while fostering trust in institutions (World Bank, 2017).

Effectiveness measures how well governments achieve their intended goals. It encompasses efficient use of resources, timely service delivery, and the ability to adapt to changing circumstances (United Nations Development Programme, 2018). Lastly, equity focuses on ensuring fairness in resource allocation and policy implementation. It seeks to address social disparities by prioritizing marginalized groups (World Bank, 2017). In conclusion, these six dimensions provide a comprehensive framework for analyzing governance systems. Accountability, transparency, participation, predictability, effectiveness, and equity are all essential components for building strong institutions that serve the needs of society as a whole.

4.2.3 Governance and the SDGs

Although the impact of governance on sustainable development is widely discussed (Sou and Vinnicombe, 2023), governance-SDGs nexus in Africa has been much less obvious. Scholarly research has highlighted the significance of good governance in

advancing the SDGs. According to a study by Kroll et al. (2019), countries with strong institutions and transparent decision-making processes are more likely to make progress towards sustainable development. This is because effective governance ensures accountability, promotes citizen participation, and fosters stakeholder cooperation. Furthermore, scholars have emphasized the need for inclusive governance structures involving all societal segments. A study by Bäckstrand et al. (2020) argues that participatory decision-making processes lead to better outcomes for sustainable development as they incorporate diverse perspectives and local knowledge.

Additionally, research has shown that good governance practices contribute to economic growth and social well-being, essential to SDGs. For instance, a study by Knack (2017) found that countries with higher government effectiveness experience more significant improvements in human development indicators. Acemoglu and Robinson (2012) argue that countries with strong institutions and effective governance mechanisms are more likely to achieve the SDGs. Likewise, Kaufmann et al. (2009) find that good governance, including transparency, accountability, and rule of law, is positively associated with progress towards SDGs. Meanwhile, Knack and Keefer (1995) justify that governance indicators such as corruption control and economic growth do not drive sustainable development.

Regarding each of the 17 SDGs, Vinayagathan and Ramesh (2022) record that weak governance structures and corruption lead to ineffective poverty reduction programs, hindering progress towards eradicating poverty (SDG 1 – No poverty). Similarly, Johnson and Brown (2019) argue that poor governance practices, such as a lack of transparency in agricultural policies, contribute to food insecurity and hinder efforts to achieve zero hunger (SDG 2 – Zero Hunger). Chen et al. (2020) demonstrate that

inadequate governance systems result in limited access to healthcare services, compromising efforts to improve health outcomes for all (SDG 3 - Good Health and Well-being). Lee and Kim (2017) also highlight how weak governance structures in education systems lead to unequal access to quality education, undermining progress towards achieving inclusive education for all (SDG 4 – Quality education).

Moreover, Smithson and Hertzog (2016) show that gender-biased governance practices perpetuate gender inequalities, hindering progress towards achieving gender equality (SDG 5 – Gender equality). Additionally, studies (see World Bank Group, 2022) show that weak governance negatively impacts several goals, including clean water and sanitation (SDG 6), affordable and clean energy (SDG 7), decent work and economic growth (SDG 8), industry, innovation and infrastructure (SDG 9), reduced inequalities (SDG 10), sustainable cities and communities (SDG 11), responsible consumption and production (SDG 12), climate action (SDG 13), life below water (SDG 14), life on land (SDG 15), peace, justice and strong institutions (SDG 16) and partnerships for the goals (SDG 17). Addressing these governance challenges is crucial to ensure progress towards a sustainable future in Africa (Gyimah et al., 2023).

The above studies show there is an extensive investigation on how governance affects the SDGs or sustainable development or growth; however, fewer studies are conducted focusing on the nexus of governance and the 17 SDGs in Africa with their key pillars such as environmental, social and economic issues. Thus, the implementation of SDGs requires a dedicated effort at several levels, including the development of collaborative alliances across nations and stakeholders. These entities need to work together to successfully attain the desired objectives and targets (Aust et al., 2020). The pursuit of these objectives poses several problems for governments as they strive to combat

extreme poverty while simultaneously promoting sustainable development in economic, environmental, and social domains (Gyimah et al., 2023). To accomplish these objectives, it is incumbent upon each country to ensure effective governance mechanisms and foster novel collaborations between the private and public sectors (Glass et al., 2023).

In this study, governance assumes a pivotal role in fostering sustainable development and facilitating the attainment of the 17 SDGs in Africa. African nations exhibit several distinguishing features such as inadequate corporate governance procedures, significant political and economic instability, and a pronounced prevalence of corruption. The study adds to the extant literature by examining the effect of governance on the achievement of the SDGs in a comprehensive manner using the network theory of governance. The SDGs represent the first global framework that encompasses all three dimensions of sustainability: environmental, social, and economic. By considering these dimensions, this study aims to provide a holistic analysis of the influence of governance on SDG attainment.

4.3 Methods

4.3.1 Sample and Data

The sample contains data governance, SDGs score and macroeconomic indicators of 54 nations in Africa from 2015 to 2022. However, due to unavailable dataset data on the variables for the 54 nations, the multivariate analysis is limited to 46 nations. The SDG score data is retrieved from the Africa SDG Index and the dashboard report 2022. An SDG score of 50% signifies that a nation has achieved 50% progress towards achieving the SDG.

The existing scoring model for the Africa SDG dashboard and the Africa SDG trend dashboard is further enhanced by transforming them into a scoring model. Subsequently, the colours of the Africa SDG dashboard are converted into numerical values. The colour green, representing SDG achievement, is assigned a value of 4. Yellow is assigned a value of 3, orange is assigned a value of 2, and red, indicating significant challenges, is assigned a value of 1. The colour grey, indicating no information, is assigned a numerical value of 0.

The annual averages for the secondary dataset of the macroeconomic indicators over eight years (2015 to 2022) are employed to investigate the effect of these indicators on the SDG value in 2023 (Izadi and Madirimov, 2023). The data collection for the macroeconomic variables is sourced from the World Bank database and references information published by Freedom House in 2022.

4.3.2 Models and Measures

In order to examine how governance advances SDGs in Africa, the study estimates the following model:

$$SDG_i = \delta_0 + \delta_1 Governance_i + \delta_2 Gross Domestic Product_i + \delta_3 Government Expenditure_i + \delta_4 Inflation_i + \delta_5 Foreign Direct Investment_i + \delta_6 Population_i + \delta_7 Freedom Index_i + \delta_8 African Regions_i + \epsilon_i \quad (\text{Model 1})$$

From the econometric model (1), governance represents the World Bank's WGI's average governance of the six indicators (control of corruption, voice and accountability, government effectiveness, political stability and absence of violence/terrorism, rule of law, and regulatory quality for African countries from 2015 to 2021 (Wirajing and Nchofoung, 2023). The governance indicator ranges from -2.5 (poor) to 2.5 (good). Most extant literature considers effective governance as a critical driver of SDGs; the study predicts

a positive coefficient for governance ($\delta_1 > 0$). Gross domestic product (GDP) is the average real gross domestic growth (Haldar et al., 2023). Halder et al. (2023) and Mainali et al. (2018) argue that GPD positively affects SDGs, and the study also predicts a positive GPD-SDGs nexus ($\delta_2 > 0$). Government expenditure denotes the amount of the final government's consumption expenditure over the GPD (Arora and Sarker, 2023).

Arora and Sarker (2023) and United Nations (2022) argue that higher government spending hinders developing countries' ability to meet SDGs; thus, the study anticipates a negative relationship between government expenditure and SDGs ($\delta_3 < 0$).

Inflation measures macroeconomic stability through changes in total goods and services (Ibrahim and Ajide, 2022). Inflation, measured by consumer price index annual percentage growth (Bandura, 2022), is expected to influence SDGs negatively ($\delta_4 < 0$).

Foreign direct investment represents the natural log of the average amount of foreign direct investment (Martins et al., 2022). We anticipate a positive coefficient for FDI ($\delta_5 > 0$) because most studies view FDI as pertinent to the SDG (Izadi and Madirimov, 2023).

The natural log of the population for each nation denotes the population (Adjei et al., 2023). Since the population inversely correlates with the gross domestic product, we expect POP to impact SDG achievement negatively ($\delta_4 < 0$).

The freedom index equals the aggregate value that ranges from zero (least-free) to 100 (most-free) obtained from Freedom House. We anticipate a positive relationship between the freedom index and the SDGs because a higher score indicates greater freedom and civil rights (Aust et al., 2020).

The African Regions are dummies for the regions that denote one by region: Central, East, North, South, and West Africa. δ , i , and ϵ represent the coefficients, the African nations, and the model errors, respectively. Also, an ordered probit regression model with a TREND dependent variable is estimated to investigate whether governance affects the achievement of the SDGs in Africa.

$$Probability (TREND_i > j = g (X_i \delta_j) = \frac{expected (\infty_j + X_i \delta_j)}{1 + expected (\infty_j + X_i \delta_j)} \quad j = 0, 1, 2, 3, 4$$

(Model 2)

From the econometric model (2), the X_i denotes the vector of the independent macroeconomic indicators discussed (Governance, Gross Domestic Product, Government Expenditure, Inflation, Foreign Direct Investment, Population, and Freedom Index).

TREND is an ordinal indicator between zero and four, representing each nation's trending achievement of the SDGs. The indicator is derived by transforming the trends dashboard into a scoring model from the lowest (zero) to the greatest (four) trend in SDG achievement as follows:

- Score Four (4) means the score is level and trending toward achieving the SDGs.

- Score Three (3) indicates an increasing rate needed to achieve the SDG by 2030.
- Score Two (2) shows that the score is increasing above 50% but below the rate needed to achieve the SDG by 2030.
- Score one (1) represents that the score remains stagnant or is increasing below 50% of the growth rate needed toward SDG achievement.
- Score zero (0) shows that the nations are moving in the wrong direction and cannot achieve the SDGs by 2030.

Model 2 predicts each of the 17 SDGs for the five African Regions (See Table 5).

4.4 Results and Discussions

4.4.1 SDGs Statistics

Table 4.2A presents the descriptive statistics for UN SDGs scores for each of the five African Regions and the average scores for the whole African region for discussion. Additionally, Table 4.2B presents the average scores of the dependent, independent and control variables for discussion. Central Africa records the lowest SDGs score of 51.84% and is under the score for Africa.

Table 4.2A- Dashboard statistics for SDG

Sustainable Development Goals	Africa	Central Africa	East Africa	North Africa	South Africa	West Africa
SDG1: No poverty	1.33	1.13	1.50	1.80	0.90	1.15
SDG2: Zero hunger	1.05	1.13	1.10	1.00	1.00	1.00
SDG3: Good health and well-being	1.07	1.00	1.10	1.40	1.00	1.00
SDG4: Quality education	2.33	1.13	1.30	2.40	2.40	1.15
SDG5: Gender equality	2.52	1.13	2.70	2.60	2.60	1.00
SDG6: Clean water and sanitation	1.15	1.00	1.10	1.80	1.20	1.00
SDG7: Affordable and clean energy	1.13	1.13	1.10	1.40	1.10	1.08
SDG8: Decent work and economic growth	1.11	1.00	1.10	1.00	1.00	1.31

SDG9: Industry, innovation and infrastructure	1.20	1.13	1.10	1.80	1.20	1.08
SDG10: Reduced inequalities	1.46	1.25	1.30	1.60	1.00	1.62
SDG11: Sustainable cities and communities	1.24	1.00	1.20	1.60	1.50	1.08
SDG12: Responsible consumption and production	3.63	3.63	3.50	3.20	3.60	3.92
SDG13: Climate action	3.57	3.75	3.80	3.20	3.10	3.77
SDG14: Life below water	0.91	1.25	0.60	1.20	0.80	0.92
SDG15: Life on land	1.46	1.88	1.00	1.00	1.60	1.62
SDG16: Peace, justice and strong institutions	1.11	1.13	1.10	1.08	1.40	1.40
SDG17: Partnership for the goals	2.57	1.25	1.40	2.20	2.30	1.46

Table 4.2B- Descriptive statistics for variables

	Africa	Central Africa	East Africa	North Africa	South Africa	West Africa
SDG score (%)	58.09	51.84	54.41	70.38	58.69	55.12
SDG score SD (%)	7.36	8.19	8.40	6.44	4.42	3.99
Governance score	0.67	0.91	0.76	0.58	0.49	0.59
Governance score SD	0.38	0.47	0.46	0.29	0.25	0.34
No of countries	46	8	10	5	10	13
% countries	100	17.39%	21.74%	10.87%	21.74%	28.26%
Gross Domestic Product	4.20	1.56	4.30	4.88	4.74	4.86
Foreign Direct Investment	8.11	8.49	8.62	9.14	6.08	8.65
Government Expenditure	12.32	11.91	10.39	15.95	15.66	10.09
Inflation	7.50	3.14	5.88	4.62	17.35	5.85
Population	7.13	6.87	7.23	7.40	6.98	7.22
Freedom Index	51.64	50.00	48.10	52.72	51.84	56.55

Specifically, the Central Africa region records the lowest score for SDG 4 (Quality education) and SDG 17 (Partnership for the goals). SDGs 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,

16, and 17 are under 50% of the growth rate needed towards SDG achievement, and Central African nations are not making strides towards the achievement of these 13 SDGs. However, the Central African scores in terms of SDG 13 (Climate action), SDG 14 (Life below water), SDG 15 (Life on land), and SDG 16 (Peace, justice and strong institutions) are higher than the average scores of Africa. In particular, SDG 12 (Responsible consumption and production) and SDG 13 (Climate action) scores of 3.75 and 3.63, respectively, imply that the achievement of the Central African region towards SDG 12 and SDG 13 is level and trending towards achieving the SDGs before 2030. East Africa records higher in SDG 5 (Quality education), SDG 12 (Responsible consumption and production), and SDG 13 (Climate action) than Africa's score, which is increasing above 50% needed to achieve the SDG by 2030. However, achieving SDG 1 (No poverty) in East Africa is below the needed rate towards achieving the SDGs. Similarly, West Africa records an SDG score of 55.12%, below Africa's 58.09%. West African nations have been able to achieve above 50% of the needed rate towards the achievement of SDG 12 (Responsible consumption and production) and SDG 13 (Climate action) but below 50% of the rate needed to advance SDG 10 (Reduced inequalities), SDG 15 (Life on land), and SDG 17 (Partnership for the goals). Other 12 SDGs, such as 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 14, and 16, have remained stagnant in West African nations and may be unachievable before 2030.

South Africa (average SDG score = 58.69%) and North (average SDG score = 70.36%) are higher than Africa's SDG score, indicating that they are the leaders towards the achievement of the Agenda 2030 in Africa. In particular, South African nations have been able to achieve above 50% of the needed growth rate towards the advancement of

SDG 5 (Gender equality), SDG 12 (Responsible consumption and production), and SDG 13 (Climate action). Also, South Africa recorded low scores in SDG 6 (Clean water and sanitation), SDG 11 (Sustainable cities and communities), and SDG 15 (Life on land), but they are higher than the average scores in Africa. In Northern Africa, they also have been able to achieve above 50% of the needed growth rate towards the advancement of SDG 5 (Gender equality), SDG 12 (Responsible consumption and production), and SDG 13 (Climate action). Again, North Africa's

SDG scores in SDGs 1, 4, 6, 9, 10, 11, and 17 are also higher than in Africa. Regarding governance score, the countries in Central Africa (representing 17.39% of total countries) record 0.91, which is higher than Africa's aggregate score of 0.67. This aggregate value indicates an excellent governance system in central African nations in terms of voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. Central African countries have diverse governance systems, from presidential to semi-presidential. Some countries in the region have faced political instability, corruption, and human rights issues. However, efforts are being made to promote good governance, strengthen institutions, and enhance transparency.

East Africa's aggregate governance score yields 0.76, which is also higher than Africa's score of 0.67. Regarding governance in East Africa, the region consists of a mix of political systems, including presidential republics, parliamentary democracies, and constitutional monarchies. Some countries have experienced political stability and economic growth, while others face corruption, ethnic tensions, and human rights concerns.

North Africa's governance score of 0.58 is lower than Africa's score of 0.67, indicating that the governance systems in the Northern part of Africa do not ideally strive for

peaceful government systems. Countries in North Africa have presidential republics, while others have parliamentary systems or constitutional monarchies. While some nations have enjoyed political stability and economic growth, others have faced political unrest, authoritarianism, and human rights concerns. Similarly, South African nations' low score ($= 0.49$) is due to persistent challenges such as corruption, inequality, and high crime rates. However, nations in the South have made significant progress in political stability and human rights since the end of apartheid. Likewise, the low score ($= 0.59$) for West Africa is not surprising due to political stability and challenges, including corruption, ethnic tensions, and economic disparities. These five regions have their own unique governance structure and political landscape, and efforts are being made to strengthen democratic institutions, promote accountability, and ensure regional inclusive governance.

A comparative analysis of the government expenditure scores shows that regions spending more recorded higher in the SDGs. For instance, North Africa's and South Africa's government expenditures of 15.95 and 15.66, respectively, enhance SDG scores. Equally, regions with a high freedom index lead to SDG 16 (Peace, justice and strong institution). For instance, West Africa's freedom index ($= 56.55$) leads to a higher SDG 16 score ($= 1.40$) than other African regions. Regarding foreign direct investment (FDI), the North African regions record the highest SDG achievement ($= 67.14\%$), and it could also be the highest FDI ($= 9.14$). This achievement is due to their investment in automobile technologies, ICT and innovation (Aust et al., 2020). Nations in Central Africa record the lowest SDG score ($= 51.84\%$), which can be attributed to low population and gross domestic product (GDP). Another observation is that North Africa and South Africa, with the highest GDP, are attributed to the high SDGs' achievement

in Africa. Low inflation and population contribute to economic stability; however, achieving the SDGs requires a comprehensive approach that addresses various social, economic, and environmental factors (Gyimah et al., 2023).

Figure 4.2 illustrates the outcomes derived from the SDG trend points and percentages concerning the attainment of the five regions. Except for South African regions, the others actively pursue SDG 12 (Responsible consumption and production) and SDG 13 (Climate action). Africa recognizes the importance of responsible consumption and production by promoting sustainable practices and aims to minimize waste generation, reduce environmental impacts, and ensure the efficient use of resources. This result aligns with the continent's commitment to sustainable development and creating a better future for its people and the planet. Also, Africa is pursuing SDG 13 because it understands the urgent need to address climate change and its impact on the continent by reducing greenhouse gas emissions, increasing resilience, and promoting sustainable practices. Africa aims to mitigate the effects of climate change and protect its environment for future generations. This commitment aligns with the continent's efforts to create a sustainable and resilient future. Central and West African regions are focusing more on SDGs 12 and 13, as discussed above. In addition to SDGs 12 and 13, East African regions are exhibiting encouraging advancement of SDG 5 (Gender equality) by empowering women and girls, eliminating discrimination, ensuring equal access to education and healthcare, and promoting women's participation in decision-making processes.

North African regions focus on advancing SDG 4 (Quality Education) and SDG 17 (Partnership for the goals) in addition to SDGs 12 and 13. North African regions focus

on SDG 4 to ensure inclusive and quality education. Education is seen as a critical driver of development and empowerment, and by prioritizing SDG 4, North Africa aims to provide equal educational opportunities and enhance skills for its people. Additionally, North Africa is focusing on SDG 17 to strengthen partnerships for sustainable development through collaboration, cooperation, and sharing of knowledge and resources by fostering local, regional, and international partnerships.

Finally, South African Regions are interested in advancing SDGs 5 and 17 by ensuring gender equality in governance and policy decisions, health, and education and accelerating progress towards sustainable development through partnerships among other developing and advanced countries. In summary, the dominance trends of the SDGs Africa countries are focusing are SDG 4 (trend 4), SDG 5 (trend 5), SDG 12 (trend 12), SDG 13 (trend 13), and SDG 17 (trend 17).

	Below African mean	Above African mean	(+) trend expected
Central Africa	1 3 4 5 6 9 10 11 17	2 13 14 15 16	12 13
East Africa	4 6 7 8 9 10 11 12 14 15 16 17	1 2 3 5 13	5 12 13
North Africa	2 8 12 13 15	1 3 4 5 6 7 9 10 11 14 16 17	4 12 13 17
South Africa	1 2 3 7 8 10 12 13 14 16	4 5 6 11 15 17	5 17
West Africa	1 2 3 4 5 6 7 9 11 16 17	8 10 12 13 14 15	12 13

Figure 4.2: Results of the scoring model by trend and region

4.4.2 Diagnostics Tests

Table 4.3 presents the results of correlation, multicollinearity, data normality, and heteroscedasticity. Pearson Correlation coefficient and Variance Inflation Factor (VIF) tests determine if the variables are multicollinear. If the VIF score is more than 10, the research finds that a variable is impacted by multicollinearity (Brekumi et al., 2023). Additionally, when the R-value of the Pearson correlation coefficient is 0.700 or above, there is multicollinearity between the two explanatory factors (Gyimah et al., 2020). All the VIF record values are less than 10, suggesting no significant collinearity among the regressors (Appiah et al., 2020; Jalloh et al., 2019). The VIF results show no problem with multicollinearity (Gyimah et al., 2019).

None of the R-values in the Pearson correlation matrix exceeded 0.70, indicating a lack of strong association among the variables. The results indicate no collinearity or multicollinearity among the dependent, independent, and control variables. However, the pairwise correlation records a high R-value of 0.645 between population and inflation. However, their VIF is 3.478, indicating the variables are not multicollinear. Also, the Shapiro-Wilk W test null hypothesis indicates that our data has a normal distribution since all the p-values of variables are significant ($p\text{-value} < 0.05$).

One of the critical assumptions of regression estimation is that the error term has to be homoscedastic to ensure unbiased test statistics. Using the Breusch-Pagan/Cook-Weisberg to test for heteroskedasticity under the null hypothesis, we record a Chi-squared of 0.584 with a p-value of 0.337. Therefore, we accept the null and

conclude that no heteroskedasticity exists between the dependent variable and the error term.

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Table 4.3: Correlation and Validity Test

	1	2	3	4	5	6	7	8
1. SDG Score	1.000							
2. Governance	0.423**	1.000						
3. Gross Domestic Product	0.220*	0.024	1.000					
4. Government Expenditure	0.127	0.251**	-0.237	1.000				
5. Inflation	-0.456	0.124	-0.176	0.521	1.000			
6. Foreign Direct Investment (Log)	0.327***	0.254*	0.428*	-0.354	-0.234	1.000		
7. Population (Log)	0.493*	0.310	-0.123	0.452*	0.645	0.243	1.000	
8. Freedom Index	0.254**	0.209	0.439	0.324	0.319*	0.278*	0.321*	1.000
VIF	2.121	1.958	1.654	2.045	2.009	1.624	1.731	1.680
1/VIF	0.472	0.511	0.605	0.489	0.498	0.616	0.578	0.595
Shapiro-Wilk W Score	0.632***	0.712***	0.785***	0.645***	0.658**	0.825**	0.735***	0.775***

(1) Chi-squared and p-value for Breusch-Pagan/Cook-Weisberg test for heteroskedasticity = 0.584 and 0.337

(2) Significant levels: *** p-value < 0.001, ** p < 0.01, * p < 0.05

Table 4.4: Multivariate results

Variables	Δ	Predicted Sign	(1)	(2)	(3)	(4)	(5)	(6)
Governance	δ_1	Positive	0.098*** (0.0287)	0.106*** (0.023)	0.090*** (0.019)	0.107*** (0.024)	0.010*** (0.002)	0.113*** (0.021)
Gross Domestic Product	δ_2	Positive	0.219*** (0.034)	0.097*** (0.032)	0.033*** (0.012)	0.181*** (0.033)	0.118*** (0.035)	0.130*** (0.026)
Government Expenditure	δ_3	Positive	0.132 (0.110)	0.090 (0.106)	0.083 (0.084)	0.120 (0.106)	0.078 (0.106)	0.049 (0.085)
Inflation	δ_4	Negative	-0.053 (0.057)	-0.037 (0.059)	-0.065 (0.045)	-0.043 (0.070)	-0.057 (0.056)	-0.088 (0.758)
Foreign Direct Investment (Log)	δ_5	Positive	0.653** (0.291)	0.708** (0.319)	0.484*** (0.099)	0.703** (0.301)	0.707** (0.305)	0.325*** (0.113)
Population (Log)	δ_6	Negative	-0.229 (0.144)	0.259 (0.240)	-0.154 (0.114)	-0.243 (0.241)	-0.252 (0.238)	-0.199 (0.187)
Freedom Index	δ_7	Positive	0.150*** (0.040)	0.165*** (0.025)	0.147** (0.077)	0.173*** (0.067)	0.135*** (0.056)	0.187** (0.084)
Central Africa	δ_8		0.036 (0.204)	0.183 (0.126)	0.083 (0.084)	-0.120** (0.061)	0.054 (0.119)	0.041 (0.268)

Central Africa *Governance

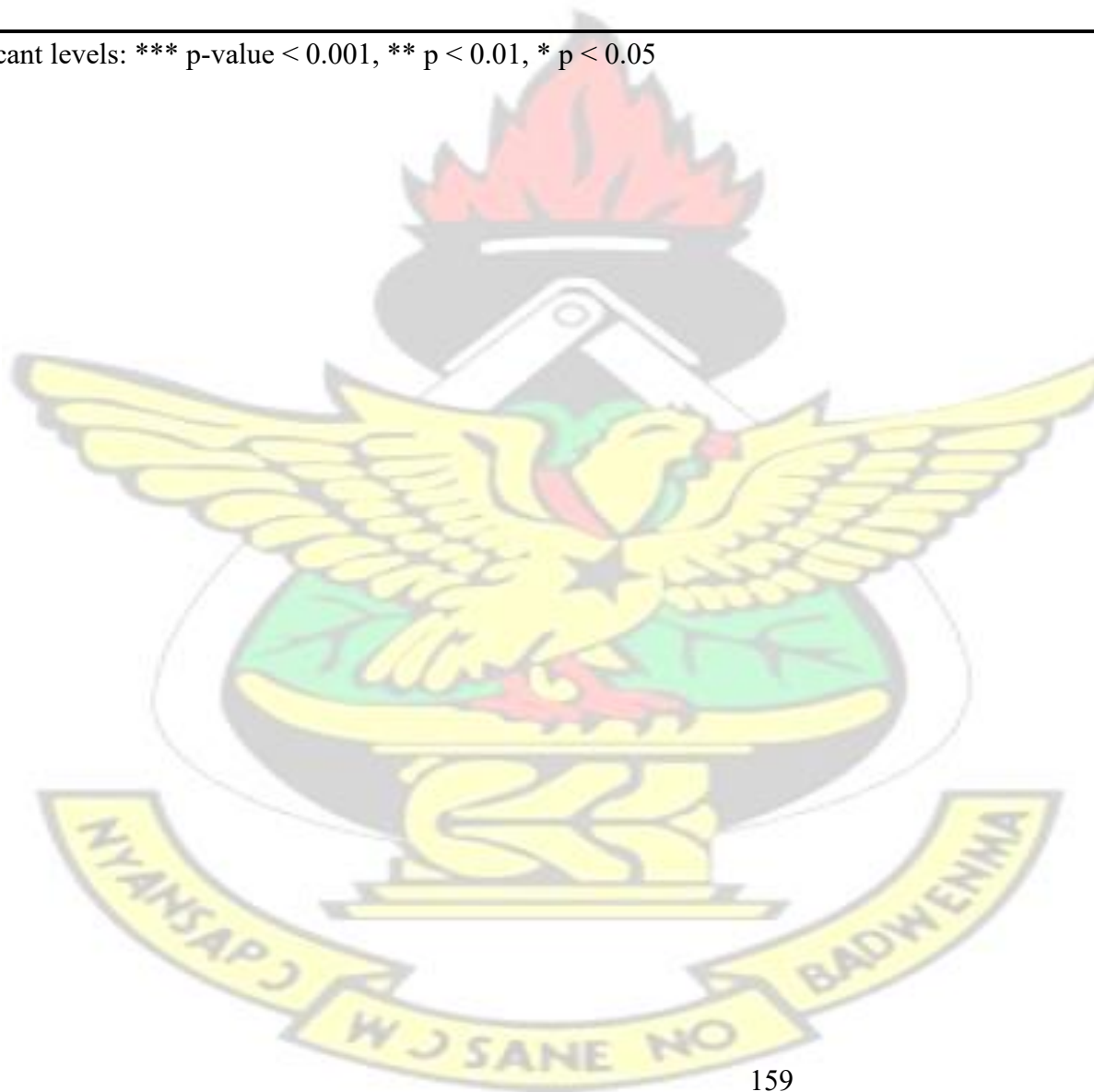
δ_9

0.188*
(0.025)

East Africa	δ_{10}	0.043*** (0.013)	0.185*** (0.028)	0.012 (0.177)	0.106*** (0.038)	0.032* (0.018)	0.130 (0.318)
East Africa *Governance	δ_{11}		0.098*** (0.006)				
North Africa	δ_{12}	0.068** (0.030)	0.016*** (0.004)	0.171*** (0.053)	0.218** (0.092)	0.091*** (0.011)	0.118*** (0.013)
North Africa *Governance	δ_{13}			0.081** (0.030)			
South Africa	δ_{14}	-0.053 (0.315)	-0.087 (0.359)	-0.095 (0.372)	-0.046 (0.413)	-0.099*** (0.007)	0.089 (0.211)
South Africa *Governance	δ_{15}				-0.130 (0.371)		
West Africa	δ_{16}	0.021 (0.714)	0.007 (0.317)	0.065 (0.432)	0.011 (0.526)		0.123 (0.211)
West Africa *Governance	δ_{17}					0.051*** (0.003)	
Constant	δ_0	?	0.427*** (0.102)	0.470*** (0.106)	0.478*** (0.082)	0.428*** (0.103)	0.408*** (0.101)
Countries			46	46	46	46	46

R-squared	0.588	0.600	0.736	0.586	0.605	0.788
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000

Significant levels: *** p-value < 0.001, ** p < 0.01, * p < 0.05



4.4.3 Discussion of Multivariate Analysis

Table 4.4 shows the outcomes of the multivariate analysis examining the relationship between governance and SDG achievement in Africa. The study records a significant positive coefficient for governance ($\delta_1 = 0.098$, $p\text{-value} < 0.001$), indicating that an increase in effective governance enhances the achievement of the SDGs in Africa. Put differently, effective governance in Africa plays a critical role in achieving the SDGs by promoting transparency, accountability, and the rule of law. Also, gross domestic product (GDP) is positive and significant ($\delta_2 = 0.219$, $p\text{-value} < 0.001$), implying that GDP is also a fundamental driver of SDGs in Africa. Increased GDP can contribute to poverty eradication, improved infrastructure, access to quality education and healthcare, and the creation of decent work and economic opportunities. It provides a solid foundation for sustainable development and helps address the various challenges faced by Africa.

Moreover, as predicted, foreign direct investment (FDI) records a significant positive relationship ($\delta_5 = 0.653$, $p\text{-value} < 0.01$), which shows that an upsurge in FDI contributes to the advancement of the SDGs. By attracting FDI in Africa, countries can benefit from increased capital, technology transfer, job creation, and enhanced productivity towards achieving the SDGs by stimulating economic growth, reducing poverty, improving infrastructure, and promoting sustainable development. Additionally, the Freedom Index records a positive coefficient ($\delta_7 = 0.150$) and a significant relationship ($p < 0.001$) with the SDGs score. The observed coefficient suggests that nations with higher levels of stability may have more potential for attaining environmental, social, and economic sustainability. Enhanced freedom and ensuring a high Freedom Index in Africa create an environment that fosters human

rights, democracy, and the rule of law, and these advances the SDGs by empowering individuals, promoting social inclusion, and fostering sustainable development.

Variables such as government expenditure ($\delta_3 = 0.132$, p-value > 0.1), inflation ($\delta_4 = 0.053$, p-value > 0.1), and population ($\delta_6 = -0.229$, p-value > 0.1) do not have a significant impact on the achievement of the SDGs in Africa. Public finance, such as how the government spends, high inflation levels and population rate, do not drive SDGs in Africa. Government expenditure does not align with the SDGs due to a lack of prioritization or inefficient allocation of resources towards initiatives that contribute to sustainable development, poverty reduction, or other SDG targets. Also, high inflation rates can erode purchasing power, increase poverty, and hinder the SDGs. Thus, affordable access to education, healthcare, and other essential services becomes challenging in Africa. Similarly, rapid population growth can strain resources, infrastructure, and social services, making it challenging to meet the population's needs; thus, achieving the SDGs will be problematic.

Concerning regional interactions, the governance impact on attaining Sustainable SDGs is more pronounced in North Africa. Despite the observed decrease in effective governance in North Africa, Countries such as Morocco, Tunisia, and Algeria have tried to implement effective governance systems towards the SDGs by aligning their national development plans with the SDGs, establishing monitoring mechanisms, and engaging stakeholders in the implementation process. These countries aim to promote transparency, accountability, and citizen participation through good governance practices, which are essential for achieving the SDGs and fostering sustainable development in the region. However, the effective governance system in Central Africa

is reduced due to a negative significant coefficient between the interaction of East Africa and governance. Thus, Central Africa has the minimum level of effective governance systems towards SDGs for the timespan from 2015 to 2022.

4.4.4 Robustness – Ordered Probit Results

Table 4.5 shows the outcomes of the multivariate results examining the relationship between governance and SDG trends (see Figure 4.2) in Africa.

Table 4.5: Ordered Probit Regression

Variables	Coefficient	Trend4	Trend5	Trend12	Trend13	Trend17
Governance	δ_1	0.226*** (0.075)	0.323*** (0.082)	0.124 (0.097)	0.885** (0.221)	0.280*** (0.070)
Gross Domestic Product	δ_2	0.174* (0.100)	-0.108 (0.092)	0.134 (0.094)	0.865*** (0.081)	-0.058 (0.082)
Government Expenditure	δ_3	0.048 (0.033)	0.013 (0.027)	-0.049* (0.029)	-0.047* (0.027)	0.051** (0.026)
Inflation	δ_4	0.007 (0.024)	0.033** (0.014)	-0.526*** (0.053)	-0.02 (0.013)	-0.012 (0.015)
Foreign Direct Investment (Log)	δ_5	0.004 (0.100)	-0.028 (0.084)	-0.240 (0.230)	-0.695*** (0.094)	-0.154 (0.097)
Population (Log)	δ_6	0.718 (0.455)	0.216 (0.355)	0.541 (0.445)	0.216*** (0.034)	0.329 (0.334)
Freedom Index	δ_7	0.003 (0.031)	-0.099*** (0.029)	0.046* (0.025)	0.003 (0.033)	0.071*** (0.026)
Countries		46	46	46	46	46
Pseudo r-squared		0.343	0.325	0.298	0.258	0.322
Prob > chi2		0.000	0.000	0.026	0.040	0.000

Significant levels: *** p-value < 0.001, ** p < 0.01, * p < 0.05

From Table 4.5, the outcomes show that except for SDG 12 (Responsible consumption and production), governance increases the likelihood of the achievement of the trends of SDG 4 (Quality education), SDG 5 (Gender equality), SDG 13 (Climate action), and SDG 17 (Partnership for the goals). For SDG 4, the findings agree with the study of Asongu and Odhiambo (2020), Lee and Kim (2017), Wise et al. (2020), and Yirdaw (2016) who argue that governance positively affects quality education. Governance promotes transparency and accountability in the education sector. This ensures that resources allocated for education are effectively utilized and reach those most need it. For example, Ghana established an Education Management Information System (EMIS) to monitor school performance and resource allocation (UNESCO Institute for Statistics, n.d.).

Regarding SDG 5, the outcome agrees with Susan and Natsu's (2023) study that highlights that effective governance structures are pivotal in promoting women's rights and empowering them economically, socially, and politically. Similarly, this study emphasizes the importance of good governance in reducing gender inequalities in Africa.

Additionally, the positive correlation between governance and climate action (SDG 13) agrees with the studies of Bäckstrand et al. (2017) that argue that governance enhances climate policy effectiveness by promoting transparency, accountability, and citizen participation. Similarly, the study aligns with Huq et al.'s (2015) study that emphasizes that countries with better governance structures are more likely to implement effective adaptation or climate measures.

Finally, our outcomes recognize the importance of effective governance in achieving all other goals (SDG 17). The positive significant relationship between governance and SDG 17 agrees with the findings of Biermann et al. (2017) who conclude that effective governance structures facilitate knowledge sharing, technology transfer, and capacity building among nations.

4.5. Conclusion

Gyimah et al. (2023) emphasise the significance of research in advancing the UN SDGs and in advocating for the integration of sustainability in business, management, and accounting practices. Given the pivotal role of governance in facilitating transformative global development, this study aims to examine its potential impact on the attainment of SDGs within a representative sample of 46 African nations. The findings indicate that effective governance is crucial in facilitating this accomplishment in African nations. The positive effect between the governance and the scores of SDGs is significant, as nations with higher levels of stability tend to exhibit enhanced environmental, social, and economic sustainability. The findings of our study provide additional evidence supporting the significance of governance in promoting SDGs in developing nations, particularly in the areas of quality education, gender equality, climate mitigation efforts, and the partnership for the goals. Nevertheless, effective governance in Africa may yield unfavourable outcomes in relation to responsible consumption and production.

This study makes significant contributions to the on-going global discourse on the SDGs in underdeveloped nations. This study represents the multivariate analysis of the impact of governance on the attainment of SDGs in a comprehensive manner,

encompassing both the overall achievement of SDGs and the individual achievement of each SDG. Furthermore, the sample utilised in this study is derived from African nations. Research conducted on Africa provides valuable insights that are applicable not only within the African setting but also in other developing nations (Aust et al., 2020).

The present investigation is constrained by some limitations. The lack of access to and dependability of data pertaining to African countries resulted in a reduction in our sample size from 54 countries to 46 countries. Furthermore, it hindered our capacity to estimate non-trend SDGs 1 (no poverty), 2 (zero hunger), 3 (good health and wellbeing), 6 (clean water and sanitation), 7 (affordable and clean energy), 8 (decent and economic growth), 9 (industry, innovation and infrastructure), 10 (reduced inequalities), 14 (life below water), 15 (life on land), and 16 (peace, justice and strong institutions) in Africa. Moreover, it can be anticipated that governance is inclined to be attracted to nations exhibiting higher scores on the governance average index score and SDG score index and regions having more available data.

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CHAPTER FIVE

PAPER FOUR

MOVING THE SUSTAINABLE DEVELOPMENT GOALS FORWARD? FIRMS CONTRIBUTIONS IN AFRICA

CHAPTER FIVE

MOVING THE SUSTAINABLE DEVELOPMENT GOALS FORWARD?

FIRMS CONTRIBUTIONS IN AFRICA

Abstract

We comprehensively examine the corporate reports of 223 firms to find out their contribution towards the achievement of the United Nations (UN) Sustainable Development Goals (SDGs) in Africa. The study employs content analysis using a Responsible Research and Innovation (RRI) perspective to ascertain innovation

approaches firms have employed or engaged to accomplish the SDGs in Africa. The results suggest that organisations emphasise mitigating greenhouse gas emissions, implementing robust data security measures, fostering workplace diversity, and ensuring the health and safety of their workers. There is a prevailing inclination towards adopting business policies that support global goals, provide tangible financial benefits, and address legal requirements. Therefore, it is essential to establish a comprehensive framework for sustainability reporting to prevent the misuse of the SDGs as a means of greenwashing and other misleading practices in Africa.

Keywords: Corporate reports, engagement, global goals, Africa, content analysis

5.1 Introduction

The United Nations (UN) approved the 17 Sustainable Development Goals (SDGs) in 2015, aiming to enhance the three dimensions of sustainable development and safeguard the earth's and humanity's future (Gyimah et al., 2023; Patuelli and Saracco, 2023; Tetteh, Agyenim-Boateng and Simpson, 2023). These goals prioritise economic, social, and environmental aspects (Amorós Molina et al., 2023; Aust et al., 2020). Nevertheless, according to the UN 2022 status report, the pace of development towards the established objectives has been deemed insufficient (Gyimah et al., 2023). Furthermore, global efforts have encountered a significant setback due to the COVID19 epidemic, resulting in a notable increase in extreme poverty, unprecedented in recent history (United Nations, 2022; Saenz, 2023; Tetteh et al., 2023). These objectives can alone be attained by a collaborative effort using innovative methodologies and involving all society members with a vested interest. It is imperative to thoroughly

comprehend stakeholder engagement within this framework to expedite the advancement towards attaining the global goals (Subramaniam et al., 2023; Van Hoang, Pham and Nguyen, 2023).

The primary objective of this study is to provide a distinct contribution towards enhancing comprehension of firms' involvement in the SDGs using Responsible Research and Innovation (RRI) perspective in Africa. RRI is an inclusive strategy that aims to include stakeholders from diverse domains throughout the research and innovation process (Wiarda et al., 2021). Firms can demonstrate responsibility by proactively considering the potential consequences of an invention, conducting thorough assessments of these consequences, including relevant stakeholders in the decision-making process, and promptly addressing any issues that may arise (Nylund et al., 2022; Tetteh et al., 2023). The SDGs' level of detail offers firms distinct focal points to address when predicting the consequences that may arise throughout the innovation process. Additionally, it motivates them to consider the many stakeholders affected by these implications. Furthermore, the 169 goals linked to the SDGs provide precise instructions for auditing the firm's RRI perspective. According to Stahl et al. (2017), companies' RRI generally progresses from unawareness to reactivity and ultimately to proactive and strategic methods. Establishing specific and measurable objectives is crucial for commencing the process of organisational maturity. These goals provide organisations with the resources and capabilities to address any discrepancies in target attainment, laying the foundation for further Responsible Research and Innovation (RRI) efforts with a more strategic perspective.

The SDGs have played a significant role in fostering a shared understanding and agreement on concepts like sustainability and accountability, specifically concerning RRI (Abhayawansa et al., 2021). Therefore, the comprehensibility of SDGs becomes advantageous in facilitating the deconstruction, quantification, and enhancement of RRI (Yaghmaei and Poel, 2021). The evaluation of progress towards the 17 SDGs is frequently conducted at regional or national levels, focusing on specific SDGs (Gyimah et al., 2023). However, a comprehensive assessment of the progress towards achieving SDGs across various objectives, targets, and firms has not been conducted (Bebbington and Unerman, 2020; Tetteh et al., 2023)

Accordingly, we aim to fill this gap in the existing body of scholarly work by determining the scope of a firm's contribution towards the SDGs in Africa using content analysis. Insufficient progress measurement towards the SDGs persists, necessitating a deeper examination of the operationalisation of progress indicators (Lozano et al., 2018). There is a growing trend among firms to not only include references to actions linked to the SDGs in their yearly reports but also to produce dedicated reports, such as corporate sustainability reports, to address these goals (Subramaniam et al., 2023). The use of enhanced sustainability reporting is expected to provide improvements in the outcomes of content analyses conducted on sustainability reports (Arena et al., 2023; Gyimah et al., 2023; Subramaniam et al., 2023). This research seeks to examine how businesses are now addressing the SDGs, given the existing gap in our comprehension of firm's involvement with these goals. Currently, there is a lack of research examining firm reports on the sustainable practices used to attain the SDGs.

Previous research has mostly focused on the examination of sustainability reports in order to get insights into organisations' comprehension of sustainability and to analyse their implementation of sustainable practices (Bebbington et al., 2017; Dressler and Bucher, 2018). However, there is a lack of consideration for examining sustainability reports concerning the execution of sustainable initiatives to attain SDGs. This study investigates the digital publication of corporate sustainability reports, specifically focusing on the sustainable practices implemented by firms and their alignment with the SDGs. The outcome entails a comprehensive examination of the sustainable initiatives firms undertake to attain the SDGs and identifying distinct trends about the frequency of these initiatives across different sectors for discussion.

5.2 Method

5.2.1 Design and Sample

This study adopts both quantitative (focus on counting and measuring) and qualitative (focus on interpreting and understanding) to firm's contributions towards the achievement of the SDGs in Africa. Data for 481 firms are already available during the data-collecting procedure, including identical records due to the availability of synchronized consolidated or unconsolidated financial statements from African Market. Most of the data before 2015 and beyond 2021 are unaudited or unavailable after data screening, and thus the study removes the duplicated statements and focuses on audited and consolidated financial information. A final usable sample of 223 firms based on available datasets operating between 2015 and 2021 are used for data analysis. Other information for analyses are retrieved from the filed audited financial statements and annual reports downloaded from African Market website and firm's website. The corporate sustainability reports are used to examine the implementation of SDGs among

the firms included in the sample. Corporate sustainability reports are often published yearly on the firm's official website, ensuring open accessibility to all relevant stakeholders.

A comprehensive examination is conducted on the websites of 223 to retrieve corporate reports, SDGs or sustainability reports for analysis. Sustainability reports provide reliable data for assessing a company's involvement in the SDGs. The reports adhere to the Triple-Bottom-Line Approach, which examines the effects on the economy, environment, and society (Tsalis et al., 2020). In cases where sustainability reports are unavailable, we relied on the information provided in the annual reports.

Table 5.1 shows the sample firms distributed across the five regions in Africa. West Africa region has the highest firms ($n = 81$, 36%), followed by South African firms ($n = 49$, 22%), North African firms ($n = 33$, 15%), East African firms ($n = 41$, 14%), and Central African firms ($n = 30$, 13%). Table 5.2 provides statistics for the type of firms such as financial, manufacturing, retail and wholesale, business service, healthcare, food and beverages, hotel and restaurants, ICT or technology, chemical, and energy.

5.2.2 Content Analysis

The study identified firm engagement or involvement in SDGs by applying a traditional in-depth content analysis of the papers to identify the contributions of firms in Africa towards the SDGs for policy decisions. The exploratory SDGs research commonly uses content analysis to ascertain contributing determinants of SDGs in Africa (see Cottafava et al., 2022; Erin et al., 2022; Gyimah et al., 2023; VyasDoorgapersad, 2022). The use of this approach is often employed in the evaluation of corporate reports (Nylund et al., 2022). For instance, Amini et al. (2018) and Nylund

et al. (2022) conducted a study analysing sustainability reports of organisations operating in various sectors. Similarly, Jang and Ardichvili (2020) conducted research that focused on responsibility reports to get insights into the role of human resources. According to Mayring (2021), the first step in the approach involves segmenting texts into theme blocks. Subsequently, the assignments are subjected to iterative themes through the process of inductive categorisation, aiming to achieve a high specificity level. The three-step technique of content analysis, as developed by Mayring (2021), included Reduction, Explanation, and Structuring are used for the study. The objective is to decrease and comprehend the substance to an abstraction where the themes and accompanying metrics could ultimately be harmonised with particular SDGs. The themes that are selected undergo a process of repeated comparison and standardisation using spreadsheets using an inductive approach. Thus, each topic is allocated to a designated SDG. The coding structure is not enforced but derived from the studied material. This material examines the aim and indicators associated with each SDG, with the coding process driven by identifying recurring themes throughout the content. The frequencies of the metrics are then tallied for each topic across the various firms. Furthermore, the frequency of these themes is used to establish a

Sector	With reports	With reports in %
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hierarchy in determining the most significant objectives for the organisations.

Table 5.1: Regions profiles

Regions	With reports	With reports in %
Central Africa	30	13
East Africa	29	14
North Africa	33	15
South Africa	49	22
West Africa	81	36
Observation	223	
Percentage		100

Finance	30	13
Manufacturing	21	9
Retail and Wholesale	33	15
Business Service	29	13
Healthcare	12	5
Food and Beverages	19	9
Hotels and Restaurants or Leisure	17	8
ICT or Technology	16	7
Chemicals	14	6
Agriculture	13	6
Energy	19	9
Observation	223	
Percentage		100

Table 5.2: Sector statistics

5.3. Results

5.3.1 Analysis of each SDG

A comprehensive content analysis is conducted on the released corporate reports to evaluate the many sustainable measures used by organisations in pursuit of the SDGs. Table 5.3 shows an inclusive summary of the many strategies firms use to achieve certain objectives.

SDG 1 aimed at eradicating poverty in all its forms worldwide is now situated at a relatively low level of responsiveness regarding RRI. This particular goal has received little attention, with only a few implemented actions to address it. The predominant method used by the firms in the sample to combat poverty is the provision of paid leave benefits for their workers. This implies that the employer provides additional remuneration to their workers in the form of an allowance and their regular hourly earnings. The subsequent most often-seen interventions included the supply of financial aid aimed at preserving lives and the implementation of a wage that enables individuals to sustain a reasonable standard of living. Sufficient remuneration should be set at a level that adequately encompasses essential expenditures such as sustenance, beverages, and housing. The industries with the highest representation level in meeting SDG 1 are manufacturing, business services, and agriculture.

The aims included by SDG 2 include the eradication of global hunger, the establishment of food security, the enhancement of nutritional standards, and the advancement of sustainable agricultural practices. A limited number of firms emphasised food safety, primarily concentrating their efforts on mitigating risks within the value chain and operational processes, as well as providing education in this domain. 60% of firms are

unaware of this goal except those in the catering sector. 40% of the food and beverage industry is now involved in this endeavour. Except for the hotel and restaurant, and food and beverage sectors, the degree of knowledge of this aim on the RRI scale is quite low for other industries.

Regarding SDG 3 framework, enterprises actively endeavour to promote optimal health and well-being within the workplace. One of the strategies used is the reduction of occupational injuries by implementing various measures, including completing safety training programs for all factory personnel. Companies are adopting a proactive approach towards this issue. Health technologies have been shown to effectively decrease maternal mortality and morbidity rates, leading to an indirect decline in newborn mortality rates. Additionally, these technologies play a crucial role in promoting the autonomy and well-being of the older population. A further way to encourage a healthy lifestyle is to implement off-site health activities, such as offering staff-reduced gym memberships, health courses, and seminars. The healthcare firms have significant representation in SDG 3.

SDG 4 aims to provide an education that is inclusive, equal, and of high quality. In this particular instance, it is noteworthy that 74 firms (33%) are involved in advancing this objective by providing access to further educational opportunities for their workers. One of the primary endeavours undertaken by the firms is to facilitate equitable access to high-quality educational opportunities, including providing job preparation initiatives for disadvantaged children. All firms within the financial sector are included in this objective because of the significant financial resources and credit play in this domain.

SDG 5 primarily focuses on the implementation of policies that promote gender diversity and inclusivity within the workplace and workforce, which are seen to be reasonably easy. Few firms are involved in initiatives to promote women's empowerment, including areas such as female empowerment in developing countries, facilitating the use of mobile internet, ensuring educational opportunities for girls and women, and supporting the advancement of women in leadership and management roles. Firms in hotels and restaurants or leisure dominate a proactive commitment towards achieving this aim.

The content analysis for SDG 6 reveals a strong commitment to clean water and sanitation in Africa. Initiatives encompass approaches that facilitate utilising natural resources, such as rainwater, through specialised systems or technologies that effectively monitor urban water quality. These systems also offer water administrators immediate access to precise and up-to-date data. Industries involved in producing domestic and personal items and those operating in the hotel and restaurant or leisure, sectors are progressively implementing the SDG 6. However, their efforts mostly focus on reactive measures rather than proactive ones.

Pursuing inexpensive and renewable energy, as outlined in SDG 7, is facilitated through various activities. 67 firms contribute to this objective by offering technology that provides access to affordable and dependable energy while promoting sustainability and modernisation in the energy sector. These firms are endeavouring to address energy-related challenges by implementing energy management strategies. This includes enhancing energy efficiency and promoting the use of renewable energy sources.

Moreover, a portion of the firms are actively promoting the development of sustainable energy sources, shown by their investment in wind power generation facilitated by establishing wind farms. The agriculture, healthcare, and manufacturing sectors exhibit less involvement and commitment towards this objective, and this demonstrate a relatively limited awareness of the RRI concept.

The primary objective of SDG 8 is to foster economic development and promote decent work. This entails a firm commitment to upholding human rights and labour rights inside the workplace, particularly in eradicating forced labour, bonded labour, child labour, slave labour, human trafficking, and exploitative recruiting practices. This endeavour is conducted across the whole value chain, including enhancements in remuneration, working hours, occupational health and safety, the right to associate freely, non-discrimination, and the prevention of harassment. In order to foster and enhance talent, the companies included in the study engage in continuing assessment of outsourced talent alternatives to maximise effectiveness. They use technological tools to find talented individuals, allocate resources for training and retraining, and facilitate the continuous development of talent. The companies provide financial help, procure goods and services from small enterprises, and impart market and manufacturing expertise to benefit small businesses and entrepreneurs. Firms in Africa strategically pursue this objective.

SDG 9, which promotes inclusive and sustainable industrialisation, innovation, and infrastructure, is primarily characterised by the prominence of green transportation and other advancements in green technology. This entails using the potential of current technologies, such as Blockchain, Internet of Things (IoT), and Artificial Intelligence

(AI), to develop environmentally sustainable inventions and technology. Research and development activities in urban areas have been shown to increase company participation significantly. This finding underscores the significance of ongoing knowledge acquisition and use in driving the creation of novel processes and products to enhance urban sustainability. The ICT or technology industries prominently embody a proactive strategy, exemplifying technological innovation's significance.

The implementation of SDG 10's objective to reduce disparities is primarily carried out by sampled firms by establishing equitable job opportunities, including possibilities for those with lower levels of expertise. Numerous firms are actively advocating for equitable business prospects, focusing on promoting the inclusion of women-owned and diverse businesses. The healthcare sector is the reactive strategy advancing reduction of inequalities in Africa.

Employee volunteering is crucial in advancing the objectives of SDG 11, which pertains to the development of sustainable cities and communities. This kind of engagement bolsters local communities by facilitating various initiatives, including but not limited to supporting educational programs, fostering gender equality, and addressing fundamental needs such as combating hunger. Numerous firms actively encourage their employees to engage in volunteer activities, not just during their leisure time but also by providing compensated time off. In the context of disaster relief, corporations provide immediate assistance. In addition, they address this objective by facilitating the development of early warning systems for regions prone to catastrophe risks via technological tools, including mobile apps. In each industry examined, at least 60% of

the enterprises within such sector are actively engaged in endeavours to contribute to this objective.

In order to enhance the sustainable production and consumption patterns outlined in SDG 12, the firms under investigation focus on reducing carbon emissions throughout the manufacturing process. The procurement of environmentally friendly and sustainable energy for production and overall facility operations is achieved via wind, solar, hydropower, biomass, or landfill gas sources. All firms strategically undertook the pursuit of achieving responsible consumption and production except a small sample from the healthcare sector.

To address the issue of climate action (SDG 13), firms in Africa are endeavouring to minimise the emission of greenhouse gases. This reduction is primarily focused on sectors such as food production and human activities. The mitigation of trash accumulation in landfills is achieved through several strategies, including adopting practices that discourage the use of soap and plastic bottles and promoting waste reuse and upcycling wherever feasible. Using sustainable product design facilitates consumers' ability, among other stakeholders, to mitigate their carbon emissions effectively. Various sectors have actively implemented strategies to attain SDG 13.

The understanding of SDG 14, which endeavours to safeguard and sustainably exploit oceans, seas, and marine resources, is partially facilitated by certain corporations through the provision and progression of technology intended to foster the welfare of the ocean. As an example, their contributions included the development of early warning systems about water quality as well as the detection of significant fluctuations

in water levels. The financial and healthcare industries have shown a rather low commitment towards this objective, opting for a reactive strategy.

The retail sector has shown significant interest and involvement in SDG 15, which focuses on protecting terrestrial ecosystems, mitigating desertification, and promoting sustainable forest management. The remaining sectors exhibit a responsive attitude toward this objective. The attainment of SDG 16, which encompasses peace, justice, and the establishment of robust institutions, is facilitated by firms that prioritise the assurance of data security for their customers and partners, particularly through the use of Internet of Things (IoT) and Artificial Intelligence (AI) technologies. In addition, the companies strive to guarantee the preservation of individual rights, prevent any illegal disclosures, and safeguard the privacy of minors. Moreover, it is worth noting that all present sectors showed a strong dedication to actively participate towards achieving this objective.

The last objective of the United Nations' 17 SDGs is to necessitate collaborative efforts to accomplish the broader aims which should be strategically implemented by all participating entities. The lack of uniformity in the degree of information provided to describe relationships and partnerships hindered the ability to conduct a more accurate assessment. In some firm reports, the presence and promotion of partnerships as a means to accomplish objectives are briefly acknowledged in a single phrase, while in other reports, a more comprehensive account is provided about the extent of their contribution to the overall strategy. Often-referenced collaborations include relationships with suppliers, non-governmental organisations (NGOs), third-party commercial partners, educational institutions, communities, public bodies, and

governments. In contrast, firms play a crucial role in disseminating established knowledge and offering financial assistance to enhance further the attainment of energy-related objectives, including conserving energy and water resources.

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Table 5.3: Implementations of Firms advancing the SDGs

SDG Number	Measure	Firms
SDG 1	No poverty	0.53
	Paid leave	0.29
	Providing financial lifesaving assistance	0.17
	Paying living wage	0.16
	Equal rights	0.11
SDG 2	Zero hunger	0.38
	Sustainable and innovative agriculture	0.14
	Promotion healthier lifestyles	0.12
	Donate meals	0.11
	Food safety	0.09
SDG 3	Good health and well-being	0.84

	Safety-focused environment for workers	0.59
	Employee health, safety, and well-being	0.35
	Health technologies	0.26
	Off-site health promotion	0.27
	Personal and family care leave	0.25
SDG 4	Quality education	0.95
	Equal access to affordable technical, vocational, and higher education	0.48
	Equal access to quality school education	0.51
	Learning support technologies	0.25
	Supporting students	0.26
SDG 5	Gender equality	0.82
	Diverse and inclusive workplace and workforce	0.62
	Women empowerment	0.37
	Fostering global inclusion and diversity	0.38
SDG 6	Clean water and sanitation	0.51
	Water stewardship	0.18
	Access to safe drinking water	0.19
	Water and sanitation technologies	0.17
	Water conservation and recycle wastewater	0.11
	Reduction of water pollution	0.12
SDG 7	Affordable and clean energy	0.39
	Access to affordable and renewable energy	0.24
	Clean energy technologies	0.09

	Energy management	0.07
	Sustainable power sources	0.06
SDG 8	Decent work and economic growth	0.83
	Human and labour rights	0.41
	Supporting diverse talent development	0.32
	Supporting entrepreneurs and small businesses	0.42
SDG 9	Industry, innovation and infrastructure	0.91
	Green and energy-efficient transportation	0.61
	Green technology innovations	0.51
	Research and development	0.17
SDG 10	Reduced inequality	0.90
	Promoting gender equality	0.55
	Equal opportunities	0.35
	Equity pay	0.19
	Equal business opportunities	0.28
SDG 11	Sustainable cities and communities	0.86
	Employee volunteering	0.42
	Access to affordable homes	0.17
	Disaster relief	0.19
	Green and smart buildings	0.18
	Sustainable transport systems	0.12

SDG 12	Responsible consumption and	0.93
production		
	Reducing carbon emission	0.59
	Sourcing green and renewable energy	0.48
	Energy and water conservation	0.49
SDG 13	Climate action	0.80
	Reduce greenhouse gas emissions	0.65
	Reduce waste to landfill	0.24
	Sustainable product design	0.26
SDG 14	Life below water	0.60
	Reduce ocean acidification	0.26
	Reduce marine pollution	0.25
	Reduce the risk of impact on	0.12
biodiversity and water quality		
SDG 15	Life on land	0.40
	Protect biodiversity and natural habitats	0.14
	Recycling	0.13
	End deforestation and restore degraded	0.11
forests		
SDG 16	Peace, justice, and strong institutions	0.85
	Data privacy and cyber-security	0.51
	Corporate responsibility and business	0.57
ethics		
	Risk management	0.21
SDG 17	Partnership for the goals	0.99

Table 5.4: Mapping of measures to RRI Maturity levels

SDG No.	SDGs	Maturity Level	Industries
SDG 1	No poverty	Reactive	Manufacturing, business services, agriculture
SDG 2	Zero hunger	Unaware	All industries except food and beverage
SDG 3	Good Health and Wellbeing	Proactive	Healthcare
SDG 4	Quality education	Strategic	Financial
SDG 5	Gender Equality	Proactive	Hotel, restaurant or leisure
SDG 6	Clean Water Sanitation	Reactive	Hotel, restaurant or leisure
SDG 7	Affordable and Clean Energy	Unware	Healthcare, manufacturing, agriculture
SDG 8	Decent work and economic growth	Reactive	All sectors
SDG 9	Industry, Innovation, and Infrastructure	Strategic	ICT or Technology
SDG 10	Reduced Inequality	Strategic	Healthcare
SDG 11	Sustainable cities and communities	Proactive	All industries
SDG 12	Responsible consumption and production	Strategic	All industries
SDG 13	Climate action	Proactive	All industries
SDG 14	Life below water	Reactive	Healthcare, finance
SDG 15	Life on land	Reactive	All industries except retail and wholesales
SDG 16	Peace, justice, and strong institutions	Reactive	All industries

5.4 Discussion

Table 5.4 presents the mapping of measurements to the stages of RRI Maturity. The SDGs and RRI Maturity Level are important frameworks for assessing the progress of industries in addressing societal challenges. Nylund et al. (2022) use the frequency of occurrence to gauge the amount of maturity of RRI, progressing from a lack of awareness to reactive responses and ultimately to proactive and strategic methods. The mapping of frequency levels to corresponding approaches is as follows: frequencies over 0.90 are associated with a strategic approach, frequencies ranging from 0.70 to 0.90 are associated with a proactive approach, frequencies ranging from 0.40 to 0.70 are associated with a reactive approach, and frequencies below 40% are associated with an unawareness level.

For objectives that are less popular and do not have a clear connection to industrial emphasis areas are SDG 1, 2 and 6. The only exemption is for manufacturing, business services, and hotel and restaurant that correlate with the SDG 1. Similarly, in terms of SDG 2, the industries, as a whole, seem to be unaware, except the food and beverage sector, which has shown some acceptance. The SDG 3 has seen a proactive response from the healthcare sectors. However, regarding SDG 4, the industries have generally taken a reactive stance, particularly is the financial sector. Moreover, regarding SDG 5, the hotels and restaurants or leisure sectors have displayed a proactive approach. Clean water sanitation (SDG 6) refers to providing safe and hygienic water for various purposes, such as personal use, in establishments like hotels and restaurants or leisure facilities. Affordable and clean energy (SDG 7) pertains to the availability of energy sources that are both cost-effective and environmentally friendly. Unaware healthcare

refers to the lack of knowledge or awareness regarding healthcare services and practices. SDG 8 promotes fair and productive employment opportunities within the industrial sector, leading to overall economic development.

Strategic approaches across industries are employed to achieve industry, innovation, and infrastructure goals (SDG 9). Proactive measures are taken in the technology sector to address challenges and promote advancements. Reduced inequality (SDG 10) refers to efforts to decrease disparities in various aspects, particularly healthcare. Sustainable cities and communities (SDG 11) involve proactive strategies implemented across industries to ensure urban areas' long-term viability and wellbeing. Responsible consumption and production practices (SDG 12) are strategically implemented across industries to minimise negative environmental impacts. Climate action (SDG 13) involves proactive measures across industries to mitigate and adapt to climate change. Life below water (SDG 14) refers to reactive efforts to protect and preserve marine ecosystems and resources, particularly in the financial and healthcare sectors. Life on land (SDG 15) refers to reactive approaches implemented across industries, excluding the retail sector, to address challenges related to land ecosystems. Partnerships (SDG 17) are formed to foster collaboration and cooperation among various stakeholders in achieving sustainable development goals.

Firms in Africa across industries demonstrate a strategic approach and greater maturity on the RRI scale concerning the particular objectives of SDGs 4, 8, 9, 10, 12, and 17. Proactive strategies are observed concerning goals that directly pertain to specific industries. For instance, the healthcare and financial sectors actively emphasise the pursuit of good health and well-being. Similarly, efforts towards achieving gender

equality are evident in the retailing, hotel, restaurant, and apparel industries. Furthermore, the technology sector significantly emphasises industry innovation and infrastructure development. Furthermore, a proactive attitude is found across several industries concerning SDGs 11 and 13. The industry's response to SDGs 1, 6, 14, and 15 is reactive. This reactive approach can be attributed to several causes, including top management priorities, brand alignment, and corporate social responsibility initiatives.

5.5 Conclusion, Implications and Further Study

We conduct a content analysis on the corporate reports of 223 firms to assess the amount and manner in which firms in Africa address the SDGs. The findings of this study have significant implications for future research on sustainability reporting and RRI. The study delves into the implications and potential avenues for future research to augment our understanding of firms' engagement with the SDGs. The results of this study have significant implications for future research in the field of sustainability reporting. The findings relied on 223 firms that have integrated sustainability reporting into their operations. Given the extensive scope of the SDGs, firms have the potential to exploit the inclusion of business-aligned objectives as a means of greenwashing, although this is not always applicable (Nishitani et al., 2021). It is essential to enhance reporting mechanisms to effectively identify instances when companies go beyond mere compliance and prevent the SDGs from being used as a means of greenwashing and other misleading tactics.

Regarding SDGs that exhibit little involvement, it is worth noting that there is a lack of active participation. For instance, the absence of decisive measures poses limitations to implementing RRI, as seen by the challenges faced in achieving SDGs 2, 7, and 15. It

might be argued that considering constraint-based and thrifty innovation, which focuses on innovative processes affected by limited resources, is necessary in the context of RRI in these domains. Recent studies have also shown that implementing thrifty innovations has the potential to contribute significantly to achieving SDGs (Gyimah et al., 2023). For the SDGs that exhibit a significant level of involvement, such as SDGs 3, 4, 5, 8, 11, 12, 13, and 16, it may be argued that major multinational firms possess a distinct advantage in terms of their capacity to undertake substantial RRI endeavours. According to Nylund et al. (2022), the ability of large firms to effectively use their RRI endeavours is enhanced when they engage in innovation ecosystems. This allows for the amplification of their efforts through the entrepreneurial activities of other entities within the system, therefore surpassing the capabilities of small firms.

Additional findings suggest that most corporate sustainability initiatives focus on endeavours that enhance firm outcomes or ensure adherence to legal requirements. The analysis conducted on the predominant approach used for each objective provides further evidence to support the assertion that most sustainability initiatives are focused on the interests of individual firms or compliance with regulations (refer to Table 5.3). This phenomenon is also evident in the cross-goal assessment of the measures, as shown in Table 5.4. This suggests that firms are predominantly engaged in the SDGs due to the predominant advantages they get from their investments. In light of this context, several managers rationalise their decision to restrict their efforts only to internal measures by asserting that the duty of promoting sustainability and ensuring its implementation lies with the government and should be governed by legal regulations (Nylund et al., 2022). Given the growing recognition of green-washing and its potential to lead to reputational challenges in the future (Uyar et al., 2020), it becomes imperative

for managers to evaluate the effectiveness of adopting sustainable development methods.

Every research endeavour has inherent limitations, which serve as valuable foundations for further research. For instance, it is worth noting that no specific measures are allocated to several goals despite the potential for sustainable interventions to have various effects. One illustration of this phenomenon is the facilitation of accessible housing, which serves as a contributing factor to the achievement of both SDGs 1 and 11. Nevertheless, achieving a comprehensive definition of the metrics remains challenging. This phenomenon may be attributed mostly to the fact that many measures in place operate in a manner that aligns with multiple objectives simultaneously. However, to ensure the precision and clarity of the outcomes, a specific definition of the metrics is established to assign the objectives. However, it is recommended that future studies explore the possibility of using different measurements to examine the extent to which the priority of objectives may change.

Furthermore, the absence of uniformity and coherence in corporate reporting practices across several sectors has impacted the assessment of this study. Studies with a length of with 20 pages cannot deliver the same level of depth and material as comprehensive studies spanning more than 100 pages. Consequently, organisations that use comprehensive reports may exhibit more effectiveness in their analysis than those that provide succinct summaries. A further constraint encountered in the assessment of the reports is the lack of uniformity of same across the five regions in Africa, and thus it is advisable to conduct a content study of uniform sample from the regions in Africa to examine potential changes in organisations' strategies and priorities.

One further constraint of the study is the absence of an examination of the extent to which the analysis incorporates the many attributes of RRI, such as anticipation and responsiveness. Future studies need to inculcate in their analysis.

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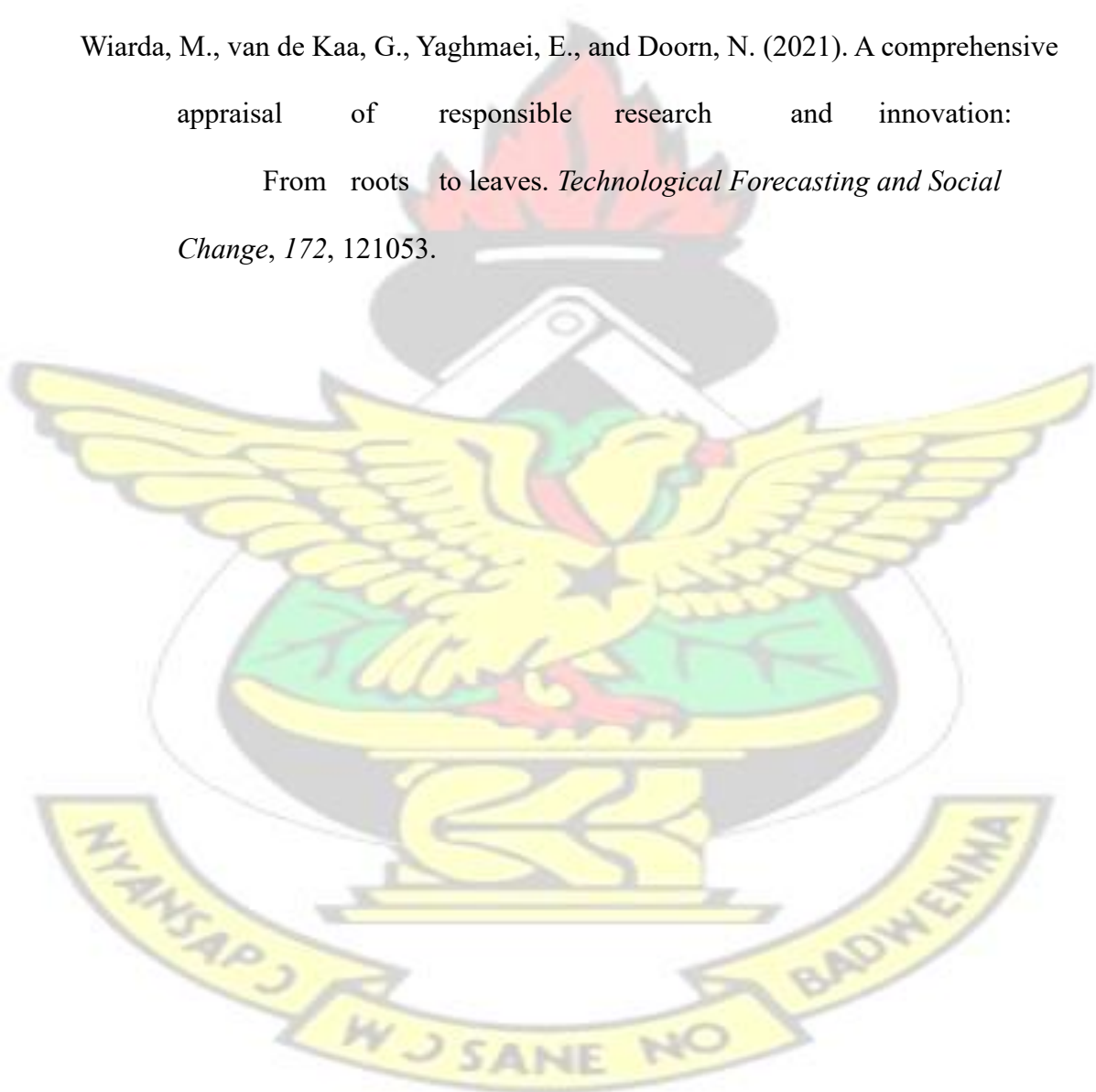
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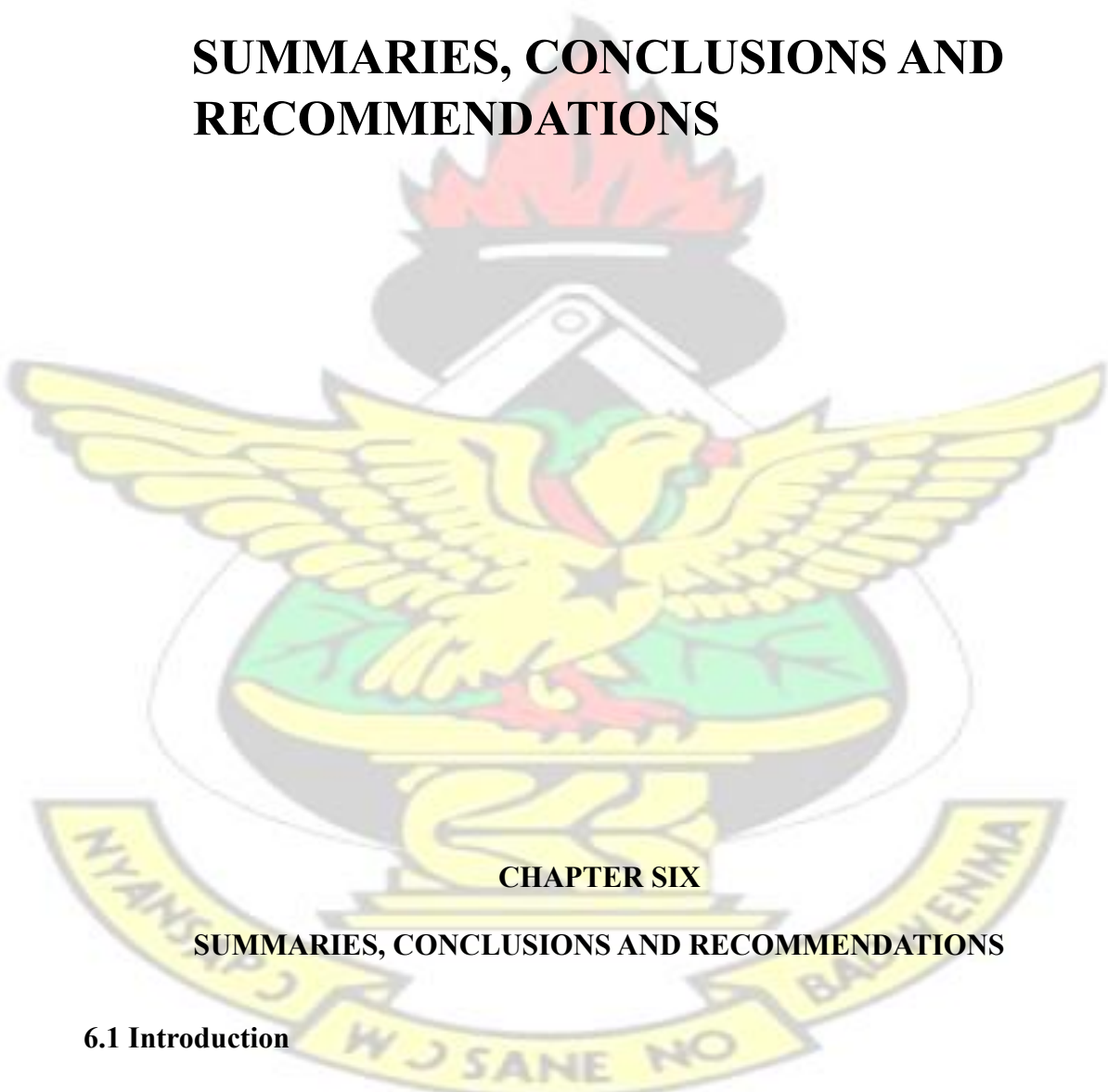
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CHAPTER SIX

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SUMMARIES, CONCLUSIONS AND RECOMMENDATIONS



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SUMMARIES, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents the summaries, conclusions and recommendations for the complete research. The chapter begins with summaries of the entire study, followed by the conclusions and recommendations. The limitations of the study and

contributions of the study have also been highlighted.

6.2 Summaries

Business, management, and accounting bodies are inevitable partners in achieving the SDGs (Ordonez-Ponce et al., 2021). Surprisingly, the need to assess and understand the SDGs using appropriate methods remains unaddressed (Schaltegger et al., 2018). Most extant literature focuses on developed countries, neglecting developing countries with different economic, cultural, and governance systems (Rosati and Faria, 2019). Hence, there again is the need to conduct research focusing on developing nations to develop precise SDGs strategies or drivers. Surprisingly, extant literature has not delved into why African countries cannot achieve most SDGs. Contemporary scholars are calling for more research to be conducted in Africa due to the complexity and diversity of cultures, ethnic compositions, currencies and geography variations, and varied typologies of political and economic institutions that undergird the processes of political transformation and economic development. Thus, there is the need to conduct another study focusing on only Africa to understand better the trends, gaps, and future directions towards the achievement of the SDGs.

This study fills these gaps by examining the extent to which neglected issues such as governance and firm engagement are advancing the SDGs in Africa in four studies. The first study identifies accounting research or literature gaps concerning the SDGs, and this objective led to the first paper titled, —Business Contributions on Sustainable Development Goals: Seven Years Bibliometric and Systematic Literature Review Analysis|. The second study also investigated business research and methodological gaps in Africa, and this also led to the second paper titled, —Seven Years of United

Nations' Sustainable Development Goals in Africa: A Bibliometric and Systematic Methodological Review. The third objective is to assess the effect of governance mechanisms on UN Sustainable Development Goals. The third paper titled, —Governance And United Nations' Sustainable Development Goals: Falling behind or getting ahead in Africa?, is used to achieve the objective. The final objective examines how firms are involved or engaged towards the achievement of the SDGs in Africa, and this also led to the final paper titled, —Moving the Sustainable Development Goals forward? Firms Contributions in Africa.

The next paragraphs highlight the summary for each chapter.

The first chapter of this research report offers a general introduction to the study comprises the introduction, research objectives, stylized facts on governance and SDGs, firm engagement and SDGs, theoretical framework, research design, and study's contribution.

The second chapter reports the first paper that presents a bibliometric performance and systematic literature review (SLR) of research publications related to the 17

SDGs in multidisciplinary business, management, or accounting fields between 2015 and 2022. Using the 2020 updated PRISMA is used to ascertain 583 usable papers, the analysis from *VOSviewer* and *R Studio software* reveals the existence of nine independent clusters of SDGs business research: artificial intelligence and digitalization, business collaboration, corporate sustainability, circular economy and corporate social responsibility, entrepreneurship and innovation, education for developing countries, climate change and tourism, sustainable investment and Africa perspectives.

The third chapter based on African scholarly papers also uses the *R Studio software* to analyze 200 papers on SDGs, authored by 606 scholars and published in 102 peerreviewed leading sources between 2015 and 2022. The results reveal that SDGs literature in Africa is an imminent study area, and there are two main strands of literature advancing SDGs in Africa: (1) business growth, entrepreneurship, and poverty reduction, and (2) renewable energy, tourism, and ICT. The in-depth content analysis noted 15 research questions that are unaddressed in Africa including governance, firm engagement and the 17 SDGs.

The fourth chapter addresses the unaddressed issues such as the nexus between governance and the SDGs. Thus, the third paper examines the extent to which governance contributes to the attainment of the 17 SDGs in the African context. The multivariate analysis and ordered probit analysis on 46 countries record a positive effect between the governance and the scores of SDGs. Also, FDI, GDP, and freedom index drive SDGs in Africa. Additional findings support the significance of governance in promoting SDGs in focus, particularly in the areas of quality education (SDG 4), gender equality (SDG 5), climate mitigation efforts (SDG 13), and partnership for the goals (SDG 17).

Chapter five covered the last empirical paper that employs comprehensive content analysis of 223 corporate reports to find out the extent of a firm's engagement or involvement towards the SDGs in Africa. The study shows that firms in Africa are making strive towards the achievement of the SDGs, but they placed much emphasis

on quality education (SDG 4), industry, innovation and infrastructure (SDG 9), reduced inequality (SDG 10), responsible consumption and production (SDG 12), and partnership for the goals (SDG 17).

In this final chapter (Chapter Six), the study presents the summaries, conclusion and recommendations for the entire research.

6.3 Conclusions

The study set out with the aim of achieving four objectives or papers advancing the UN 17 SDGs. The following are the conclusions from the study, as organised according to the specific objectives of this study.

6.3.1 Accounting Research or Literature Gaps and SDGs

This study uses bibliometric analysis and SLR of 583 papers to determine literature advancing the SDGs. The bibliometric analyses focus on the trends of prolific authors, countries, journals, papers, most linked references, bibliographic coupling, and keywords analysis highlighting current SDGs research themes. The SLR reviews five taxonomies regarding research jurisdiction, organizations or institutions, geographical settings, SDG studies, methods, and frameworks driving SDG research. The study concludes here that there is currently an absence of precise analyses on the 17 SDGs in business, management, or accounting studies. With less than a decade towards the end of the 2030 Agenda, no global unified theory or framework has been formulated to aid in policy formulation or decisions toward the SDGs. The study also concludes that there is no African nation among the top 10 countries advancing the SDG business studies,

and there is a need for more collaboration between countries toward achieving the 17 SDGs before 2030.

6.3.2 Business Research and Methodological Gaps in Africa

First, the study concludes that SDGs literature in Africa is an imminent study area, and there are two main strands of literature advancing SDGs in Africa: (1) business growth, entrepreneurship, and poverty reduction, and (2) renewable energy, tourism, and ICT. Second, the study concludes that there is no unified framework connecting the business sector and SDGs in Africa, and there is an urgent need to examine the complexities such as how governance contributes to the SDGs.

6.3.3 Effect of Governance Mechanisms on UN SDGs

First, the study concludes that governance drives SDGs in Africa, particularly in the areas of SDGs 4, 5, 13, and 17. Thus, except for other SDGs, effective governance increases the likelihood of quality education, gender equality, climate actions, and partnerships for the goals in Africa. Therefore, when governance is strong, it promotes effective policies and strategies that prioritize education, empower women, address climate change, and foster partnerships. This can lead to improved access to quality education, reduced gender disparities, enhanced environmental sustainability, and stronger collaborations among stakeholders. By recognizing the importance of governance in these areas, we can work towards creating an enabling environment that supports the achievement of all the SDGs in Africa.

6.3.4 Firm Engagement and SDGs

The study concludes that firms in Africa involvement emphasise mitigating greenhouse gas emissions, implementing robust data security measures, fostering workplace diversity, and ensuring the health and safety of their workers. Finally, firms in Africa are not interested in advancing the 17 SDGs but focus on advancing quality education (SDG 4), industry, innovation and infrastructure (SDG 9), reduced inequality (SDG 10), responsible consumption and production (SDG 12), and partnership for the goals (SDG 17). Most sustainability initiatives at firm levels are focused on the interests of individual firms or compliance with regulations. It suggests that while firms are making progress in these areas, there may be a need for greater attention to the other SDGs as well. By expanding their efforts to address all 17 SDGs, firms can have a more comprehensive impact on sustainable development in Africa. It's important to recognize the interconnectedness of the SDGs and work towards a balanced approach that addresses multiple dimensions of development. This research highlights the areas where firms are already excelling, and can serve as a starting point for broader engagement across all the SDGs.

In conclusion, the study observes that government and firms are advancing Quality Education (SDG 4), Gender Equality (SDG 5), Industry, Innovation and Infrastructure (SDG 9), Reduced Inequality (SDG 10), Responsible Consumption and Production (SDG 12), Climate Actions (SDG 13), Responsible Consumption and Production (SDG 12), and Partnership for the Goals (SDG 17). These indicates that countries in Africa are getting ahead achieving SDGs towards people (SDGs 4, 5, and 10), planet (SDGs 12 and 13), and partnership (SDG 17), but falling behinds others SDGs on peace and prosperity. While African countries have made significant progress in achieving the

SDGs in terms of people, planet, and partnership, the challenges in attaining peace and prosperity are complex. Achieving peace requires addressing various factors such as conflict resolution, political stability, and social cohesion, which can take time and concerted efforts. Similarly, prosperity encompasses economic growth, job creation, and reducing inequalities, which can be influenced by factors like governance, infrastructure, and access to resources. It's important to recognize that each SDG is interconnected, and progress in one area can positively impact others. By focusing on building peace and prosperity alongside the other dimensions, African countries can work towards a more sustainable and inclusive future.

6.4 Recommendations

Based on the above findings and conclusions, the following recommendations have been advanced:

Business scholars need to delve into firms' financial and integrating reporting to develop unique strategies that can advance the SDGs. Also, SDG studies are heterogeneous and require a mixed research approach, and the study recommends that future SDG research use the mixed research method to examine diverse viewpoints and uncover remedies to achieve the SDGs before 2030.

Currently, there is no unified framework connecting the country, business sector and SDGs due complexity of nations and firms, however, the study recommends that business and the SDGs need to continue to investigate unexplored business research areas and methodological choices that contribute to sustainability, sustainable development, or the SDGs. Also, local and global organizations or agencies understand

the business impact of the SDGs in the African context and can assist in policy directions and the development of innovative strategies.

Effective governance is crucial in facilitating SDGs accomplishment in African nations, as nations with higher levels of stability tend to exhibit enhanced environmental, social, and economic sustainability. Thus, the study recommends that governments and policymakers need to ensure transparent decision-making, inclusive policies, and accountability. Again, African governance systems need to empower communities to actively participate in shaping their future. When governance is strong, progress towards the SDGs becomes more achievable.

The study also recommends firms align their business practices with the SDGs to contribute to poverty reduction, environmental protection, and social progress. Their commitment and actions can create positive change and help achieve the SDGs. Additionally, Additional findings suggest that most corporate sustainability initiatives focus on endeavours that enhance firm outcomes or ensure adherence to legal requirements. The analysis conducted on the predominant approach used for each objective provides further evidence to support the assertion that most sustainability initiatives are focused on the interests of individual firms or compliance with regulations. In light of this context, the study recommends that several managers rationalise their decision to restrict their efforts only to internal measures by asserting that the duty of promoting sustainability and ensuring its implementation lies with the government and should be governed by legal regulations. Also, managers of firms need to evaluate the effectiveness of adopting sustainable development methods. The government also need to support the firms especially those in the private sector to

develop, be sustainable, and achieve the UN SDG goals, such as SDG 1 (End Poverty), SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-Being), SDG 8 (Decent Work and Economic Growth), and SDG 9 (Industry, Innovation, and Infrastructure).

6.5 Limitations of the Study

The present study is constrained by some limitations. The lack of access to and dependability of data pertaining to African countries resulted in a reduction in our sample size from 54 countries to 46 countries. Furthermore, it hindered our capacity to estimate non-trend SDGs 1 (no poverty), 2 (zero hunger), 3 (good health and wellbeing), 6 (clean water and sanitation), 7 (affordable and clean energy), 8 (decent and economic growth), 9 (industry, innovation and infrastructure), 10 (reduced inequalities), 14 (life below water), 15 (life on land), and 16 (peace, justice and strong institutions) in Africa. Moreover, it can be anticipated that governance is inclined to be attracted to nations exhibiting higher scores on the governance average index score and SDG score index and regions having more available data. Future studies need to use other quantitative measures to measure the non-trend indicators.

Also, study uses a sample from Africa, which may have common characteristics to other developing countries in other continents, but, the results may not be generalized to other developing countries. Thus, future studies should be replicating using samples from in different developing countries to help further validate and generalize the findings.

Another further constraint of the study is the absence of an examination of the extent to which the analysis incorporates the many attributes of RRI, such as anticipation and responsiveness. Future studies need to be inculcated in their analysis.

Finally, the study excluded cultural dimensions, regulatory requirements, and other micro-and-macroeconomic indicators that can affect the SDGs in Africa. Future studies can include these indicators as control, mediating, and moderating factors to examine their impact on the achievement of the SDGs.

6.6 Contributions of the Study

The study's contribution to existing knowledge, managerial practice, and policy are fourfold in addressing the significant gaps in the business and SDGs literature.

The study contributes to sustainability literature by examining the key drivers of firms' contributions towards the UN SDGs from a developing country context. Again, the study contributes to accounting research on the relationship between governance, firm engagement, and sustainable accounting practice from the African regions. Thus, the study provides guidelines to sets framework and regulations for financial reporting in Africa. Again, the study promotes the inclusion of non-financial information in reporting, such as sustainability or SDGs metrics, which can contribute to a more holistic understanding of organization's performance and its impact to society.

The study also extends the network theory of governance by whether governance (control of corruption, voice and accountability, government effectiveness, political stability and absence of violence/terrorism, rule of law, and regulatory quality) advances SDGs in Africa. Indeed, to the best knowledge of this researcher, this study is the first to examine this nexus in Africa by incorporating all 17 SDGs. Again, the study also

extends the institutional theory by finding how firms in Africa are involved or engaged and/or their contributions to the global agenda.

This study also uses a unique approach concerning the dimensionality and conceptualization of trends in SDGs literature using bibliometric and SLR. Also, the theoretical and empirical gaps are identified for further studies in Africa toward the achievement of the SDGs.

The study has managerial and policy implications relevant to international bodies (UN, World Bank, Africa Unions), new and prevailing firms, government agencies or policymakers, consultants, educational institutions, and investors. For instance, the UN that signed to achieve the SDGs by 2030 can use the study's findings of critical drivers of the SDGs in a developing country context. New and prevailing firms can use the results to adjust their productive activities towards sustainable practices (or SDGs). Government agencies or policymakers can use the findings in developing policies and developmental strategies. Society can profit indirectly and directly via the distribution of scarce resources, such as government aid towards the SDGs. Consultants and educators can use the findings to advise their clients on contributing factors to the SDGs.

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