INVESTIGATING BARRIERS TO EFFECTIVE REPORTING OF SUSTAINABLE DEVELOPMENT GOALS BY GOVERNMENT INSTITUTIONS IN KENYA: A CASE OF NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

by

Kibe Peter Mwangi

A thesis submitted to the School of Human and Social Sciences,

of

Daystar University
Nairobi, Kenya

In partial fulfilment of the requirements for the degree of

MASTER OF ARTS
in Monitoring and Evaluation

October 2021

APPROVAL

INVESTIGATING BARRIERS TO EFFECTIVE REPORTING OF SUSTAINABLE DEVELOPMENT GOALS (SDGS) BY GOVERNMENT INSTITUTIONS IN KENYA: A CASE OF NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

by

Kibe Peter Mwangi
17-1416

In accordance with Daystar University policies, this thesis is accepted in partial fulfillment of the requirements for the Master of Arts degree.

Date:

_____ _____
Philemon Yugi, PhD,
1st Supervisor

_____ _____
Mary Mogute, PhD,
2nd Supervisor

_____ _____
Philemon Yugi, PhD,
HOD, Development Studies Department

_____ _____
Kennedy Ongaro, PhD,
Dean, School of Human and Social Sciences

DECLARATION

INVESTIGATING BARRIERS TO EFFECTIVE REPORTING OF SUSTAINABLE DEVELOPMENT GOALS BY GOVERNMENT INSTITUTIONS IN KENYA: A CASE OF NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

I declare that this thesis is my original work and has not been submitted to any other college or university for academic credit.

Signed: _____ Date: _____

Kibe Peter Mwangi
17-1416

ACKNOWLEDGEMENTS

I start by thanking the Almighty God for his providence, care, and protection throughout this journey. My greatest appreciation also goes to my supervisors, Dr. Philemon Yugi (PhD), and Dr. Mary Mogute (PhD), for their patience, guidance, and words of encouragement throughout this research. My sincere appreciation to my parents, Mr. and Mrs. David Kibe, and my entire family for their support - both spiritually, financially and encouraging me to never give up.

I extend my appreciation to the management of National Environment Management Authority, and in particular; Mr. Francis Inganga and Mr. Wilson Businei, for their great assistance during my data collection and the entire staff fraternity that responded to the questionnaire. It would be remiss of me not to mention the input of Michael Mwangi of the State Department of Planning and the entire World Environment Situation Room unit at UNEP for the support they accorded me during my research. Lastly, I would like to pass my great appreciation to my research assistant, Mr. Paul Kiarie, for his great input.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

CIDP	County Integrated Development Plans
CoG	Council of Governors
DSDG	Division for Sustainable Development Goals
FDES	Framework for the Development of Environmental Statistics
GoK	Government of Kenya
KII	Key Informant Interview
MDGS	Millennium Development Goals
MTPs	Medium Term Plans
MoEF	Ministry of Environment and Forestry
MEA	Multilateral Environmental Agreement
M&E	Monitoring and Evaluation
NEMA	National Environment Management Authority
PMI	Project Management Institute
SDGs	Sustainable Development Goals
SoE	State of the Environment
SPSS	Statistical Package for the Social Sciences
UN	United Nations
UNDAF	United Nations Development Assistance Framework
UNDESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Programme
UNSD	United Nations Statistical Division
WMO	World Meteorological Organization

ABSTRACT

The purpose of this study was to establish the barriers to effective reporting of the sustainable development goals (SDGs) in Kenya, with the primary focus being environmental reporting using the National Environment Management Authority (NEMA) as a reference point. The objectives were to establish systems NEMA uses to report environmental issues, assess NEMA's technical capacity for effective reporting of environmental statistics, determine challenges when reporting environmental statistics, and propose recommendations to enhance effective reporting of environmental statistics by NEMA. The study was anchored on accountability and sustainability theories. Descriptive design was adopted, and the study population was drawn from NEMA, State Department of Planning in Kenya, and the United Nations Environment Programme. Census sampling was used and 91 out of 98 respondents filled and returned self-administered questionnaires. Six key informants (KI) were interviewed by the principal researcher. Generated data was analyzed using the Statistical Package for the Social Sciences (SPSS), version 25. There was a positive significant moderate linear relationship between effective reporting of SDGs and NEMA's institutional capacity, $r = 0.263$; $p = 0.012$; M&E Framework, $r = 0.327$; $p = 0.002$; environmental governance, $r = 0.353$; $p = 0.001$; enabling environment, $r = 0.352$; $p = 0.001$. The study concluded that organizations need enhanced technology for data acquisition, clear M&E structures, and continuous institutional capacity building to address changing reporting environment and policy needs. One of the study's recommendation is that there needs to be bridging of existing knowledge gaps in the sector through research and partnership, organizational and individual capacity building, establishment of innovation/science centers, data driven governance, policy coherence, and environmental advocacy.

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

Introduction

Reporting process in any programme is an integral part of the implementation cycle and more so, in the attainment of the set goals and objectives (Project Management Institute, 2018). The reporting process involves collection of data, its analysis into consumable information that guides the progress and the attainment of overall results (Collins, 2015). With the launch of the sustainable development goals (SDGs) in 2015 that were adopted by countries worldwide, the need for their reporting remains a very critical aspect if at all this ambitious undertaking is to be accomplished. Reporting for the SDGs is country based and requires member countries to integrate the right reporting mechanisms from project implementation level to sectoral and national level all the way to the United Nations Statistical Division.

The United Nations (UN) score card on the SDGs has indicated that accountability for many of the indicators of? is still lacking, mostly due to weak reporting structures and lack of data on the indicators. Challenges have marred the reporting process and yet there is not enough research on the root causes that are inhibiting effective reporting, more so, for environmental data. For this reason, this study investigated barriers in reporting of SDGs by government institutions in Kenya., with a focus on environmental reporting by the National Environment Management Authority (NEMA) headquartered in Nairobi County, Kenya.

The chapter covers the background of the study, statement of the problem, study objectives, justification, scope, as well as limitations and delimitation. It also features

the rationale of the study, assumptions, the definition of terms, and finally the chapter summary.

Background to the Study

The world today is dynamic. The technological advancements and periodic waves of technical change have revolutionized the way organisations and nations carry out their mandate and more so, restructured the global economy (Stever & Muroyama, 1988). As a result of this globalization, competition has gained momentum at a global scale, necessitating organisations to do more to meet the growing developmental opportunities and overcome related challenges (International Monetary Fund, 2008). Human activities, innovations, spreading technology and increasing policy work have come into force in the race for stronger economies, but one common denominator in all these development efforts has continued to be the exploitation of the natural environment (WIPO, 2018).

Human activities have been linked to increasing environmental degradation, necessitating more accountability for sustainable development (Kenya, Ministry of Environment, Water and Natural Resources, 2013). Natural resources are universal and exist as physical phenomenon that aren't constrained by the physical boundaries put in place under the political structures (Zhang, Xu, Li, He, & Chen, 2005). Environmental accountability in the face of increasing calls for sustainable development is critical and an emerging universal requirement (Arunachalam, 2011).

The SDGs, adopted by the UN and partner countries in 2015 placed so much emphasis on the development and tracking of the environment, borrowing heavily from lessons learned from the implementation and evaluation of the Millennium Development Goals (UN, 2015). Through the development of dedicated channels for the development and tracking of Environmental statistics, there is notable progress that

has been made (UN Enviroment Programme [UNEP], 2019). This alone indicates that there lies an opportunity to come to the realization of the intended goals of sustainable development. However, a lot is still pending (UNEP, 2019), and urgent attention is required. Accountability for progress on initiatives and proper channels of reporting are necessary, but they lack in many fronts (Caron, Lapointe, & Gendron, 2012). Major policy works are still non-existent since they depend mostly on the quality and adequacy of Environmental Statistics. To inform policies, communicate progress, effective reporting is thus very critical. Reporting is a crucial part of any programme or project success since it guides efficient control and coordination of people, processes, and technologies (Baguma, 2014).

For reporting to be effective, it should run side by side with monitoring and evaluation (M&E) and anchored in the continuous and periodic collection and analysis of project data to aid in the collection of facts for learning purposes and decision making (UN Development Programme [UNDP], 2009). Through M&E processes, raw data are widely acquired and made available to the various stakeholders, but it is the efficiency in reporting that guides the quality of information (Centre for Learning on Evaluation and Results [CLEAR], 2012). The people who consume this data should also be keen on the information they need for the reporting process to be effective. This is because when the capacity to supply M&E information is high, but capacity on the part of decision-makers to demand quality evidence is low, supply and demand are mismatched (CLEAR, 2012) and this again, beats the logic of investing heavily on the whole monitoring and reporting process. To investigate the gaps within the SDGs reporting process, a review of the flow of data from the sub-sectoral to sectoral, national, and global levels is necessary. This is discussed in the subsequent sections.

SDG Monitoring and Reporting at the Global Level

In the spirit of inclusivity, the 17 SDGs came in as the calls to action for all countries, government institutions and non-governmental organisations, to partner for the welfare of the humankind (Costanza, et al., 2016). The 17 SDGs have been broken down to 169 targets and a monitoring framework of 244 indicators developed (UNEP, 2019). Of these 244 indicators, 93 of them communicate specifically on the environmental aspects of the SDGs (UNEP, 2019). Over the years, the UN in collaboration with select research institutes have continued defining these indicators and developing their methodology in the hope of acquiring globally accepted and reflective standards of measurement (UNEP, 2019).

At the top-most UN secretariat level, United Nations Statistical Commission has brought together an inter-agency and expert groups on the SDG indicators who have been tasked with the development and implementation of the 17 SDGs and the 169 targets. While these goals are global in nature, the UN expert group considers different national realities, capacities, and development levels to be able to guide their implementation bearing in mind the different national capabilities. A tier classification system has been developed which enables tracking of the methodology development for the calculation of the indicators and enhancement of reporting. Tier 1 indicators are those that have their concept fully developed, an internationally established methodology, set standards and countries have regularly reported on them (UN Statistical Commission, 2019). This means that, for the indicators in tier one, regular data is available. Tier two have known methodology but lacks data while tier three lack clear concept, lacks methodology and thus data is non-existent (UN Statistical Commission, 2019). Moving indicators from tier 3 upwards has been one long tedious process, financially demanding and one that requires involvement of technical experts

who possess authority in their thematic areas (UN Statistical Commission, 2019). All these factors are not always readily available, and this slows down the process.

According to UN statistical Commission (2019), for a process that started before the launch of SDGs in 2015, only 101 indicators are so far in tier one with 143 still in tier two or three, a clear indication that the process is not as easy, swift and efficient as it should be for goals that should be met by year 2030. Without a methodology, tracking these indicators is a futile process and consequently the reporting process is in the receiving end, with nothing or very little to report. Various UN agencies have been allocated custodian roles to follow up and track specific numbers of indicators in line with their respective mandates. UNEP, for instance, is a custodian agency for 26 indicators of the environmentally related indicators (UNEP, 2019). Figure 1.1 shows the ideal scenario of how data should flow from grass root level to the United Nations Statistics Division (UNSD) database.

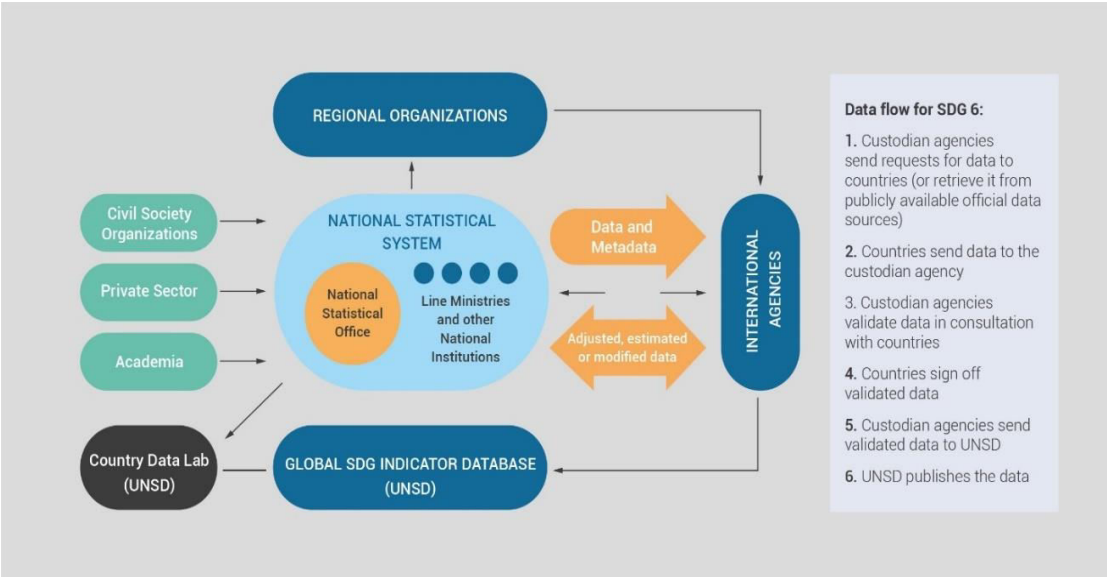

Figure 1.1: Recommended Data Flow for SDGs

Although Figure 1.1 shows the recommended flow of data, it is not usually the case on the ground (Karuri-Sebina, 2013). Most time, the challenges at the national level and at the sectoral levels make it impossible to acquire enough quality data.

Measuring progress report, a derivative of the Global Environment Outlook 6 (2019), indicated that, only 23% of the 93 environmental indicators have shown progress, with the rest, 77% lacking adequate data to measure progress either because of lack of credible baselines, poor systems and in some cases lack of implementation. The same report further revealed that, up scaled actions to build capacity for implementation and reporting are missing but quite necessary if at all the SDG targets are to be met. Twelve of the 169 SDG targets relate to the environment but still, there is either no sufficient data or progress due to gaps within the reporting systems (UNEP, 2019). A review on the SDG 6 Synthesis report (2018) highlighted that many countries across the globe lacked infield data-collection systems and thus they lacked the readiness to meet their reporting obligations, something that has continued to inhibit effective reporting and consequently the measurement of SDG progress (Ortigara, Kay, & Uhlenbrook, 2018). Identification and rectification of the challenges affecting effective reporting of SDGs at the global level is therefore a genuine concern and one that demands urgent attention.

SDG Implementation and Reporting in the Region

In the African region, countries are at different levels in strengthening and building capacity of their national statistical bodies which are critical for effective reporting (African Development Bank Group, 2019). While this is the case, lack of reliable, up to date data has continued to be a common phenomenon, within the specific countries and the economic blocks in the African region (United Nations Conference on Trade and Development (UNCTAD), 2018). All the 54 countries in Africa are members of the United Nations according to United Nations Department for General Assemblies (UN, 2018). By this virtue, they are bound by the resolutions of the UN assembly. The countries are required to map the SDGs in their development priorities and develop their United Nations Development Assistance Frameworks (UNDAFs)

through which the UN involvement in the respective country will be conducted (UN Sustainable Development Group, 2016). While it is not compulsory to report, the countries are obligated to do regular and inclusive voluntary national reviews and reporting for the SDGs (UN Department of Economic and Social Affairs, 2019). While this stand, in Africa, six out of ten SDG indicators are still unaccounted for due to lack of adequate data as reported in the Africa Sustainable Development Report (UNDP, 2017).

The countries' SDG scorecards published by the UN, evidences a lot of gaps and missing data across the 17 goals (UNEP, 2020). Poor M&E systems and lack of baseline surveys have been highlighted as major inhibiting factors towards attainment of the required data (Centre for Learning on Evaluation and Results (CLEAR), 2012). The sustainable development impact summit (2020) hosted under the world economic forum indicated that corruption, mismatched priorities, absence of relevant policy work and technology are part of the major inhibiting factors to SDGs reporting and their attainment (Rubio & Andvig, 2020).

SDG Implementation and Reporting in Kenya

The government of Kenya (GoK) acknowledges that a healthy environment is crucial in the attainment of the Vision 2030. Kenya has been actively involved in advocating for the Agenda 2030 (Kenya, Council of Governors, 2019). As a member of the High-Level Panel of Eminent Persons, Kenya carried out the advisory role to the Secretary-General of the United Nations on the pro-2015 development framework (UN, 2013). Ambassador Macharia Kamau, the then Permanent Representative to the UN, co-chaired the UN General Assembly Open Working Group on SDGs, with the primary goal of brainstorming on a set of Sustainable Development Goals as observed by Baba, Tifwa, and Achoba (n.d) By the time of SDG inception, Kenya was in the eighth year

of Vision 2030 implementation which followed elaborate Medium-Term rollout plans (MTP). In the third year of second MTP (2013-17), the SDGs were adopted which showed good progress and were incorporated during the preparations for the third MTP (2018-2022).

In the creation of the second-generation County Integrated Development Plans (CIDPs) in the year 2013, the SDGs were also greatly featured (Kenya, Ministry of Devolution and Planning, 2017). From these elaborated development agendas in Kenya, it is very evident that the implementation process is well thought out but conspicuously missing is the monitoring and evaluation system and structures put in place for reporting. While emphasis and documentation of the implementation plans has been done, reporting has remained one aspect that has been greatly overlooked.

Previously and despite being a late starter, Kenya was also involved in the implementation of the Millennium Development Goals (MDGs) (GoK, 2012). The MDGs review report (2015) portrayed that their implementation process outlined vital lessons that were very beneficial in informing the SDG localization and implementation process in the country. For instance, in Kenya, the MDGs implementation lacked an agreement on the framework and thus prevented adequate political support that would have been attained through the formulation of a national steering committee (Kenya, Ministry of Devolution and Planning, 2016). The MDG final status analytical report (2016), showed that, the MDGs were marred by lack of an elaborate advocacy and implementation roadmap, something that lead the country to undertake advocacy for ten years and thus limited implementation period. The same report indicated that the partnership element was also greatly overlooked, an aspect that translated to high dependency on donors. The process also lacked well-formulated monitoring systems, which led to the absence of adequate, timely, and reliable data necessary for tracking

results against the goals (Shekdar, 2009). The absence of reliable data significantly hindered the reporting process especially in informing the progress of implementation.

With lessons drawn from the MDGs incorporated and the post-2015 development agenda being country and regionally specific, Kenya proceeded with a pre-implementation planning process that brought about critical stakeholders across the board. GoK) therefore, gave more focus on the areas of employment and enterprise, health, farming and food security, gender sensitivity, education, and environment. Each of the 17 SDGs was mapped within the economic framework of Vision 2030 in its second medium term plan (MTP). This was geared towards putting in place coordinated global growth guidelines and a rollout directly aimed at achieving both the SDGs and the Vision 2030.

According to the Kenya, State Department of Planning (2016), a road map for SDG implementation was to follow the launch on September 2016 with seven broad areas which included: aligning interested parties and creating partnerships, resource mobilization, advocacy, domestication/localization, mainstreaming and accelerating implementation, sensitization, tracking, reporting and capacity building. Despite the road map featuring the tracking and reporting aspects, progress reports have cited absence of data so often (SDGs Kenya Forum, 2019), a good indication that a big gap exists within the monitoring and reporting system.

Kenyan is way ahead of its peers in the region on reforming National Statistical Systems in Africa, but it still faces quite a number of challenges (Kiregyera, 2008). A 2019 report by the World Bank indicated that intensive efforts have been put in building national capacity and ownership in reforming the Kenyan statistical structures. While this is the case, effective reporting in Kenyan public sector is marred by absence of adequate and reliable data, weak implementation of existing policies, lack of baseline

studies and absence of ideal technology for easy data acquisition coupled with low technical expertise (Kenya, Ministry of Education, 2019).

Kenya has been involved in two voluntary progress review on implementation of SDGs the latest being in June 2019. Both reports emanating from these reviews have indicated that data acquisition remains a challenge, with feedback and reporting system faulted for this (SDGs Kenya Forum, 2019). While this is the case, a more pressing question remain unanswered, of what is really the underlying inhibiting factors behind this absence of data. The SDGs Kenya Forum (2019) recommended that state actors and non-state actors need to actively collaborate in the implementation, monitoring and reporting of these goals, something that is currently missing, if at all these goals are to be attained in Kenya. The report further cites, manipulation of data by some organisations as a common phenomenon in Kenya, for purposes of tax evasion or fear of their data being used against them (SDGs Kenya Forum, 2019). If these gaps at the country level in as far as reporting is concerned are not rectified in time, measurement on the SDG implementation in the country will remain an uphill task and this is a big reason why, research on the root causes to barriers of effective reporting need to be conducted.

Reporting of Environmental Dimensions of SDGs in Kenya

With regard to the environmental reporting in Kenya, the GoK acknowledges that a healthy environment is crucial in the attainment of the Vision 2030. The GoK, (2010) acknowledged that all Kenyans are supposed to enjoy clean and healthy environment with the Kenya Ministry of Environment and Forestry (MoEF) mandated to oversee issues pertaining to the ecosystem and the environment. The state is supposed to coordinate a practice of good governance in the attempt to restore, conserve, protect, develop, and monitor and control the environment and natural

resources for equal distribution and their ability to sustain development. Therefore, the core values guiding the ministry in this mandate are innovativeness, Sustainable development, participatory approach, and Human Dignity, among others (Kenya, Ministry of Environment, Water and Natural Resources, 2013).

The MoEF has five independent arms, each with their own specific mandate. These agencies include, NEMA, Kenya Water Towers Agency (KWTA), Kenya Forest Service (KFS), Kenya Forest Research Institute (KEFRI), and National Environment Trust Fund (NETFUND). The Environmental Management and Coordination Act (EMCA) (Act No. 8 of 1999) mandates NEMA to produce annual state of the environment report (SoE) and present it in the national assembly. In addition to the national legislative requirement, Kenya as a signatory to a number of multilateral environmental agreements is required to fulfill its reporting obligation to among others the UNEP, Convention on Biological Diversity (CBD), World Metrological Organization (WMO), and the UN body tasked with monitoring and reporting Climate Change (UNFCC) (NEMA, 2011).

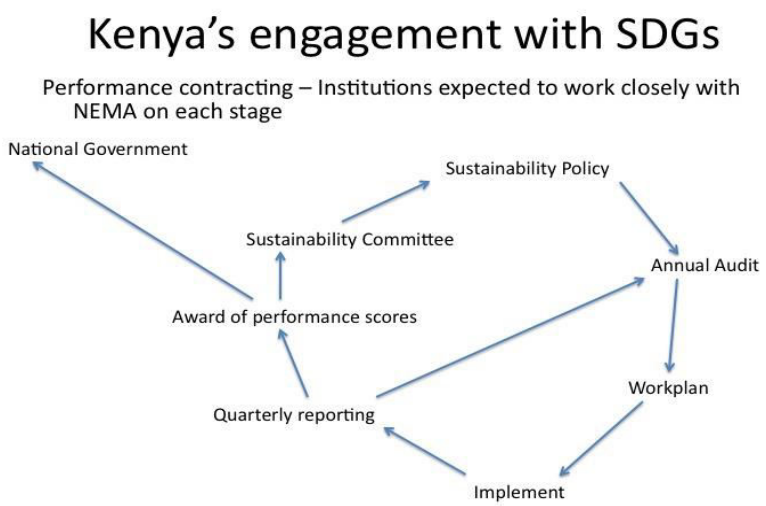

Figure 1.2: Kenya's Engagement with SDGs

NEMA and State Department of Planning in Kenya, which was previously under the Ministry of Devolution but has since been moved to Treasury, should

coordinate the SDG implementation in the country (Macharia, 2016). Figure 1.2 is an indication of how organisations work alongside NEMA through institutionalizing sustainable development. As to whether this happens, it is still very unclear (Macharia, 2016). Development of policy work, work plans, and performance contact assessments should be done and quarterly progress reports by government institutions should be submitted to NEMA which ideally should review against the policies, annual audits and work plan and rates them before submitting them to the office of the president (Macharia, 2016).

Despite these laid down guidelines, it is still not very clear that the country has institutional mechanism in place, which periodically brings together the line ministries to enhance coherence across sustainable development related policies (Moyare, 2012). This poses as a big risk where it could result in duplication of efforts and scenarios where ministries work in silos without cross sectoral linkages and thus reporting on various dimensions of sustainable development becomes ineffective and inefficient. Hence, this study sought to investigate the barriers to effective reporting of sustainable development goals (SDGs) by government institutions in Kenya, using NEMA as a reference organisation.

Statement of the Problem

While Kenya has quite advanced in systems for data acquisition as compared to other countries in the region, it still lags behind when compared to the first world countries (Caron et al., 2012; World Bank Group, 2016)) pointed out that accountability for progress on initiatives and proper channels of reporting are very important on all development spectrums, but are lacking in many fronts (Caron, et al., 2012). Besides and despite a lot of research being carried out on the on-going implementation of the SDGs, there is still insufficient information across the board in environmental issues

(Sachs, 2012). Major policy works are still missing as they are dependent on the availability of quality, adequate and timely environmental data. The barriers and root causes of effective reporting are still largely unknown (UNEP, 2019). This presents a gap that require to be identified and sealed if at all the SDGs' dream is to be attained in the country (UNEP, 2019).

The SDGs will only remain beautiful writings on the wall if concrete actions are not directed upon them. For good decisions to be effected towards attaining the SGDs, there is need for accessible, reliable and adequate data which has been flagged out as missing in Kenya. Therefore, this study endeavored to investigate the barriers experienced in reporting processes of environmental dimensions of the SDGs and based on the study findings, suitable recommendations have been preferred to inform policy and practice on how to enhance effective reporting on SDGs and in particular, environmental reporting in Kenya and beyond.

Purpose of the Study

This study's main purpose was to establish the barriers to effective reporting of the SDGs in Kenya, with the primary focus being on environmental reporting using NEMA as a reference point.

Objectives of the Study

The objectives of this study were as follows:

1. Establish the systems NEMA uses to report environmental issues in Kenya
2. Assess NEMA's technical capacity for effective reporting of environmental statistics in Kenya
3. Examine the effects of factors affecting the reporting of environmental statistics by NEMA in Kenya

4. Propose recommendations to enhance effective reporting of environmental statistics by NEMA in Kenya

Research Questions

1. What is the system of reporting that NEMA uses on environmental issues in Kenya?
2. What is NEMA's technical capacity for effective reporting of environmental statistics in Kenya?
3. What are the effects of the factors affecting the acquisition and reporting of environmental statistics by NEMA in Kenya?
4. What recommendations will enhance effective reporting of environmental statistics by NEMA in Kenya?

Justification for the Study

While the Sustainable Development Goals provide good prospects for countries across the globe, it is important to avoid what Karuri-Sebina (2013) referred to as naïve optimism. The goals provide good vision, but policy works, and decisions require factual data for informed planning and implementation, not only on environment issues but developments at large (Lundvall & Lema, 2014). There is an increased need for data driven reports across the board. While this is the case, every other report produced on SDG progress, cites inadequate and lack of data as a major challenge (UNEP, 2019).

In addition, there is a gap in literature on the root causes of these challenges and thus most institutions are unable to put in place corrective measures towards effective reporting of the environmental statistics (SDGs Kenya Forum, 2019). Therefore, this study was deemed important because it would endeavor to establish the challenges and root causes that inhibit effective reporting of the environmental dimensions of the SDGs

in Kenya and recommend possible solutions worth adopting to improve these systems. This study was, therefore, considered essential and timely for Kenya as a country, especially in accelerating her towards the realization of the SGDs and Vision 2030.

Significance of the Study

The findings of this study may impact values to a range of institutions through contributing to the existing body of knowledge in the environmental field at the country level, institutions concerned with environmental issues, academic field and even to the people of Kenya. This will be as follows:

The Government of Kenya

The government of Kenya is a signatory of several multilateral environmental agreements and is required to fulfill a number of international reporting obligations. Further, Kenya is at a point where all guns are pointed towards fighting corruption and misuse of public resources (Sood, Shih, Nuys, & Goldman, 2017). To attain these objectives, the government needs to streamline its reporting systems and attain foolproof and effective reporting mechanisms through reduction of key barriers affecting that process. This study may therefore be very beneficial in guiding such a process. Effective reporting system of SDGs may be a good reference point for the government as it does its varied international reporting.

Projects Implementation Partners

Kenya is currently considered to be a growing economy thereby attracting diverse investment partners. These partners need enough justification that their capital will be well utilized. This study therefore may be a guide to these partners on some of the barriers that need rectifications to achieve a smooth and credible reporting process so as project reporting is relevant, adequate, and timely.

Other Governments in The Region

Countries within the same region as Kenya in terms of geographical, economic levels and socio-political factors more or less undergo through similar challenges in the way that the government run its business. This means that, within an acceptable error mark, they also experience similar barriers in their SDG implementation and reporting. This study may be useful to such countries, and they stand to benefit if recommendations given by this study are well implemented.

United Nations Custodian Agencies

United Nations is a key development partner of Kenya. Two secretariat organizations are headquartered in Kenya, one of which is UNEP which is mandated in reporting on the environmental dimensions of the SDGs. This study may help the UN Environment and other agencies further understand some of the challenges the government is experiencing in the SDG reporting and thus derive appropriate ways to seal such gaps.

Scholars

Kenyan scholars and nationals with keen interest in the SDG conversation may benefit from this study which may provide significant information into their research work and recommend further areas of study. It will offer intelligence and basis upon which a typical Kenyan can tap into and get some level of enlightenment in as far as environmental reporting in Kenya is concerned.

National Environment Management Authority (NEMA)

Through this study, NEMA may be able to identify the gaps within their reporting structures and thus make informed decisions towards effective reporting

systems. The study may also set a foundation upon which the organisation can continue with its own business- fact finding, towards realization of the SDGs.

Citizens of Kenya

The citizens are usually the main beneficiaries or victims of the government policies, system of governance and even decisions made on their behalf by the ruling class. While this may not always be direct, the trickle-down effects of decision are definitely felt by the vast majority. Through this study, the information and knowledge garnered may guide decision-making in the Kenyan environmental sector which may in turn benefit the citizens in the medium term and also in the future.

Assumptions of the Study

The study assumed the following:

1. Essential assistance required for a successful study will be accorded to the researcher
2. The respondents will provide the necessary information to aid realization of the study's objectives.

Scope of the Study

This study will mainly focus on the environmental reporting processes in Kenya. It will be limited within the investigation of the barriers affecting the effective reporting of the environmental dimensions of the Sustainable Development Goals in Kenya. It will be done within Nairobi County which hosts the National Environment Management Authority headquarters.

Limitations and Delimitations of the Study

One of the limitations for this study would be the inability to quantify to a value, the uptake rate by the target audience and policy makers on the findings and the

recommendations. To delimit this, the study will be uploaded on the internet and made readily accessible and downloadable to aid in dissemination and also guide on further research work. It will also be presented in relevant avenues such as workshops and conferences where key messages will be disseminated.

Secondly, over generalizing the challenges faced in Environmental Reporting to be similar in nature for all the SDG reporting systems may bring some certain level of bias. A longitudinal study would yield unbiased findings but the time limits for this study may not allow for such a study. To avoid this, the study will incorporate relevant secondary data that informs changes through time. Further, a journal paper will be derived from this study and published in an appropriate Journal where it can be critiqued by fellow academicians.

Definition of Terms

Custodian agencies: UNSD (2020) referred custodian agencies as United Nations bodies and other select international organizations that are responsible for compiling and verifying country data and metadata, and for submitting the data, along with regional and global aggregates, to the UNSD. In this study, custodian agencies referred to the UNEP, as a custodian agency is tasked with the key responsibility of tracking and verifying data submitted on the environmentally related SDG indicators.

Effective reporting: This is the ability of the reporting system to attain the reporting objectives through collection of adequate, quality, and timely data that when analysed is able to influence changes and improve the performance of the subjects under study (Sherrill, 2020). In this study, effective reporting referred to the seamless flow of data through the organisations tasked with environmental data management at a country level up to the UNSD.

Environmental data: This are unprocessed measurements related to environment that are generated through national, sub-national and projects and which are used to communicate on specific environmental issues (Badriyah, 1995). According to this study environmental data refers to data generated through statistical surveys conducted by national and project based statistical systems and may be, acquired from records, databases, administrative registries, monitoring systems, thematic mapping, remote sensing, field studies and scientific research and experiments and consolidated by NEMA for submission to UNEP.

Environmental indicators: This refers to pre-defined measures which guide and inform measures depicting important environmental phenomena and/or dynamics in simple, clear and relevant ways (Badriyah, 1995). In this study, reference was made to the 93 environmental indicators developed under the SDG framework through the breakdown of the 17 SDGs to 169 targets and a monitoring framework of 244 indicators developed (UNEP, 2019).

Environmental statistics: Refers to processed data that has been given meaning through a structured, systematic, and scientific methods, standards and procedures (Badriyah, 1995). In this study, environmental statistics referred to the processed data on environmental issues and indicators that NEMA and its partner organisations consolidate for the national and international reporting.

Summary

This chapter has provided a synopsis of the study by highlighting the introduction and background research of the barriers to effective reporting on the environmental dimensions of the sustainability development goals. Through this, the chapter has stated briefly how the study will contribute to the broader literature on effective reporting of SDGs. The objectives of the research, research questions and the

significance of the study have also been stated. The chapter has also stated some of the limitations anticipated and recommends best ways of managing such during the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter will clearly give a detailed review of literature related to SDGs implementation and reporting, more so, on key challenges that inhibit effective reporting. The chapter entails the theoretical framework, empirical literature reviews and conceptual frameworks all which will guide and identifies the study gap.

Theoretical Framework

Neuman (2006) describes a theory as a system of interconnected ideas that condense and organize knowledge about the world. Cooper and Schindler (2003), further explained theoretical literature to be in close relation with the studies' philosophical basis, forming a link between the theoretical aspects and the practical component of the problem under study. This section therefore explores the theoretical foundation that will guide the study on investigating barriers to effective reporting of SDGs by government institutions in Kenya, with a focus on NEMA. The theories that informed this study are the accountability theory and the sustainability theory of development. They are discussed in the subsequent sub-sections.

Accountability Theory

The theory of accountability was originally developed by Tet lock, Lerner, and colleagues and has for a long period of time been effectively applied in organizational research. This theory underlines that being accountable on one's behaviors to other parties' causes one to consider and feel accountable for the process by which decisions and judgments have been reached. In turn, this perceived need to account for a decision-

making process and outcome increases the likelihood that one will think deeply and systematically about one's procedural behaviors (Lerner & Tetlock, 1999).

Nature of accountability

The world is governed under accepted social systems that are defined by some common set of shared expectations for behavior. In that regard, accountability acts as the adhesive forces that work to bind the social systems together. Frink and Klimoski (2004) emphasized on the need for organizations to put in place adequate and effective measures to seek accountability from their constituents and members alike. Such measures would include creation of formal reporting mechanisms, periodic performance reporting, review on existing contractual agreements, performance monitoring, training on supervisory roles and so on (Frink & Klimoski, 2004). Frink and Klimoski (2004) further called for improved capacity for individual agents to report on their actions, as an integral component of maintenance of order in an ecosystem.

Maintenance of any kind of social system and indeed, social order, therefore, cannot happen without meeting to an acceptable percentage, the shared expectations. These formal mechanisms cannot occur in isolation but are complimented by informal accountability sources. For governments and organizations whose mandate affects a wide proportion of the population, they must be wary of the fact that they are embedded in a complex web of accountability. To this myriad can be added the notion of self-accountability (Schlenker & Weigold, 1989). Thus, we can readily see that people are constantly influenced by the potential for scrutiny and evaluation, and indeed, they likely expect to be held accountable.

Conceptualizing Accountability

Accountability revolves around two thematic areas, one being who and what is involved in certain specific context and the second being provision of structured

feedback and evaluation in some form. Previous research work classifies first theme to be an inter-personal context where, two parties carrying out distinctive roles of an 'agent' and 'principle' (Adelberg & Batson, 1978) (Cummings & Ronald, 1990). The agent is the person whose actions are under evaluation by another who is concerned and consumes the results. It is also a very viable concept for one individual agent to self-evaluate therefore possessing a degree of self-accountability (Schlenker & Weigold, 1989). Other factors in the interpersonal context include structural, social, and relational possibilities which entrench the accountability phenomenon (Frink & Klimoski, 2004). Under the second theme, activities are the main rudiments of the accountability sensation. These activities are in quintessence related with the observation made after the assessment of the agent's actions, the judgment made upon which the agent might be obliged to protect, defend, or else answer for, and the creation of prospects for such responsibility (Frink & Klimoski, 2004).

Lastly, for accountability to have an effect on the conduct there is necessity for a related remuneration or chastisement system which makes the assessments significant to the agent (Mitchell, 1993). Moreover, Carothers and Brechenmacher (2014) emphasized on transparency, participation and inclusion in the modern-day governance structures and of the policy statements and programs of international development organizations. Accountability must, therefore, be explicit in any organizations or government strategies and activities as well as being engraved in the social normative prospects. Therefore, a wide-ranging conceptualization of accountability comprises both formal and informal systems, impartial and subjective assessments and recompenses, and internal and external audiences.

Significant to note, however, is the point that assessment systems come second to the peoples shared expectation in as far as accountability behavior is concerned. The

prospects neighboring probable assessments are at the origin of our responses. The associations and assessment mechanisms that are present are employed for the foundation of insights and prospects concerning forthcoming assessments. In other words, instead of seeing accountability fundamentally as a state of affairs, we incline to perceive it as a state of mind which is resultant, in section, from a state of affairs. Therefore, accountability comprises of an actor or agent in a social setting who possibly is subject to observation and assessment by some audience, involving oneself. There are also standards, prospects against which the agent's conducts are equated, and the belief on the section of agent of some possibility that he or she might require to answer for, defend, or justify the judgments or conducts.

Moreover, it is significant that there are consequences for the agent for instance sanctions, recompense or penalties that can be clear or hidden, and also objective or subjective. Ultimately, the emphasis is the conducts or verdicts by the agent. It is the control of the latter, despite everything that is the reason of accountability techniques put in place for the organizations. The accountability theory is important in this study as it brings out the principles of accountability and justifies why reporting is critical especially on country's sustainable development. The accountability is necessary as issues pertaining nature are not limited to country boundaries but affects across border.

Sustainability Theory of Development

The second theory that informed this study will be the sustainability theory of development that provides a picture of an economy and society that goes through positive transformations yielding enough for the current population while still safeguarding resources for the future (Ekardt, 2009). Sustainability theory was first developed in 1972 after a report: 'limits of growth' was published by the international think tanks of Rome (Jenkins, n.d). Another report, commonly known as the Brundtland

Report, followed in the year 1987, providing a clearer definition of what sustainability is. The Brundtland report heavily linked sustainability with development, while over emphasizing on the human life at the expense of other lives. It however, lay stable foundation for the Rio Conference (1992) that went beyond the trio aspects of sustainability which are social, economic, and environmental, towards adopting broader perspectives informing policy works across more social sciences including, law, political science, sociology, theology and even psychology (Ekardt, 2009).

Often, sustainable is viewed as being about protection of the amenities and social diversity but under it all, it is the principle of continued advancement of creation geared towards a more just world (Gibson, 2005). Further, Gibson (2005) stated that protection of existing amenities and creation of new and better services in the face of increasing demand, require a wide degree of innovation both at the institutional level and equally at the sectoral, national and international spectrum. Ekardt (2016), in his work on Legal, Ethical and Political Approaches to Sustainability, called for more elaborate, transdisciplinary outlook towards sustainability. The sustainability theory, therefore, greatly supports and gives this study a theoretical basis by providing a background on Sustainable Development process and the importance of tracking development progress.

Sustainability and Development

Traditionally, the Nation has for a long period of time been the standard unit of development. This is however changing with increased globalization and regionalization that has seen steady transformation on how things are done across the globe. Development alludes to desirable changes in the society, attainment of modernization that is heavily characterized by how well unit of development attains economic empowerment. Despite the classical interpretation painting a perfect picture

of development that was geared to modernization, most would argue that modernization is no longer very attractive nor an obvious objective. This is because of the existence of a lot of negative externalities. Towards that end, sustainable development is advocated for especially with competing needs and growing global competitions. Sustainable development is one that drives development without compromising the needs of the future generation. It is however, not possible to talk of sustainable development without featuring in the environmental and socio-political aspects as most development utilize natural resources.

With deployment of a lot of innovation and entrepreneurship in sustainable development, the question, therefore, remains to be - how effective are measures and indicators aimed at planning sustainable development and tracking progress? Allin (2018) in his work on keeping track of sustainable development illustrates the importance of building knowledge in the area, as it shapes perceptions, agendas, and policies. He, however, cautions that knowledge is very political and the whole process risks being politicized (Pieterse, 2009).

At a global level, countries have realized the underlying need to acknowledge the negative impacts that come with over exploitation of the natural resources and the fact that these impacts are not selective but global. To this end, international oversight bodies, backed by the countries have come into existence with conventions guiding their mandate. The need for continuous monitoring and voluntary reporting by the nations involved, being at the center piece for sustainable development within the said countries.

General Literature Review

This section reviews relevant studies, documentation and research work that relates to investigating the barriers to effective reporting of SDGs by government institutions in Kenya, using NEMA as a reference point.

Ministerial Declaration of the 2019 United Nations Environment Assembly

The UN Environmental Assembly, that brings together environment ministers from across all UN member states gathered in Nairobi for the 4th chapter of UN Environment Assembly and assumed the declaration "innovative resolutions for conservation confronts and workable consumption and production" as the main outcome of that assembly (UNEP, 2019). In line with attainment of the global environment agendas both in SDGs and Agenda 2063, the declaration highlighted the UN member countries commitment in using inventive solutions for building resilient societies and attainment of sustainable solutions to modern day configurations of consumption and production (UNEP, 2019).

One of the resolutions passed, (A/RES/66/288) outlined that environmental aspects cannot be ignored if at all eradicating poverty and attainment of other goals of development is to be achieved. This resolution advocated for altering unmaintainable and stimulating maintainable patterns of consumption and production and defending and managing the natural resource base of economic and social development for sustainable development. To do this, however, the member countries were encouraged to set out their commitment in scaling-up national and international efforts to overcome collective environmental challenges, nurturing sustainable and effectual resource management, promoting the use and sharing of environmental data, and engaging civil society, citizens, indigenous peoples and local communities, private sector, academia and other relevant stakeholders (UNEP, 2019).

The ministerial declaration further, reinforced the mandates provided by the Environment Assembly to the UNEP at its fourth and third sessions, to invest and build partnerships in inventive environmental solutions for hastening the application of the SDGs. The assembly reinforced the ability of the Environment Programme to develop knowledge management systems for the environment, through establishing a worldwide environmental data strategy by 2025. The assembly further mandated UNEP to conduct regular environmental valuation processes and to support our national efforts.

By embracing a culture of innovation, the Ministerial Declaration highlighted the need for the member countries to enhance their eminence of life devoid of compromising that of forthcoming generations by taking on the main enablers of an innovative culture. It further advocated the need for accountability, adopting necessary policy work to scale up fruitful tactics and inventive solutions for the implementation and reporting of the global environmental targets.

Monitoring and Evaluation (M&E) Systems

Through M&E, informed decisions can be made, and control measures taken upon the project based on the evidence generated from the past failures and successes of the investments. Monitoring ensures continuous data collection and analysis that is analyzed to inform the ongoing project/program efforts while evaluation is periodic information gathering for reporting and control purposes. In the recent past, M&E have grown to be one of the most crucial project performance management instruments utilized in both preparation or planning and decision making in programs, projects, and investment endeavors. Governments, international development corporations and private developers likewise are slowly placing M&E at the center of their economic governance systems

Effective coordination, as well as control, is about individuals, procedures, or processes plus technologies. The standard and dependable infrastructure of technology must enable smooth sharing, connecting persons who are conversant and supporting the trait to inquire, listen, and share. Thus, the processes should be modest to make the sharing, justification, and information distillation easy. According to Aramyan (2007), M&E is attached in a permanent plus periodic collection and project data analysis to help in the gathering of facts for the purposes of learning and decision making. Supervision is undertaken all through the project program development; on the other hand; evaluation is periodic. Most are the instances the project team uses one in the position of the other. This is in the case monitoring, or supervision replaces evaluation and supervision charades as evaluation. In the instances where decision-makers projects to utilize evidence from both M&E systems to aid them in making choices, a requirement for monitoring and evaluation is generated.

The monitoring and evaluation information capacity to supply is high, but capacity on the decision maker's part to demand quality evidence is limited, and therefore demand and supply are mismatched. The quality of the M&E process is, therefore, as good as the effectiveness of the reporting itself and the ability for that information transforming to right decisions. Through M&E processes, raw materials may be widely acquired and made available to the numerous shareholders. Nevertheless, if knowledge management strategies are not encompassed; therefore, the information might not transform into appropriate information or help in the accomplishment of the organizational goals.

Record keeping must be effected in a development endeavor if it has to achieve the desired quality standards and success rates. Every aspect should be kept in records for reporting purposes and tracking changes. Reports may be internal, those that

communicate to the internal stakeholders and project team while others are for external partners, financiers, etc. These reports include status reports, which are produced weekly, monthly, or as many times as required. Risk reports are also developed every time a risk assessment is carried put, perhaps monthly. It is a summary of the risk profile of the project and mitigation actions in place. The project manager should further develop executive reports to the organizational leadership, donors, and other stakeholders whose input or concern is crucial. Resource reports, audit reports and evaluation reports also form part of the necessary reports that are produced in a project's lifetime.

Technical Capacity in Effective Environmental Reporting

The ability to collect and manage data is at the center of the reporting process. At a national and international reporting scale, the generation of information is done in various growing techniques. Traditional databases utilization has been overtaken by the emerged multimedia platforms, including myriad types of sensors and social media (Manyika, Brown, & Bughin, 2011). The internet has made it possible for business executives, scholars, and policymakers to be in positions to access vast amounts of data (Purcell, 2012).

While the uptake of sophisticated technology has seen a general increase in the companies and organization handling big data, the cost of such remains the most limiting factor (Raguseo, 2018). Organizations have to deal with the fervent changes in the business environment, where business models and customer relations are increasingly requiring data-driven decisions (Tambe, 2014). This means that, in the place of the increasing importance of data, organizations have to put in place appropriate mechanism to leverage against such and position themselves strategically to exploit new opportunities while gaining intelligence of the hidden values.

While the need for reporting as well as accountability is always on an increasing trend, disparagement is focused on sources traceability and methodology of the information collection and analysis. Wanner (2019) highlighted that the assumption of the potential improvement is based on the recognition that the perceived credibility correlates with the information quality of the report, which in turn depends on the quality of the data. This being the case; therefore, governments and their agencies of whom, the burden of reporting is overwhelming, have to invest in modern technologies or risk falling in the already existing credibility gap.

Early studies such as that of Gregor (2006), also indicated that benefits associated with technological investments fall squarely under the strategic, informational, transactional, and transformational typologies. The SDGs reporting requirements in its diversity falls across all the categories. Further, the SDGs present a case of ever-growing data, much of which is in an unstructured form. This notwithstanding, a secondary need arises in the speed at which this data is analyzed and made into understandable information for decision making. Technology that supports the acquisition of real data is, therefore at the center of future trends and keep gaining popularity by the day. Organizations such as Google, AirBus, and MapX, among others, are good examples that indeed value exist in the ability to acquire and transmit data in real-time.

Effects of Factors Affecting Environmental Reporting Process

Environmental governance features as one factor that affect the reporting process. Amidst competing interests at national and global levels, one unifying factor should be the universal agreements in pursuit of the common set of sustainable development goals (Ortigara, Kay, & Uhlenbrook, 2018). To achieve these goals, however, governance at the specific levels plays one of the heaviest roles (CLEAR,

2012). Robert Gibson (2005) terms governance and sustainability as two siblings, with an enjoined history and parentage. Perhaps, the interlinkage between these two is still one of the most understudied but while this may be the case, most of the existing literature establishes interconnectivity between these two variables. In the July 2012, UN General Assembly member states reaffirmed good governance as a foundation for development.

Kameri-Mbote (2008), in her book on environmental governance in Kenya highlighted Kenya as one of 42 countries in Africa which have enacted framework environmental laws but flagged out a big disjoint between the policy works and their implementation. Mireri and Letema (2012), in their review of environmental governance in Kenya analysis of environmental policy and institutional frameworks, contradicted Kameri-Mbote's (2008) findings and indicated that Kenya lacked elaborative legislative framework with instruments that could significantly contribute to the sustainable environmental framework at least up until the Rio Conference. Further, Mireri and Letema (2012) highlighted that environmental legislation faces a number of challenges among them the unavailability of policies on environmental management and weak capacity for implementation, tracking and reporting of environmental data. While institutions have been formed and mandated with different but complementary jurisdictions under the environment management (Kenya, Ministry of Environment, Water and Natural Resources, 2013) coherence of policy works, inter-organizational and cross-sectoral coordination still remains an uphill task (Mireri & Letema, 2012).

The Brundt Land Commission in the 'Our Common Future' report, strived to relate the economic development issue with that of the environment (UN, 1987). In summary, the report defined sustainable development as that which satisfies the current

needs without making those of the future generation worse off. Albeit the vagueness and complexity behind the meaning of this statement, there is proof that natural resources fuel most economic activities. To attain a sustainable and efficient economy, therefore, a balance needs to be struck between the supply, demand, and allocation of the earth's natural resources.

In as early as 1920, scholars such as Arthur Pigou under his work of 'The Economics of Welfare" studied the relationship and marginal private costs discrepancy as well as significances against marginal social costs and remunerations that lead to the introduction of the Pigouvian tax to compensate for the externalities. Michael Porter (1985) theorized pollution as an indicator of inefficiency in the exploitation of resources (Porter, 1985). Furthermore, Porter (1985) argued that innovations were the key to the attainment of competitive advantage in the industries and thus recommended regularization of the environmental sector. According to Porter (1985), an expertly designed environmental policy work would substantially translate to the use of advanced technologies that reduce wastes.

The sustainable development general goals allude to the long-term constancy in both the economy plus the environment; there is the need, therefore, to ensure total incorporation and contemplation of all the economic, environmental, and societal distresses across all the decision-making systems. Emas (2015) advocated for the integration of the social, ecological, and economic objectives in all the institutions, sectors and government agencies to be the guide in a common forged pathway to a truly sustainable future (Emas, 2015). Governments and governmental agencies should not only work to put in place the required and necessary regularization measures but should go an extra mile to ensure that they are able to track and monitor such.

Institutional Capacity plays a critical role as a factor in ensuring smooth flow of data or lack thereof. According to both UNDP and the United Nations Disaster Risk Reduction Offices (UNISDR) institutional capacity, it is the institution's capability to plan and implement a set of socio-economic objectives and goals, through knowledge, skills, systems, and institutions. A key contribution of institution's capacity is the Individuals' skill set and performance (Willems & Baumert, 2003). Individual factors include the employees' understanding of the mission, skill set that are reflective of the job requirements, available training opportunities incentives and even their motivation to perform and take on new tasks (Willems & Baumert, 2003). The performance of the organisations is also a measure of its capacity especially its management capacity. Further, organisational networking capacity, more so, the ability to co-operate with other organisations and its ability to adapt to merging policy works are key factors on its institutional capacity.

While organisations, do not exist in isolation, the enabling environment is critical for effective reporting. This being the case, individuals, institutions and/or network need to be entrenched in the existing wider public sector setting such as the sector policy work, laws, and regulations (Willems & Baumert, 2003). Further, William and Baumert (2003) outlined political priorities, policies, regulatory frames, public administration, fiscal frame, and accountability are also factors outside the organisation that contribute one way or another to an organization's institutional capacity. It is, therefore, important for the institutions within the enabling environment ensure they understand the challenges and solutions as they build on the policy works (Alaerts & Kaspersm, 2009).

The measurement of sustainable development is not without a fair share of challenges and difficulties (Pearce & Atkinson, 1993). Also, the African Union (2017)

report on sustainable development indicated that six out of ten SDG indicators in the African states are barely tracked due to data limitation. The inadequacy in statistical data inhibits the SDG's transformational process. Studies and evaluations conducted across the region have shown strong evidence that lack of enough monitoring surveys, absence of baselines, inadequate financing and limited autonomy of national statistical systems are the significant promoters of data gaps in key development indicators (World Bank, 2018). The environmental aspects, having been sidelined in the MDGs were severely affected as the absence of data highly limited the establishment of baselines, compounding the challenges of measuring the progress. Evidence-based policymaking in the region has not been guided by adequate data (Bossel, 1999). Nevertheless, the International Institute for Sustainable Development, identified the selection of appropriate indicators for tracking critical information at any given level as one of the heftiest tasks in the modern world (Bossel, 1999).

Empirical Literature Review

Different scholars have made attempts to look into the challenges that affect development projects and why in most cases, these development programmes and projects never live to their full glory. This sub-section identifies key researchers who have conducted studies on the challenges affecting reporting, especially for SDGs and development programmes as a whole.

The preparation of Measuring Progress Report (2019) brought together over a 100 renowned scientists and researchers to contribute on the SDGs thematic analysis and over 50 other scholars from across the globe to review. The team conducted progress analysis for the 12 of the SDGs targets and the 93 indicators that communicate directly to the environmental dimensions of the environment. One of the main findings that cut across all the indicators is that data and statistics for measuring the

environmental issues in the SDGs remains a major constraint towards the attainment of the goals (UNEP, 2019).

Some of what was termed as substantial limitations to the monitoring of the environmental issues were; low development in national capacities in the partner countries, deficiency in agreed upon methodologies, limitations in data integrations and reporting burdens at the national and sub-national levels (UNEP, 2019). As to why countries could be having reporting burdens, the measuring progress report indicated that countries may be experiencing a lot of data demand from a variety of global entities, but lacked the right infrastructural, financial capacities or even political will power to supply such data. As the measuring of progress report reviewed the monitoring and reporting processes at the global level, the scientists recommended a more targeted study at country levels to make reliable diagnostics to what could be ailing the respective countries and institutions.

In a review conducted on the SDG 6 synthesis report (2018) from an education, training and research perspective, three key issues of interest were established. Scarcity of data across the global water sector, acute lack of human and institutional capacity to manage water in many low- and middle-income countries and the need to turn research into policy making and practical development were noted to be major inhibiting factors to the attainment of the SDG 6 (Ortigara, Kay, & Uhlenbrook, 2018). Further, the low attention given by the governments was noted to be alarming (Ortigara, et al., 2018).

The reviews opened up three key focus areas of data acquisition, capacity development and research into policy and practice, as areas that required further study to identify their direct contribution in the overall attainment of, not just SDG 6 but all the SDGs. The study flagged out data acquisition as the biggest challenges, majorly due to wanting efficiency of monitoring programs and data interpretation, absence of

physical infrastructure for sample collection and analysis and low human capacity (Ortigara, et al., 2018). Another major finding was that many countries lacked mechanism of institutional cooperation and lacked central facilities for quality data storage and dissemination. Further, policies to harmonize data standards and enable intra- and inter-sectoral cooperation within and beyond national boundaries were reported as missing (Ortigara, et al., 2018). The report was, however, unable to provide detailed insights of how the reporting and feedback structures could have affected the overall realization of necessary data or even key recommendations of how this could be rectified.

Mugo and Oleche (2015) conducted a study to find out the impact of monitoring and evaluation of development projects on economic growth in Kenya. From their study, they established that, while the M&E system has improved with decentralization of the accountability in line with new two-tier governance system in Kenya, monitoring and feedback system is still one area that has not received the deserved attention (Mugo & Oleche, 2015). The study further established that tracking the development progress in time and accurately can be achieved if an integrated nationwide M&E system is established. The absence of an M&E framework negatively affects the effectiveness of public service delivery which then constrains the acceleration of economic development in Kenya and the overall wellbeing of the citizens (Mugo & Oleche, 2015). As a conclusion, Mugo and Oleche (2015) called for an establishment of factors that influence the implementation of the M&E of development projects in Kenya so as to have a timely establishment of a guide which would inform the M&E functions and limitation and the necessary policy development. To do this, a situational analysis on the current situation would be mandatory, establishing the pros and cons of the current monitoring, evaluation and reporting structures. While SDG implementation in the

country is done as a development programme, establishing the challenges and barriers within the reporting structures would be a key step towards addressing the gaps established in the study by Mugo and Oleche (2015).

Research Gaps in Environmental Data Monitoring and Reporting

The measurement of sustainable development is not without a fair share of challenges and difficulties (Pearce & Atkinson, 1993). The African Union (2017) report on sustainable development indicated that six out of ten SDG indicators in the African states are barely tracked due to data limitation. The inadequacy in statistical data inhibits the SDG's transformational process. Evaluations conducted across the region have shown strong evidence that lack of enough monitoring surveys, absence of baselines, inadequate financing and limited autonomy of national statistical systems are the significant promoters of data gaps in key development indicators (World Bank, 2018).

The environmental aspects, having been sidelined in the MDGs were severely affected as the absence of data highly limited the establishment of baselines, compounding the challenges of measuring the progress. Evidence-based policymaking in the region has not been guided by adequate data (Bossel, 1999). Nevertheless, the International Institute for Sustainable Development, identified the selection of appropriate indicators for tracking critical information at any given level as one of the heftiest tasks in the modern world (Bossel, 1999). In spite of this, there are still bottlenecks that hinder effective reporting in the environment sector since there are no studies that have been done to identify the barriers to effective reporting in Kenya. This study sought to fill this gap by investigating contextualized barriers that hinder effective reporting towards sustainable development.

Conceptual Framework

Conceptual framework is a graphic and intellectual representation of the researcher's objectives, which provides the variables under study. Through the flow diagram, it is easy to establish the linkage between the independent, intervening and dependent variables (Adom, Hussein, & Joe, 2018). At a glance, the reader can interpret the flow of the factors under study and how they build up to the research area. In this study, the independent variables feature factors that would hinder the effective reporting of the environmental statistics', intervening variables outline the factors that affect in one way the overall reporting structures and under the dependent variable is the effectiveness of the SDG reporting. This is represented in Figure 2.1.

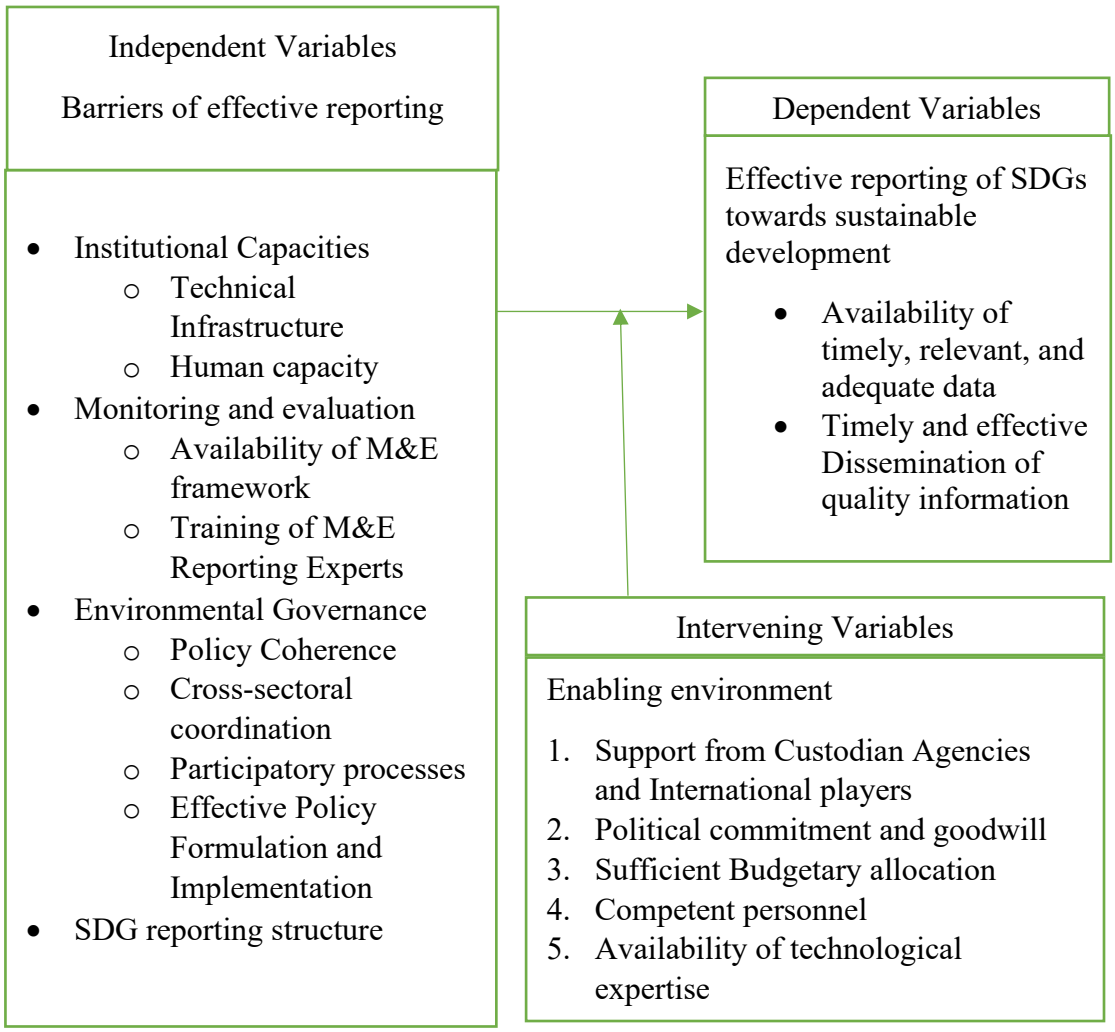

Figure 2.1: Conceptual Framework
Source: Author (2021)

Discussion

In this study and as shown in the conceptual framework, barriers of effective reporting of environmental dimensions of SDGs are presented as the independent variables. These include institutional capacities that range from technical infrastructure and human capacity, monitoring and evaluation, environmental governance and SDG reporting structures. These independent variables are key determinants on whether data is effectively collected, processed and disseminated in a timely manner and through appropriate means and methods. A systematic review of existing research literature (CLEAR, 2012;UNEP, 2019)) highlighted these independent variables as crucial in

attainment of effective reporting process not only for environmental statistics but for any reporting need.

Technical capacity is part of the independent variables because technology is at the center of the realization of timely and quality data. Data is only useful when it is acquired and utilized within the time limits for which the issue in question is relevant. Human resources, therefore, must be equipped with necessary skills in line with NEMA's mandate of environmental management to deliver within the stipulated guidelines and standards. This, therefore, makes human capacity an integral part of the independent variables. The reporting of the SDGs is not a process that exists in solitude and therefore, cross-sectoral coordination, policy coherence and participatory approaches are factors that definitely affect the reporting process positively or negatively either through their availability or unavailability.

Barriers to effective reporting which constitute the independent variables, can result to inefficiencies in the realization of SDG goals (dependent variable) in any specific sector. However, when the intervening variables are introduced, they influence the interaction between the independent and dependent variables and anticipated results are realized. The intervening variables in this case, range from effective policies, political willpower, sufficient budgetary allocation, support from UN agencies guiding the process and training of M&E reporting experts.

SDGs implementation and reporting are not just technical but also a political process. It is a process that cannot achieve effective implementation unless, it is backed up by good policy work, sufficient budgetary allocation, political commitment and support from UN agencies guiding the process. These factors have therefore been provided as intervening variables that have a significant effect on the independent variables in attainment and realization of the SDGs in Kenya. In a perfect word, where

the independent and intervening variables exist in totality, it means that the realization of the environmental dimensions of the SDGs in Kenya would be possible. This, however, isn't the case, and therefore, the conceptual framework guides the investigation of the existing barriers of effective reporting of the environmental dimensions of the SDGs in reference to NEMA.

Summary

This chapter reviews the literature that features the reporting structures and process of the sustainable goals. The literature aids in establishing linkage between the independent, intervening and dependent variables. It has further explored the theories guiding the study which includes, accountability and sustainability theories. The theoretical framework, empirical review and the conceptual framework featured form part of the backbone to the researcher's study.

CHAPTER THREE

RESEARCH METHODOLOGY

Introduction

The methodology is an essential part or section in any research. The methodology is defined as a systematic, theoretical analysis of the techniques or methods utilized in the study field (Jones, Baxter, & Khanduja, 2013). Any research methodology contains the theoretical body analysis of principles as well as the methods connected with the particular branch of knowledge. It offers a rationale for the way one precedes as a researcher. This chapter outlines the approach and methodology adopted by the study. It entails the research design, population of the study, target population, sample size, sampling techniques, sampling procedures, data collection tools, data collection procedures, analysis and presentation methods and ethical considerations. This is used to establish the barriers to effective reporting of SDGs by government institutions in Kenya.

Research Design

Akhtar (2014) described a research design as the glue that binds together all the elements in a research study. It is the process that a researcher must employ in order to attain the research objectives. Kothari (2004) described a good research design as one that is flexible, appropriate, efficient, and accurate. According to Mugenda and Mugenda (2003), a good research design involves planning, organisation, collection, and analysis of data to arrive at the desired results of the study.

A number of research designs exist ranging from exploratory, descriptive, causal studies and case studies. The exploratory research design is majorly featured when the researcher needs new information, produce elementary knowledge as it is very

open-ended. Descriptive design is effective in answering the, who, what, when, where, why, and how of a research problem. It is the method used in research to outline, describe, integrate, approximate, forecast and probe associative affiliations of a study. Causal design offers a cause-effect explanation to a problem. Finally, a case-study is the method that provides a comprehensive and thorough explanation of the subject (Jones et al., 2013).

This study made use of descriptive design method, which accommodate both the qualitative and quantitative research methodologies. Descriptive design enabled the researcher to gather data that describes the SDG reporting patterns by NEMA, examine events aimed at discovering causal relationship and allowed that data to be analyzed, organized and presented in a wide range of tabular, graphs, pie-charts.

Population

Collis and Hussey (2014) defined a population as a body of people or objects under consideration for statistical purposes. It is an identifiable total group or aggregation of elements that are of interest to a researcher and pertinent to the specified information problem. Maxfield (2015) defined a population as that group that is required for a study to make unbiased conclusion. The population of this study comprised all the staff members of NEMA who are approximately 250 in number working in Nairobi area (NEMA, 2020). About 450 staff members at UNEP (UNEP, 2020) also form part of the study population in addition to 38 people in the state Department for Planning at the Government of Kenya (Kenya, State Department for planning, 2020). In total, the population of this study adds up to 738 people. This study draws the population from three institutions across the reporting line of the environmental statistics in Kenya, with NEMA at the sectoral level, SDG Focal points at the Kenya, State Department of Planning at the National level and UNEP as the lead

UN agency on environmental matters. Involving these three orgranisations enhanced better understanding of the reporting process and reduced bias in the findings.

Target Population

The target population was restricted to those specifically mandated in contributing towards the SDGs' implementation and reporting processes. In NEMA, three departments included Environmental Planning and Research Coordination department (29 people), Environmental Education and Public Participation department (24 people) and the Compliance and Enforcement department (22 people) (National Environment Management Authority, 2020).

Hence, from NEMA, the target population was 75 people out of 250 who are involved with data collection, analysis and dissemination of environmental data at NEMA. At UNEP, 9 out of the 450 staff members comprises the SDG unit, formed part of the target population as it is the group that consolidates the environmental statistics from the countries and partners before submitting to the UNSD (UNEP, 2020). In the State Department for Planning, 14 SDG focal points responsible for coordinating SDG efforts with the line ministries were also part of the study population (Kenya, State Department for planning, 2020). Therefore, in total the target population of this study added up to 98 people who are directly concerned with reporting of environmental data in Kenya at the sectoral level, national level all the way to the UN database.

Sample Size

A sample size is representation of the target population which is carefully selected to eliminate bias and errors in the study. A good sample is characterized by minimal testing errors, suitability, temperate to efficiently produce information that is sensible and true reflection of the population under study (Kothari, 2004). In this study,

the target population added up to 98 respondents. Given that the number was not very big to incur a lot of time, cost, the researcher made use of whole population for the research study. This was owed to the fact that; the target population was drawn from three organisations, all with different roles and responsibility in the SDG reporting eco-system. Using the whole target population as a sample is acceptable when the target population is small. Therefore, census sampling technique was used in this study since the target population is only 98 people. Hence, the sample size for the study was 98 respondents.

Table 3.1: Study Population, Target Population and Sample Size

Category	Population of the Study	Target Population	Sample Size
NEMA	250	75	75
State Department of Planning	38	14	14
UNEP	450	9	9
Total	738	98	98

In addition to the sample size of 98 respondents, the researcher conducted in-depth interviews with key informants who included three departmental heads at NEMA, one head of the SDG focal points at the State Department for Planning and two branch heads at UNEP. A total of 6 key informant interviews were conducted.

Sampling Techniques

Sampling techniques is the systematic selection of a right representation of the population under study, which reflects all elements of that population (Mugenda & Mugenda, 2003). Such a representation should feature the characteristics of the study population so as the findings from the study can be used as true reflection of the main target population (Mugenda & Mugenda, 2003). Sampling techniques can be categorized into two groups, namely probability and no-probability sampling. In probability sampling, the researcher has a complete sampling frame of all eligible respondents from which a sample may be drawn (Barrat, 2009).

In this study, the sampling procedures that was used was census sampling technique since the target population was only 98 people. Hence, the target population of 98 constituted study sample/respondents. Lavrakas (2008) defined census sampling technique as the attempt by a researcher to list and study all elements in the group under study, to acquire information of those elements in attainment of the study objective. Census sampling technique possess a higher degree of accuracy and is appropriate for respondents with heterogeneity and different mandates (Barrat, 2009).

Data Collection Instruments

According to Akhtar (2014), data collection instruments refer to the tools used to measure the concept of interest that a researcher uses to collect data. For this study questionnaires and key informant interview guides were used to collect data.

Questionnaires

A questionnaire was used to collect data from the 91 respondents who were sourced from three different orgranisations, namely NEMA, UNEP, and the State Department of Planning.The questionnaires were developed by the researcher and administered to primary respondents of the study who were from NEMA, UNEP and the State Department of Planning. The questionnaires were preferred as they are cost and time effective. Further, they are easy to use and analyse as many respondents are familiar with them (Jones, et al., 2013). The questionnaires had both open and closed ended questions. Each questionnaire was divided in different sub-sections guided by the study objectives. In addition, the questionnaire had a demographic section that solicited data on gender, job level, profession, and years of experience of the respondent. This information was useful in proving that the respondents in the study were a good representation of the target population and thus reduced bias in

generalization of the study findings. Likert scale type of questions was also incorporated into the questionnaire as they are easy and fast to respond to, and also due to the fact that, it limits the yes and no responses, allowing the respondents to give a degree of agreement or disagreement on an issue under investigation.

In-depth interview guides

In-depth interview guide is a qualitative research method that enables a researcher conduct intensive individual interviews to acquire and explore their ideas, perspectives on some said subject that affects them (Showkat & Parveen, 2017). In-depth interview guides were used to collect data from six (6) key informants who included three (3) departmental heads at NEMA, one (1) in State Department of Planning and two (2) branch heads at UNEP. The selected key informants were from the senior and middle level management team and thus possess the legal mandate and ability to talk with authority on the specific subject matters under study. Key informant interview guide is a useful tool as it allows the researcher to probe more and ask for clarifications whenever necessary. In addition, the researcher is able to read and interpret the non-verbal cues such as respondent's emotions and attitudes. Key informant interview guide was opted for as the most appropriate data collection tool because it targets people with a good understanding of the subject under study.

Types of Data

Two type of data that are commonly available include primary and secondary data. The primary data is collected and made available for the first time while secondary data is obtained from publications, articles, books, and journals (Lavrakas, 2008). In this study, both types of data were used. Primary data may be both qualitative and quantitative data in nature (Kabir, 2016). Primary data collected generated both quantitative and qualitative data. Quantitative is more of numerical while qualitative

data is highly constituted of words. Qualitative data is non-statistical, descriptive, and conceptual in nature (Pickell, 2019) and was generated through the use of open-ended questions, notes and reviews of secondary materials. Unlike qualitative data, quantitative data is statistical in nature and is presented in terms of numbers and values generated through tests, experiments, surveys, reports, and metrics (Pickell, 2019). Quantitative data was collected using close-ended questions in the questionnaire.

Data Collection Procedures

Prior to the data collection, a written introductory letter was obtained from Daystar University, Department of Development Studies. Further, approvals were obtained from Daystar University Ethics and Review Board (DU-ERB) and the National Commission for Science, Technology and Innovation (NACOSTI). After obtaining these clearances, the researcher made appointments with the necessary office within NEMA, and the State Department of Planning to seek for approval and to be advised on the best approach to use while interacting with staff, agree on the data collection modalities and period.

The researcher made use of one research assistant who distributed the questionnaires and was on standby incase a respondent requested some clarifications. The questionnaires were self-administered, and the researcher allowed appropriate period of ten days for the respondents who were not able to fill them within the data collection day. The principal researcher, while collecting the filled forms ensured to take the contact of those who had not filled the forms and were still willing to work on them and ensure they were reminded constantly for another five days. The principal researcher engaged the senior officers within NEMA, UNEP, and State Department of Planning in the key informants' in-depth interviews and outlined the interview questions that were asked and record the responses in both hard copy and voice

recording devices. The soft copy was voice recorders that aided the researcher in clarifying points after the interviews when transcription was being done.

Pretesting

Pretesting of the data collection tools was done to help in determining their efficiency, clarity, validity and ease of use (Mugenda & Mugenda 2003). Pretesting is important as it helps the researcher identify errors and act on them immediately to make the tools of data effective. It also offers a platform for training research assistants to gain competency in readiness for actual data collection. According to Mugenda and Mugenda (2003), an effective pretest sample can be between 1 per cent and 10% of the study sample. For this study, the questionnaire was using a 5 per cent of 98 sample size which translates to about 5 people as recommended in research methodology guidelines (Kabir, 2016). The 5 respondents for the pretesting were acquired from the Ministry of Environment so as to avoid contamination of the data. However, data collected for pre-test was not factored in the main study. From the pretest, the researcher established that questions were clear and well understandable by the respondents.

Data Analysis Plan

Collected quantitative data was processed; cleaned, edited, classified, and coded before being entered into the computer. Analysis was done using the Statistical Package for the Social Sciences (SPSS), version 25. Quantitative data was analyzed through descriptive statistics such as percentages, frequency distribution, measures of central tendencies (mean) and measures of variation (Standard deviation). Frequencies were used to analyze the responses on the biodata such as the respondents' age, gender, work level, position held, department, organization, education levels, and years of experience.

Further, descriptive statistics was utilized to explore the barriers to effective reporting of the SDGs. The results were presented using tables, graphs, and narratives. Qualitative data acquired from both the questionnaire and the key informant interviews was cleaned and through the use of excel, was classified based on identified thematic categories, coded and subjected to analysis and interpretation to determine the effect relationship between the independent and dependent variables. Voices of participants was also used for triangulation between data collected from primary respondents and KIs.

In addition, inferential statistics was used to analyze quantitative data where the effect of barriers on effective reporting was investigated. This was achieved through Pearson's correlation and simple linear regression.

Pearson's Correlation Analysis

Correlation technique was used to analyze the degree of association between two variables. The computation of a correlation coefficient yields a statistic that ranges from -1 to +1. This statistic is called a correlation coefficient (r) which indicates the relationship between the two variables being compared. The direction of the relationship is also important in that if it is positive (+) it means that there is a positive relationship between the two variables, and this means that when one variable increases the other variable increases or when one variable decreases the other variable also decreases. A negative relationship (-) means that as one variable decreases the other variable increases and vice-versa and hence an inverse relationship. If there is no relationship the coefficient is equal to zero (0). Pearson correlation coefficient was used to determine the strength and direction of the relationship between the dependent variable and the independent variable. The analysis using Pearson's product-moment

correlation was based on the assumption that the data is normally distributed and also because the variables are continuous.

Linear regression analysis

A linear regression analysis was used to establish relations and build a model between the independent and dependent variables. Regression analysis refers to an inferential statistical technique which is used to predict a variables' value based on two or more values of variables. The value being predicted was the dependent variable while independent variable was the variable used to predict the value of the dependent variable (Mahbobi & Tiemann, 2010). The regression model equation was as follows:

$$Y = \beta_0 + \sum_{0}^{n} \beta_i x_i + \varepsilon$$

Where Y – Effective reporting (ER)

β_0 – a constant term

β_i - regression coefficient for the determinants (Institutional Capacity (IC), Monitoring and Evaluation Framework (M&E), Environmental Governance (EG), and Enabling Environment (EE))

X_i - independent variables (Effective reporting)

ε - regression error

In testing the significance of the model, the coefficient of determination (R^2) was used to measure the extent to which the variation in ER is explained by the variations in the independent variable. F-statistic computed at 95% confidence level was used to test whether there is any significant relationship between the independent variables and the dependent variable. This analysis was achieved through the use of a

statistical application tool (SPSS software) and the findings were presented in the form of a research report.

Ethical Considerations

According to Mugenda and Mugenda (2003), ethical issues in academic research studies are either related to the researcher or subjects. This study was undertaken with strong consideration of all the necessary ethical requirements. The researcher sought an introductory letter from the Department of Development Studies, Daystar University, and ethics approval from DU-ERB. After this, permit to conduct research was sought from NACOSTI. Once cleared by these institutions, the researcher used the introductory letter from Daystar University, the ethics clearance letter, and the research permit to approach and introduce himself to NEMA, UNEP and State Department of Planning which are the institution from which the sample was drawn.

Further, focus was placed on good public relations between the researcher and the respondents. Informed consent of the respondent was sought after explaining the purpose of the study, confidentiality of the information collected assured and guaranteed. The researcher clearly explained to the respondents that their participation in the research was voluntary, they could withdrawal at any point if they choose to, and that they should not expect any reward in return. The researcher further, ensured that the data collection tools don't capture the names of the respondents. The time for administration of tools of data collection was negotiated with the participants to guarantee their active participation without compromising their daily livelihood activities.

High ethical standards were adhered to in the storage and handling of data to avoid data contamination and leakage to unauthorized parties. Back-up was done to reduce data loss. Finally, and in accordance with Cooper and Schindlier (2003), the

researcher observed few ethical issues that conforms to an examination, which include presenting non-distorted results, informing unwavering quality and observing copyright. Plagiarism was avoided, and the research was strictly guided by the APA referencing style as per the regulations and recommendation of Daystar University postgraduate student's handbook.

Summary

This chapter has presented a short introduction, before proceeding to discuss the study design which is descriptive. Further, it has discussed the target population from which the sample size, was computed under the sampling techniques highlighted. The proposed sampling method is census method given the target population is 98 respondents. This chapter has also discussed the research tools which are questionnaires and interviews under the category of primary data. Finally, the chapter has also highlighted the data analysis and presentation methods to be used.

CHAPTER FOUR

DATA PRESENTATION ANALYSIS AND INTERPRETATION

Introduction

This chapter provides information on the findings of the study. The general research goal focused on establishing barriers to effective reporting of the SDGs in Kenya, with the primary focus being on environmental reporting using NEMA as a reference point. In this study a semi-structured questionnaire with both closed and open-ended questions was used in gathering data. To analyse data, SPSS, version 25 was used and the study results were presented in tables, graphs, descriptive and inferential statistics and narratives in-line with the study objectives which were to establish the reporting systems NEMA uses for environmental issues in Kenya, assess NEMA's technical capacity for effective reporting of environmental statistics in Kenya, examine the effects of factors affecting the reporting of environmental statistics by NEMA in Kenya, and lastly propose recommendations to enhance effective reporting of environmental statistics by NEMA in Kenya. The chapter encompasses information related to the respondents' response rate, respondents' demographic information, data presentations, analysis and interpretation, summary of key findings, and chapter summary.

Analysis and Interpretation

Response Rate

Questionnaire return rate is the proportion of the sample that participated in the survey and returned dully filled as intended by the researcher. The study targeted a sample size of 98 respondents. However, only 91(92.8%) were dully filled and returned as presented in Table 4.1. A response rate of 92.8% was excellent and sufficient to

facilitate statistical analysis as argued by Baruch and Holtom (2008), who stated that a response rate of 50% is sufficient for analysis.

Table 4.1: Respondents' Response Rate

	Frequency	Percent
Responded	91	92.8
Not responded	7	7.2
Total	98	100

Demographic Information of the Sample

This section presents the general characteristics of the respondents. They include their organization, work level, department, gender, years of experience, highest education level and age. The demographic information results derived from the questionnaires are as presented in tables 4.2, 4.3, and 4.4.

Table 4.2: Respondents' Organization Affiliations

	Frequency	Percent	Cumulative Percent
NEMA	73	80.2	80.2
State Department of Planning	12	13.2	93.4
UNEP	6	6.6	100.0
Total	91	100.0	

As shown in Table 4.2, the majority, 73(80.2%), of the respondents were from NEMA, 12(13.2%) were from the State Department of Planning while 6(6.6%) were from UNEP. The bulk of the respondents were drawn from NEMA, being the main organisation under investigation. This study drew the population from three institutions across the reporting line of the environmental statistics in Kenya, that is, NEMA at the sectoral level, SDG Focal points at the State Department of Planning at the national level and UNEP as the lead UN agency on environmental matters. Involving these three orgranisations enhanced better understanding of the reporting process and reduced bias in the study findings.

Table 4.3: Respondents' Highest Level of Education, Gender, and Age

		NEMA		State Department of Planning		UNEP	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Highest education level	Diploma	5	6.8	0	0.0	0	0.0
	First Degree	42	57.5	12	100.0	6	100.0
	Second Degree	26	35.6	0	0.0	0	0.0
	Total	73	100.0	12	100.0	6	100.0
Gender	Male	47	64.4	6	50.0	3	50.0
	Female	26	35.6	6	50.0	3	50.0
	Total	73	100.0	12	100.0	6	100.0
Age	19-29 years	15	20.5	0	0.0	0	0.0
	30-39 years	16	21.9	6	50.0	0	0.0
	40-50 years	27	37.0	6	50.0	6	100.0
	Above 50 years	15	20.5	0	0.0	0	0.0
	Total	73	100.0	12	100.0	6	100.0

Table 4.3 summarizes demographic information of the respondents in regard to their gender, age and level of education. At UNEP 3(50%) and State Department of Planning 6(50%), of the respondents were of either gender indicating that the study observed gender sensitivity in equality. At NEMA, however, the males were slightly more than their female counterparts at 47(64.4%) and 26(35.6%) respectively. The gender distribution enhanced equal gender visibility and diversity and equal gender contribution to the study.

Further, Table 4.3, indicates that the age group of respondents' at NEMA were fairly distributed with 15(20.5%) being between 19-29 years, 16(21.9%) being under the 30-39 years of age and 15(20.5%) being above 50 years. The distribution of ages shown by the respondents was necessary in capturing diverse opinions from respondents at different levels and experience in their careers and this brought in diverse abilities, knowledge and understanding in conclusively responding to the questionnaires. In addition, Table 4.3 indicates that, more than half of the respondents at NEMA 42(57.6%) had a first degree and those at State Department of Planning and UNEP all had a first degree.

Table 4.4: Respondents' Work Level, Department, Position Held and Years of Experience

		NEMA		State Department of Planning		UNEP	
		f	%	f	%	f	%
Work level	Operational level	42	57.5	0	0.0	0	0.0
	Technical level	26	35.6	12	100.0	6	100.0
	Strategic level	5	6.8	0	0.0	0	0.0
	Total	73	100.0	12	100.0	6	100.0
Department	Compliance and enforcement	27	37.0	0	0.0	0	0.0
	Coastal marine and fresh waters	5	6.8	0	0.0	0	0.0
	Environmental planning and research coordination	31	42.5	12	100.0	0	0.0
	Environment education and participation	10	13.7	0	0.0	0	0.0
	SDG	0	0.0	0	0.0	6	100.0
	Total	73	100.0	12	100.0	6	100.0
Position held	Research officer	16	21.9	0	0.0	0	0.0
	Compliance and Enforcement Officer/Investors Advisor on Environmental Requirements	5	6.8	0	0.0	0	0.0
	Principal CMF Officer	5	6.8	0	0.0	0	0.0
	Assistant Research officer	5	6.8	0	0.0	0	0.0
	Chief Compliance Officer	11	15.1	0	0.0	0	0.0
	Middle level	11	15.1	0	0.0	0	0.0
	Environment Education Information Officer	5	6.8	0	0.0	0	0.0
	Chief Environmental Research officer	5	6.8	0	0.0	0	0.0
	Internship	5	6.8	0	0.0	0	0.0
	Corresponding officer	5	6.8	0	0.0	0	0.0
	SDG focal points	0	0.0	12	100.0	0	0.0
	Program Assistant	0	0.0	0	0.0	6	100.0
	Total	73	100.0	12	100.0	6	100.0
Years of experience	1 to 5 years	20	27.4	0	0.0	0	0.0
	6 to 10 years	22	30.1	6	50.0	6	100.0
	Above 10 years	31	42.5	6	50.0	0	0.0
	Total	73	100.0	12	100.0	6	100.0

Table 4.4 provides a summary of the respondents' information on their work level, department they worked in, positions held and years of experience. From Table 4.3, 42(57.5 %) of the NEMA respondents were in the operational level, 26(35.6%) technical level while 5(6.8%) were in the strategic level. On the other hand, all the respondents from State State Department of Planning and UNEP worked at the technical level. All the six respondents from UNEP were drawn from the SDG unit that

is within science division. Similarly, the 14(100%) respondents from the State State Department of Planning were the SDG focal points. At NEMA, 31(42.5%) respondents were drawn from the department of Environmental planning and research coordination, 27(37.0%), from Environmental Compliance and Enforcement, 10(13.7%) were from Environment education and participation.

All the respondents possessed experience within the environment sector, with 14(100%) of the respondents at State Department of Planning and 6(100%) at UNEP working directly within the SDG framework. At NEMA, 53(72.6%) indicated that they have over 6 years of experience with 31(42.5%) having over 10 years. At UNEP and State Department of Planning, 18(100%) respondents have over 6 years of experience. This is an indication that the respondents possess adequate experience and knowledge on the subject under study and thus were well versed to respond on the survey.

Systems used by NEMA to Report Environmental Issues

A reporting system is the process, procedures and facilities used to address existing knowledge gaps (Alby, 2016). This section presents data according to the study objective one that sought to find out the systems used by NEMA to report environmental issues in its mandate for management of environment in Kenya and more so in the reporting of environmentally related SDGs in Kenya. To establish this, the researcher sought to identify key laws and guidelines that guide NEMA's role in environmental management.

A 5-point Likert scale to measure the respondents' response to the areas being examined was used. The results were presented in a two-number summary (Mean and standard deviation) and cross-tabulated according to the organizations surveyed (NEMA, UNEP and State Department of Planning). From the results, a mean value close to 1, indicated strongly disagree, 2, disagree, 3, moderately agree, 4, agree and 5,

strongly agree. A standard deviation of 1 and above showed great variance in the respondents' responses while a value below 1 showed a narrow variability in the responses. The descriptive results are presented in Table 4.5.

Table 4.5: Descriptive Statistics of NEMA's Reporting System

	NEMA			State Department of Planning			UNEP		
	N	Mean	Std. Dev	N	Mean	Std. Dev	N	Mean	Std. Dev
NEMA has dedicated departments to address the diverse reporting obligations	73	3.50	.450	12	4.00	.000	6	5.00	.000
NEMA has sufficient legal framework to guide its reporting mandates	73	3.56	.913	12	3.75	.423	6	4.75	.421
There are clear procedures and guidelines necessary to guide the diverse reporting obligations	73	4.29	.589	12	3.50	.522	6	4.00	.000
NEMA has adequate facilities to support the data acquisition, processing and dissemination	73	3.56	.745	12	3.00	.000	6	3.00	.000
NEMA has adequate and quality manpower to ensure effective delivery of its reporting obligations	73	4.00	.000	12	3.20	.375	6	3.50	.125
NEMA has put in place structures that contribute to acquisition and reporting of quality information	73	3.36	.903	12	3.50	.472	6	3.00	.000
NEMA has in place structures that enhances timely, relevant, and adequate environmental reporting	73	3.05	.970	12	2.50	.522	6	3.00	.000

Respondents from NEMA, State Department of Planning and UNEP reported that NEMA has put in place structures that contribute to acquisition and reporting of quality information as reflected by a mean of 3.36 at standard deviation of .903 from NEMA respondents, a mean of 3.50 at standard deviation of 5.22 by State Department of Planning and a mean of 3.00 at zero standard deviation by UNEP respondents. Further, most of the respondents from the three organisations moderately agreed that NEMA has structures that enhance timely, relevant, and adequate environmental reporting as shown by a mean of 3.05 at a standard deviation of .970 for NEMA, 2.50 mean at a standard deviation of .522 for State Department of Planning and a mean of 3.00 at a standard deviation of 0.00 for UNEP.

On exploring on the reporting structures in place, a mean of 3.50 at .450 standard deviation captured from NEMA's responses, indicated that NEMA has in place dedicated departments that work towards meeting its environment management and reporting mandates. This was echoed by the respondents from State Department of Planning and UNEP respectively as registered in their responses at a mean of 2.50 at SD of .522 and a mean of 3.00 at SD of 0.00 respectively. Agreeing with this finding was a KI and a senior officer from one of the organizations who stated that as follows:

> *The organisation has established departments in line with its diverse obligations. Some of these departments include; compliance and enforcement and climate change departments, biodiversity, chemical pops, environment research and the youngest one being M&E department that was established two years ago. Every department plays an important role towards the overall success of the organisation and more so in addressing respective reporting mandates.*

The study endeavored to find out if there are clear procedures and guidelines to guide diverse reporting obligations, a mean value of 4.29 at a standard deviation of .589 from NEMA's responses clearly shows that majority of them strongly agreed that such procedures are present. Similarly, respondents from State Department of Planning and UNEP were in agreement with means of 3.50 and 4.00 respectively. An in-depth Interview with a KI who is a senior officer at NEMA confirmed that; "at a national level, NEMA is guided immensely by the Environmental Management and Coordination Act (EMCA) (Act No. 8 of 1999) to coordinate environmental management issues in Kenya which entails coordination with all agencies under the environment sector." The same KI further confirmed as below:

> *At an international level, and with the mapping of SDGs in our development agendas, NEMA abides by various regulation that ensure reporting for SDGs within the multi-lateral agreements are in place. These MEAs includes; (i) Convention of Biological Diversity (CBD), (ii) World Metrological Organization (WMO) (iii) Monitoring and reporting Climate Change (UNFCC), (iv) Ramsar Convention on Wetlands (v) Stockholm Convention on chemical and Persistent organic pollutants (POPs).*

Further, the same KI elaborated that, at *an institutional level, regulations have been established in line with the MEAs in place to ensure seamless processes for their implementation*.

Table 4.6 outlines these regulations as provided during the interview with the senior KI at NEMA.

Table 4.6: NEMA's Regulations That Guide SDGs Reporting

Regulation	Definition
Wetland Regulation	To guide conservation and sustainable use of areas classified as wetlands
Environmental regulations	Guiding environmental audit and systematic documentation towards sustainable and economically sustainable decisions
Water Quality regulations	To guide management and regulation and protection of surface and underground water bodies
Controlled substances	Provides for a system of data collection to facilitate compliance and relevant reporting
Bio-diversity regulations	Guides management and data acquisition for the protection of biological diversity and resources
Air Quality regulations	Guides the regulation, management and acquisition of data to guide decisions towards ambient air quality
Waste management	Guides regulation, management and co-ordination of waste management practices in the country.
Noise Regulations	Guides the regulation and management of noise pollutants towards psychological wellbeing of citizens

The study also sought to establish whether NEMA has adequate facilities to support data acquisition, processing, and dissemination. Respondents across the three organisations under investigation moderately agreed that NEMA had adequate facilities. NEMA's responses were at a mean of 3.56 at a standard deviation of .745, and a mean of 3.00 at a standard deviation of 0.00 for both State Department of Planning and UNEP respectively). During a follow-up interview with a senior Officer in one of the organizations investigated revealed the following:

> *Due to the heavy and broad mandate that NEMA has, it is not self-sufficient to collect data, process and disseminate it in-house, it therefore has to greatly collaborate with line agencies for acquisition and dissemination of some environmental data. The organization for instance, has to work very closely with Kenya National Bureau of Statistics that is in possession of superior data management facilities.*

Key informant interviews conducted with senior officers in the organisations under investigation sought to establish environmental data flow in Kenya, and how NEMA's systems and structures support that flow. Figure 4.1 depicts the diagrammatic illustration of the information gathered from the interviewees.

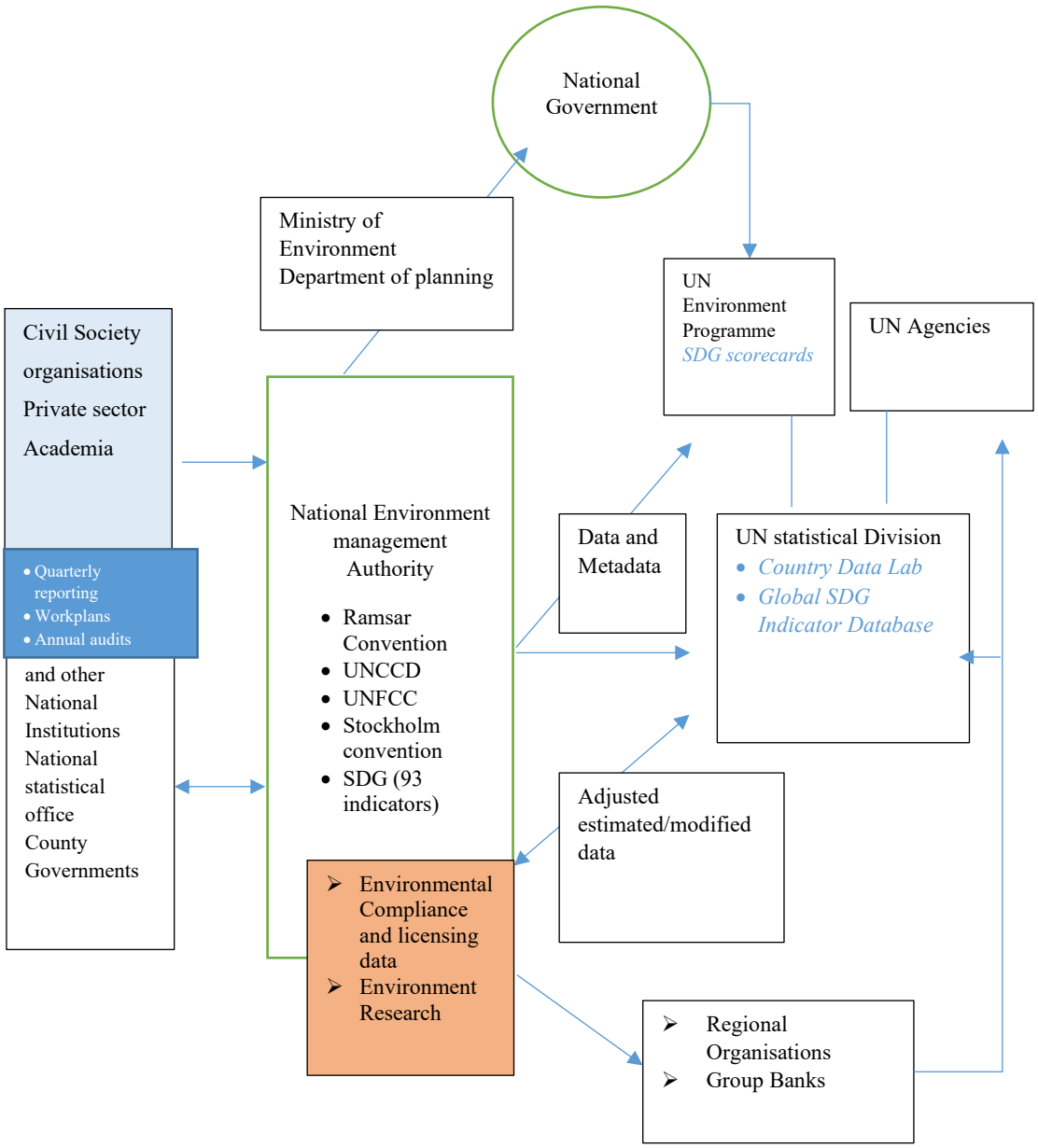

Figure 4.1: Environmental Data Flow

Figure 4.1 gives a diagrammatic impression of the flow of environmental data at different levels and the place of NEMA in that environmental reporting ecosystem.

As a national government institution, NEMA plays a critical role in ensuring the flow of environmental data and information from the line ministries, civil society organisations, private sector, academia, and the county and sub-county organisations.

Through organizational collaborations, NEMA receives quarterly reports, work plans and annual audits from other government organisations and line agencies. Further, it acquires a lot of primary data from its environmental enforcement work, licensing data and through environment research. While it's not entirely a data custodian agency, the organisation works closely with Kenya Bureau of Statistics which is the national data custodian agency, State Department of Planning that coordinates the SDG and other development agendas in the country, group banks supporting developmental projects and the United Nation agencies. NEMA coordinates the annual state of the environment reporting that is tabled in parliament in addition to submitting data and meta data to meet the international reporting obligations including the MEAs and SDGs to the UN agencies and conventions.

Information gathered through KIs, confirmed that NEMA is required to partner with line ministries, agencies and government in the acquisition, processing and dissemination of data vis a vis various reporting responsibility. According to a second KI at NEMA,

> *it is critical for NEMA to consolidate the relevant information for both National and International reporting with the state environment report expected to be tabled in parliament annually.* Further, another KI respondent in the same organisation explained that *data is consolidated through primary sources such as, compliance and licensing processes and secondary sources, quarterly reports, work plans and audits submitted from line agencies and government institutions.*

A KI and senior officer at the State Department of Planning, confirmed that

> *the department works closely with NEMA and the ministries to ensure various development agendas across sectors, national and SDGs are all speaking towards a common national goal.* The KI further reported that *it is part of our responsibilities to ensure vision 2030, medium term plans, and the agenda*

4 are unified towards attainment of the sustainable development goals. The KI however, termed the process as *complex and requires a lot of resources, hence, the need for partnership with public, private and international bodies*.

Similarly, this same KI confirmed as follows:

> *One successful collaboration between the government and the United Nation has been the United Nations Development Assistance Framework (UNDAF) (2018-2022) that is a strategic, medium term results framework that describes the collective vision and response of the UN system to national development priorities and results on the basis of normative programming principles.*

At the international level, a KI at UNEP explained as below:

> *NEMA plays a critical role in submission of data and metadata that is environmentally related. While NEMA submits data across the UN custodian agencies, UNEP being a custodian agency of 26 indicators, receives some of it from NEMA and thus has to coordinate with the rest of the UN agencies and other government sectors to report on the 79 environmental indicators as mandated. NEMA's positioning at environment reporting ecosystem is very ideal and one that facilitates cooperation with UN at large.*

NEMA's Technical Capacity for Effective Reporting of Environmental Statistics in Kenya

The second objective sought to assess NEMA's technical capacity for effective reporting of environmental statistics in Kenya. Under NEMA's technical capacity the study looked at four aspects, NEMA's Institutional Capacity, M&E Framework, Environmental Governance, and Enabling environment. Each of these aspects are discussed in the subsequent sections.

NEMA's Institutional Capacity

National Environment Management Authority (NEMA), Institutional capacity is one of the variables that was studied. There were five items asked which acted as the indicators of the variable. The items used a 5-point Likert scale to measure the respondents' response to the areas being examined. The results were presented in a two-number summary (mean and standard deviation) and cross-tabulated according to the

organizations (NEMA, UNEP and State Department of Planning). From the results, a mean value close to 1 indicated strongly disagree, 2 was disagree, 3 was moderately agree, 4 was agree and 5 was strongly agree. A standard deviation of 1 and above showed great variance in the respondents' responses while a value below 1 showed a narrow variability in the responses. The findings are presented in Table 4.7.

Table 4.7: Descriptive Statistics of NEMA's Institutional Capacity

	NEMA			State Department of Planning			UNEP		
	N	Mean	Std. Dev	N	Mean	Std. Dev	N	Mean	Std. Dev
NEMA has adequate technical expertise that promotes timely and adequate acquisition of environmental reporting	73	3.03	.971	12	3.50	.522	6	3.00	.000
NEMA has the right technology for the acquisition and dissemination of the environmental statistics	73	2.82	.918	12	2.00	1.044	6	2.00	.000
NEMA's human resource is well facilitated skill wise to acquire and disseminate environmental statistics	73	3.56	.745	12	3.00	.000	6	3.00	.000
The staff receive additional training towards building skill-sets necessary to carry your work effectively.	73	3.51	.974	12	3.50	.522	6	3.00	.000
NEMA has technology that promotes realization of real time data e.g. from satellite providers?	73	2.38	1.126	12	2.00	1.044	6	1.00	.000

A mean value of 3.03 with a standard deviation of .971 was registered at NEMA, a mean of 3.50 with a standard deviation of .522 and 3.00 with a standard deviation of 0.00 were registered at State Department of Planning and UNEP respectively, confirming that most respondents moderately agreed that NEMA has adequate technical expertise that promotes timely and adequate acquisition of environmental reporting. These results reveal that most of the respondents from NEMA, State Department of Planning and UNEP moderately agreed that NEMA has adequate technical expertise that promote timely and adequate acquisition of environmental reporting.

As to whether, NEMA has the right technology for acquisition and dissemination of environmental statistics, the results from the respondents from NEMA indicated a mean value of 2.82 with a standard deviation of .918 while those from State Department of Planning and UNEP indicated a mean of 2.00 at a standard deviation of .522 and a mean of 3.00 with a zero standard deviation respectively. Therefore, majority of the respondents from the three organisations moderately agreed that NEMA has the right technology for acquisition and dissemination of environmental statistics.

Similarly, on whether NEMA's human resource is well facilitated skill-wise to acquire and disseminate environmental statistics and that the staff receive additional training towards building skill-sets necessary to effectively carry out their work, a mean value of 3.56, 3.50 and 3.00 from NEMA, State Department of Planning and UNEP respectively showed that the respondents moderately agreed with this. Most respondents, however, disagreed to NEMA having the right technology for the acquisition and dissemination of the environmental statistics. Likewise, the respondents were of the idea that NEMA did not have technology that promotes realization of real time data from satellite providers.

A KI and senior officer at NEMA reported as follows:

> *The availability of necessary human resource hasn't been a problem; however, retention of quality talents has been a challenge either through brain drain to developed countries or/and movement to international and private organisations that have advanced technology and more attractive term of service."*

An interview with a KI at UNEP further confirmed that *Kenya still lags with regard to real time data acquisition in the environmental sectors and where that data exists it belongs to international players and its acquisition is quite expensive.* These findings implied that, an opportunity still exists for NEMA to still build on its technology and human resource skill sets for effective delivery on their mandate. The

findings also concurred with Gregor (2006), that indeed the future of effective management lies in investment on right information systems for the acquisition and dissemination of data in real time.

Monitoring and Evaluation Framework

Monitoring and evaluation framework was the second of the variables that were studied under NEMA's technological capacity. There were four questions asked which acted as indicators of this variable. The items used a 5-point Likert scale to measure the respondents' response to the areas being examined. The results were presented in a two-number summary (Mean and standard deviation) and cross-tabulated according to organization (NEMA, UNEP and State Department of Planning). From the results, a mean value close to 1 indicated strongly disagree, 2 was disagree, 3 was moderately agree, 4 was agree and 5 was strongly agree. A standard deviation of 1 and above showed great variance in the respondents' responses while a value below 1 showed a narrow variability in the responses. The findings are presented in Table 4.8.

Table 4.8: Monitoring and Evaluation Framework

	NEMA			State Department of Planning			UNEP		
	N	Mean	Std. Dev	N	Mean	Std. Dev	N	Mean	Std. Dev
NEMA has put in place a department/unit that is specifically mandated with conducting Monitoring and Evaluation	73	4.29	.589	12	3.50	.522	6	4.00	.000
An M&E framework has been put in place with clear stipulated targets and indicators	73	3.62	.907	12	2.50	.522	6	2.00	.000
Challenges in monitoring and reporting of environmental dimension of the SDGs lie in the lack of accountability, particularly for monitoring and reporting on performance information, unrealistic target setting and poor quality of performance information.	73	4.16	1.236	12	5.00	.000	6	5.00	.000
Monitoring and evaluation budget is delineated within the overall project budget	73	3.81	.680	12	3.50	1.567	6	5.00	.000

A mean value of 4.29 at a standard deviation of .589 registered from NEMA respondents indicates that majority of them agreed that NEMA has put in place a department/unit that is specifically mandated with conducting M&E within the organisation and its projects. This finding was echoed by the respondents from State Department of Planning and UNEP who agreed to this indicating by a mean value of 3.50 and strongly agreed with a mean value of 4.00. A mean value of 4.16 at a standard deviation of 1.2, registered at NEMA suggests that the bulk of the respondents agreed that challenges in monitoring and reporting of environmental dimension of the SDGs lie in lack of accountability, particularly for monitoring and reporting on performance information, unrealistic target setting and poor quality of performance information. Respondents from State Department of Planning and UNEP fully agreed with the findings, as the results indicated a mean value of 5.00 at a zero-standard deviation from respondents in both organisations.

The study participants from UNEP, State Department of Planning and NEMA again agreed that monitoring and evaluation budget is obviously delineated within the overall project budget to give monitoring and evaluation function due recognition it plays in acquisition of environmental statistics. However, on whether an M&E framework has been put in place with clear stipulated targets and indicators towards realization of the environmental dimensions of the SDGs, those from UNEP disagreed with mean value of 3.62 at .907 standard deviation, those from State Department of Planning agreed moderately with a mean value of 2.50 at a standard deviation of .522 while those from NEMA agreed with a mean value of 2.00 at a standard deviation of 0.00.

Upon enquiry of why their results at UNEP were in contrary of what was registered at NEMA, a KI and senior officer at UNEP highlighted the following:

> *the process of making a monitoring framework for the SDGs is very a complex process, that requires a lot of investment even at a global level, as a result, most countries were still struggling to realize this goal.*

According to UN statistical Commission (2019), for a process that started before the launch of SDGs in 2015, only 101 indicators are so far in tier 1 with 143 still in tier 2 or 3, a clear indication that the process isn't easy, swift, and efficient as it should be for goals that should be met by year 2030. Without a methodology, tracking these indicators is a futile process and consequently the reporting process is in the receiving end, with nothing or very little to report.

To reinforce this finding, a KI and a senior officer from NEMA revealed as below:

> *To effectively track SDG related indicators, a lot of coordination and ownership is necessary from the line agencies that report on various environmental dimensions. Further, "coordinating across the organisations is an expensive venture that require bringing the officers together for workshops, something that is logistically intensive and financially consuming.*

Environmental Governance

The third variable that was studied under technical capacity was Environmental Governance and its effect on effective SDG reporting. There were four items asked which acted as the indicators of the variable. The items used a 5-point Likert scale to measure the respondents' response to the areas being examined. The results were presented in a two-number summary (Mean and standard deviation) and cross-tabulated according to organization (NEMA, UNEP and State Department of Planning). From the results, a mean value close to 1 indicated strongly disagree, 2 was disagree, 3 was moderately agree, 4 was agree and 5 was strongly agree. A standard deviation of 1 and above showed great variance in the respondents' responses while a value below 1 showed a narrow variability in the responses. The findings are presented in Table 4.9.

Table 4.9: Environmental Governance

	NEMA			State Department of Planning			UNEP		
	N	Mean	Std. Dev	N	Mean	Std. Dev	N	Mean	Std. Dev
Kenya has in place institutional mechanism that periodically brings together NEMA and other relevant institutions and government entities to enhance coherence across SDGs related issues i.e. implementation, reporting and policy related	73	3.56	.913	12	4.00	.000	6	3.00	.000
Kenya has institutionalized Political Commitment towards attainment of SDGs	73	3.14	1.205	12	1.00	.000	6	3.00	.000
There are sufficient budgetary allocations towards management of environmental issues in Kenya	73	2.21	.407	12	1.50	.522	6	3.00	.000
Unlimited funding in Monitoring and acquisition of environmentally related data is one of the main causes of unavailability of data	73	4.51	.503	12	4.50	.522	6	5.00	.000

From the 73 respondents in NEMA, a mean value 3.56 at a standard deviation of .913 indicates that majority of study participants at NEMA agreed that Kenya has in place institutional mechanism that periodically brings together NEMA and other relevant institutions and government entities to enhance coherence across SDGs related issues in areas related to implementation, reporting and policy. This was reinforced by

the 12 respondents from State Department of Planning who were all in agreement provide statistics. All the respondents from UNEP moderately agreed too, as observed from the mean value of 3.00 at zero standard deviation. A KI at NEMA, however, highlighted the following:

> *Bringing organisations together is very expensive and financially burdening on NEMA. While NEMA has received assistance from organisation such as UNEP, for instance in the preparation of 2010 state of the environment report, it would be more effective if desk officer positions were established at NEMA with dedicated tasks for the inter-organizational coordination.*

This remark highly agreed with the respondents' from NEMA views who revealed that unlimited funding in monitoring and acquisition of environmentally related data is one of the main causes of unavailability of data as indicated by the 4.51 mean value at .531 standard deviation in their responses. This is supported by respondents from State Department of Planning and UNEP who registered mean value of 4.50 and 5.00 at standard deviation of below one respectively. Supporting this finding, a KI and a senior officer at NEMA, stated as below:

> *...while environment affects all walks of life, most at times it is omitted in most development agendas, with politicians keen to finance more visible projects such as infrastructures. For example, the big 4 agenda initiative in Kenya, features affordable housing, health care, manufacturing and food security and doesn't really feature a lot of environmental issues even though environment is at the center of all that.*

Another interview conducted with a KI and a data expert at UNEP further revealed that

> *financial constraints have been a perpetual issue in a wide range of environmental agendas in developing countries given that environment is very broad and cross-cutting, thus, can never be financed enough.*

On whether Kenya has institutionalized political commitment towards attainment of SDGs and whether there are sufficient budgetary allocations towards management of environmental issues in Kenya, study participants from State Department of Planning disagreed strongly as portrayed by the mean value of 1.00 at

zero standard evaluation. The 6 respondents from UNEP also moderately agreed with a mean value of 3.00 at zero standard deviation. While most respondents seemed to disagree on whether Kenya has institutionalized political commitment towards attainment of SDGs, an interview with a KI and senior officer at UNEP confirmed that *Kenya has made great strides in policy formulation; however, policy coherence is weak, leading to weak systems, duplication of mandates and weak guidelines on how best to coordinate reporting obligations*.

Enabling Environment

Enabling environment was one of the variables being studied under technical capacity. There were five items asked which acted as the indicators of the variable. The items used a 5-point Likert scale to measure the respondents' response to the areas being examined. The results were presented in a two-number summary (Mean and standard deviation) and cross-tabulated according to organization (NEMA, UNEP and State Department of Planning). From the results, a mean value close to 1 indicated strongly disagree, 2 was disagree, 3 was moderately agree, 4 was agree and 5 was strongly agree. A standard deviation of 1 and above showed great variance in the respondents' responses while a value below 1 showed a narrow variability in the responses. The findings are presented in Table 4.10.

Table 4.10: Enabling Environment

	NEMA			State Department of Planning			UNEP		
	N	Mean	Std. Dev	N	Mean	Std. Dev	N	Mean	Std. Dev
NEMA has partnered greatly with international bodies i.e. financial firms, technological firms which build its capacity for environmental management in Kenya	73	3.12	.927	12	2.00	1.044	6	3.00	.000
NEMA effectively liaises with other government entities to avoid duplication of duties and acquisition of necessary environmental information?	73	2.74	1.093	12	3.00	1.044	6	4.00	.000
NEMA receives sufficient support from UN agencies e.g. UN environmental programs in realization of the environmental dimensions of SDGs.	73	2.97	.763	12	4.00	.000	6	5.00	.000
Low advocacy on SDGs related issues in the country is a man cause of unavailability of data	73	4.44	.500	12	4.00	.000	6	5.00	.000
Fear of misuse or misinterpretation of data by entities reporting is one of the main causes of unavailable data		2.41	1.544		4.50	.522		1.00	.000

A mean of 3.12 at a standard deviation of .927 captured from the NEMA respondents, indicates they agreed that NEMA has partnered greatly with international bodies operating financial firms and technological firms which build its capacity for environmental management. Complimenting that, a KI at NEMA, acknowledged that,

> *NEMA has benefitted greatly from partnership with UNEP e.g. in their support for the development of state of the Environment report (2010). In addition, however, there is need to take more advantage on opportunities that are offered by the fact that UNEP is headquartered in Kenya.*

All the six respondents from UNEP strongly agreed that UNEP has offered sufficient assistance to NEMA and other government institutions under the SDG framework with a Mean of 4.00 at zero standard deviation. A KI at UNEP, further highlighted the following:

> *Kenya is among the pilot countries benefitting from the Common Country Assessment (CCA) that provides insights to guide the development of the new United Nations Development Assistance Framework (UNDAF) for the years*

2018-2022 that supports the countries in attainment of the SDGs, the Vision 2030 and the Big Four Agenda.

This is an indication that the UN is keen in supporting government's agenda if and when the governance structures are in place.

As to whether NEMA effectively liaises with other government entities to avoid duplication of duties and acquisition of necessary environmental information, NEMA respondents agreed moderately with a mean of 2.75 at standard deviation of 1.093). One of the KI and senior officer at NEMA, while supporting the findings, clarified that, "There is a lot of policy gaps and financial constraints that inhibit continuous and effective cooperation which can be addressed through close collaborations by the government institutions." This view was supported by the KI at UNEP who termed "the process of bringing together organisations for joint workshop as budget intensive and tasking."

Lastly, all respondents strongly agreed that low advocacy on SDGs related issues in the country is one of the main causes of unavailability of data with NEMA's respondents having a mean of 4.44 at standard deviation of .500, State Department of Planning with a mean of 4.00 at S.D of .000and UNEP at mean of 5.00 at S.D of .000 respectively. This finding reflects the MDG final status analytical report (2016) showed that, the MDGs were marred by lack of an elaborate advocacy and implementation roadmap.

Effects of the factors affecting the Reporting of Environmental Statistics

The third objective of this study sought to examine the effects of the factors affecting the reporting of environment statistics by NEMA in Kenya. The research conducted correlation and regression analysis to establish the relationship between the variables under study. Correlation analysis was performed in this section as the study

sought to establish the significance, direction and strength of linear relationships between main causes of unavailability of data which is the dependent variable, and barriers of effective reporting which were the independent variables. These factors were NEMA's Institutional Capacity (IC), M&E Framework (M&E), Environmental Governance (EG), and Enabling Environment (EE). Effective Reporting of SDGs (ER) was also examined which was the moderating variable. This was achieved through performing a Pearson's correlation analysis. Pearson's correlation values range from −1 to 1. -1 indicates a perfect negative relationship, 0 indicates that there is no relationship between the variables while +1 indicates a perfect positive relationship. An absolute Pearson's correlation value of 0.5 indicates a strong linear relationship between the variables while a value below 0.5 indicates a weak linear relationship. The sign of the Pearson's correlation coefficient value indicates the direction of the relationship. Finally, the resultant p-value of less than 0.05 at 95% confidence level indicates that the linear relationship between variables of interest is statistically significant. The findings are presented in Table 4.11

Table 4.11: Correlation Analysis

		IC	M&E	EG	EE	ER
IC	Pearson Correlation	1	-.439**	.735**	.142	.263*
	Sig. (2-tailed)		.000	.000	.179	.012
	N		91	91	91	91
M&E	Pearson Correlation		1	-.109	.216*	.327**
	Sig. (2-tailed)			.306	.040	.002
	N			91	91	91
EG	Pearson Correlation			1	.376**	.353**
	Sig. (2-tailed)				.000	.001
	N				91	91
EE	Pearson Correlation				1	.352**
	Sig. (2-tailed)					.001
	N					91
ER	Pearson Correlation					
	Sig. (2-tailed)					
	N					

According to these findings, there was a positive significant moderate linear relationship between ER of SDGs and NEMA's IC, $r = 0.263$; $p = 0.012$; M&E, $r =$

0.327; $p = 0.002$; EG, $r = 0.353$; $p = 0.001$; EE, $r = 0.352$; $p = 0.001$; This was indicated by significant p-values of less than 0.05 at 95% confidence level. This implied that barriers of ER of SDGs were positively related to ER of SDGs.

While conducting a regression analysis to determine the effects of challenges faced in the reporting of environmental statistics by NEMA in Kenya. ER of SDGs was the dependent variable while NEMA's IC, M&E, EG, and EE were the independent variables. They are presented in the subsequent sections.

Effect of NEMA's Institutional Capacity (IC) on Effective reporting of SDGs

A simple linear regression analysis was performed with effective reporting of SDGs as the dependent variable, and NEMA's IC as the independent variable. The results are presented in the tables 4.12, 4.13 and 4.14.

Table 4.12: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.263[a]	.069	.059	.40781

a. Predictors: (Constant), IC

According to the results in Table 4.12 NEMA's IC was found to explain 6.9% of the variation in ER of SDGs as indicated by a coefficient of determination (R^2) value of 0.069.

Table 4.13: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.101	1	1.101	6.621	.012[b]
	Residual	14.801	89	.166		
	Total	15.902	90			

a. Dependent Variable: ER
b. Predictors: (Constant), IC

The results on analysis of variance in the case of regression between IC and ER of SDGs, was used to test whether the model was statistically significant in predicting effective reporting of SDGs. The results indicated significance of the model and proved that there was sufficient proof or evidence to conclude that there was a significant effect

of NEMA's IC on ER of SDGs, (F = 6.621, p = 0.012). Therefore, NEMA's IC was a statistically significant predictor of ER of SDGs.

Table 4.14: Model Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.116	.231		13.487	.000
	IC	.196	.076	.263	2.573	.012

a. Dependent Variable: ER

Hence, this model has been obtained from the study results; ER = 3.116 + 0.196 * IC. The association between NEMA's IC and ER of SDGs was found to be significant and positive, β = 0.196, t = 2.573, p = 0.000. This means that there was a significant association between NEMA's IC and ER of SDGs. In addition, the findings indicate that a unit increase in NEMA's IC increases ER of SDGs by 0.196 units. Figure 4.2 further illustrates this relationship.

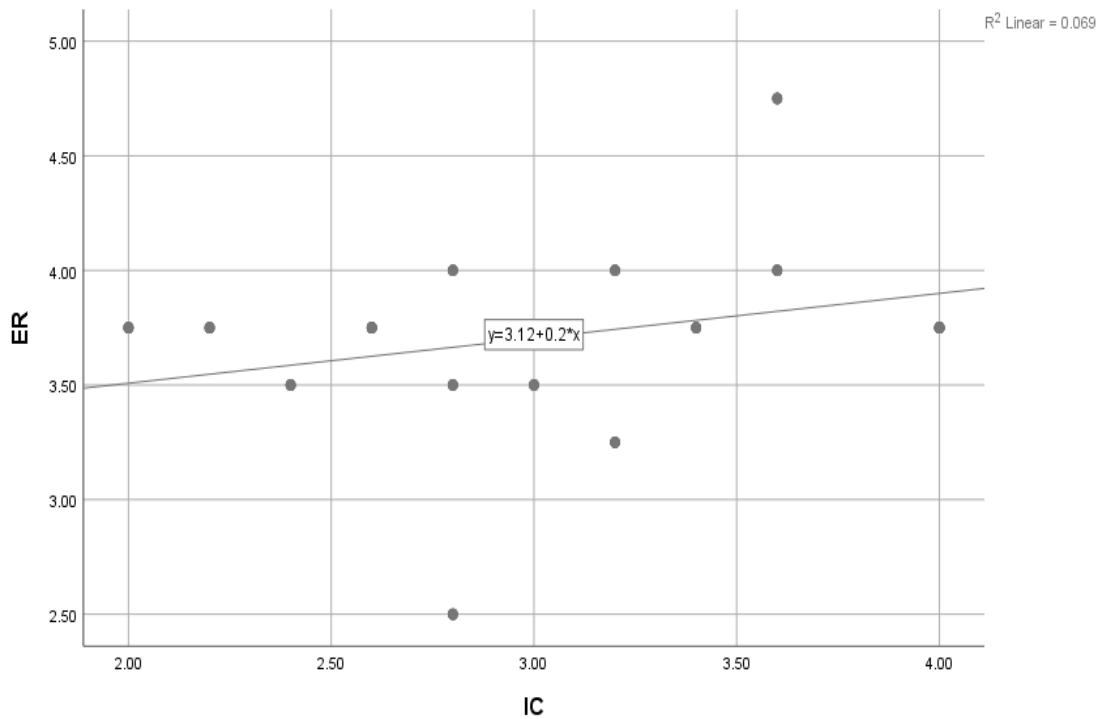

Figure 4.2: Relationship Between NEMA's Institutional Capacity & Effective Reporting (of SDGs

Monitoring and Evaluation Framework on Effective reporting of SDGs

A simple linear regression analysis was performed with ER of SDGs as the dependent variable, and M&E Framework as the independent variable.

The findings are presented in tables 4.15, 4.16, and 4.17

Table 4.15: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.327[a]	.107	.097	.39945

a. Predictors: (Constant), M&E

According to the results in Table 4.15, M&E framework was found to explain 10.7% of the variation in ER of SDGs as indicated by a coefficient of determination (R^2) value of 0.107.

Table 4.16: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.701	1	1.701	10.663	.002[b]
	Residual	14.201	89	.160		
	Total	15.902	90			

a. Dependent Variable: ER

b. Predictors: (Constant), M&E

The finding on analysis of variance in the case of regression between M&E framework and ER of SDGs, was used to test whether the model was statistically significant in predicting ER of SDGs. The results indicated significance of the model and proved that there was sufficient evidence to conclude that there was a significant effect of M&E framework on ER of SDGs, (F = 10.663, p = 0.002). Therefore, M&E framework was a statistically significant predictor of ER of SDGs.

Table 4.17: Model Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.490	.373		6.674	.000
	M&E	.329	.101	.327	3.265	.002

a. Dependent Variable: ER

This model has been obtained from the study results; ER = 2.490 + 0.329 * M&E.

The association between M&E framework and ER of SDGs was found to be significant and positive with a β = 0.329, t = 3.265 and p = 0.002. This means that there was a significant association between M&E framework and ER of SDGs. In addition, these findings indicate that a unit increase in M&E framework increases ER of SDGs by 0.329 units. Figure 4.3 further illustrates this relationship.

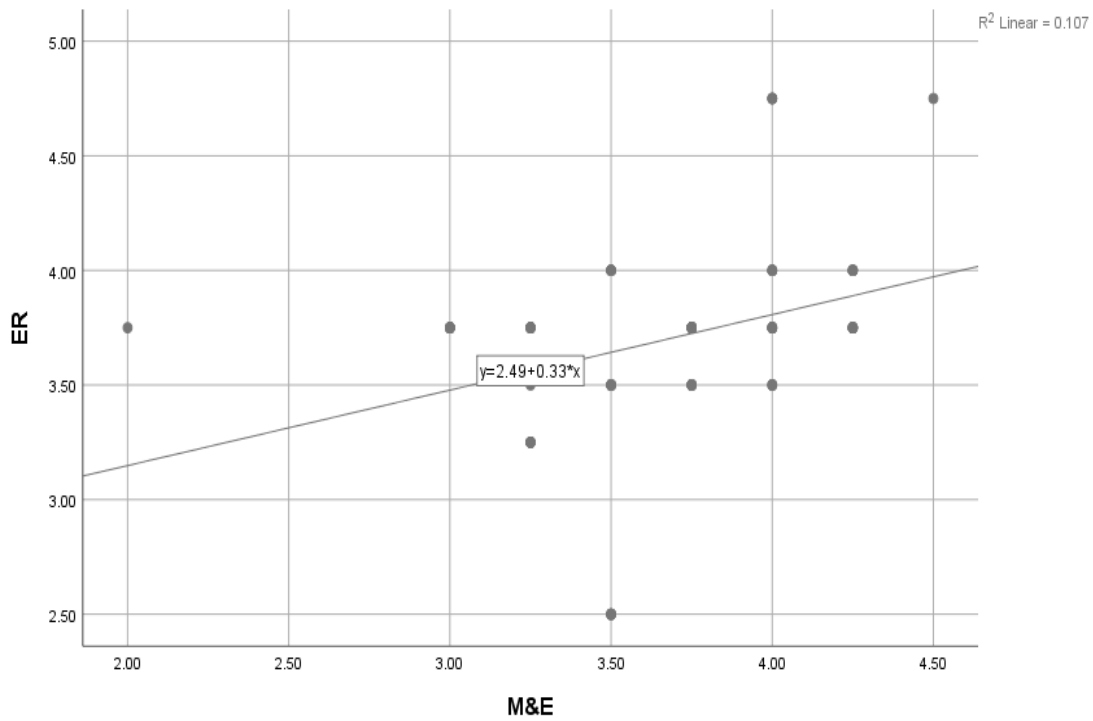

Figure 4.3: Relationship Between M&E framework and Effective Reporting (ER) of SDGs

Effect of Environmental Governance (EG) on Effective Reporting of SDGs

A simple linear regression analysis was performed with ER of SDGs as the dependent variable, and EG as the independent variable. The findings are presented in tables 4.18, 4.19, and 4.20.

Table 4.18: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.353[a]	.124	.115	.39552

a. Predictors: (Constant), EG

According to the results in Table 4.18, EG was found to explain 12.4% of the variation in effective reporting of SDGs as indicated by a coefficient of determination (R^2) value of 0.124.

Table 4.19: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.980	1	1.980	12.655	.001[b]
	Residual	13.923	89	.156		
	Total	15.902	90			

a. Dependent Variable: ER
b. Predictors: (Constant), EG

The finding on analysis of variance in the case of regression between EG and ER of SDGs, was used to test whether the model was statistically significant in predicting effective reporting of SDGs. The results indicated significance of the model and proved that there was sufficient evidence to conclude that there was a significant effect of EG on ER of SDGs, ($F = 12.655$, $p = 0.001$). Therefore, EG was a statistically significant predictor of effective reporting of SDGs.

Table 4.20: Model Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.601	.312		8.338	.000
	EG	.343	.096	.353	3.557	.001

a. Dependent Variable: ER

Therefore, this model has been obtained from the study results; ER = 2.601 + 0.343 * EG.

The association between EG and ER of SDGs was found to be significant and positive as reflected by, $\beta = 0.343$, $t = 3.557$ and a $p = 0.001$. This means that there was a significant association between EG and ER of SDGs. In addition, the findings indicate that a unit increase in EG increases ER of SDGs (ER) by 0.343 units. Figure 4.4 further illustrates this relationship.

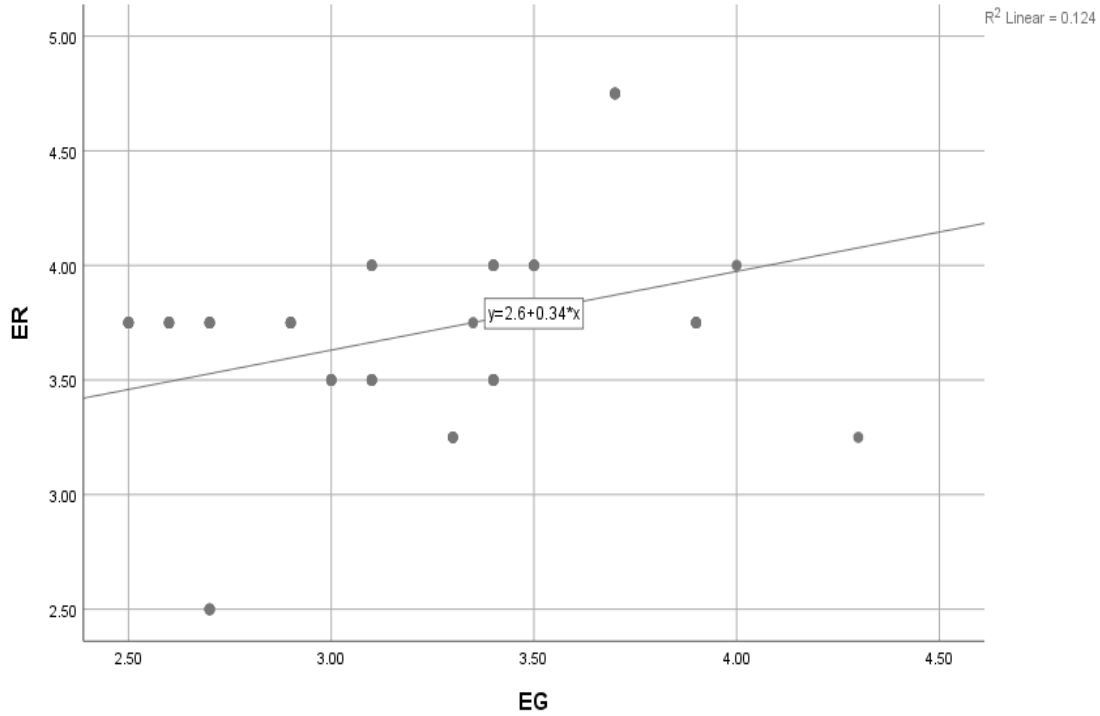

Figure 4.4: Relationship Between Environmental Governance & Effective Reporting of SDGs

Effect of Enabling Environment (EE) on Effective reporting of SDGs

A simple linear regression analysis was performed with ER of SDGs as the dependent variable and EE as the independent variable. The findings are presented in tables 4.21, 4.22, and 4.23. Table 4.21 presents the model summary.

Table 4.21: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.352[a]	.124	.114	.39564

a. Predictors: (Constant), IC

According to the results in Table 4.21, EE was found to explain 12.4% of the variation in ER of SDGs as indicated by a coefficient of determination (R^2) value of 0.124.

Table 4.22: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.971	1	1.971	12.594	.001[b]
	Residual	13.931	89	.157		
	Total	15.902	90			

a. Dependent Variable: ER
b. Predictors: (Constant), IC

The results in on analysis of variance in the case of regression between EE and ER of SDGs, was used to test whether the model was statistically significant in predicting effective reporting of SDGs. The results indicated significance of the model and proved that there was sufficient proof or evidence to conclude that there was a significant effect of EE on effective reporting of SDGs, (F = 12.594, p = 0.012). Therefore, EE was a statistically significant predictor of ER of SDGs.

Table 4.23: Model Coefficient

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.372	.377		6.294	.000
	EE	.413	.116	.352	3.549	.001

a. Dependent Variable: ER

The model below has been obtained from the study results; ER = 2.372 + 0.413 * EE.

The association between EE and ER of SDGs was found to be significant and positive, β = 0.413, t = 3.549, p = 0.001. This means that there was a significant association between EE and ER of SDGs. In addition, the findings indicate that a unit increase in EE increases ER of SDGs by 0.413 units. Figure 4.5 further illustrates this relationship.

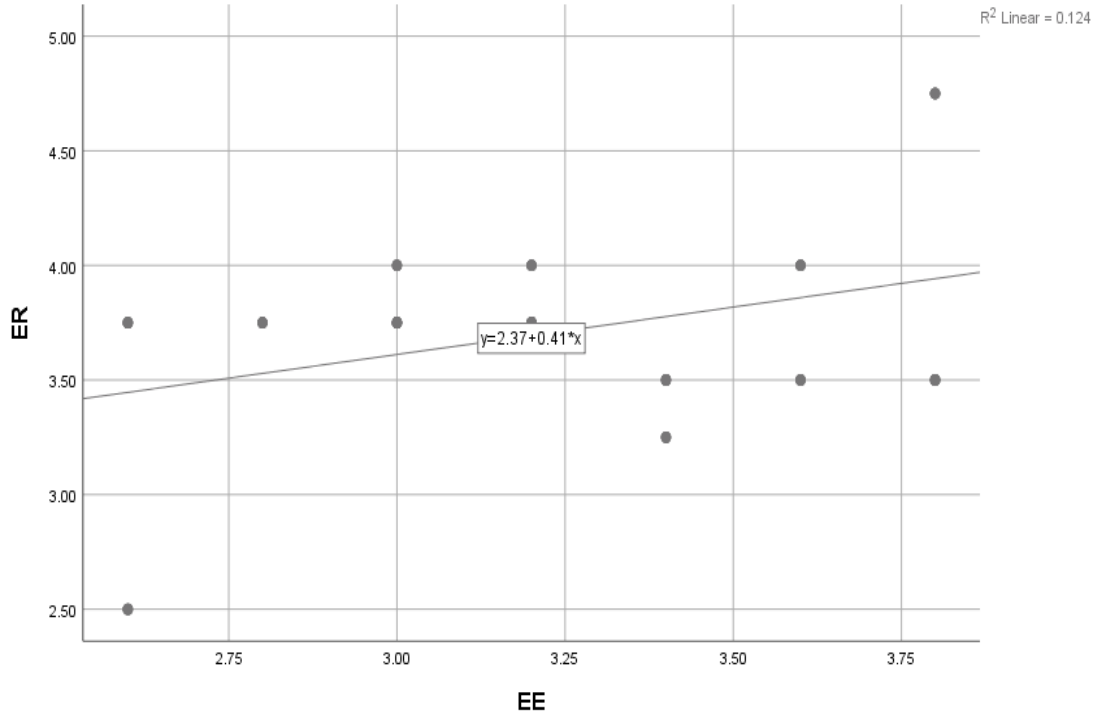

Figure 4.5: Relationship Between Enabling Environment & Effective Reporting of SDGs

Lastly under establishing the challenges experienced in the ER, the study participants were asked to indicate other main causes of unavailability of data and negatively affected the realization of the SDGs in Kenya. The findings are as indicated in Table 4.24.

Table 4.24: Main Causes of Unavailability of Data

	NEMA			State Department of Planning			UNEP		
	N	Mean	Std. Dev	N	Mean	Std. Dev	N	Mean	Std. Dev
Data is unavailable because of lack of baselines	73	4.05	1.053	12	4.00	.000	6	5.00	.000
Unlimited funding for Monitoring and acquisition of environmentally related data	73	4.08	.878	12	3.50	.522	6	4.00	.000
Low advocacy on SDGs related issues in the country	73	3.42	.815	12	2.50	.522	6	3.00	.000
Fear of misuse or misinterpretation of data by the entities reporting	73	3.36	.806	12	4.50	.522	6	2.00	.000

A mean value of 4.05 at SD of 1.053 was registered at NEMA, a mean of 4.00 at SD of 0.00 and a mean of 5.00 at SD of 0.00 at State Department of Planning and

UNEP respectively showed that study participants from the organisation of study agreed strongly that data was unavailable because of lack of baselines and unlimited funding in Monitoring and acquisition of environmentally related data. The respondents also strongly agreed that unlimited funding for Monitoring and acquisition of environmentally related data was also a main hinderance to data availability with a mean value of 4.08 at .878 standard deviation at NEMA, 3.50 at .522 standard deviation at State Department of Planning and a mean of 4.00 at 0.00 standard deviation at UNEP.

Further, majority of the respondents strongly agreed that low advocacy in SDG related issues in the country was also major cause of data unavailability with a mean of 3.36 at .806 standard deviation at NEMA, a mean of 4.50 at .522 standard deviation at State Department of Planning and 3.00 at 3.00 standard deviation at UNEP. Additionally, those from State Department of Planning felt strongly that data unavailability was also due to fear of misuse or misinterpretation of data by the entities reporting. However, those from UNEP disagreed with a mean of 2.00 at 0.00 standard deviation while those from NEMA moderately agreed with a mean of 3.36 at .806 standard deviation.

Enhancing Effective Reporting of Environmental Statistics

The fourth objective sought to proffer recommendations that could be adopted to promote ER of the environment statistics in the government institutions and at a national scale, using NEMA as a point of reference. The following recommendations were suggested:

There were five key items asked as possible recommendations for the betterment of environmental reporting by NEMA and other government institutions. The items used a 5-point Likert scale to measure the respondents' response to the areas being examined. The results were presented in a two-number summary (Mean and

standard deviation) and cross-tabulated according to organization (NEMA, UNEP and State Department of Planning). From the results, a mean value close to 1 indicated strongly disagree, 2 was disagree, 3 was moderately agree, 4 was agree and 5 was strongly agree. A standard deviation of 1 and above showed great variance in the respondents' responses while a value below 1 showed a narrow variability in the responses. The findings are presented in Table 4.25.

Table 4.25: Descriptive Statistics of Recommendations for Improved SDG Reporting

	NEMA			State Department of Planning			UNEP		
	N	Mean	Std. Dev	N	Mean	Std. Dev	N	Mean	Std. Dev
NEMA and other government institutions in the sector should focus on bridging knowledge gaps through establishment of partnerships, communities of practice and knowledge networks	73	4.12	.127	12	4.00	0.000	6	5.00	.000
NEMA and other government institutions should enhance their institutional capacities through investing on modern technology for better data management	73	4.74	0.493	12	5.00	0.000	6	5.00	.000
Investment on research and innovation is very necessary for attainment of SDGs in Kenya	73	2.97	.763	12	4.00	.000	6	5.00	.000
Enhance advocacy on SDGs related issues in the country	73	4.44	.500	12	4.00	.000	6	5.00	.000
Enhance data driven governance and policy work	73	4.41	.544	12	4.50	.522	6	4.00	.000

A mean of 4.12 at .127 standard deviation registered from the 73 respondents of NEMA, indicates that majority of them strongly agreed that NEMA and other government institutions in the sector should focus on bridging knowledge gaps through establishment of partnerships, communities of practice and knowledge networks. The 12 respondents from the State Department of Planning and the 6 respondents at UNEP also supported this recommendation as depicted by a mean of 4.00 and 5.00 respectively. Further, a mean of 4.74 at 0.493 standard deviation from NEMA respondents showed that majority agreed strongly that NEMA and other government

institutions should enhance their institutional capacities through investing on modern technology for better data management.

Similarly, the importance of data was registered as the respondents from the three organisations agreed that there was great need for data driven decision making and policy formulation and implementation as supported by a mean value of 4.41 at a standard deviation of 0.544 registered from the 73 respondents at NEMA. The respondents further, strongly agreed that advocacy for the SDGs was needed as interpreted from their responses with a mean of 4.41 at SD of .544 for NEMA, and a mean of 4.50 at SD of .522 from State Department of Planning and a mean of 4.00 at 0.00 SD for UNEP respectively.

In addition to the recommendations registered in Table 4.26, the respondents were requested to propose any other recommendations that could be adopted to enhance the implementation of ER of the SDGs in Kenya. Table 4.26 summarizes the responses generated in order of their frequencies and percentages.

Table 4.26: Strategies to Enhance Implementation of Effective Reporting of the SDGs in Kenya

	Frequency	Percent	Cumulative Percent
Adoption and domestication in institutional framework and streamlining data acquisition within work plans and project documents and development of central system for data collection sharing and feedback pathway	16	17.6	17.6
Enhanced domestic and international partnership on wide range of environmental issues including financial, tech transfer, knowledge transfer etc.	27	29.7	47.3
Enhance capacity building, awareness, fiscal instruments, tech transfer	5	5.5	52.7
Mainstreaming environmental issues in all development and reduced corruption	21	23.1	75.8
Having in place - Inter-ministerial coordinating committee -Institutional coordination committees -Strong coordination between national and county governments coordination	10	11.0	86.8
More political will, enhanced environmental governance structures, addressing policy gaps	6	6.6	93.4
Production of policies to govern environmental data collection and dissemination and association of government and other entities within the sector	6	6.6	100
Total	91	100	

From the responses captured, about 27(29.7%) of them spoke towards enhanced domestic and international partnership on wide range of environmental issues including financial, technology transfer, and knowledge transfer, among others. In addition, 10(11%) of the responses proposed building a smooth coordination channel between the different ministries, level of government and organisations in matters related to environmental management and development. Continuous capacity building within the lead environment agency and its partner agencies was highlighted by 5(5.5%) of the responses. That was highly complimented by the recommendations for adoption and domestication in institutional framework and streamlining data acquisition within work plans and project documents and development of central system for data collection sharing and feedback pathway at 16(17.6%).

The need to have robust data sharing and feedback system within the sector and a country as whole was deemed a necessity. The need for better environmental governance was also highlighted with about 6(6.6%) responses proposing the need for mainstreaming environment issues in all government development agenda, more political will, enhanced environmental governance structures, and need to address policy gaps. This recommendation greatly reflects the work of Dalal-Clayton & Bass (2009) who pointed out that however much challenging mainstreaming of environment in development agendas is, it is the very catalyst for change.

Summary of Key Findings

The first objective of this study was to establish the reporting systems NEMA uses for environmental issues in Kenya. From the study, the following key findings were established:

1. NEMA is mandated by the Environmental Management and Coordination Act (EMCA) (Act No. 8 of 1999) to coordinate environmental management issues in Kenya which entails coordination with all agencies under the environment sector.
2. NEMA collects and collates data on the following multi-lateral agreements (MEAs) which are building blocks to SDG framework. These MEA include, Convention of Biological Diversity (CBD), World Metrological Organization (WMO), monitoring and reporting Climate Change (UNFCC), UN Convention to Combat desertification (UNCCD), the Ramsar Convention on Wetlands and the Stockholm Convention on chemical and Persistent organic pollutants (POPs).
3. Participants from State Department of Planning agreed that NEMA have put in place structures that contribute to acquisition and reporting of quality

information while those from NEMA and UNEP agreed moderately. All the study respondents moderately agreed that NEMA has in place structures that enhances timely, relevant, and adequate environmental reporting. The study, however, established that continuous capacity building in the structures in place was lacking in some fronts.

The second objective of this study was to assess NEMA's technical capacity for effective reporting of environmental statistics in Kenya. The researcher examined key barriers in environmental reporting in relation with NEMA's technical capacity to report. The following were the key findings:

1. The research established that NEMA has a well-trained human resource.
2. A mean value of 4.29 at a standard deviation of .589 of the respondents agreed that NEMA has in place a M&E department and framework. They also agreed that challenges in monitoring and reporting of environmental dimension of the SDGs lie in the lack of accountability, particularly for monitoring and reporting on performance information, unrealistic target setting and poor quality of performance information. Further, they agreed that monitoring and evaluation budget is obviously delineated within the overall project budget to give the monitoring and evaluation function the due recognition it plays in acquisition of environmental statistics
3. The respondents agreed that Kenya has in place institutional mechanism that periodically brings together NEMA and other relevant institutions and government entities to enhance coherence across SDGs related issues such as implementation, reporting and policy related. They also agreed that unlimited funding in monitoring and acquisition of environmentally related data is one of the main causes of unavailability of data. On whether Kenya has

institutionalized Political Commitment towards attainment of SDGs and whether there is sufficient budgetary allocations towards management of environmental issues in Kenya, the study established that financial constraint has been a perpetual issue.

4. On enabling environment for reporting most respondents highlighted that advocacy was lacking in many fronts. A mean of 3.12 at a standard deviation of .927 of the respondents agreed that NEMA receives periodic assistance from UNEP but hasn't really exploited the opportunity of having UNEP headquartered in Kenya. They further, agreed that NEMA brings together organisations in the environment sector, but a gap exist within the policy coherence for this coordination to be effective.

The third objective was to determine the effects of factors affecting the reporting of environmental statistics by NEMA in Kenya. The following were the key findings:

1. There was a positive significant moderate linear relationship between ER of SDGs and NEMA's IC, $r = 0.263$; $p = 0.012$; M&E Framework, $r = 0.327$; $p = 0.002$; EG, $r = 0.353$; $p = 0.001$; EE, $r = 0.352$; $p = 0.001$; This was indicated by significant p-values less than 0.05 at 95% confidence level. This implies that barriers of ER of SDGs were positively related to ER of SDGs.
2. A simple linear regression analysis performed with ER of SDGs as the dependent variable, and NEMA's IC as the independent variable explained 6.9% of the variation in ER of SDGs as indicated by a coefficient of determination ($\mathbf{R^2}$) value of 0.069.
3. Further, analysis of variance in the case of regression between IC and ER of SDGs, indicated significance of the model and proved that there was sufficient proof or evidence to conclude that there was a significant effect of NEMA's IC

on ER of SDGs, (F = 6.621, p = 0.012). Therefore, NEMA's IC was a statistically significant predictor of ER of SDGs.

The findings indicate that a unit increase in NEMA's IC increases ER of SDGs (ER) by 0.196 units.

4. Monitoring and Evaluation framework found to explain 10.7% of the variation in ER of SDGs as indicated by a coefficient of determination (R2) value of 0.107.

   The results on analysis of variance in the case of regression between M&E and ER of SDGs, indicated significance of the model and proved that there was sufficient proof or evidence to conclude that there was a significant effect of M&E on ER of SDGs, (F = 10.663, p = 0.002). Therefore, M&E was a statistically significant predictor of ER of SDGs.

5. Environmental Governance (EG) was found to explain 12.4% of the variation in ER of SDGs as indicated by a coefficient of determination (R2) value of 0.124.

   The results on analysis of variance in the case of regression between EG and ER of SDGs, indicated significance of the model and proved that there was sufficient proof or evidence to conclude that there was a significant effect of EG on effective reporting of SDGs, (F = 12.655, p = 0.001). Therefore, EG was a statistically significant predictor of ER of SDGs.

   The findings indicate that a unit increase in EG increases ER of SDGs by 0.343 units

6. Enabling Environment (EE) was found to explain 12.4% of the variation in ER of SDGs as indicated by a coefficient of determination (R2) value of 0.124.

The results in on analysis of variance in the case of regression between EE and ER of SDGs, indicated significance of the model and proved that there was sufficient proof or evidence to conclude that there was a significant effect of EE on effective reporting of SDGs, ($F = 12.594$, $p = 0.012$). Therefore, EE was a statistically significant predictor of ER of SDGs.

The findings indicate that a unit increase in EE increases ER of SDGs by 0.413 units.

Summary

This chapter has presented analyzed data of key finding of the study. It has also provided interpretation the findings in line with the study objectives. The findings were presented in tables, figures, charts, and text narration. The chapter concludes with a summary of the key findings revealing that a positive significant moderate linear relationship between ER of SDGs and NEMA's IC; M&E Framework; EG; EE was established.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents a discussion of the main findings from the study in line with the objectives of the study while explaining how each objective has been addressed. It further, compares the findings of this study against reviewed literature and the work of other scholars who have documented empirical finding related to this area of study. Additionally, the chapter gives a conclusion and key recommendations of the study for policy, practice, and areas for further study.

Discussions of Key Findings

This study sought to investigate the barriers to effective reporting of sustainable development goals (SDGs) by government institutions in Kenya, a case of National Environment Management Authority. The objectives of the study were to establish the reporting systems NEMA uses for environmental issues in Kenya; to assess NEMA's technical capacity for effective reporting of environmental statistics in Kenya; to determine the effects of challenges faced in the reporting of environmental statistics by NEMA in Kenya and lastly propose recommendations to enhance effective reporting of environmental statistics by NEMA in Kenya. This section, therefore, discusses the key findings based on the study objectives.

As far as the first objective of this study was concerned, its mandate was to establish NEMA's reporting system for environmental statistics in Kenya. A simple dictionary meaning of a system is a set of things coordinating as part of a big mechanism (Merriam webster, n.d.). Scientifically, a system can be defined as set of principles and procedures under which something is done (Alaerts & Kaspersm, 2009). Through a

reference to NEMA, this study, reviews its institutional capacity as a representation of the government organisations and the enabling environment, all which are critical in assimilation of modern approaches, methodologies; adoption of right technologies and management, essential in addressing complex challenges in the environmental sector. North (2005), describes an institution as one that can take the form of policies, objective, laws and regulation, administrative procedures, norms and even traditions. While the study sought to identify key procedures, techniques, methodology and process that NEMA has in place to aid in environmental reporting, the findings confirmed that NEMA plays an integral role in the ecosystem of environmental reporting in Kenya but still a lot of unexploited opportunities exist.

The finding builds more on the review on the SDG 6 Synthesis report (2018) that placed national statistics systems at the center of data flow from the sub-national levels to the international level (Ortigara, et al., 2018). Additionally, this study established that strong institutions are important variables in development not only in sense of their quality by also capacity i.e. quantity and qualification of staff; organizational ability to absorb resources in preparedness for future actions. This finding justifies in sense Alaerts and Kaspersm (2009) call, on incremental change by organisations and realization that they could do better by altering the existing institutional frameworks and continuous system improvement at some margin in addressing current needs and changes.

The study established that clear guidelines are in place to lead Kenya's international reporting obligations. These include need for data and metadata on multilateral environmental agreement and the SDGs. The United Nations Development Group (2020), however, terms the process of developing the methodology on the SDG indicators as long, intensive, consultative process, that follows a tier classification

system that is resource consuming. The reports further, highlight that organisations and Kenya as a country risk getting overwhelmed by growing international reporting demands as reported by UN Development Group (2020).

The research, further, examined NEMA's technical capacity to report. This study established that, acquisition of environment data is a complex situation requiring a lot of resources which are not always readily available. This finding resonates well with the findings of Ortigara, et al., (2018), who highlights scarcity of data across the global sector as one big barrier of attainment of the SDGs. Further, the findings corroborate with the Measuring Progress review (2019) that reports scarcity of resources and reporting burden as key challenges to effective reporting of environmental statistics. While resources cut across financial, technological, human, among others, this study established that mobilization of human resources isn't very difficult where financial resources are adequate, and thus, agrees with Ortigara, et al.'s (2018) finding that report acute lack of human capacity to manage water and environmental resources in many low- and middle-income countries as a barrier.

With constraints in resources, the study established that partnership at both domestic and international level presented a lot of opportunity that was not being properly exploited. NEMA as the lead environment agency in the country stands to gain immensely in partnering with other organisations playing different roles in the environment sector so as to maneuver around resource constraints. The UN environment (2019) observes the importance of partnership as a way of enhancing coordination of environmental management among stakeholders at all levels; mobilize sufficient resources for the implementation of priority environmental programmes and projects; and also enhancing linkages between Africa's environment and key productive socioeconomic sectors such as trade, infrastructure and the extractive

industry; enhance knowledge sharing and capacity development initiatives on the environment; and facilitate the monitoring and evaluation of environmental priority programmes and projects at national, regional and continental levels.

Further, the study established that there is a great need to turn research into policy–making and practical development, something that was noted to be a major inhibiting factor to the attainment of the SDGs. In Kenya, for instance the linkage between the research done and its guidance on governance structure seems to be very unclear (Maher & Andersson, 2000). According to research done by Centre for Learning on Evaluation and Results (CLEAR) (2012), attainment of development goals is highly dependent on governance structure instituted at specific levels as this plays the heaviest role in driving day to day operations and strategic approach to development issues. This is supported by Gibson (2005) who terms governance and sustainability as two siblings, with an enjoined history and parentage. Technology has been established as the main inhabiting aspect towards real time reporting as that influenced in great deal the institutional capacity to report quality and adequate data.

The need for reporting as well as accountability is on an increasing trend, disparagement is focused on sources traceability and methodology of the information collection and analysis, something that cannot be done without the right technology (Wanner, 2019). While this study, highlights the importance of technology in supporting the acquisition of real time data being at the center of future trends and gaining popularity by the day, Gregor (2006) terms acquisition of such technologies as very expensive. Kenya can, therefore, greatly benefit with partnership with organisations such as NASA, Google, AirBus, and MapX, among others who have right technologies and who collect a lot of satellite data (Ndungu, 2019).

With regard to objective three, the variables under study; institutional capacity, monitoring and evaluation, environmental governance and the enabling study indicated a direct contributing ability to effective reporting. There was a positive significant moderate linear relationship between effective reporting of SDGs (ER) and NEMA's Institutional Capacity (IC), $r = 0.263$; $p = 0.012$; Monitoring and Evaluation Framework (M&E), $r = 0.327$; $p = 0.002$; Environmental Governance (EG), $r = 0.353$; $p = 0.001$; Enabling Environment (EE) $r = 0.352$; $p = 0.001$; This was indicated by significant p-values less than 0.05 at 95% confidence level. This implies that barriers of effective reporting of SDGs were positively related to effective reporting of SDGs. These findings collaborate with the study by Mugo and Oleche (2015). which revealed that tracking the development progress in time and accurately can be achieved if an integrated nationwide M&E system is established.

The absence of an M&E framework negatively affects the effectiveness of public service delivery which then constrains the acceleration of economic development in Kenya and the overall wellbeing of the citizens. Further, these findings echo what the 2019 report on Measuring Progress Report termed as substantial limitations to the monitoring of the environmental issues such as low development in national capacities in the partner countries, deficiency in agreed upon methodologies, limitations in data integrations and reporting burdens at the national and sub-national levels (UNEP, 2019).

Conclusion

Based on the findings of this study, the researcher concluded as follows:

The environment sector performance thrives from effective actions of individuals with access to proper knowledge and capacity while functioning within the wider organisations, ministries and institutions within and working for the attainment

of the environmentally sustainable goals. The effectiveness of these organisations and in this case, NEMA lies on the effectiveness of those individuals, and on the typical variables that shape the organization's capacity i.e. skill mix, internal operations, procedures and ability to respond to the laws and regulations under which they operate. Both for individual and organisations, it is increasingly crucial to adopt a network for generating resources, sharing, corroborating and for attainment of knowledge and capacity transfer. This network may be from within and without and are critical in addressing the existing constraints within the environmental sector in Kenya and beyond.

This study also concludes that to address the barriers within the management and reporting in the environment sector, an enabling environment from the government, the UN bodies, development partners is very important both at policy formulations, resource mobilization but more importantly in continuous learning and establishment of best practices. It is therefore as important a factor, for the organisations within the enabling environment continue learning on how to provide a more enabling environment to promote the delivery of environment management functions.

For SDGs and more so, the environmental dimensions of the SDGs to be achieved, there is great need to enhance the institutional capacities of the organisations involved in driving the process. Key barriers that lie within the institutional capacity, monitoring and evaluation, governance and enabling environment contributes significantly to the inefficiencies in data acquisition, processing, and dissemination. Building technical infrastructures and capacity development of human resources is key in strengthening institutional capacity. While NEMA has made significant achievements in putting in place the right technical capacity in its role as lead environmental agency in Kenya, it can thrive even better if all players in the sector

ensured that there is continuous application of principals of good governance, proper resource allocation within their policy frameworks, transparency, and accountability.

Further, the study concludes that partnership is key to achieving goals within an environment that is constrained by resources. Further, political will and governance structures coupled with nationwide monitoring and evaluation framework would greatly enhance the management and reporting structures in the environmental sector. Environmental issues need to be encompassed in all development agenda as it cuts across all development issues. While Kenya has made strides in SDGs implementation and reporting, a lot is still desired within the whole ecosystem of environmental sector in addressing the barriers that have been identified in this study.

Recommendations

This study recommends the effective management and reporting of environmental dimensions of the SDGs. These recommendations cut across the environmental sector and all organisations and players within the environmental ecosystem. Further, the recommendations are applicable to Kenya as a country and can be generalized with caution to those countries experiencing similar challenges. The recommendations are grouped into three categories: practice, policy. and areas for further studies.

Under practice category, the study makes the following recommendations:

1. Bridging the Knowledge gap

Changes within and without the environmental sector are creating new demands for knowledge and capacity. It is, however, notable that at the national and sub-national levels, institutions have considerable inertia and are not flexibly readjusting to the changing demands. To address that gap, the following is recommended: Establishment of partnerships, communities of practice and knowledge networks. This is necessary

for individuals and organisations within the environmental sector to adopt a framework that enhances these partnerships, communities, and knowledge networks. Having desk-officers in the lead environmental agency to drive this process may be necessary.

2. Institutional capacity development

a) Enhance technology

New and exciting technology are being realized every waking day. To effectively deliver on their mandate, organisations need to invest on these technologies. For instance, an environmental management organisation should have technology that creates interactive visuals on the day to day changes in the environment. Real time data is getting more desirable by day. While it may be expensive to acquire such technology, partnership for goals is recommended as there are organizations, whose primary mandate is in this data acquisition.

b) Continuous capacity building

Capacity building for the personnel is necessary and highly recommended. It will however be futile to have well trained personnel but lack the right technology to deliver. Therefore, investment across board as far as institutional capacity is concerned is needed.

c) Innovation/science centers within the lead environmental agency

It is recommendable for an organisation such as NEMA have in place a science/innovation center within its system. This may be in any form or shape as long as it addresses the evolving environmental issues. This will significantly put NEMA at a better position to effectively manage the environment. This can be the center of all coordination with the line ministries, data centers and agencies within the sector.

Policy recommendations are as follows:

3. Need to promote integrated analysis of environment and of policy interactions

There is need to reduce data fragmentation in support more sharing across national and international interactions. Lack of a single-entry point of accessing environmental data is common at the national, regional, and global levels making it very expensive to access necessary data and also creating a barrier for experts and professionals to analyse environmental trends. This study thus recommends integrated analysis of environment and policy interactions across the sector players.

4. Investment on research to enhance efficiency in environmental management

Research is very necessary not just at national but also institutional levels. Partnership with research institutes, institutions of higher learning and innovation centers is very necessary and recommended. NEMA for instance should get in partnership with institutions that have advanced laboratory services to be able to monitor the organisation effectively. Further, the government need to put research as one of its priorities to be able to even deliver on its other projects effectively, efficiently through exploitation of local personnel and innovations.

5. Promoting data driven governance and policy framework

The study recommends a more enhanced linkage between the research and data for improved policy work and governance process. Governance structures should put environmental data in the center of decision making. Kenya should institutionalize the political commitment towards attainment of SDGs. The country should institutionalize its commitment towards policy coherence for sustainable development at the highest political level.

6. Enhanced advocacy on environmental issues

Advocacy is necessary. The sustainable development goals are being implemented for the welfare of the masses. It is, therefore, very necessary for more investment on advocacy programmes to ensure participatory approaches are adopted, total by-in from

masses and eradication of ignorance on environmental issues by the masses. It can be more effective if NEMA for instance partners with schools and institutions of learning as this segment of citizens represent the future.

Recommendations for Further research

Lastly, the study recommends the following areas for further research:

1. Ways of enhancing the interlinkage between research and governance

For environmental governance to be a success there is need for research to generate knowledge and information necessary to guide decision making and policy formulation. This study established that governance and sustainability go hand in hand but due to scope and limited resources could not conduct research on ways to enhance interlinkages between environmental governance and sustainable development. Therefore, this study recommends further study in the subject as it is an area of with potential benefit for policy makers.

2. Opportunities and approaches for knowledge and capacity development in the environment sector

Opportunities and challenges likewise exist in the environment sector. While this study established that partnership for growth and networking at an individual and institutional levels have been known to work, there is still need for research on how best this can be effected without having overlapping mandate that can cause conflicts and inefficiencies in the sector. Researching on this aspect would have created a scope creep that would have greatly impacted on the timelines and resources for this study and thus recommends this rea for further studies.

3. Mechanisms for enhancing policy coherence for sustainable development

This study established a gap exists in policy issues within the environmental sector especially lack thereof of systematic and consistent existences of organisation working

within the sector for various reasons ranging from overlap in mandates, budget imitations, inefficiencies in the system among others. This study however was limited by scope on establishing ways and mechanism for enhanced policy coherence. Through this recommendation, however, research in the subject would be very important and timely for the environmental sector players.

REFERENCES

Adelberg, S., & Batson, D. C. (1978). Accountability and helping: When needs exceed resources. *Journal of Personality and Social Psychology, 36*(4), 343-350.

Adom, D., Hussein, E. K., & Joe, A.-A. (2018). Theoretical and conceptual framework: Mandatory ingredients of a quality research. *International Journal of Scientific Research*, 438-441.

African Development Bank Group. (2019). *Statistical capacity building*. Retrieved from Knowledge Statistics-Capacity-Building: https://www.afdb.org/en/knowledge/statistics/statistical-capacity-building

Akhtar, I. (2014). *Research in social science: Interdisciplinary perspectives.* Cambridge, UK: Cambridge Scholars Publishing.

Alaerts, G., & Kaspersm, J. (2009). Progress and challenges in knowledge and capacity development. In M. Blockland, G. Alaerts, & J. Kaspersma, *Capacity development for improved water management* (p. 16). London, UK: Taylor and Francis Group.

Alby, T. (2016). Reporting system. *Project management body of knowledge*. 11(6), 579.

Aramyan, L. H. (2007). Measuring supply chain performance in the agri-food sector. *ResearchGate*, 123-147.

Arunachalam, M. (2011). International declarations on sustainable development: Implications for community and accountability. *Journal of the Asia-Pacific Centre for Environmental Accountability, 17*(2), 75-107.

Badriyah, M. (1995). *Environmental statistics textbook.* Amman, Jordan: OIC-Stat.

Baguma, S. D. (2014). Rethinking knowledge management as a stimulant to improved use of M&E processes and results. *Centre for development innovation.* Retrieved from http://www.managingforimpact.org/sites/default/files/case/cdi_me_seminar_2014_perspective_1_knowledge_management_sylvester_baguma.pdf

Barrat, H. (2009). Methods of sampling from a population. *International Journal of Academic research in management*.5(2), 18-27.

Bossel, H. (1999). An ethics-based system approach to indicators of sustainable development. *International Journal of Sustainable Development*. 3(3), 221-238. doi:10.1504/IJSD.2000.001533

Caron, M.A., Lapointe, A., & Gendron, C. (2012). Social accounting and public management. *Routledge Taylor & Francis Group*, 227-251. doi: https://doi.org/10.1080/13545700902893114

Carothers, T., & Brenchenmacher, S. (2014). Accountability, transparency, participation and inclusion; A new development consensus. *Quarterly Journal of Economics,* 124(42), 65-87.

Centre for learning on Evaluation and Results. (2012). *African monitoring and evaluation systems.* Johannesburg, South Africa: University of the Witwatersrand.

Collins, J. (2015, August 17). *3 ways to help you measure your project performance.* Retrieved from www.ims-web.com/blog/3-ways-to-help-you-measure-your-project-performance

Collis, J., & Hussey, R. (2014). *Business research: A practical guide for undergraduate and postgraduate students*. Hampshire, UK: Palgrave Macmillan.

Cooper, D., & Schindler, P. S. (2003). *Business research methods* (8th Ed.). Boston, MA: McGraw-Hill Irwin.

Costanza, R., Daly, L., Fioramonti, E., Kubiszewski, I., Mortensen, L. F., Pickett, K. E., . . . Wilkinsn, R. (2016). Modelling and measuring sustainable wellbeing in connection with the UN sustainable development goals. *Ecological Economics*, 130, 350-355.

Cummings, L., & Ronald, A. J. (1990). The logical and appreciative dimensions of accountability. *American Psychological Association*, 87(1), 257-286.

Dalal-Clayton, B., & Bass, S. (2009). *The challenges of environmental mainstreaming.* London, UK: International institute for environment and development.

DESA. (2007). *Indicators of sustainable development goals: Guidelines and methodology.* Newyork, NY: United Nations.

Ekardt, F. (2009). *Theory of sustainability*. Retrieved from research unit sustainability and climate policy: http://www.sustainability-justice-climate.eu/en/nachhaltigkeit.html

Ekardt, F. (2016). Research unit sustainability and climate policy. *ResearchGate*. 331-347. doi:10.1007/978-94-017-7612-7_16

Emas, R. (2015). The Concept of sustainable development: Definition and defining principles. *Brief for GSDR, Florida International University*. 9(7), 51-58

Frink, D., & Klimoski, R. J. (2004). *Advancing accountability theory and practice: Introduction to the human resource management review special edition.* 14(1), 1-17. doi:10.1016/j.hrmr.2004.02.001

Gibson, R. B. (2005). Governance for sustainable development: Moving from theory to practice. *International journal of sustainable development, 8*(1/2), 12-30.

Government of Kenya. (2010). *The constitution of Kenya*. Retrieved from http://www.kenyalaw.org:8181/exist/kenyalex/actview.xql?actid=Const2010

Gregor, S. (2006). The nature of theory in information science. *MIS quarterly*, 611-642.

International Monetary Fund. (2008). *Globalization: A brief overview.* Retrieved from: https://www.imf.org/external/np /exr/ib/2008/053008.htm

Jenkins, W. (n.d). Sustainability theory. *Berkshire encyclopedia of sustainability: The spirit of sustainability*, 23(1), 381-384.

Jones, T., Baxter, M., & Khanduja, V. (2013). A quick guide to survey research. *Annals of the royal college of surgeons of England, 95*(1), 5-7. doi:https://doi.org/10.1308/003588413X13511609956372

Kabir, S. M. (2016). Chapter 9: Methods of data collection. In S. M. Kabir, *Basic guidelines for research: An introductory approach for all disciplines* (201-275). Dhaka, Bangladesh: Book Zone Publication.

Kameri-Mbote, P. (2008). *Environmental governance in Kenya. Implementing the framework of law.* Nairobi, Kenya: East African Educational Publishers.

Karuri-Sebina, G. (2013). *Building innovation driven economies in africa*. doi: 10.1080/20421338.2013.798094

Kenya, Council of Governors. (2019). *Inclusive subnational participation in voluntary national reviews*. Retrieved from https://www.regions4.org/ actions/the-council-of-governors-in-kenyas-vnr/

Kenya, Ministry of Devolution and Planning. (2016). *Progress in achievement of millenium development goals in Kenya: Final status report.* Nairobi, Kenya: Ministry of devolution and planning.

Kenya, Ministry of Devolution and Planning. (2017). *Implementation of the agenda 2030 for the sustainable development in Kenya.* Nairobi, Kenya: Ministry of devolution and planning.

Kenya, Ministry of Education. (2019). *Sessional paper No. 1 of 2019.* Nairobi, Kenya: Government Printers.

Kenya, Ministry of Environment, Water and Natural Resources. (2013). *National environment policy.* Nairobi, Kenya: Government of Kenya.

Kenya, State Department for planning. (2020). *About us*. Retrieved from https://planning.go.ke/

Kenya, State Department of Planning. (2016). *Roadmap to sustainable development goals: Kenya's transition strategy.* Nairobi, Kenya: Ministry of Devolution and Planning.

Kiregyera, B. (2008). *Refirming national statistical systems in Africa.* Addis Ababa, Ethiopia: Economic Commisions for Africa.

Kothari, C. R. (2004). *Research methodology: methods and techniques.* New Delhi, India: New Age International.

Lavrakas, P. J. (2008). *Encyclopedia of survey research methods*. Thousand Oaks: Sage. doi: http://dx.doi.org/10.4135/9781412963947.n61

Lerner, J. S., & Tetlock, P. E. (1999). Accounting for the effects of accounatbility. *Psychological bulletin, 125*(2), 255-275.

Lundvall, B.-A., & Lema, R. (2014). Growth and structural change in Africa: Development strategies for the learning economy. *African Journal Of Science, Technology, Innovation And Development, 6*(5), 455-466. doi: 10.1080/20421338.2014.979660

Macharia, A. (2016, November 25). *Framework for implementing sustainable development goals in Kenya*. Retrieved from Mazingira safi: https://ayubmacharia.com/2016/11/25/framework-for-implementing-sustainable-development-goals-sdgs-in-kenya/

Mahalingam, B., & Samudhararajakumar, C. (2015). The role of middle level managers and corporate entrepreneurship. Retrieved from https://www.researchgate.net/publication/332037803_The_Role_of_Middle_Level_Managers_and_Corporate_Entrepreneurship.

Mahbobi, M., & Tiemann, T. (2010). *Introductory business statistics with interactive spreadsheets - 1st Canadian edition.* Toronto, Canada*:* BCcampus.

Maher, M., & Andersson, T. (2000). *Corporate governance.* Organisation for Economic Co-operation and Development. doi: http://dx.doi.org/10.2139/ssrn.218490

Manyika, C. J., Brown, M., & Bughin, J. (2011). Big data: The next frontier for innovation, competition, and productivity. *Mckinsey Global Institute*, 5(3), 140-146.

Maxfield, M. G. (2016). *Basics of research methods for criminal justice and criminology.* Boston, MA: Cengage Learning.

Merriam webster. (n.d.). *Definition of system*. Retrieved from https://www.merriam-webster.com/dictionary/system

Mireri, C., & Letema, S. (2012). Review of environmental governance in Kenya: Analysis of environmental policy and institutional frameworks.. Retrieved from researchgate.net: https://www.researchgate.net/publication/291108370_Review_of_environmental_governance_in_Kenya_Analysis_of_environmental_policy_and_institutional_frameworks

Mitchell, R. B. (1993). Compliance theory: A synthesis. *Wiley Online Library*, 2(4), 327-334.

Moyare, F. M. (2012). *Challenges of implementing the Kenya vision 2030.* Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/ 11295/96873/Moyare_Challenges%20of%20Implementing%20the%20Kenya %20Vision%202030.pdf?sequence=1

Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: Quantitative and qualitative approaches.* Nairobi, Kenya: African Centre for Technology Studies.

Mugenda, O., & Mugenda, A. G. (2003). *Research methods: Qualitative and quantitative approaches.* Nairobi, Kenya: Acts Press.

Mugo, P. M., & Oleche, M. O. (2015). Monitoring and evaluation of development projects and economic growth in Kenya. *International Journal of Novel Research in Humanity and Social Sciences, 2*(6), 52-63.

National Environment Management Authority. (2020). *About us*. Retrieved from Departmentsnema.go.ke: http://www.nema.go.ke/index.php?option=com_ content&view=article&id=6&Itemid=140

National Environment Management Authority. (2011). *State of the environment report for year 2010.* Nairobi, Kenya: Author.

Ndungu, N. (2019). *Digital technology and state.* Washington, DC: Center for Global Development.

Neuman, W. (2006). *Social research methods: Qualitative and quantitative approaches.* Toronto, Canada: Pearson.

North, D. (2005). *Institutions, institutional change and economic performance.* Cambridge, UK: Cambridge University.

Ortigara, A. R., Kay, M., & Uhlenbrook, S. (2018). A Review of the SDG 6 synthesis report 2018 from an education, training and research perspective. doi: 10.3390/w10101353

Pearce, D. W., & Atkinson, G. D. (1993). Capital theory and the measurement of sustainable development: an indicator of “weak” sustainability. *Ecological Economics, 8*(2), 103-108. doi:https://doi.org/10.1016/0921-8009(93)90039-9

Pickell, D. (2019, March 4). *Qualitative vs quantitaive data*. Retrieved from https://learn.g2.com/qualitative-vs-quantitative-data

Pieterse, N. (2009). *Trends in development theory.* Thousand Oaks, CA: Sage.

Porter, M. (1985). *Competitive advantage.* Newyork, NY: The Free Press.

Project Management Institute. (2018). *What is project management*. Retrieved from www.pmi.org/about/learn-about-pmi/what-is-project-management

Purcell, B. (2012). The emergence of 'Big data" technology and analytics. *Journal of Technology Research, 4*(1), 14-25.

Raguseo, E. (2018). Big data technologies: An empirical investigation on their adoption, benefits and risks for companies. *International Journal of Information Management, 38*(1), 187-195.

Rubio, D. F., & Andvig, E. (2020). Serious about sustainability? Get serious about corruption. *World economic forum; Sustainable development impact summit.* Davos. Retrieved from https://www.weforum.org/agenda/2019/09/serious-about-sustainability-get-serious-about-corruption/

Sachs, J. D. (2012). From millennium development goals to sustainable development goals. *The lancet, 379*(9832), 2206-2211. doi: https://doi.org/10.1016/S0140-6736(12)60685-0

Schlenker, B. R., & Weigold, M. F. (1989). Self-identification and accountability. Retrieved from https://journals.sagepub.com/doi/abs/10.1177 /0146167291171004Sustainable development goals,

Kenya Forum. (2019). *Civil society report: The second progress report on implementation of SDGs in Kenya.* Nairobi, Kenya: The SDGs Kenya Forum.

Shekdar, A. (2009). Sustainable solid waste management: an intergrated approach for asian countries. *Waste Management, 10*(8), 1438-1448.

Sherrill, K. K. (2020). Effective reporting. *International customer management institute*, 14(3), 1-18.

Showkat, N., & Parveen, H. (2017). *In-depth Interview. e-Pathshala. Retrieved from University of Peshawar*. Retrieved fromhttp://www.uop.edu.pk/ocontents/ Lecture%204%20indepth%20interview.pdf

Sood, N., Shih, T., Nuys, K. V., & Goldman, D. (2017). *The flow of money through the pharmaceutial distribution system.* South California, CA: Leonard D. Schaeffer Center for Health Policy and Economics.

Stever, H., & Muroyama, J. (1988). Globalization of technology: International perspectives. *The national academics of sciences engineering and medicine*. 9(4), 216. doi: doi.org/10.1177/027046768900900432

Tambe. (2014). Big data investment skills and firm value. *Management science, 60*(6), 1452-1469.

University of California, Los Angeles, Statistical Consulting group. (2016). *Introduction to SAS*. Retrieved from https://stats.idre.ucla.edu/sas/modules/ sas-learning-moduleintroduction-to-the-features-of-sas/

United Nations. (1987). *Report of the world commission on environment and development; Brundt Land commision.* Newyork, NY: World Commission on Environment and Development.

United Nations. (2013). *Report of the secretary-general's high-level panel of eminent persons on the post-2015 development agenda*. Retrieved from Report of the Secretary-General's High-Level Panel of Eminent Persons on the Post-2015 Development Agenda: https://www.un.org/sg/en/management/beyond2015.shtml

United Nations. (2015). *The millennium development goals report.* Newyork, NY: Author.

United Nations. (2018). *United Nations; shaping our future together*. Retrieved from where we work; AFRICA: https://www.un.org/en/sections/where-we-work/africa/index.html

United Nations Department of Economic and Social Affairs. (2019). *Voluntary national reviews database*. Retrieved from sustainable development knowledge platform: https://sustainabledevelopment.un.org/vnrs/

United Nations Development Group. (2020). *Guidelines to support countries reporting in SDG.* Newyork, NY: United Nations.

United Nations Environment Programme. (2020, Feb 01). *Structure and leadership; UN Environment organigramme*. Retrieved from https://www.unenvironment.org: edocs.unep.org/bitstream/handle/20.500.11822/26006/UNEnvironmentOrganigramme.pdf?sequence=1&isAllowed=y

United Nations Statistical Commission. (2019). *Tier classification for global SDG indicators.* Newyork, NY: United Nations.

United Nations Sustainable Development Group. (2016). *Tailoring SDG to national, sub-national and local contexts.* Retrieved from https://undg.org/2030-agenda/mainstreaming-2030-agenda/tailoring-sdg-to-national-context/

United Nations Development Programme. (2009). *Handbook on planning, monitoring and evaluation for development results.* Newyork, NY: Author.

United Nations Development Programme. (2017). *Africa sustainable development report.* Newyork, NY: Author .

United Nations Environment Programme. (2019). *Global environment outlook-GEO 6.* Nairobi, Kenya: United Nations.

United Nations Environment Programme. (2019). *Measuring Progress: Towards achieving the environmental dimension of the SDGs.* Nairobi, Kenya: UNON Publishing Services Section.

United Nations Environment Programme. (2019). *Ministreal declaration of the United Nations Environmental Assembly at its fourth session.* Retrieved from http://wedocs.unep.org/bitstream/handle/20.500.11822/27925/K1901029%20-%20UNEP-EA.4-HLS.1%20-%20Advance.pdf?sequence=4&isAllowed=y

United Nations Environment Programme. (2020). *Sustainable development goals scorecard*. Retrieved from https://uneplive.unep.org/sdg/scorecard/index.php

United Nations Conference on Trade and Development. (2018). *Economic development in africa report.* Newyork, NY: United Nations Publications.

Wanner, J. (2019). Big data analytics in sustainability reports: an analysis based on the perceived credibility of corporate published information. *Business Research*. doi:doi:10.1007/s40685-019-0088-4

Willems, S., & Baumert, K. (2003). *Institutional capacity and climate actions.* Organisation for Economic Co-operation and Development International Energy Agency.

World Intellectual Property Organisation. (2018). *The impact of innovation: WIPO and the sustainable development goals*. Retrieved from WIPO.int: https://www.wipo.int/sdgs/en/story.html

World Bank. (2018). *Improving household surveys and administrative data in Sudan: Statistical capacity building.* Washington, D.C: The World Bank.

World Bank. (2019, December 2). *Building capacity to improve data collection in Kenya*. Retrieved from https://www.worldbank.org/en/results/2019/12/02/building-capacity-to-improve-data-collection-in-kenya?cid=EXTIK_Tokyo_eNews_P_EXT

World Bank Group. (2016). *Kenya-country economic memorandum.* Washington, DC: The World Bank Group.

World Economic Forum. (2020, September). *Sustainable development impact summit*. Retrieved from World Economic Forum: https://www.weforum.org/events/sustainable-development-impact-summit-2020

Zhang, J., Xu, Y., Li, Y., He, F., & Chen, S. (2005). Natural environment types and environment characteristics in Northwest China. *ResearchGate*, 6(1), 93-99.

APPENDICES

Appendix A: Consent Form for Questionnaire Respondents

STUDY TITLE: INVESTIGATING BARRIERS TO EFFECTIVE REPORTING OF SUSTAINABLE DEVELOPMENT GOALS BY GOVERNMENT INSTITUTIONS IN KENYA: A CASE OF NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

Dear Sir/Madam

Part I: Participant's Information

My name is Peter Mwangi Kibe. I am pursuing Master of Arts, Monitoring and Evaluation at Daystar University. I am conducting a research study on *Investigating Barriers to Effective Reporting of Sustainable Development Goals by Government Institutions in Kenya: A Case of National Environment Management Authority.* I am requesting your time and input in responding to a self-administered questionnaire that will take about 5-10 minutes to complete. This consent form enlightens you on the study purpose, benefits, risks, confidentiality and the process that will be used during the study.

The purpose of this study is to establish the barriers to effective reporting of the SDGs in Kenya, with the primary focus being on environmental reporting using NEMA as a reference point. The study is important because it will endeavor to establish the challenges and root causes that inhibit effective reporting of the environmental dimensions of the SDGs in Kenya and recommend possible solutions worth adopting to improve these systems. This study is therefore be very essential and timely for Kenya as a country, especially in accelerating her towards the realization of the SGDs and Vision 2030. Participation in this study is wholly voluntary. All information gathered with be treated confidentiality and purely for academic purposes. You are free to ask

for clarification where necessary and decline to answer any question that makes you uncomfortable.

Part II: Participant's Declaration and Consent Form

I hereby give my consent to participate in this study. I have been informed of the nature of the study, its objectives, and potential risks explained to me. I have understood clearly the purpose of the study and my rights as participant in the study have been explained to me. I have been allowed a chance to clarify and ask questions and I am aware of my rights as a respondent. I have been reassured that my participation in the study, my personal details and information will be treated in confidential.

Participant's Signature _____ Date

_____

I confirm that I have clearly explained to the study participants the nature of the study and the contents of this consent form in details. The participant has agreed to participate voluntarily and without any coercion, or under pressure or gift expected.

Research Assistant Signature _____ Date

_____

Principal Investigator Signature _____ Date

_____

Appendix B: Questionnaire

My name is Peter Mwangi Kibe. I am pursuing Master of Arts, Monitoring and Evaluation at Daystar University. The purpose of this questionnaire is to aid an academic research work for investigating barriers to effective reporting of the SDGs in Kenya with reference to environmental reporting by NEMA. This study is being conducted through School of Human and Social Sciences, of Daystar University, Nairobi, Kenya. You are invited to take part in this study through completing the questions by putting a tick against the preferred response where applicable. Your participation is voluntary, and you may decline to answer any question that makes you uncomfortable. Kindly be assured that the information gathered is purely for academic purposes and will be treated in confidence.

Section A. Background Information

1. Position……
   ……..
2. Organization……
   ……..
3. Department……
   …….
4. What is your Gender? Male { } Female { }
5. What is your age?
   a. 19-29 years { }
   b. 30 -39 years { }
   c. 40 -50 years { }
   d. Above 50 { }
6. What is your highest level of education

a. High school certificate { }

b. Diploma { }

c. First Degree { }

d. Second degree and higher { }

e. Other specify……..

7. What position do you hold in your organization……

8. Years of experience?

a. Less than 1 year { }

b. 1 to 5 years { }

c. 6 to 10 years { }

d. Above 10 years { }

9. Which level in the organisation do you work in?

a. Strategic Level { }

b. Operational Level { }

c. Technical Level { }

Section B. Factors for Effective Reporting

I. NEMA's Reporting systems

Please indicate how much you agree with the following statements by ticking within the preferred answer.

Where; [strongly agree =5, Agree= 4, Neutral = 3, Disagree = 2 and Strongly Disagree =1]

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
NEMA has adequate technical expertise that promotes timely and adequate acquisition of environmental statistics					
NEMA has dedicated departments to address the diverse reporting obligations					

NEMA has sufficient legal framework to guide its reporting mandates					
There are clear procedures and guidelines necessary to guide the diverse reporting obligations					
NEMA has adequate facilities to support the data acquisition, processing and dissemination					
NEMA has adequate and quality manpower to ensure effective delivery of its reporting obligations					

II. NEMA's Institutional Capacity

Please indicate how much you agree with the following statements by ticking within the preferred answer.

Where; [strongly agree =5, Agree= 4, Neutral = 3, Disagree = 2 and Strongly Disagree =1]

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
NEMA has adequate technical expertise that promotes timely and adequate acquisition of environmental statistics					
NEMA has the right technology for the acquisition and dissemination of the environmental statistics					
NEMA's human resource is well facilitated skill wise to acquire and disseminate environmental statistics					
The staff receive additional training towards building skill-sets necessary to carry your work effectively?					
NEMA has technology that promotes realization of real time data e.g. from satellite providers?					

III. Monitoring and Evaluation Framework

Using a scale 1-5, where; [strongly agree =5, Agree= 4, Neutral = 3, Disagree = 2 and

Strongly Disagree =1]; to what extent do you consider monitoring and evaluation

framework influence the implementation, data acquisition and reporting of environmental statistics at NEMA? Put a tick against your preferred response.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
NEMA has put in place a department/unit that is specifically mandated with conducting Monitoring and Evaluation within the organisation and its project					
An M&E framework has been put in place with clear stipulated targets and indicators towards realization of the environmental dimensions of the SDGs					
Challenges in monitoring and reporting of environmental dimension of the SDGs lie in the lack of accountability, particularly for monitoring and reporting on performance information, unrealistic target setting and poor quality of performance information.					
Monitoring and evaluation budget is obviously delineated within the overall project budget to give the monitoring and evaluation function the due recognition it plays in acquisition of environmental statistics					

IV. Environmental Governance

Using a scale 1-5, where; [strongly agree =5, Agree= 4, Neutral = 3, Disagree = 2 and Strongly Disagree =1]; to what extent do you consider Government and the Ministry of Environment to have put in place environmental governance structures for the realization of the Environmental dimensions of the SDGs in Kenya. Kindly put a tick against your preferred response.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Kenya has in place institutional mechanism that periodically brings together NEMA and other relevant institutions and government entities to enhance coherence across SDGs related issues i.e. implementation, reporting and policy related?					
Kenya's has institutionalized Political Commitment towards attainment of SDGs					
There is sufficient budgetary allocations towards management of environmental issues in Kenya					

V. Enabling Environment

Using a scale 1-5, where; [strongly agree =5, Agree= 4, Neutral = 3, Disagree = 2 and Strongly Disagree =1]; to what extent do you consider NEMA partnership with international and other local organisations has facilitated realization of its mandate

and attainment of the Environmental dimensions of the SDGs in Kenya. Kindly put a tick against your preferred response.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
NEMA has partnered greatly with international bodies i.e. financial firms, technological firms which build its capacity for environmental management in Kenya					
NEMA effectively liaises with other government entities to avoid duplication of duties and acquisition of necessary environmental information?					
NEMA receives sufficient support from UN agencies e.g. UN environmental programmes in realization of the environmental dimensions of SDGs.					

VI. Effective Reporting of SDGs

Using a scale 1-5, where; [strongly agree =5, Agree= 4, Neutral = 3, Disagree = 2 and Strongly Disagree =1]; to what extent do you think NEMA has put in place structures that promote acquisition of timely, relevant and adequate environmental reporting? Kindly put a tick against your preferred response.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

NEMA has put in place structures that contribute to acquisition and reporting of quality information					
NEMA has in place structures that enhances timely, relevant and adequate environmental reporting					

VII. Main causes of unavailability of data

Using a scale 1-5, where; [strongly agree =5, Agree= 4, Neutral = 3, Disagree = 2 and Strongly Disagree =1]; to what extent do you consider to be the main barriers hindering acquisition of timely and adequate data at NEMA and the sector at large? Kindly put a tick against your preferred response.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Data is unavailable because of lack of baselines					
Unlimited funding in Monitoring and acquisition of environmentally related data					
Low advocacy on SDGs related issues in the country					
Fear of misuse or misinterpretation of data by the entities reporting					

VIII. Recommendations for enhancing effective reporting of environment statistics

Using a scale 1-5, where; [strongly agree =5, Agree= 4, Neutral = 3, Disagree = 2 and Strongly Disagree =1]; to what extent do agree with the following recommendations towards better environment reporting by government institutions in Kenya

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
NEMA and other government institutions in the sector should focus on bridging knowledge gaps through establishment of partnerships, communities of practice and knowledge networks					
NEMA and other government institutions should enhance their institutional capacities through investing on modern technology for better data management					
Investment on research and innovation is very necessary for attainment of SDGs in Kenya					
Enhance advocacy on SDGs related issues in the country					
Enhance data driven governance and policy work					

Vi. In additions to the above-mentioned challenges, what would be other hindrances that negatively affects the realization of the SDGs in Kenya?

……

……

……

……

……

……

……

……

…

Vii. What recommendations can you provide that can enhance the implementation, reporting of the SDGs in Kenya?

……

……

……

……

……

Thank you for your response

Appendix C: Consent Form for Key Informant Interview

STUDY TITLE: INVESTIGATING BARRIERS TO EFFECTIVE REPORTING OF SUSTAINABLE DEVELOPMENT GOALS BY GOVERNMENT INSTITUTIONS IN KENYA: A CASE OF NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

Dear Sir/Madam

Part I: Participant's Information

My name is Peter Mwangi Kibe. I am pursuing Master of Arts, Monitoring and Evaluation at Daystar University. I am conducting a research study on *Investigating Barriers to Effective Reporting of Sustainable Development Goals by Government Institutions in Kenya: A Case of National Environment Management Authority.* I am requesting your time and input in taking part in a Key Informant Interview take about 30 minutes. The interview will be conducted within your convenience, either through a visit to your office or through an online meeting facility. This consent form enlightens you on the study purpose, benefits, risks, confidentiality and the process that will be used during the study.

The purpose of this study was to establish the barriers to effective reporting of the SDGs in Kenya, with the primary focus being on environmental reporting using NEMA as a reference point. The study is important because it will endeavor to establish the challenges and root causes that inhibit effective reporting of the environmental dimensions of the SDGs in Kenya and recommend possible solutions worth adopting to improve these systems. This study is therefore be very essential and timely for Kenya as a country, especially in accelerating her towards the realization of the SGDs and Vision 2030. Participation in this study is wholly voluntary. All information gathered with be treated confidentiality and purely for academic purposes. You are free to ask for clarification where necessary and decline to answer any question that makes you uncomfortable.

Part II: Participant's Declaration and Consent Form

I hereby give my consent to participate in this study. I have been informed of the nature of the study, its objectives, and potential risks explained to me. I have understood clearly the purpose of the study and my rights as participant in the study have been explained to me. I have been allowed a chance to clarify and ask questions and I am aware of my rights as a respondent. I have been reassured that my participation in the study, my personal details and information will be treated in confidential.

Participant's Signature _____ Date

_____

I confirm that I have clearly explained to the study participants the nature of the study and the contents of this consent form in details. The participant has agreed to participate voluntarily and without any coercion, or under pressure or gift expected.

Principal Investigator Signature _____ Date

_____

Appendix D: Key Informant Interview Guide

The purpose of this interview is to aid an academic research work for investigating barriers to effective reporting of the SDGs in Kenya with reference to environmental reporting by NEMA.

1. Kenya's institutionalization of Political Commitment towards attainment of SDGs?
   a) Do you think Kenya has institutionalized its commitment towards policy coherence for sustainable development at the highest political level?
2. Cross-Sectional Coordination among the Ministries and Sectors for SDG attainment
   a) Would you say the Kenya has in place institutional mechanism that periodically brings together relevant institutions and government entities to enhance coherence across SDGs related issues i.e. implementation, reporting and policy related?
   b) How effective would you say the process is?
   c) What are some problem?
3. Financing for SDGs attainment in Kenya
   a) Do you think the SDG implementation, Monitoring and reporting process in Kenya is well financed?
   b) Are there mechanisms in place that promote the Private, public partnership for financing the SDGs objectives in Kenya more so in the environmental related goals?
   c) What are areas that can be improved?
4. Participatory Approaches

a) Would you say that the country has in place mechanisms, to ensure that laws, policies, plans, programmes, and major development projects at different levels of government and including at the overarching/general, sectoral and local level are developed through participatory processes that involve relevant stakeholders?

b) From your expert judgement, would you say the masses have adequate knowledge about the SDGs and how they should be involved?

c) What measures can be put in place to ensure the vast majority are also part of the decision-making process?

5. Long-term consideration in decision making

a) Do you think Kenya has mechanisms in place to ensure that long-term considerations are integrated into decision-making, policy development and planning?

6. Challenges to SDG reporting

a) What would you say is the main inhibiting factors to the reporting of the SDGs in Kenya and especially the environmental dimension of the SDGs?

b) How can these challenges be addressed?

Appendix E: Ethical Clearance

DAYSTAR UNIVERSITY

Excellence • Transformation • Servant-leadership

Adc River Campus
P. O. Box 17 - 90143
Daystar University, Kenya
Tel: 045 6622601 (2) (3)
Fax: 045 6622420
Email: admissions@daystar.ac.ke

Nairobi Campus
P. O. Box 44400 - 00100,
Nairobi, Kenya
Tel: 020 2723 002 (3) (4)
Fax: 020 2728538
Email: admissions@daystar.ac.ke

Mombasa Campus
Apollo House, Kisii Avenue
P.O. Box 99483 - 80107,
Kilindini Mombasa
Tel: 020 2416916
Email: mombasa@daystar.ac.ke

www.daystar.ac.ke

VERDICT – PASS

Daystar University Ethics Review Board

Our Ref: **DU-ERB/25/08/2020/000444**

Date: 25th August 2020

To: Peter Mwangi Kibe

Dear Peter,

RE: INVESTIGATING BARRIERS TO EFFECTIVE REPORTING OF SUSTAINABLE DEVELOPMENT GOALS (SDGS) BY GOVERNMENT INSTITUTIONS IN KENYA: A CASE OF NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

Reference is made to your ERB application reference no. 050820-01 dated 5th August 2020 in which you requested for ethical approval of your proposal by Daystar University Ethics Review Board.

We are pleased to inform you that Daystar University Ethics Review Board has reviewed and approved your above research proposal. Your application approval number is **DU-ERB-000444.** The approval period for the research is between ***25th August 2020 to 24th August 2021*** after which the ethical approval lapses. Should you wish to continue with the research after the lapse you will be required to apply for an extension from DU-ERB at half the review charges.

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by Daystar University Ethics Review Board.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to Daystar University Ethics Review Board within 72 hours of notification.
iv. Any changes anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to Daystar University Ethics Review Board within 72 hours.
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of a signed one page executive summary report and a closure report within 90 days upon completion of the study to Daystar University Ethics Review Board via email [duerb@daystar.ac.ke].

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and other clearances needed.

Yours sincerely,

Mrs. Purity Kiambi,
Secretary, Daystar University Ethics Review Board

Encl. Review Report

"...until the day dawn and the **daystar** arise in your hearts"
2 Peter 1.19 KJV

Appendix F: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **164555**

Date of Issue: **04/September/2020**

RESEARCH LICENSE

This is to Certify that Mr.. Peter Mwangi Kibe of Daystar University, has been licensed to conduct research in Nairobi on the topic: INVESTIGATING BARRIERS TO EFFECTIVE REPORTING OF SUSTAINABLE DEVELOPMENT GOALS (SDGS) BY GOVERNMENT INSTITUTIONS IN KENYA: A CASE OF NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY for the period ending : 04/September/2021.

License No: **NACOSTI/P/20/6490**

164555

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

Page 1 / 2

Appendix G: Plagiarism Report

Peter Kibe Thesis

ORIGINALITY REPORT

14%	13%	5%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.coursehero.com Internet Source	1%
2	pdfs.semanticscholar.org Internet Source	1%
3	Submitted to University of Nairobi Student Paper	1%
4	www.ijsrp.org Internet Source	1%
5	erepository.uonbi.ac.ke Internet Source	1%
6	wedocs.unep.org Internet Source	<1%
7	www.mdpi.com Internet Source	<1%
8	Dwight D Frink, Richard J Klimoski. "Advancing accountability theory and practice: Introduction to the human resource management review special edition", Human Resource Management	<1%

Page 102 / 111