UNIVERSITY OF NAIROBI

INSTITUTE OF DIPLOMACY AND INTERNATIONAL STUDIES (IDIS)

MA RESEARCH PROJECT

THE IMPACT OF ENVIRONMENTAL SECURITY ON SUSTAINABLE LIVELIHOODS IN INFORMAL URBAN SETTLEMENTS IN KENYA: CASE STUDY OF MUKURU SLUM IN NAIROBI COUNTY, KENYA.

REG. NO: R52/88017/2016

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A RESEARCH PROPOSAL SUBMITTED TO THE INSTITUTE OF DIPLOMACY AND INTERNATIONAL STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTERS IN INTERNATIONAL CONFLICT MANAGEMENT, UNIVERSITY OF NAIROBI

18th October 2018

DECLARATION

This research project is my own work that has never been presented in any other learning institutions for academic award.

Signed……………….....................................Date…………………………….

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This research project has been submitted for examination with my approval as the university supervisor.

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Supervisor

Dr. SHAZIA CHAUDHRY

DEDICATION

"This academic work is a special dedication to Almighty God"

ACKNOWLEDGEMENT

I am grateful to the Almighty God who has seen me through right from the conception of the idea to the completion and submission of the final report. Secondly, to my loving and supportive husband Bernard Nyakundi Moindi, my children Paul and Nayla whose understanding and encouraging words gave me the drive and inspiration that saw me through even when it seemed tough.

I would like to express my heartfelt appreciation to my able and supportive supervisor; Dr. Shazia Chaudhry for guiding me through the research process. Her understanding and insightful thoughts and ever open door for consultation facilitated the successful completion of this report.

I also highly appreciate the IDIS staff for their assistance whenever I consulted them. Many thanks to Miss Irene Mbaruka of Mukuru Promotional Centre whose support during the research cannot be underestimate.

ABSTRACT

Environmental security is among pertinent issues of human security. It plays a significant role in as far as sustainable livelihoods in informal urban settlements is concerned. In some of the developing states in the global south, significant milestones have been made in environmental protection boosting security. However in Sub-Saharan Africa, environmental insecurity in informal urban settlements remain a major problem that require urgent attention for the region to experience sustainable development. In Mukuru Slum, Nairobi, environmental insecurity concerns are characterized with flooding risks during short and long rains, drought and water scarcity, air and water pollution, poorly handled waste, clogged sewer lines and drainages. The research was guided by the quest to address these issues hence questions; to what extent does environmental security affect sustainable livelihoods in Kenya's informal urban settlements? What is the role of national institutions and policies in the provision of environmental security for sustainable livelihoods in informal urban settlements in Kenya? What is the government's response to effects of environmental security issues on sustainable livelihoods in Mukuru slum, in Nairobi? All these informed the general and specific objectives of the study. The researcher used Sustainable Livelihood Approach and Environmental Scarcity Theory whose tenets guided the study to the end. Qualitative Research Method was used with case study design. The researcher employed purposive sampling in identifying and selecting the respondents whereby semi-structured interview guides were used to collect data. The findings established as hypothesized, environmental security has an influence on sustainable livelihoods, it recommends integrated strategies by the government and all the relevant stakeholders in the area to minimize environmental hazards hindering sustainable livelihoods in slums across Kenya.

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ACRONYMS

ASALs -   Arid and Semi-Arid Lands

AU   -   African Union

CHV   -   Community Health Volunteers

IEL   -   International Environmental Law

KENSUP-   Kenya Slum Upgrade Program

KMD-   Kenya Meteorological Department

MDGS-   Millennium Development Goals

MPC -   Mukuru Promotional Centre

NDMU-   National Disaster Management Unit

NEAP-   National Environmental Action Plan

NEMA-   National Environmental Management Authority

NGOs-   Non-Governmental Organizations

OSCE-   Organization for Security Cooperation in Europe

SLA-   Sustainable Livelihood Approach

UNCHS-   United Nations Commission of Human Settlement

UNEP-   United Nations Environmental Program

UNSC-   United Nations Security Council

WARMA-   Water Resource Management Authority

WB-   World Bank

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Background to the Study

Environmental security is a vital component of human security, it refers to the state of human-environmental related changes that entail environment; degradation, destruction by military activities, increased resource scarcities and biological threats influencing social disorder and conflicts[1]. Emerging environmental security issues attracted the global attention from the 1980s when the environmental security school of thought focused on environmental change and its implications on security, while the traditional military security school of thought were concerned with national security inclined to territorial state boundary protection from external attack, this reasoning was anchored on the post-cold war era.[2]

Overtime, it has been acknowledge that the global impact of environmental change including depletion of the ozone layer and trans-boundary pollution are vital threats to security that cannot be ignored.[3] Issue of climate change that trigger environmental hazards which are a threat to human safety has attracted international environmental law that emphasize protection of human rights by ensuring safety of lives while safeguarding livelihoods. This has prompted formulation of policies for guidance.[4] This has led to the military authorities' acknowledgment of the complexity of security hence adjusting the security policy measures to accommodate the environmental dimensions as well.[5]

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[1] The millennium Project; definitions of environmental security 2009. (3) 5-9.

[2] Homer-Dixon T., F. Environmental Change as a cause of Acute Conflict 1991. *International Security*, Vol. 16, No. 2. PP. 76-116

[3] OSCE Doc. 'Rapporteurs Report': Informal Group. 'Environmental Security'. Informal Group Environmental Security; OSCE Economic Forum on. 'Security Aspects in the field of Environment', 1999. EF DEL/87/99.

[4] Corendea C. Migration and human rights in the wake of Climate Change: A policy perspective over the Pacific. UNU-EHS Publication Series, Policy Report 2017 Vol./Issue No.2. Bonn, United Nations University.

[5] United Nations, Environmental Perspective to the year 2000 and beyond. Security and Environment Report, 2002. PP. 82.

Environmental matters are sensitive because they entail access, use and management of scarce resources like land, water, pasture, forest and minerals which attracts the state security authorities[6]. The world population has grown building pressure on these limited resources for sustaining livelihoods[7]. For instance, in 1950s there was a comprehensive plan to ensure cooperative use of the Jordan River waters. However, this failed due to mistrust among the four bordering states (Syria, Lebanon, Israel and Jordan). Each of the states opted to follow its own policies, later this attracted the push for militarization of water as a resource and on numerous occasions, Israel and its neighboring Arab countries have been in protracted conflict over the access and use of the Jordan waters.

The UN General Assembly introduced the notion of environmental security through the United Nations Environmental Program (UNEP), Organization for Security Cooperation in Europe (OSCE), and North Atlantic Treaty Organization (NATO). All these have played a significant role in championing environmental security among aspects of state security internationally. In 1988 UNEP established a special commission that dealt with elaborate concept of international security which finally developed a concrete and inclusive international security system. In all these, the focus was to enlighten the world on the connection between environmental security and international security in its entirety.[8]

The African continent has not been spared from threats of climatic variations and their implications on environmental security, most of the African states have suffered the climatic shift effects which highly threaten sustainable livelihoods. The inter and intra territorial boundary pollutions, conflict over scarce natural resources, for example the Nile waters issue of controversy among Egypt, Uganda, Sudan and others that directly or indirectly have a share on its waters[9] and it proves beyond reasonable doubts that it is not

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[6] Trombetta M. J. Environmental Security and Climate Change: Analyzing the Discourse. Vol. 21, No. 4 2008. 590-594.

[7] Oswald Spring et al. (eds.). Regional Ecological Challenge for peace in Africa, the Middle East, Latin America and Asia Pacific, the Anthropocene: Politik-Economic-Society-Science. 5 1007/978-3-319.

[8] Cheng, Anthony S.; Kruger, Linda E.; Daniels, Steven E. "'Place' as an Integrating Concept in Natural Resource Politics: 2003: Propositions for a Social Science Research Agenda" in: Society & Natural Resources, 16,2: 87–104.

[9] M Chatteri et al. (2002) *Conflict Management of Water Resources*. Hampshire, Ashgate Publishing Ltd. p. 146.

satisfactory to just focus on traditional/border security but rather include environmental security in relation with competition for scarce resources like land, water, pasture and wood[10] for sustainable livelihoods. Therefore, it is clear that human security right from the local, regional and global view can no longer be limited to traditional military notion but rather it includes environmental related matters which play a role on security necessary for enhancing livelihoods in not only the rural communities but also formal and informal urban areas.

Sustainable livelihood include the human capabilities and actions enhancing means of living and access to assets like stores, resources and claims necessary for an average living. Livelihood is considered sustainable when it has the potential to cope with emerging threats, shocks[11] and still is able to conserve and manage resources sustainably. In the long run, it generates a net benefit for livelihoods at both the local and global levels, therefore, promoting standard living for populations far and wide the divide.[12]

Generally, Security is important for growth of societies towards the intended healthy and competitive societies whose livelihoods are self-sustaining for remarkable development. However, the global south is yet to reach a level of self-sustainable livelihoods given the advent of globalization and its negative effects combined with threats of environmental changes that adversely affect human safety. To shed light on this facts as stated, this study will seek to establish the link between security of slum environment and livelihoods in informal urban settlements in Kenya, a case study of Mukuru slum with an approximate population of 80, 000[13] people in Nairobi County.

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[10] Land Center for Human Rights, 2005. Water Problems in the Egyptian Countryside Between Corruption and Lack of Planning, Case Studies of Two Egyptian Villages, Land and Farmers Series, Issue No. 32

[11] Chambers, Robert and Gordon Conway. Sustainable Rural Livelihoods: Practical concepts for the 21st Century. IDS Discussion Paper 296, IDS, Brighton, UK, February 1992.

[12] Krantz L. The sustainable Livelihood Approach to poverty reduction. 2001: An Introduction. Division for Policy and Socio-Economic Analysis. PP. 5-6. Sida, Sweden.

[13] Irene Mbaruka. Social Worker, Mukuru Promotional Centre (MPC).Head count of the population in Mukuru slum conducted in October 2017.

1.2 Statement of the Research Problem

To study sought to address was the livelihoods state in most informal urban settlements in Sub-Saharan Africa indicating a growing trend of urbanization of poverty, urban management systems that are far from attaining recognition of the rights of the poor, unreliable governance system by all for all, creating space, services and opportunities for the poor to include them in the distribution of benefits that urbanization presents. In conjunction to this, clearly there is regular attacks by environmental hazards that not only take lives but totally disrupt the vulnerable living conditions and any little effort to sustainability. Since time immemorial, Africa is depicted as a developing continent and true to this, the gap between the rich and the poor is widening every other day. No significant achievement in curbing the growth of slums, existing policies on environmental matters and sustainable development seem to be well pronounced on paper as opposed to their implementation for remarkable results.

Environmental hazards as desertification, land degradation, floods, pollution and prolonged drought are regular while no sufficient capacity of slum dwellers to overcome the harsh effects of the same. The problem is quite evident that sustainable livelihoods are far from being realized. In Mukuru slum, the residents' ability to handle environmental insecurity in the quest for sustainable livelihoods is a huge challenge. The study aimed at investigating the link between environmental security issues and sustainable livelihoods in this area and efforts made to ensure sustainable livelihoods for the residents in Mukuru Slum in Nairobi Kenya, to effectively capture the issue, the following research questions were fronted and guided the research.

1.3 Research Questions

1.1.1 To what extent does environmental security affect sustainable livelihoods in Kenya's informal urban settlements?

1.1.2 What is the role of national institutions and policies in the provision of environmental security for sustainable livelihoods in informal urban settlements in Kenya?

1.1.3   What is the government's response to effects of environmental security issues on sustainable livelihoods in Mukuru slum, in Nairobi?

1.4 Objectives of the study

Mainly the study sought to establish the effect of environmental security on sustainable livelihoods in informal urban settlements where it assessed the situation in Mukuru Slum. The other objectives were:

1.1.4   To assess the extent to which environmental security affect sustainable livelihoods in Kenya's informal settlements.

1.1.5   To find out what national institutions and existing policies contribute in beefing up environmental security for sustainable livelihoods in informal urban settlements in Kenya.

1.1.6   To interrogate the government's response to effects of environmental security issues on sustainable livelihoods in Mukuru slum, in Nairobi.

1.5 Literature Review

The literature review for the study scrutinized existing papers, reports, journals and documents established on environmental security issues, sustainable livelihood and the link between these two variables.

1.5.1 Environmental Security and Sustainable Livelihoods

Security of the environment can be defined as an effort to safeguard humanity from dangers caused by human activities happening as an accident, ignorance, and misunderstanding or by design originating from across national borders and/or caused by natural disasters.[14] This forms part of the definitions as provided for by various scholars attempting to define environmental security, though still debatable given the fluidity of security as a concept[15].

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[14] Ibid

[15] Makana J. and Thomas S., c. Impacts of selective logging and Agricultural clearing of forest structure, floristic composition and diversity and timber tree regeneration in the Ituri Forest, DRC Congo. 2006. Bio diversity and Conservation. 15 (4); 1375-1397.

Human security in regard to issues of environmental security have been a subject attracting many research and debates in the last two decades and from findings and recommendations made by various scholars, it is emerging as a significant area of focus in both national and international security[16]. Environment as a whole is viewed as a significant transnational issue among others that encompass vital dimensions of peace, security and human rights.[17]

The United Nations Security Council (UNSC) recognizes environmental security as an important security concern and further allude that the threat to international stability and peace is not only tied to military sources but also non-military sources causing instability in social, economic, humanitarian and fields of ecology[18] where both combined affect societal livelihood across the world. The traditional realist approach on international security is skewed to military endowment and efforts to safeguard territorial state boundaries. However, over time this approach has been rendered insignificant due to the growing challenges of globalization and climate change facing both the developing and the developed world.

In the recent past, it's been agreed that security threats include; environmental security, human security, economic security and transnational boundary safety. All these combined, influence livelihood across the world and progressive growth socially and economically relies on how they are handled and the adaptive capability of people in respective localities.[19] In some states, for example in Haiti, the earth quake event experienced in January 2010 outweighed the traditional military known threats to security and the disaster[20] adversely affected the livelihoods of Haiti people both in the rural and urban areas forcing many to start from scratch. Indeed environmental security issues plays a role on livelihoods.

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[16] Mayer, B., International Law and Climate Migrants: A Human Rights Perspective, Sustainable Development Law on Climate Change, Legal Working Paper Series, March 2011.

[17] Cyril O. Globalized images of environmental security in Africa. 2007. Review of Africa Political Economy, 27:83, 47-62.

[18] Millennium Ecosystem Assessment, Ecosystem and Human Wellbeing: Current State and trends, 2010-Retrieved online, 19 Jun 2018.

[19] Boan C., Zetter, R. and Morris T. Environmental change, livelihoods and forced migration. 2008. Refugee Study Centre Policy Brief No. 1 (RSC: Oxford). PP. 4.

[20] 'Lessons learned from Haiti's Tsunami' BBC News 25 February 2010.

Politically, the world is divided and comprise of independent states, whereas, environmentally, the world is made up of ecosystems. What challenges the management of environmental issues globally, regionally and at state level is the existing disconnect between political and ecological systems[21], this as a result of the choice to ignore environmental matters due to political interests and/or little or no concession by the states authorities. It has been proven that a state which is internally destabilized by environmental crisis end up creating refugees[22] who in turn affect stability of neighboring countries.[23] For example, it is predicted that in India, Bangladesh and China, environmental refugees[24] are likely to escalate into millions due fast spreading desertification, water scarcity and unproductive turned irrigation lands and bio-diversity deterioration.[25] This clearly demonstrates that livelihoods of millions of people are under threat hence hindering efforts to realizing sustainable livelihood, therefore, something need to be done.

1.5.2 Environmental Security Issues in Africa

Africa is one among the developing world regions characterized with uncontrolled population growth especially in informal urban areas while means to meet the demand for this population for a sustainable livelihood are such a huge challenge to many states herein. Just like other parts of the developing world, the continent constitutes of many people who are poor economically and more natural resource- dependent for survival while residing in conditions precarious from environmental, human rights and legal perspectives.[26]. Most people rely on the scarce natural resources for their livelihoods. However, access, use and management of these resources is hindered by a few given their power and military prowess at the expense of many, for example the crisis in Somalia[27]. As a result of this, many people

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[21] Marchal, V., et al, OECD Environmental Outlook to 2050, Climate Change Chapter, Pre Release Version, OECD, November 2011.

[22] McLeman, R., and Smit, B., „Assessing the Security Implications of Climate Change-related Migration‟, Presentation to Workshop on Human Security and Climate Change, 21-23, Oslo, June 2005.

[23] Marshall N. "Forced Environmental Migration: Ethical consideration for emerging Migration Policy" 2016: Ethics, Policy and Environment: 19(10) 1-18.

[24] Grant, H. et al. 'UK should open borders to climate change refugees'. Bangladesh Minister, 2009. The guardian 4th December 2009.

[25] Myers, N. 'Environmental Refugees'; a growing phenomenon. 1997; population and environment. 19(2) 167-182.

[26]Matthew, R.: Sustainable Livelihoods, Environmental Security and Conflict Mitigation: 4 Four Cases in South Asia (Draft, February 2005)

[27] Maystadt, Jean-Francois et al., Extreme Weather and Civil War in Somalia, Institute of Food

are struggling to meet the basic needs and are highly vulnerable to factors affecting their security as they lack the skills and resources to sustainably adapt to environmental hazards[28] whenever they occur.

From the Western, Great Lake, Southern, Eastern and Horn of Africa regions, many of the people in rural areas rely on agriculture where majority are subsistence farmers relying on rain water[29] for farming activities. On the other hand, many of the informal urban settlements depend on casual labor and small scale business with low income levels[30], they mostly depend on rural areas for supply of food. Therefore, environmental changes affecting food production in the rural area lead to prices of food in towns shooting rendering many food insecure as their livelihoods sources and means are over stretched. With emerging climate change, rising temperatures and prolonged drought most of the areas in these respective regions are drying up leaving people devastated and vulnerable to environmental changes and its threats.

 There is increased human activities deteriorating the safety of the environment like burning of fossil fuels, deforestation and increased greenhouse emission that has contributed to environmental degradation which has greatly exposed the African continent to heightened environmental insecurity in this generations threatening the future[31]. For example, the fast spreading of desertification affecting livelihoods in the rural and informal urban areas[32] in Chad is influenced to some extent by deforestation in the neighboring DRC Congo Forest, this is contributing to increasing poverty for many people and especially informal urban settlers in the region.

Policy Research Discussion Paper 01243, February 2013.
[28] Maathai, W. The Challenge for Africa, (London: William Heinemann, 2009).
[29] National Report on Climate Change", AQUASTAT, Lesotho; Irrigation in Africa figures-
AQUASTAT Survey, Food and Agriculture Organization, 2005.
[30] Alexandria, Engineering Journal: Regeneration as an approach for the development of informal settlements. September 2012. Vol. 51, Issue 3. Pp.229-239
[31] Marchal, V., et al, OECD Environmental Outlook to 2050, Climate Change Chapter, Pre Release Version, OECD, November 2011.
[32] World Bank Report: Chad Urban Population, 2016. Indexmundi.

The UNSC and World Bank (WB) focus on causes of conflicts and unsustainable livelihoods in Africa whose potential for conflict traces back to competition over scarce resources that are as a result of increasing deforestation and desertification. For instance, poverty levels in Darfur are rising despite donor support. The government of Sudan doing little to help support the region to enable people have a more sustainable livelihood, this in turn affects the capacity of the people to jointly protect themselves from vulnerability to environmental changes hence leaving them more frustrated.[33]

Generally, the entire Horn of Africa is not spared from environmental changes that highly disrupt the traditional livelihood lifestyle of relying on agriculture and pastoralism especially for communities in ASALs and trade including barter trade and hawking especially in downtown in major towns and city as a means of earning a living. Whenever catastrophes like floods occur, many are displaced, crops destroyed, livestock carried away and even people losing lives, this clearly demonstrate how environmental insecurity hinder sustainable livelihoods.

Kenya falls among countries in Africa whose population is vulnerable to environmental changes, though its contribution to Greenhouse Gas Emission is insignificant, the vulnerability manifests on a huge number of people relying on rains for farming activities, informal settlement areas that highly prone to risk due to flash floods and drought that lender them food and health insecure and lack of capability to manage shocking events that they face whenever disaster occur. [34] There is need to have measures in place to safeguard people from eminent health and food insecurity whenever disaster occur. This is largely due to poor drainage systems leading to contamination of water and food hence highly affecting livelihoods in vulnerable areas especially informal urban settlements.

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[33] Abass, A. Protecting Human Security in Africa. 2010. Environmental Security in Africa. Oxford University Press.

[34] Mariara, J., K. and Kabara, M. 'Climate Change and food Security in Kenya. Environment for Development Paper series 19 (3) March 2015.

1.5.3 Environmental security and Sustainable Livelihoods in Informal Urban Settlements in Kenya

The growth of slums which are commonly poverty stricken areas can be traced from the colonial times as well as post-colonial era[35] and are commonly found in the global south that comprise of underdeveloped and developing states. From the UN-Habitat analysis, an estimated 25% of the urban population reside in informal settlements and this percentage has grown tremendously over the years[36]. Informal urban settlements are described as residential areas where the residents develop temporary housing units on illegal land vulnerable to environmental change risks. Commonly these areas lack basic services, proper sanitation as well as unplanned city infrastructure. The housing units herein are commonly non-compliant to the legal established urban building regulations and are located in areas that are environmentally and geographically sensitive.

In the developing world, most governments ignore the existence of slums in city development and prosperity plans. Slums are socially and economically excluded from the formal urban systems and far removed from urban opportunities for decision making.[37] In Kenya, the common attitude to informal urban settlements is marred with opposition and evictions to intolerance and support for upgrading of slums and legalization of these settlements. A good example is South Africa, with one of the largest slum in Africa-Soweto, they have embraced the move to legalize and promote informal settlements through tenure regularization and provision of infrastructure which has been widely welcome as opposed to relocation[38]. In the long run, if the same is embraced in Kenya and other parts of Africa, it will boost livelihoods in slums and ensure safety from environmental insecurity.

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[35] UNFPA-UN Population Fund. State of the world population. 2007. Unleashing the potential of urban growth. New York.
[36] UN-HABITAT. 'For a Better Urban Future'. Urban Indicators Guidelines. October 19th 2016.
[37] UN-HABITAT-Urban Governance (Habitat III Issue Paper 6). Nairobi: UN Habitat-Informal settlement assessment. 2015.
[38] Chege, E., N. Challenges of Slum Upgrading for Urban Informal Settlements. 2012. Real Estate and Construction Management.B42-82146. U.o.N.

1.5.4 The link Between Environmental Security Issues and Sustainable Livelihood in Informal Urban Settlements

It is evident that environmental security is threatened by the ongoing climate changes, and increasing population growth especially in the global south. This is a challenge to developing countries whose governments lack the capacity to address demand for basic wants for the rising population like proper housing[39], drainage plans and calamity preparedness from risky environmental changes since many are traditionally rooted to relying on natural resources that are to be protected for their food, health and environmental safety.

In Africa, most cities and town plans are non-inclusive whereby informal settlements are not factored, although this settlements have been there for over a long period of time most city planners are always initiating and regularizing exclusive plans for industrial, factory and real estate development which is a wrong strategy to ensuring disaster preparedness in the event of natural calamities like floods[40] and possible mud slides. Challenges as posed by environmental changes are real threat that call for consultative approach to address diminishing water resource, rising sea level and proper all-weather housing development. Consequently, in regions like West Africa most governments have exhibited continued resistance to pressure to upgrade and regularize policies for securing and protecting formal tenure to accommodate informal urban residents.[41]

East Africa urban growth is considered to be the least but it's not spared from the mushrooming informal settlements that have grown over years from the colonial unto post-colonial era. The problems faced by the residents informal settlements almost cut across all slums in the SSA, many of the informal settlements are marred with rising unemployment, uncontrolled vulnerable urban expansion, overcrowding, deterioration of

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[39] Wornock, V. and Warnock, F., T. Markets and housing in finance. 2008. Journal of Housing Economics. 3(1) 2008. PP.1-15

[40] Fox, I. Floods and the poor, reducing the vulnerability of the poor to the negative impacts of floods. 2003. Working Document. 3rd World water forum. Osaka. Japan.

[41] Simon, D. "Cities and global Environmental change: Exploring the links". Geographical journal. 17 3 (1) 2007 pp.75-79.

overstretched infrastructure and services, acute housing shortage and environmental degradation. The same applies to slums in Nairobi and other towns in Kenya.

1.5.5 National Institutions and policies on Environmental Security

In various countries worldwide, there are institutions well established to handle the management of environmental issues. These are independent institutions charged with the responsibility of ensuring safety of the environment as the current generation access, utilize and benefit from the resources provided for, the institutions' main objective is to ensure that the utilization doesn't compromise environmental safety and the future generations from enjoying the same benefits. For example, in Rwanda's vision 2020, they established an environmental policy in 2003 with the aim of safeguarding the natural resource overdependence in the quest to minimize poverty while considering environmental dimensions[42]. Therefore, this demonstrates sustainable environmental management in an effort to realize sustainable livelihoods.

The Rwandese government have attained some significant milestones[43] via the development of the master town plans that helping mitigate challenges of unplanned residential areas that lead to sprouting of slums. Where slums occur, the government is fighting to minimize environmental insecurity by involving both the civil society, private sector and the residents in environmental safety measures.

Kenya has guidelines established for proper and efficient management of water quality, wildlife and genetic resource conservation efforts. There are policies in place to restrict the transfer of identified productive farmland into human settlement and commercial development. However alternative land for settlement is never designated and if any, it is either owned by a few. This affect attempts to establish legal settlement especially for the growing urban poor[44]. For example, the war between real estate developers raising rentals

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[42] Ministry of Lands, Resettlement and Environment. "Rwanda Environmental Policy" 2003_Retrieved on 23rd July 2018.
[43] Rwanda Environmental Management Authority (REMA). Top 10 Environmental Milestones for 2016: Notice_highlights, latest_news. Retrieved 23rd July 2018.
[44] Ministry of Lands and Physical Planning: Sessional Paper No. 1 of 2017; natural land use Policy. P. 12-15.

and commercial premises and the informal urban settlers on lands not legally allocated for settlement. This greatly hinders the government's enforcement of existing legislations[45] due to population growth and pressure on fast declining habitable land.

On water management, Water Resource Management Authority (WARMA), a lead agency in water resource management countrywide in collaboration with National Environmental Management Authority (NEMA) have established comprehensive water database[46] with constituted management levels to ensure a self-sustainable basis to meet the rising demand for fresh water[47]. The intention is for the good of all; the rural settlers as well as the urban populations fresh water demands, this is done closely with the urban water supply companies. However, the slum areas are often left out of the formal supply plans and the water connections are mainly illegal. Also, regulations on land and water resources and management are existing but the slum areas are not formally recognized rather left for forceful evictions. The illegal settlements with no proper sanitation results to increased pollution of the water sources[48] like the Nairobi Ngong River that traverse Mukuru Slum. Various water, land and general environmental enactments have been established[49] including; Agro-forestry program legislation through the enactment of environmental management and coordination bill of 1999, national soil and water conservation program. Despite all these, informal urban settlement receive minimal attention apart from minimal support international and churched NGOs.

1.5.6 Government Response to Effects of Environmental Security

The Kenya Slum Upgrading Program (KENSUP) was established with the aim of uplifting livelihoods of approximately 5.3 million informal settlement residents in Kenya by the year 2020. This program came into being in the year 2001. In 2003, a Memorandum of Understanding was entered between the UN HABITAT and the government of Kenya under the Ministry of Housing. The purpose was to facilitate community mobilization,

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[45] Republic of Kenya: National Environmental Policy 2013_Retrieved on 23rd July 2018.
[46] National Environmental Action Plan Framework, 2009-2013.
[47] Government of Kenya 9th session of the United Nations Commission on Sustainable development, November 2001.
[48] Mireri C. Urbanization Challenges in Kenya. Environment and Sustainable Development; Cap 7, p. 109.
[49] Republic of Kenya 2003. National Development Plan 2003-2008 Nairobi; Government Printer.

establish town development plans, provision of standard infrastructure and amenities, proper housing, solid waste management, help create income generating activities, and facilitate micro-financing initiatives, conflict prevention and addressing HIV/AIDS concerns[50] in slums. All these was in writing by KENSUP.

Apart from the NGOs and IGOs and government collaboration initiatives, policies play a significant role in sustainable development. It is argued that putting in place forward thinking laws, policies and implementation procedures as a guideline for urban growth is vital. These are among identified documentations that will assist in shaping Nairobi city in infrastructure, environment and improving residents' livelihoods[51]. In 2010, Kenya adopted a new constitution[52] which spelt out an overhaul of significant legislations nationwide. To facilitate the implementation and public understanding of the intended constitutional reforms a commission for the implementation of the constitution (CIC) came into being in 2011 that championed reforms.

Among the reforms was to ensure people took part in improving the planning and governance process for Nairobi region. The goal was the success of vision 2030, however how and where slum residents are fully engaged is still not sufficiently addressed if any, and results are not yet felt. There are established institutions like NEMA with the National Environmental Committee with a mandate to formulate policies and give guideline to the purpose of this act as NEMA oversees the implementation of the same at both local and national levels. The main objectives of the set policies is prioritization of the protection and safety of the private/corporate organizations by participating in the environmental protection programs.[53]

NEMA has a responsibility of advising the government on legislations and other existing guidelines for the management of the environment as well as implementation of relevant

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[50] The UN-HABITAT KENSUP Strategy document 2003, Nairobi Planning Innovations.
[51] Nairobi Planning Innovations 2011, retrieved 28th June 2018.
[52] The Constitution of Kenya.pdf. Archived copy from the Original. Retrieved-23rd July 2018.
[53] Green Economy Strategy and Implementation Plan (GESIP) 2016-2030.

international conventions, agreements and treaties[54]. They are responsible for awareness creation to the community at large through environmental education and creating public awareness on the significance of protection, management and sound utilization of natural resources.[55]

Efforts to ensure sustainability in economic growth cannot yield fruits in isolation of environmental issues. These are two closely intertwined in as far as Kenya's economic development is concerned, Through the Environmental action plan[56], environmental matters will be incorporated in development planning as provided by EMCA (Environmental Management Coordination Act) of 1999 provided for formulation of all level environmental action plan that is reinstated every after five years. The National Environmental Action Plan (NEAP) established themes and activities with the purpose of achieving sustainable growth. All these clearly states the available policies and institutions with the potential of championing environmental security and yield fertile ground for sustainable livelihoods hence economic growth.

1.6 Knowledge Gap

From the literature reviewed, focus on environmental security and sustainable livelihoods has been highlighted, however, much of the existing literature does not address it adequately especially pointing out on tangible efforts made to address the problem of environmental insecurity hindering sustainable livelihoods in informal urban settlement. To be specific, most informal urban settlements in SSA are still grappling in abject poverty. Efforts have been made to bring to light issues of environmental changes and the threats to sustainable livelihood globally, regional and state level. However, despite the environmental issues, human safety and influence on livelihood being debated on, still a huge gap exists on what has been done to counter the recurring environmental change risks like flash floods, air and water pollution that affect sustainable livelihood in informal urban

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[54] National Waste Management Draft BILL 2017.
[55] Role of the Ministry of Environment and Forestry- in collaboration with NEMA. Retrieved 28th June 2018
[56] ibid

settlements. Year in year out these risks are common place frustrating efforts of enhancing sustainable livelihoods in slums.

Measures taken by government in Kenya are yet to yielding tangible results on the ground because despite established policies, there are continued disruptions on livelihood in informal urban settlement areas where this study focus on. There are few studies speaking to informal urban settlement areas and the state of livelihood therein in conjunction with environmental security. Therefore, it calls for more knowledge on the same and a comprehensive understanding of the environmental insecurity issues and sustainable livelihood while gauging the adaptive capabilities of the residents and what has been done to drive sustainable livelihoods. This study aimed at filling the identified gaps and contributed to the existing limited knowledge over the same.

1.7 Research Hypotheses

This study was guided by the following hypotheses:

H1. Environmental security significantly affect sustainable livelihoods in informal urban settlements in Kenya.

H2. The national institutions and policies are not sufficiently addressing the adverse effect of environmental insecurity on sustainable livelihoods in informal urban settlements.

H2. The deteriorating quality of sustainable livelihoods in Mukuru slum can be attributed to inadequate responses by the government on effects of environmental security.

1.8 Justification of the Study

1.8.1 Academic Justification

The research on what impacts environmental security has on sustainable livelihoods in informal urban settlements focused on Mukuru Slum. The information collected and compiled is of great help to other researchers who might be interested in the same line hence enhance their research.

1.8.2 Policy Justification

The research delved on what the government is doing to ensure sustainable livelihoods in regard to environmental security matters. As evident from the state of affairs in Mukuru slum, these findings will generate relevant information for policy makers that will contribute to formulation of guidelines to address concerns of environmental security and sustainable livelihoods in informal urban settlements in Kenya.

1.9 Theoretical Framework

This research was based on two theoretical models;

1.9.1 The Environmental Scarcity Theory

This was a theory that was postulated by Thomas Homer-Dixon in 1996. In his initial paper he explains of environmental scarcity and mass violence[57]. He argues that scarcities of critical environmental resources like land, fresh water and forests, scarcity of wood contribute to conflicts in various countries across the world. In this respect, his emphasis was on the cause of conflict in society. He associates these eminent societal conflicts with competition over access, management and utilization of the scarce natural resources which destabilizes the peaceful coexistence hindering sustainable economic growth and development. This is supported by the study he conducted in South Africa mass migration from rural areas due to diminishing natural resources and increased settlement of the migrants at the periphery of the urban centers leading to growth of slums.

Environmental scarcity is a theory which considers scarcity of water, land and forests as main factors that contribute to unrest in society which occur when people lack sufficient means of supporting decent livelihoods. The tenets of this theory connect well with the variables of this study as it was conducted; environmental issues and sustainable livelihoods in informal urban settlements. It was relevant since it clearly points out on environmental issues which directly and indirectly relate with factors significant to sustainable livelihoods.

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[57] Homer Dixon, T.F. Environmental Scarcity, mass violence and limits to Ingenuity. Current History. 359-365

This theory was found relevant to the study as its tenets of supply induced scarcity brought out the link between the available limited resources like land verses the increasing population with high demand on the very scarce land. In urban slums, land is vital for housing space for decent settlement, its insufficiency results to pressure amounting to instability as needs for housing, free hold subjects masses to living as squatters and also frustrating crop and food production[58]. This is evident in many urban areas where the city planners in SSA towns have left out informal settlements on the allocation of land for decent settlement. This renders them vulnerable to environmental risks since many settle on river banks, power lines and road reserves. For example, in Chiapos, Mexico, Homer-Dixon relates Zapatista insurgents over land scarcity.

He also brings out the issue of demand induced scarcity. Which denotes the notion of fast growing population against scarce natural resources, change in consumption behavior can influence scarcity due to uncontrolled rising demand of a particular resource. For example scarcity of fresh waters in most informal urban settlements due to pollution caused by improper disposal of waste and poor drainage system. This in turn hinders sustainable livelihoods as residents here are exposed to waterborne ailments like cholera. He also argues that that resource depletion and degradation due to vulnerability of limited resources[59], in towns, population size, technologies and engagements leads to several other ranging from poor status to availability of human and financial capital that influence sustainable livelihoods.

Finally, he argues of structural induced scarcity where he points out of a severe imbalance in the sharing of power and wealth. In developing countries, the gap between the poor and the rich is widening where the rich get richer whereas the poor are deprived of the little they have. The rich have access to services and goods hence afford decent sustainable livelihoods while the poor in informal urban settlements struggle to survive a day. General

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[58] Taylor O. Human Security-Conflict, Critique and concesus 2004. International Peace Research Institute, Oslo, Norway. Vol. 35 (3); 373-387.

[59] Freeman. Nations in conflict, San Francisco. 1975. B.L. Turner et al Eds. The earth as Transformed by human Action Global and regional changes in the Biosphere over the past 300 years Cambridge, Cambridge University Press. 1990, P. 13

the tenets of this theory connected well with the variables of the study hence gave it an edge as the appropriate theory to prove or disapprove the hypotheses as put forward by the researcher.

1.9.2 Sustainable Livelihood Approach (SLA)

This theory was postulated by Sen Robert Chambers and Sen in the year 1981 and 1983 respectively. They co-authored the 1st paper that spoke on various aspects of sustainable livelihoods, in this paper they defined sustainable livelihood as a way of live with capabilities, assets (resources, stores, claims and access) and engagements necessary for a means of living. In this respect, sustainable livelihood is viewed as one that can cope with, recover from shocks, enhancing capacity and assets for providing sustainable livelihood opportunities for the current generation as well as the future generation at both the local and global levels both in the short term and long term.[60]

SLA was initiated with the drive to ignite development. The proponents viewed development as focused and directed process in which the government together with non-governmental organizations have implement projects and programs with the goal of uplifting the poor. This is evident with some visible programs in various slums across Kenya and Kibera slums stands out as one of the beneficiaries. The projects are restricted in terms of time and availability of resources. However, there is a common assumption that the benefits realized will continue to flow even after the project lifespan elapse. This is viewed as more of intentional development, but it has been criticized due to its constructed notion of who is, and who is not developed and what in the real sense development stands for[61].

Late 1990s, SLA was strongly promoted by the Department for International Development, a British government development oriented agency. The champions argued that Sustainable Livelihood (SL) is influenced by the sustainable development goals. For

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[60] Chambers, R. and Conway, G. Sustainable rural livelihoods: practical concepts for the 21st century (1992) IDS Discussion Paper 296. Brighton.
[61] Morses M.C., Namara N. Sustainable livelihood Approach. A critique of theory and Practice 2013. XVII. P. 190.

example the Millennium Development Goals (MDGs) which are applied at the local levels with the intention of meeting the global intended socio-economic and political development. SLs incorporates various players who include the government, NGOs, IGOs and the local communities all with the aim of championing SLs and uplifting the living standards of the poor[62]. SLA provides an understanding of SLs with a wider applicability. It therefore stood as a significant theory that guided the study as the proponents brought out stages of development as follows; viewing environmental risks as social, economic and political genesis causing under development on a political view[63].

1.10 Methodology of the Research

The research process was guided by qualitative research methodology which embraced use of Mukuru slum as the case study and this enabled the researcher to delve on the research problem in depth.

1.10.1 Sampling Design

The researcher selected purposive sampling in picking out the respondents. This was informed by the limited resources at the disposal of the researcher who by use of this sampling design managed to evaluate and vet key informants that met the objectives of the research. This was done by diligent selection criteria vital for selecting respondents with sufficient knowledge on the main issues. This was facilitated by generating a list of possible characteristics for the intended participants.

1.10.2 Research Site and Target Population

The study was carried out in Mukuru slum in Nairobi County comprising of; Mukuru Kwa Njenga, Mukuru Kwa Reuben, Paradise, Sinai, Kayaba, Fuata Nyayo, Jamaica, Mariguini and Kingstone. With an approximate population of 80,000 people[64].

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[62] DEHAAN, L., J. The livelihood Approach. A critical Exploration, Jan 2012. Vol. 66. No.4 345-357.
[63] de Haan, L. and Zoomers, A. (2003): Development geography at the crossroads of livelihood and globalization. In: Journal of Economic and Social Geography 94 (3), 350–362. DOI: 10.1111/1467-9663.00262
– (2005): Exploring the frontier of livelihood research. In: Development and Change 36 (1), 27–47. DOI:
[64] Irene Mbaruka. Social Worker, Mukuru Promotional Centre (MPC).Head count of the population in Mukuru slum conducted in October 2017.

1.10.3 Data collection and Analysis

The study utilized both secondary and primary sources in gathering the required informative and relevant data. Secondary data was sourced from reports, publications, published and unpublished thesis, personal as well as public records. For primary data, collection, semi-structured interview guides were used. In analyzing data, the research employed content analysis via thematic coding then analyzed the data as gathered.

1.11 Scope and Limitation of the Research

The geographical coverage of the study was confined to Kenya with detailed information collected from Mukuru slum. The research was limited to matters relevant to the study. The primary data collection was within the Kenyan geographical coverage though its implications are valid beyond the Kenyan territory.

The challenges that the researcher encountered were; finances, because the research was not funded and also time constrains given the geographical area that was covered and the insecurity due to state of the area studied. However, the researcher was determined to conduct the research after successful defense and approval of the proposal and all these constrains were overcome by using purposive sampling that ensured the intended objectives were achieved and the master's degree requirement met.

1.12. Ethical Approach

The information obtained from after the research was strictly used for academic purpose, listing of names of the respondents was optional and confidential.

1.13 The Organization of the Research

This section provides the layout and logical flow of the entire research. Chapter one introduced the topic of the study, set the broad context within which the study was conducted, it gave the statement of the problem the study addressed, research objectives, questions that guided the interrogation followed by justification of the study, then literature review which was followed closely by a brief on the knowledge gap identified, the research hypotheses, theoretical framework, and finally the methodology of the study.

Chapter two assessed the environmental security issues and sustainable livelihoods on a broader perspective, it discussed the various aspect of environmental security from global to local level and what entails human livelihood. It was followed by chapter three which provided an assessment of the impact of environmental security on livelihood in informal urban areas in respect to Mukuru slum.

Chapter four investigated and presented findings on environmental security effects influencing sustainable livelihoods as well as the responses of the Kenyan government to environmental security issues via the national institutions as guided by existing policies and guidelines. Finally, chapter five provided summary of the study findings, gave conclusion and recommendations after the study.

CHAPTER TWO

ENVIRONMENTAL SECURITY AND SUSTAINABLE LIVELIHOODS: AN OVERVIEW

2.1 Introduction

This chapter highlights the concept of environmental security and sustainable livelihoods. It examined environmental security from global, regional to the local perspectives. In addition, It elaborated on how environmental security influence sustainable livelihoods. Finally, the effects of environmental security on sustainable livelihoods in informal urban settlements in Kenya.

2. 2 Environmental Security; Key Debates and Discourses

Environmental security is an important aspect of human security, this argument forms part of major debates that have taken place in the European Union forums where Environmental change threats have been considered as a threat to humanity in line with other traditionally known threats like the cold war and current terrorist attacks[65]. It is more related to access of food, water, wood and land for cultivation and settlement.[66] Human security plays a crucial role when it comes to pursuit of development in society and more so efforts to attain sustainable development. On development, livelihoods of a people in a particular community have to be put into consideration. Whatever activities people engage in to earn a living are always dependent on their surroundings.

The aspect of security plays a key role to the Millennium Development Goals (MDGs) put forward with the aim of attaining sustainable development globally. In connection with this argument, environmental security forms part of the core security concerns that require maximum attention worldwide towards a competitive but self-sustaining ecosystem. There is need for harmonious coexistence between human beings and their surroundings. This has attracted debates that have led to various countries being involved unto ensuring safety of environment by the help of the International Environmental law through which each and

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[65] European Commission Vice-President. "…….the severe threat to human security are environmental effects in relation to the influence of climate change." (SvD, 2008)
[66] Eric van de Giessen. Environmental Security for Poverty Alleviation Program, 2011. Environmental Security Assessment p. No. 11-13.

every states activities that affect the environment are monitored. IEL help restrict the access, use and natural resource over exploitation as well has minimizing pollution of environment to boost efforts towards sustainable development.[67]

Over time, there is a notable trend of rising issues and environmental challenges in many countries worldwide which has influenced a growing crisis on environmental planning and management. Rising urbanization worldwide combined with problems of resource shortages, environmental pollution and demands for economic restructuring pushing for a strategic planning to attain sustainability. In many urban areas, the complexity of sustainable planning and management not only affect the formal settlements but also the informal urban settlement areas which especially in developing nations are ignored when it comes to urban planning for habitable housing development.[68]

From numerous debates carried out, it's argued that secure environment calls for working collaboratively; governments, non-governmental institutions, locals and the international community. Governments and their operation machinery need to embrace strategies and plans that bring together the state and its people in working for a secure environments hence general growth and development. A good example is in Mumbai-Versova beach cleaning where trash and piles of waste has been cleared from the beach. However, it's not only cleaning but also afforestation, reforestation, minimization of over-reliance on scarce resources and proper management that will lead to secure environment as a catapult to sustainable livelihoods.

To counter environmental hazards, it is widely agreed that it is important to work together with the natural environment rather than being against it. Nature and human coexistence requires initiatives that attract harmonious relationship that work to ensure sustainable use of scarce natural resources linking with rising demand by the world's fast growing

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[67] Lakeshman, D., G. International Environmental Law in a Nutshell (West, 4th ed, 2012)
[68] Geroe, S.J.W. The Sino-Singapore Tianjin Eco-City: International Journal of Sustainable Development. Vol. 12. Issue 6. P.7 PR.987-994. August 2017.

population. When population increase, demand for food, shelter and other basic necessities for survival also rise. Not to forget the security concerns and aspects related to it.

Therefore, to meet these needs for the present generation without compromising the future generations enjoying access and use of the same needs require an all-inclusive initiative rather than individualized selfish desire[69]. A good example is the European Union advanced debates on the significance of environment as a major concern to sustainable development. As part of the security politics. For example, after the Cold War, the EU commenced the quest for viewing human security with environment at the core of security issues hence assuming a new security role. This shifted their attention to matters of environment as being vital hence cannot handle security in its isolation.

Globally, there is urgent need for people to change the perception of communal responsibility in safety of the environment. Individual responsibility to protect environment like on waste management goes a long way to secure mother-nature, this in turn will counter the rage that is experienced when floods occur and the hunger strike due to prolonged drought. From existing reports, natural resources assigned for private ownership have over time been found to be the best managed under the watch and adherence to IELs and local guidelines controlling access and utilization. Therefore, more privatization rather than public ownership could be a good step towards environmental security for sustainable development at the same time ensuring sustainable livelihoods for the owners as well as the employees.[70]

2.3 Environmental Security in the Sub-Saharan Africa

In Africa specifically the SSA region, a huge population rely on natural scarce resources for their daily living. Capability and support from the leadership that is meant to provide all necessary support for their wellbeing is a challenge hence predisposing many to conflict which is a barrier to growth and development[71]. Anything that deters the progress towards

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[69] Fred, L. Smith J. Environmental Protection 2010. Is There a Better Way? Retrieved on 8th August 2018.
[70] Fred, L., Smith J. Enhancing the Private Role for Public Goods 2015. Lands and Wildlife. Competitive Enterprise Institute. Retrieved on 8th August 2018.
[71] Wangari, M Environmental Change and Security Program and Africa Program. April 13th , 2009.

sustainability has to be quickly looked unto, addressed and means and ways to face it hence suppress its negative impact sort for. In this respect, the issue is environmental security. Over time, environmental changes have resulted to hazards that predispose vulnerable populations to risks of diseases, displacements, loss of lives[72] and stagnation in development. Clearly, environmental insecurity is a real time problem in Africa.[73]

Insecurity matters are among main challenges as highlighted being natural and man-made environmental threats coupled with huge external debt burden, dropping world market-Africa bound commodity prices and insufficiently skilled human skills make SSA remain behind and far from attaining sustainable development. In many countries across the region, rural to urban migrations has led to rising levels of urban poverty for example in Chad hence affecting sustainable livelihoods in urban areas[74]. Due to heightened urban poverty, environmental risks get many dwellers in vulnerable informal settlements unaware with no capacity to handle the eventualities[75].

The rising harmful impacts of degrading environment on human security in SSA, has received but minimal attention than they deserve[76]. Environmental destruction via climate change, deforestation, damaging of biodiversity is on the rise impacting on fragile human conditions in the region. One among identified threats are dwindling food supply, personal security, malnutrition, health insecurity, decaying environment and economic insecurity like in the case of Somalia for the past two decades. Due to all these, SSA countries are left incapacitated as spectators of the unfolding dangers. The institutions and policy makers have done but little effect is felt on conservation of environment as a huge population here rely on natural scarce resource for their survival.

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[72] Global Humanitarian Forum (2009).The Anatomy of a Silent Crisis. Human Impact Report Climate Change.
[73] W. Rachel. Interview with Wangari Maathai, founder of the Green Belt Movement and recipient of the 2004 Nobel Peace Prize. Ronald Reagan Building & International Trade Center, May 5th 2009.
[74] United Nations General Assembly. New Urban Agenda 2015. Retrieved on 06th August 2018.
[75] Akokpari, J. Environmental Degradation and Human Insecurity in Sub-Saharan Africa 2012. Faculty of humanities, Department of Political. Retrieved-July 31st 2018.
[76] UNEP (United Nations Development Program). Africa Environmental Outlook, Our Environment, Our Wealth 2006. UNEP Office. New York.

In the SSA region, environmental insecurity threats are underrated and issues of environment classified as 'low politics'. Most governments in the region view themselves as having minimal obligations on attention to environmental security. This has contributed to worsening state of environmental degradation with heightened threat to human survival[77] and a bottleneck to sustainable livelihoods. SSA is continually denoted with violent conflicts, for example the war in Somalia, South Sudan and embattled Darfur. This is so whereby the state of affairs is by uncontrolled rising population, over reliance on scarce resources sewed with environmental hazards[78]. This is due to environmental changes resulting to over-stretch and stressed marginal environments with weak governance hence shows an existing link between regional stability, sustainable livelihoods and environmental factors.[79]

Africa has quite a number of problems related to environment. There is scarcity of vital resources like clean sufficient water for human consumption, livestock and agricultural use. This has bred enmity between and among communities and across borders. A good example is North and Eastern Kenya; Ethiopia and Kenya, Uganda and Kenya over Migingo island; the Nile river controversies among many others. Access to fresh clean water is a challenge, highly polluted waters that are risky to health with increased air pollution predisposing many slum dwellers to water and air-borne diseases and this in turn affect human activities that boost sustainable livelihoods.

Access to adequate and balanced diet foods is another problem, across African slums, a huge percentage has minimal capacity to afford three meals a day. From early study reports, live in slums is so demanding that many households survive on a meal a day. There are many reported visible cases of malnourishment for both the aged, adult and children[80], more evident arid and semi-arid parts of Africa where extreme weather conditions lead to hunger that kills and or floods that wash away shelters, livestock and people and this

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[77] United Nations Development Trends Index 2011. Retrieved July 31st 2018.
[78] UN (United Nations) Millennium Development Goals 2009. UN's Statistics Division.
[79] Transparency International. Corruption Perception Index, Kenya, 2014. Retrieved July 31st 2018.
[80] Smith L, Alderman H, Aduayoum D. Food Insecurity in Sub-Saharan Africa: New Estimates from Household Expenditure Surveys. Washington: Food Consumption and Nutrition Division, International Food Policy Research Institute; 2006.

heavily affect agricultural production of food crops and sustainable livelihoods in slums that depend on rural areas for food supplies.[81]

2.4 The link Between Environmental Security and Sustainable Livelihoods.

The world Conservation Union (IUCN) conducted a sophisticated scrutiny on issues of environmental security and development. This contributed to establishment of how environment affects economic growth and development in communities. The review sort to establish the trending debate on human security and environment focusing on its implications on development support. All the studies were tasked to present their findings on the peace conservation resources like forest cover, livelihoods[82] and security globally but specifically in Africa. It was established human activities result to scarcity and vulnerability and has an impact on livelihoods safety rendering many susceptible to poverty. NSRs combined with environmental degradation affect human safety across the world mainly in the global south, and makes many countries vulnerable to unfair competitions that are fertile grounds for violence which in turn affects sustainable livelihoods.[83]

In establishing the connection between environmental security and sustainable livelihoods, environmental hazards emerge as an issue linking issues of social justice and equity. In Kenya for example, people and their communities rely on natural scarce resources making environment matters and growth to sustainability surrounded ideal on access and resource use rights with institutions formed to handle the same. In this respect, individuals and communities with nothing else to lean on apart from natural resources remain marginalized since their rights for free access is highly restricted with limited space to exercise their rights whenever they are championed.

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[81] Zerbe N. Feeding the Famine? 2004. American Food Aid and the GMO Debate in South Africa. Food Policy: 29: 593-608.

[82] Kaumowitz D. Forest and Rural Livelihoods in Developing Countries 2003. Center for International Forest Research.

[83] Mathew, Richard, Mark Halle, Jason Swetzer eds. conserving the peace 2002. Resources, livelihoods and security. International Institute for Sustainable Development and IUCN- The world Conservation Union. Winnipeg.

The conflict between traditional and contemporary systems to ownership of property form the basis of environmental security and livelihood. Informal settlements earn their living from casual and manual labor and small scale businesses. However, they indirectly and directly rely on natural scarce resources like supply of food stuff from rural areas, when risks like prolonged drought occur it affects food pricing. In Kenya on slum settlement matters, land is a problem and many forcefully camp and set up settlements on illegal land to which they have no tenure rights and this becomes a challenge politically, socio-culturally and economically.[84]

Issues of land access and ownership rights need to be dealt with objectively in connection with other variables to safe people from insecurity due to poor housing[85], control resource degradation in the wake of rising population building pressure on natural resources. Environmental and sustainable livelihoods nexus is considered a complex matter as it encompasses other elements in as far as and utilization of natural scarce resources are concerned. These elements include political good will, institutions controlling the access and utilization rights, culture and socio-economic status[86] of most developing countries like Kenya. The study will focus on informal settlements and environmental hazards that affect slums.

2.4.1 Environment and the Informal Urban Settlement

Informal urban settlements constitute urban poorly planned settlements located on illegal land settlements where they could be occurring as squatters on either public or private land with no legal rights of ownership. They are commonly characterized with overcrowding, dilapidated living shelters in the outskirts of city centers. The vulnerability of these settlements make them prone to risks of environmental and climatic change. Most residents are poverty stricken where some rely on small scale business, casual labor and menial jobs

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[84] Robin M. Formulating a Sectoral Approach to Urban Land Policy. The cause of Kenya. Land Governance in Support of the millennium Development Goals 2009. FIG-World Bank Conference. Washington D.C.
[85] United Nations Development Programme. Environmental Justice 2014.
[86] Enemark, S. and McLaren, R. "Preventing Informal Development – through means of sustainable land use control" 2008, FIG Working Week Proceedings, Stockholm, June 2008.

to earn a living[87]. When calamities occur, they have no capacity to handle them and many are affected hence window for sustainable development becomes strained and impossible[88].

For a better understanding of informal settlements in Kenya, focus is directed to information on social and health issues that residents wrestle with and the impacts the slum settlements have on the environment around them which include: pollution of rivers, clumsy surroundings with illegal damping of waste that form part of these settlements, water pollution and lack of proper sanitation. The following highlights the conditions within which informal settlements exist.

a.) Socio-economic conditions and settlement formation

With the conditions in many informal urban settlements, people get it rough trying to cope and having a sustainable livelihood. Due to the raging pressure, many are challenged since a sustainable livelihood require both for the present population needs and the future while ensuring that the available resources are utilized responsibly. However, this is far from being practical in informal settlements in Kenya among them Mukuru slum. These settlements are marred with inequality on patterns of their setup which can only be traced from the historical growth of towns and urban centers where they are expressed in the poor statuses of urban areas in Africa[89].

From reports in the recent past, urban poverty is growing and SSA is ranked among the regions with rising human poverty.[90] They indicate that, the number of people in poverty decreases, however the actual percentage is increasing. Evidence on estimates recently

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[87] World Bank. Approaches to urban slums 2008; UN-Habitat (2015), Streets as tools for urban transformation in slums; Cities Alliance (2010), Building Cities; Cities Alliance, World Bank and UN-Habitat (2002), Cities without Slums.

[88] Fincher, R. and Iveson, K. Planning and Diversity in the City 2008; Vicki-Ann Ware, Hellene Gronda and Laura Vitis. AHURI Research Synthesis Service 2010: Addressing locational disadvantage effectively; Mitlin, D. and Satterthwaite, D. Urban Poverty in the Global South 2013.

[89] Tostensden, A., Tvedten, I. and Vaa M. (Eds). Associational life in African Cities 2001. Popular Responses to the urban Crisis. Stockholm: Nordiska Afrikanstitutet.

[90] United Nations Development Program (UNDP). Human Development Report 2016. New York: Oxford University Press.

show Africa as a region with a big share of people living below a dollar a day.[91] Though slight improvement, SSA is still doing badly economically leaving the slum dwellers among others vulnerable to environmental hazards and this stands as bottleneck to sustainable livelihoods.

b.) Informal Settlement Formation

United Nations Commission of Human Settlement (UNCHS), is one of the key agencies by the UN handling human settlement and working towards a sustainable urban development. Since its commencement, it promotes environmentally and socially reliable and sustainable towns and cities with the aim of giving adequate shelter for all. However, still exists a huge gap to attaining the mandate as most informal urban settlements are full of shanties for houses which are prone to dangerous environmental hazards.

For many countries, around the 1960s to 1970s, after the end of the colonial rule in many of the western colonies, urban area grew exponentially[92]. In Africa, the urban growth rate based on rural-urban migration was at 5-7% with doubling population in 10-15 years' time frame[93]. However, SSA records least urbanization rate.[94] Worldwide urban areas are major drivers of economic growth where the quality and housing required and provided for has a long term consequences on inclusive growth. Ability to own a home is one largest expenditure one will ever make. This is because a home is a vital household asset for each and every person[95]. The location of homes are key as they influence the quality of town life and prospects for social mobility.[96]

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[91] United Nations Commission of Human Shelter (UNCHS). Cities in a globalizing World 2001: 14. Global Human Settlements 2001. London: Earth Scan. Though slight improvement, SSA is still badly economically leaving the slum dwellers among others vulnerable to environmental hazards and this stands a bottleneck to sustainable livelihoods.
[92] UNCHS-Habitat. An urbanizing World 1996. Global Report on Human Settlement 1996. Oxford: Oxford University Press.
[93] Mabongoje A., L. "Security for the Urban Poor: an African Regional Perspective in Proceedings of International Forum on Urban Poverty (IFUP). Third International Conference on Social Integration and Security of the Urban Poor. 1999, Towards Cities for All, Nairobi: 12-14 October 1999.
[94] UN-Habitat. The challenge of Slums. Global Report on Human settlement 2013. Nairobi.
[95] UN- World Urbanization Prospects 2014. Revisions United Nations 2014. New York.
[96] World Bank. Planning, connecting and financing Cities-2013. Priorities for City Leaders. Washngton, DC.
………2016, doing business database Washington, DC. Work Bank.

Contrary to concurrent urbanization and economic per capita growth in SSA, the income levels for many in urban areas are not in tandem with urbanization as dwellers in slums struggle to meet the decent housing needs. This is caused by the huge gap between the poor and the rich a problem propelled by inequality in distribution of the national cake due to weak governance. This has led to the mushrooming of slums where many from poor rural backgrounds struggle to put up with devastating conditions surviving a day. Many countries in the SSA region lack formal investment in housing.[97]

Generally the conditions of housing units in informal urban areas can be described as temporary resulting to shaky housing. 95% of the houses are susceptible to risks of floods, typhoons. Mudslides and earthquakes. Due to inadequate access to necessary urban services which include clean water supply, proper sanitation there is heightened mishandling of wastes hence many are prone to diseases caused by highly polluted waters and general living conditions.[98] Where there is piped water supply, the connection is hardly serviced and maintained hence do not operate.

c.) Sustainable Livelihoods

Sustainability can be defined as once ability to maintain at a given level. While sustainable development refers to the ability to meet the need of the present while ensuring not to compromising the future generations ability to meet their own needs. To attain sustainability, it's a practice to rationalize the consumption of the available resources which include the tangible resources like finances and energy while the intangible like equity, social justice, culture and human rights. Where there is excessive utilization of these resources it leads to depletion and in the long run causing problems.

Continued excessive reliance and overexploitation of resources has influenced pollution leading to rising environmental catastrophes with no enough and proper financing to

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[97] Dasgupta, Basab, Somik V. Lall and Nancy Lozano-Gracia. Urbanization and Housing Investment 2014. Draft Report. World Bank.

address the unfolding problems plunging many African states into an economic crisis. Generally, it's argued that sustainable livelihoods include the ability to live within ones ecological means.[99] From an early economic report conducted, sustainability rely on the following pillars:

    i.)   Social equity. This entails a means of equipping mankind with all their essential needs which include security, health, education, equity, affordable housing, cultural heritage, jobs and aesthetic values

    ii.)   Economic success. Is viewed as a way of providing economic viability that can last a long term.

    iii.)   Environmental quality. It entails the ability of a people to interact with their surrounding while ensuring no harm to it.

If these pillars could be integrated well and fully implemented. The problems informal urban settlement face could be a thing of the past and therefore have steady developing cities and towns in SSA. However, weak governance systems prevent informal urban settlements' ability to realize sustainable livelihoods. For these reason, urbanization of poverty is on the rise and human security shaky hence futile grounds for sustainable livelihood. Livelihoods is a way in which people live their life and how their needs are met but in away considered appropriate. Sustainable livelihoods are considered as one built on the reasonable equity, capability and sustainability where both are ends and means to attain reliable standard living.[100]

The idea of sustainable livelihoods is one directed by the desire to minimize and eventually do away with poverty.[101] For development to be achieved in SSA, sustainable livelihood is one key indicator[102]. To counter urbanization of poverty, informal urban settlements

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[99] Liu, L. Sustainability 2009. Living Within one's own ecological means. 1 (4). PP. 1412-1430. Accessed August 4th 2018.

[100] Chamber, R. and Conway, G.R. Sustainable Rural Livelihoods 1992. Practical Concepts for the 21st Century. Otro. 292 (296). P. 33.

[101] IFRCRCS (International Federation of Red Cross and Red Crescent Societies World Disaster Report 2001. Retrieved on August 04th 2018.

[102] Durand-Lasserve, A. Security of the Tenure for the Urban Poor in Developing Cities 2000. Home Ownership Ideology v/s Efficiency and Equity. Draft Paper for Urban 21 conference. National Center for Scientific Research (CNRS)-France, University. Denis Didevot-Paris.

require proper attention. For example, in Kenya talking of dealing with security calls for a wholesome approach where security in urban cities and towns require that sustainable livelihood in slums cannot be ignored.

2.5 Conclusion

From literature reviewed, environmental security has a significant impact on sustainable livelihoods in informal urban areas. Many slums are prone to insecurity struggling with challenges of environmental hazards like floods, water and air pollution and lack of proper sanitation. The slum dwellers live in temporary houses not complying with the law. Whenever disaster occur, they are least attended though worst hit.

Informal settlement dwellers rely on small scale business with least profits, menial casual labor such that when environmental disaster occur they are totally devastated as they lose the little they have for survival and due to incapacitation they remain struggling to survive a day, this hinder sustainable livelihoods. It is true that efforts are made on environmental security boosting, there are policies and institutions across handling the same but the problem remain that all seasons when floods, water pollution and perennial settlement land challenge occur the slum dwellers are in problems. The study sought to establish the existing gap and why the challenges to sustainable livelihoods persist.

ROLE OF GOVERNMENT, NATIONAL INSTITUTIONS AND POLICIES ON ENVIRONMENTAL SECURITY

3.1 Introduction

This chapter explain in detail how environmental security for sustainable livelihoods is managed by existing international, regional and national institutions whose operations are guided by established policies that collaboratively guide the control and minimization of harm to the environment. This the lead to ensuring sound interactions between humanity and their surrounding in pursuit of livelihoods. The chapter also highlights international treaties that inform formulation of national institutions and policies on environmental security in developing nations. It pinpoints the Kenyan government's role in environmental security. It further denotes the national institutions and departments via which the government pushes the agenda for equality and sustainable development for the current generations as well as the future since most livelihoods are highly reliant on accrued benefits from natural resources.

3.2 1nternational Institutions Responsible for Environmental Security

Environmental security is a pertinent component of human security,[103] socio-economic growth cannot be pursued in isolation of environmental security concerns. Worldwide environmental deterioration due to human activities has become a major concern where commonly the environment that harbor resources necessary for supporting a living is being attacked both internally and externally. After the cold war, attention from military security shifted to non-military security as they gained interest in environmental conservation and protection which made progress from the early 1970s.

3.2.1 United Nations Environmental Program

The United Nations Environmental Program (UNEP) formed in 1972 as an aftermath of the UN's Conference on human and Environment with a skilled workforce and funding for

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[103] Allan, C. Contemporary Security Studies 2013. Great Britain. Oxford University Press. P. 190-207.

its operations on protection of the environment. As an agency it is mandated to coordinate environmental activities while helping developing states to implement appropriate environmental policies and practices. It champions environmental debates via workshops and conferences held on issues relating to environmental protection and conservation and issues of climate change a major problem facing the world. It advocates internationally recognized strategies for achieving the green economy[104] through mainstream organizations and institutions that seek to ensure effective and sufficient environmental governance.[105]

To attain its objectives, vision and mission, globally UNEP has spearheaded formulation of international environmental conventions[106] that form the basis upon which respective states anchor their environmental policies by ensuring productive and inclusive environmental protection and conservation while minimizing it's deterioration as a means to counter the dangers of eminent risks related to climate change. This is achieved through established regional institutions like the AU and environmental non-governmental organizations cooperating to firm up environmental protection and sustainable development projects. The UN environmental arm has helped formulate frameworks and sound guidelines as well as treaties that control international trade which is highly associated with handling of harmful substances across borders, trans-boundary air and water contamination and pollution whereby relevant international environmental treaties that inform state laws are used to restrict and control trade across borders.

Sustainable development is the main goal for both the developed and developing divides of the world. It is purely anchored on the UN Conference held in 1992 and as continued in the 2012 in Rio, both conferences called for sustainable development.[107] The assessment of achievements over past years was presented and discussed at length while chatting the

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[104] Alister, D. Reformed UN formula for Making Planet greener to get first Test. Reuters. Accessed on 6th Sept 2018.
[105] Schrijver, N. Development without Destruction 2010. The UN and Global Resource Management. United Nations Intellectual History Project Series. Bloomington, Indiana. University Press. P.116.
[106] Paul Berthoud. Professional Life Narrative 2008. Inside the UNEP. Accessed on 6th Sept 2018.
[107] Dodds, F., Strauss, M., Strong, M. Only One Earth 2012. The Long Road via Rio to Sustainable Development. London. Earth Scan.

way forward to sustainability given the eminent threats and hazards associated with climate change characterizing the reactive agitated mother nature, for example the stormy hurricanes across Texas to parts of Europe coastal regions affecting lives and destroying infrastructure in perceived sustainable developed world. The summits focused on economic and governance while linking its impacts on environmental protection and conservation initiatives.

In relation to this study on impacts of environmental security on sustainable livelihoods in slums, the summit held in 2012 depicted sustainable development[108] especially in urban centers. Achievements in some specific urban areas from the previous summit action plans were identified in Canada, USA and Japan who had made significant strides on minimizing air and water pollution[109], for example in the Kitakyukyu city in Japan which has embraced international education and training in their municipal pollution control initiatives. This drove the desire for this research to establish what is happening in urban areas in Kenya and specifically slums which are characterized with adverse effects of environmental hazards.

3.2.2 The Institute of Environmental Security (IES)
This is one among key internationally identified non-governmental organization to champion global environmental safety. Among its key mandate is to advocate for maintenance and preservation of ecosystems that generally support lives. This promotion for protection of ecosystems qualifies as the core principle of the formulated internationally recognized environmental policies.

IES work to enhance efficient governance of environment by attracting government heads to pay attention to environmental security as a way of minimizing conflicts associated with insecurity that arise and also boosting the socio-economic development with the aim of alleviating poverty. In so doing, IES is gaining the political good will that embrace a

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[108] Elizabeth, C. Environmental Security 2012. A Case Study of Climate Change. Pacific Institute for Studies of Development, Environment and Security.
[109] Farah, P., D. Sustainable Energy Investments and National Security 2015. Arbitration and Negotiation Issues. Journal of World Energy Law and Business. 8(6).

multidisciplinary approach which entail setting financial frameworks to help protect and conserve the globe's ecosystems promoting lives. They enhance elaborate guidelines that strengthen the international law on environmental governance, have put in place means for informing international policy makers, target groups at regional, national and local levels including willing donors with the objective of boosting creation of appropriate tools to facilitate decision making[110]. By and large they promote linkages that connect issues of environment, security and sustainable development policies that inform governance of environmental security issues and finally work to grow environmental awareness, hence its significance to people and organizations therein.

Various programs have been initiated in Africa with the aim of not only curbing violence associated with fight over control of scarce natural resources but also poverty alleviation via supporting self-sustaining livelihoods among these programs is environmental security for poverty alleviation which was formed with the goal of bringing together various engagements of the IES. For example in the year 2006 it initiated a program that lasted for five years that was funded by the government of Netherlands by the Ministry of Foreign Affairs[111] that worked to ensure security of scarce resource for all in the horn of Africa that depend on it for their livelihoods.

The program was set to investigate specific areas in the region vulnerable to threats of environmental security, while seeking to protect the very environment by monitoring for any possible environmental insecurity and conflicts. To achieve this they resorted to establishing the influence of poverty and conflict in regard to environmental security threats and whether to consolidate aspects of environment through the natural resource base in order to minimize violence and alleviate poverty. In the same respect, this paper seek to establish how efforts to promote sustainable livelihoods can be integrated with environmental security aspects in slums so as to unsure secure and a safe environment for

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[110] Healy, S. (2008), *Lost Opportunities in the Horn of Africa: How Conflicts Connect and Peace Agreements Unravel.* Published by Chatham House - Royal Institute of International Affairs, London, United Kingdom, 2008.
[111] Millennium Ecosystem Assessment. Ecosystems and Human Well-being 2005. Synthesis. Island Press. Washington DC.

thriving livelihoods for the poor in slums. Part of the UN sustainable environmental protection initiatives is:

3.2.3 Millennium Development Goals and Environmental Security

The MDGs were formulated in 2000 during the millennium summit when the UN report, "We the People" was launched in the presence of representatives from across the world. The summit covered pertinent environmental matters including environmental protection, human rights and poverty reduction. Among the eight goals stated, this paper focused more on the two main ones that informs the objectives of this paper which include;

The Millennium Development Goal no. 7 that seek to ensure environmental security that resonates with the management of natural resource base and the ecosystem sustainably while meeting people's needs in terms of social, economic and environmental requirements but more so sufficiently. However, over time climate change pause a challenge to efforts made to meet the human needs whereas human activities in pursuit of this needs has contributed to climate variability with inevitable hazards. It has led to reduced fresh water capacities, reduced food productivity due to strained agricultural production resulting to insufficient food supplies that has attracted rising costs that the poor in slums cannot afford hence food, nutrition and health insecurity.

This goal on environmental security has an elaborate aim seeking to integrate sustainable development principles into every states' programs and policies to help minimize the depletion of scarce environmental resources. By 2020, it aims to attain a significant improvements in lives of close to 100 million people[112] staying in vulnerable areas. This is planned to be attained through reduction of biodiversity loss by reducing the rates of its loss and halve the global population with no sustainable access to clean and safe drinking water and basic sanitation. With this spirited efforts from the year 2010, there is remarkable achievement of the goal which include slide recovery of the ozone layer from depletion,

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[112] Maret, S. True Community 2011. Connecting the MDGs to Public Library Services in the US. Information, Society and Justice, 4(2). P.22-55.

and some slight increase of people accessing clean drinking water sources from a recorded 76% in 1990 to 91% in 2015[113].

On the other hand, the Millennium Development Goal No.1 seek to eradicate poverty and hunger[114]. These are among major problems that face the poor in developing nations especially SSA. The goal speaks directly to the dependent variable of this paper-sustainable livelihoods, to be able to eliminate poverty and address hunger among the poor, governments have to come up with plans ensuring that people in vulnerable areas with unfavorable conditions are provided for, and empowered such that their means of earning a living is not only meant for surviving a day but also last long to sustain lives[115]. This goal talks of extreme poverty which is defined as a state characterized by severe deprivation of access to basic needs which entail safe drinking water, food, shelter, health, sanitation, education and information[116]. All these stand out as major problems that the slum dwellers face on a daily basis whereby accessibility to these essentials is constrained with low income levels and inequalities access of basic services.

The goal was aimed at minimizing poverty with the first deliverable measured in 2015 where some significant reduction was recorded. However still in SSA, in many rural and urban areas, poverty is still on the rise like Nigeria having recorded a highest number of the poor despite its vast resource base. Same case with Kenya where the gap between the rich and the poor is so huge that efforts to reduce poverty levels are barred with overwhelming numbers of the poor against resources available. This paper picked on one key factor (Environmental Security) which forms the independent variable that is vital in the push to attain this goal.

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[113] United Nations Development Program. Multidimensional Poverty Index (MPI) 2012. Retrieved on 6th Sept 2018.
[114] United Nations Fact Sheet. 'We can End Poverty' 2015. Planets Poor set to swell as World Bank Moves Poverty Line 2015.
[115] Monitor org. Ensure Environmental Sustainability 2016. Millennium Development Goals. Retrieved 6th sept 2018.
[116] Vandemoortele, M. "The MDGs and Equity" 2010. Oversees Development Institute.

3.3 Regional Institutions managing Environmental Security in Africa

Environmental security in the African continent face a number of challenges that make it so unstable. The instability can be purely associated with a fast growing population that entirely depend on the natural resources for livelihood. Due to absence of alternative means in most areas in the region, a lot of pressure build on the increasingly diminishing resources rendering the environment insecure in that it worries what the tomorrow's generation will survive on. The main drive for rising environmental insecurity is the increasing demand for land for settlement as well as need for trees as the main source of energy that has resulted to large scale deforestation[117] with minimal efforts to conserve and protect the same.

Alongside rising demand, a problem emerges in relation to environmental governance. In most cases like recently witnessed in Kenya revealed by the ministry of Environment and natural resources, those entrusted to protect the very environment for example forests are the very people who allow illegal logging for their selfish gain[118]. This highly frustrates the effort made to secure the vulnerable environment that support livelihoods. Despite these, at the regional level, there are institutions that play a significant role on governance and management of environmental security.

3.3.1 African Union

This a regional body that bring together states of African continent in dealing with various issues that affect the continent in one way or the other. It succeeded the Organization of African Union and aims at integrating the continent[119] to facilitate collaboration towards economic, social, environmental and political development. It champions development related goal for the continent at the global level. For support of a secure environment in the continent, AU has embraced partnership with organizations like UNEP, United Nations Framework Convention on Climate Change (UNFCC), Private Sector and Environmental

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[117] Institute for Environmental Security. Environmental Security Assessment, Horn of Africa 2011. The Hague. Netherlands.
[118] John, K. How Timber Mafia walked away with Uhuru's 2 billion, May 28 2018.Daily Nation.
[119] African Union. Specialized Technical Committee 1999. Committee on Industry, Science and Technology, Energy, Natural Resources and Environment. Executive Council of the African Union.

organizations. This partnership has influenced joint workshops aiming at assessing achievements and identified challenges in implementing the Agenda 21 on climate change and environmental insecurity as well as the Rio +20 summit 2012 Conference on sustainability in development.

AU advocates for a safe and successful future for Africa through proper environmental protection via socio-economic sustainable development strategies. With vibrant political good will. To attain environmental security in both rural and urban areas, AU works through identified agents and NGOs to harness each states capability to fast track environment protection and conservation for sustainable development since most countries' economies rely on natural resources. This is done through initiatives aimed at creating awareness on environmental security and climate change at the regional, national and local level. This boosts socio-economic development while emphasizing conservation of the highly threatened resource base in the region.[120]

To achieve its goal on environmental security, they have specialized technical committees that handling issues of industry, science and technology, energy, environment and natural resources which are answerable to the Executive Council. For example, the Conference of Ministers Responsible for Environment and Conferences of Ministers Responsible for Water. This committees perform important tasks on environmental security initiatives bringing together members of states where in each state there are institutions charged with the responsibility of implementing agenda 21 via specialized manpower operating under formulated environmental policies on issues of environmental security. This paper narrowed down the research to Kenya and specifically informal urban settlements' environmental insecurity and its influence on livelihoods of the slum residents.[121]

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[120] Smail Chergui. The African Unions role in promoting Peace, Security and stability: From Reaction to Prevention? 2014. Commissioner for Peace and Security, AU. Associate Fellow. Chatham House.
[121] African Union in a Nutshell. Retrieved on 6th Sept 2018.

3.3.2 Intergovernmental Authority on Development (IGAD)

It is one of the key institutions in the horn of Africa that focus on issues of development and environmental governance. Its member states constitute of Kenya, Eritrea, Uganda, Ethiopia, Sudan, Somalia and Djibouti where the headquarters are based[122]. Its main objective is to boost regional cooperation of these states by bringing together state heads in consultative level engagements for making decisions that yield development and environment policies that give guidelines on management of environment security in the region. As an institution it employs strategies that are useful and viable economically, socially and politically at the regional, national up to the international levels using the skilled resources and funds for its operations. It works consultatively while embracing a holistic approach on programs focusing on development agendas[123] rather than stand-alone projects as initially done by its predecessor.

One of its strategy that has seen it yield meaningful results is formation of programs guided by development oriented strategies, legislations and policies of each member states as included in respective state Poverty alleviation strategy papers, National Development Plans and Sessional established papers on particular pertinent issues. To achieve these development objectives it integrates state ministries and related national institutions who are responsible for implementations of the policies pointed above that seek to influence national priorities ensuring value addition for the progress to standard living. It has a policy organ that influence development policies in its member states and much of the decisions are arrived at in various meetings and workshops held on the position of various issues concerning the region much of which focus on holistic approach to development of each state.

IGAD formulated a regional Strategy within set timelines 2011 up to 2015 that was founded on the directing and enhancing regional unity whose implementation emphasized on key issues of food security, economic cooperation, regional integration, environmental

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[122] IGAD. Land Governance Project Pioneering African Union Land Initiative 2018. Peace Prosperity and Regional Integration

[123] Myles W. CBE. IGAD's Role in Stability and Diplomacy in the Horn of Africa 2013. The Open University. Chatham House May 2013.

protection, peace and security.[124] This over time has facilitated regional cooperation of all stakeholders with a common goal and focus hence providing operational framework for enhancing partnership and collaborations for more specific interventions at both regional and respective state levels. This has facilitated increased member state participation, raising awareness in regional community and specific focus areas like on drought risk management, ensured better management, monitoring, evaluation and improved reporting on progress made in each member state. It also boosts unity and emerging of successful partnerships on handling the environmental risks experienced.

This elaborate role played by IGAD clearly shows that yes there is progress in as far as environmental security for sustainable development [125]via meaningful livelihoods. However this paper wanted to delve on the extent to which slums are involved and the impact it has given the notable environmental hazards they face and why they still remain in deplorable economic state. To further achieve the main objective of the study, the paper further analyzed the Kenyan institutions and policies alongside role they play on environmental protection for sustainable livelihoods.

3.4. National institutions handling Environmental Security in Kenya

The need to ensure a safe environment calls for establishment of guiding frameworks that inform the actions taken by existing national institutions while executing their mandate. In this respect there are set principles and mechanisms followed in order to ensure that pursuing of human needs and demands to grow and develop does not ignore environmental needs and demands for its preservation. Countries worldwide need to have provisions in the respective rule of law providing for justice in as far as protection of human security and environmental security is concerned.[126]

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[124] IGAD. Terms of Reference for National Consultant Study on In-State Early Warning Mechanisms and Their Potential Linkage to the IGAD CEWARN Mechanism.

[125] IGAD. Draft Protocol on the Establishment of Conflict Early Warning and Response Mechanisms for IGAD Member States 2003.

[126] Benedick, R.E. Human Population and Environmental Stresses in the Twenty First Century, Environmental Change and Security Project 2000, 6: 5-18. Woodrow Wilson Center for Scholars, Smithsonian Institution, Washington DC, USA.

3.4.1 The National Environmental Management Authority

It is one of the key institutions through which the government of Kenya manages, supervises and ensure proper coordination of all issues arising and connected to environmental protection in the country. It plays a very significant role as the government institution responsible for the implementation of established policies that concern environmental matters. NEMA engages in various activities ensuring meeting its legal mandate of having in place a number of initiatives aimed at controlling adverse climatic changes that affect environmental security[127] controlling the impact on human security hence affecting livelihoods.

Being a pertinent state institution they coordinate various activities carried out by various lead agencies like WARMA for promotion and integration for environmental related matters to facilitate development policies. It is their sole responsibility to assess the utilization of natural resources and conserve them for a secure environment upon which sustainable livelihoods thrive. On the other hand they oversee land use activities and patterns and this enable them capture their effects on scarce natural resources. The information extracted from such patterns is helpful in establishing informed land use policies.

NEMA is rich in information of available natural resources in various parts of Kenya. It continually gather information of emerging issues and changes in as far as access and use of these resources is concerned. Based on this varsity information, it then has the capacity to advise the government on relevant regional and international conventions and their implementation and how important it is to the security of the environment as a move for climate change impact mitigation in turn advancing sustainable livelihoods to the Kenyan citizens[128]. It advises on the regionally and environmentally agreed upon guidelines, conventions, and treaties on environmental related agreements that Kenya is part of and also as a state be.

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[127] Evelyne, B. Climate Change and Environmental Security Management in Kenya: Case Study of National Environmental Management Authority 2017. Institute of Diplomacy and International Studies. University of Nairobi. P. 82-90.
[128] GOK. The Kenya Population and Housing Census Kenya National Bureau of Statistics 2010.

Its NEMA's responsibility to facilitate human resource and financial needs for environmental management in and for their set light regional offices for effective management of environment. In the respective out stations and county offices the spearhead projects like tree planting,[129] protection of water catchment areas and protection of wetlands, on this it works with leads agencies like:

3.4.2 Kenya Water Resources Management Authority (WARMA)

It is one of the lead agencies that was established under the 2002 water act under the ministry of water and irrigation to manage water resources in Kenya. For sustainable livelihoods across Kenya, water security is an important aspect. WARMA address all concerns regarding water sources across the country operating in collaboration with NEMA to protect the environment. They come up with regulations for protecting water resources and their maintenance. It has put in place principles, procedures and guidelines that enforce water resource allocation. They enforce and force proper monitoring determining factors that influence the usage of water.

WARMA plays a very important role in assessing and monitoring the water resources which is key for ensuring that available waters are in good quality to meet the demand for the fast growing population from time to time. They also protect available water catchment areas in collaboration with KFS like natural forests in order to maintain the amount and quantity of water required, to do this they gather information on the available water resources for keeping a close check of possible threats on available waters for to help minimize the effects. They achieve this via collaboration with other responsible organizations informing the government on issues relating to water resources and this informs formulation of sound policies.

3.4.3 Kenya Meteorological Department (KMD)

It is a state instrument that serve to protect environment by informing the government and general public on possible weather and climate changes. They provide information on

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[129] CITIES ALLIANCE. Slum Upgrading up Close 2008. Experience from Six Cities.

climate and weather related issues[130] informing other related institutions and departments like forestry, water resource management, the agriculture sector, aviation department and many other relevant sectors. Since its formation it has served as a national public weather information arm crucial for timely preparation for changes of weather as well as long term shifts due to climatic variations.

This paper aimed at establishing its effect on environmental security for sustainable livelihoods in slums in[131] order to delve on the main objective hence understand the role played by KMD on preparing the public in as far as hazards like flush floods, mud slides, drought and heavy rains is concerned. The purpose is to ensure timely communication[132] of the likely dangers for timely preparedness of any threats that may accompany adverse weather changes as recorded. Over time, observations made on behavior of informal urban settlements dwellers is either they do not get the information on time and if they do many ignore and/or lack the capacity to handle the eventualities.

3.5 Policies on Environmental Protection and Security

In most developing countries where Kenya is categorized, development heavily depend on the available natural resources which are important assets that call for conservation and protection for both the present and the future generation. Some of the advantages associated with these resources are to better livelihoods, present opportunity for both local and national development while generating environmental goods and services necessary for facilitating sustainable development of a county. Some of the main policies that this paper identified in as far as environmental security for sustainable livelihoods is concerned include:

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[130] Zablon, W., Bob, A. The Role of Kenya Meteorological Services in Weather Early Warning in Kenya 2015. Atmospheric Sciences. Vol. 10. 2015. P.8.
[131] GOK. The Kenya Informal Settlement Improvement Program 2011. Ministry of Housing and Planning.
[132] R., S., Pulwarty and M., V., K., Sirakumar. "Information Systems in a changing Climate: Early Warnings and Drought Risk Management", Weather and Climate and Climate Extremes Vol. 3, pp.14-21, 2014.

3.5.1 Land Policy

Land is one key component of environment. These policy advocates for access, use and proper management of land in a way that is efficient, equitable, productive and also sustainable. It provides for rules and guidelines in as far as land acquisition and its use is concerned. Some of the main principles on land include:

Land ownership rights; All citizens are entitled to have land for settlement and use to earn a living through activities like cultivation for subsistence and cash crop farming where possible.

Equality on access of land[133]; It is clearly stipulated within the constitution that there must be equality when it comes to access of land. Whether one is crippled, man, woman, poor or rich all have the constitutionally accrued rights to access and own land. Within this provision, it is clear that no one is allowed to acquire land illegally by grabbing or confiscating that meant for public use, a good example is the current Ruaraka land saga being defended within the confines of the constitution.

Sustainable use of land; All owners of land whether in the urban areas or the rural areas should ensure they use and manage land appropriately while practicing its productivity based on appropriate practices on management of land as a crucial resource. On the other hand, there is need for transparency and cost effectiveness when it comes to land valuation and administration not by dubious means by selfish individuals who end up illegally acquiring land and selling it at exorbitant costs at the expense of the poor.[134]

This policy for the purpose of pushing provisions on environmental conservation, require land owners to have in place plans and guidelines that ensure sound protection and conservation of ecologically sensitive areas like rivers, forests, national parks, game reserves and other ecologically sensitive areas. To achieve this, the policy consultatively advice communities to handle land related disputes vial identified and legalized local community frameworks that are in tandem with the constitution. All policies on land are operationalized and implemented by the national land policy which is regularly reviewed.

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[133] Joseph, K. Mwangi. Head-Public Communication Unit. Ministry of Lands and Physical Planning. RMCRD Conference in Nairobi, 15th August 2018.
[134] Kenya Constitution. Kenya Lands Reforms Commission Act 2013. KLRC 2018. Accessed 08th Sept 2018.

For example, more meetings have been held on titling of legal land owners in the city, recent one being all MPs in Nairobi County with the Ministry of land.[135]However the question remains, how relevant is this policy to slums?

3.5.2 National Environmental Policy

This is one among the key policies that this paper reviewed, it clearly denotes environment as a surrounding of humanity rich in natural resources which are categorized as important national assets which must be well managed sustainably[136]. The advantaged of creating awareness of the valuable natural resources is associated with the ability of the very resources to enhance sustainable livelihoods, give opportunities to both the local and at national level economic growth while generating environmental goods and services that drive development in urban and rural areas in Kenya.

Natural resources form the base upon which sustainable development anchor its roots in third world countries[137]. However, Kenya face a lot of environmental degradation problems and issues associated with an increasing population who are incapacitated technologically, hence unable to come up with alternative means for earning a living resulting to over exploitation of scarce natural resources predisposing them to depletion. Increasing population raise high demand for food, shelter and fresh water for drinking and domestic use which plunge many to unsustainable consumption contributing to climate change with its numerous hazardous effects.

This policy also points on challenges facing urban areas that lead to urban environmental deterioration attributed to poor waste management, failed sanitation plan and systems, industrial and transport related pollution increasing air, soil and water pollution hence affecting human health in slums. Due to these challenges, this policy informs strategies to keep these rising environmental problems on check by monitoring the causes and devising

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[135] Nairobi News. City Leaders Meeting 2018. Ardhi House. Nairobi.
[136] Elmard Omollo. Popular Version. National Environmental Policy 2012. Conference to the Environmental Management and Coordination Act-EMCA (1999), Forest Act (2005), Water Act (2002) and Wildlife Conservation and Management Act (Rev (2009). Pelum Kenya.
[137] Prof. Judy Wakhungu, OGW. Cabinet Secretary, Ministry of Environment Water and Natural Resources 2013-2017. Natural Environmental Policy 2013.

frameworks to curb them in order to safe both urban and rural areas from serious and worrying environmental degradation that hinder sustainable development meant to alleviate poverty by championing sustainable livelihoods.

3.5.3 Policy on Disaster Management

This policy clearly states main disasters that Kenya face year in year out. Among those identified disasters are; Terrorism[138], mainly recorded in towns and urban centers like the Garissa University incident that claimed lives; Technological related disasters, diseases for both humans and those affecting domesticated animals and crops like the army worm emergency recorded in the lift valley farmlands; fires-mainly experienced in informal urban settlements, occasionally in schools; floods especially the recent once at the coastal Tana regions, Budalangi, Nairobi city and affecting mostly slums and breaking banks and washing roads and bridges downstream; and drought.

Over time, these disasters have been noted to disrupt livelihoods, loss of lives, displacing people, and derailing economic activities for example flooded roads and broken bridges stalling transportation, destruction of infrastructure and this greatly derail development and efforts made to attain sustainable socio-economic growth. To handle and minimize these risks, the government has put in place this policy to help formulate and institutionalize appropriate mechanisms and plans to manage disaster whenever they are likely to occur or have occurred. Some of the identified strategies are the set Inter-governmental Panel on Climate Change (IPCC), Climate Change Conference and other comprehensive environmental protection and conservation survey conducted throughout the country that emphasize the core role of climate change for integrated frameworks to have in place elaborate integrated national disaster management strategies.

These policy call for people to be more preventive rather than reactive especially the government, communities and other stakeholders on its implementation in an effort to

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[138] Draft Disaster Management Policy. The Role of existing Institutional Structures under the new Policy 2015. Kenya Food Security Meeting (KFSM). Food Security 2018. Accessed 8th Sept 2018.

control and curb disaster related risks[139]. The policy has a clear goal to have in place disaster management institutions, partnerships and coordinated networks for mainstream disaster and risk minimization in the development initiatives for strengthening the resilience of identified vulnerable groups, people and or areas such that they are able to deal with possible disasters and once they occur they are capable of ensuring minimal harm. This paper sought to find out the extent to which these strategies as laid in the policies discussed above involve and benefit the informal urban areas and residents therein and any notable role and benefit associated with the implementation of these policies to slum areas.

3.6 Role of Government on Environment Security for Sustainable Livelihoods

From the institutions and policies discussed above, the role played by government is elaborately cover. The emphasis is that humanity and reliable livelihoods thrive in a safe and secure environment. A secure environment provides the right to life for all, this has led to numerous debates globally pushing for safe and secure environment hence attracting numerous conventions and international agreements and treaties for environmental security[140]. However, the uptake of action to stop the eminent threats has remained dismal not sufficient for environmental safety especially in developing countries. For example the Kenyan government efforts have remained insufficient not yielding effective principles and mechanisms to propel environmental security to satisfactory levels.

The government ought to provide efficient and effective environmental security frameworks [141]enabling access to environmental goods and services to all Kenyans whether rich or poor, in informal or formal urban settlements as well as the rural areas. Equality and equity should be the emphasized. Many people in informal urban cities and towns in Kenya do not enjoy environmental services and goods as provided for in the new constitution. They are characterized with problems including lack of fresh drinking water, poor sanitation systems, food scarcity hence poor diet, poor shelter, poverty,

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[139] Ministry of State for Special Programs. Office of the President. Draft National Policy for Disaster Management in Kenya 2013.

[140]140 N. Myers. "Environmental Security 2000". What is New and Different? Retrieved 23rd August 2018.

[141] Kariuki Muigua. Achieving Environmental Security in Kenya 2015. Role of Kenyan Government. Retrieved August 2018.

unemployment and increased water and air pollution resulting to health risks. These challenges are still very evident while still bragging of devolution as a nation. Clearly much of what is denoted as devolution, bringing services close to the people as provided for in the constitution is more of corruption and delayed resources from the national government leaving the poor frustrated and depressed given the high cost of living.

The current government under the leadership of President Uhuru Kenyatta is advocating and championing the big four agendas which entail investment in the manufacturing, health, housing[142] and food and nutrition production sectors[143] while seeking to leave behind a remarkable legacy of a developed and self-reliant Kenyan economy. However, this must not ignore or leave behind environment security. By all means, it is possible to attain the globally acceptable standards for a safe and secure environment that can facilitate sustainable livelihoods for the economic growth that the government is advocating. Although it requires that the strategies should be inclusive, for slums to overcome the poverty associated with them casting them behind even when opportunities for economic growth are available requires a willing and supportive government. On the other hand the government has the potential to overcome obstacles castigating its ability to ensure a secure environment for sustainable development.

3.6.1 The Big Four Agenda

For the longest time Kenya has been denoted as the economic powerhouse for the Eastern Africa and the Horn of Africa region. However, recently the neighboring countries have recorded a steady commendable economic growth threatening Kenya economically if things remain and/or continue as they are today. Countries like Ethiopia, Tanzania and land locked Rwanda have experienced and portrayed a commendable economic growth like Ethiopia; infrastructure development, and Rwanda; environmental protection and conservation. Kenya is doing badly in terms of corruption index and expenditure verses

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[142] Castillo, L. and Stein, A. Innovating Financing for Low Income Housing Improvement 2005. Environment and Urbanization. Issue 17 No. 1. P. 47-66.
[143] Kenya Association of Manufacturers (KAM). The Big Four Agenda Investment Opportunity in the Manufacturing Sector 2018.Accessed on 10th Sept 2018.

investment and almost hitting the IMF standard credit ceiling that may deny it the opportunity to borrow.

Since the commencement of 2018, numerous corruption scandals have exploded making headlines in the media daily tainting Kenya's image locally, regionally as well as at the international arena. This has created fear to donors and investors who are eyeing other neighboring countries at the expense of Kenya's struggling economy. To counter this, the government has resolved to invest in the Big Four Agenda aiming to uplift the economy by generating an approximated number of 1.3 million jobs[144], support and improve the manufacturing sector, facilitate provision of affordable housing for many living as squatters on illegal lands and in informal settlements. The government seek to ensure food and nutrition safety for the common man and also give a universal healthcare cover[145] to minimize health insecurity that many struggle with to date.

To understand the big four elaborately, it is better to first know what they entail. These are four pillars which include; affordable housing to the common man, a revamped manufacturing sector to generate jobs hence minimizing unemployment, food security and nutrition for a health and proactive population, and a universal health care cover for all. The president defends these ambitious goals posturing that food and nutrition security is possible through formulation of sustainable processes at every stage of production of food. He focusses on addressing issues of wastages in the food production cycle while enhancing value addition to raw agricultural produce before exportation. He also argues that affordable housing can be attained via making credit facilities available as well as utilization of technologies to yield alternatives rather than relying on costly scarce resource.[146]

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[144] Kenya School of Government. Unpacking the Big Four. Weekly Bulletin 2018. Vol. 7 Issue No. 20.
[145] Columnists Egla Kerubo. It is Time to start marketing the Big Four Agenda to Kenyans 2018. Cytonn Investment Brand and Marketing Department.
[146] Kenya Institute for Public Policy Research and Analysis (KIPPRA). Policy Monitor. Realizing the "Big Four "Agenda through Energy as an Enabler. Supporting Sustainable Development through Research and Capacity Building 2018. Issue 9 No.3.

On issues of health, to provide a secure health services and facilities there is a vigorous move to create awareness for each and every Kenyan to register and take cover with NHIF (National Hospital Insurance Fund) to enable every Kenyan access health services. Generally it is a good move and if the pillars are implemented to the letter equitably and ensuring equality then even the informal settlement dwellers will reap heavily. It is a matter of time to weigh and see. This paper aim to establish the role of government, policy and institutions as at now.

3.7 Conclusion

The chapter highlights on the key factors that combine with the role played by the government through the national institutions and policies in place for ensuring environmental security for sustainable livelihoods. It clearly depicts that sustainable livelihoods are vital for development and enabling principles and guidelines that provide for a secure environment can make it easier for people especially in informal urban settlements to enjoy rights for freedom to access, utilize goods and services that proceed from a well secured environment.

It's agreeable that the government operates via the established policies whose implementation is facilitated with the national institutions who upon executing their mandate as expected yields an enabling environment that facilitates sustainable livelihoods for all especially informal urban settlement dwellers. By so doing this will uplift Kenya to a much stable developed country hence minimizing the gap between the poor and the rich.

CHAPTER FOUR
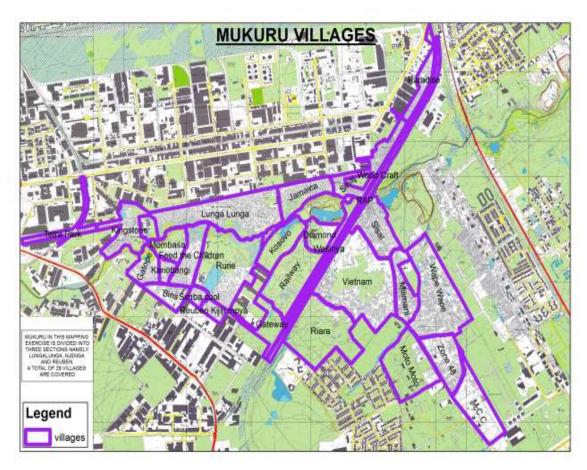# ANALYSIS OF ENVIRONMENTAL SECURITY AND SUSTAINABLE LIVELIHOODS IN MUKURU SLUM

4.1 Introduction

This chapter takes off by giving a general summary of the previous chapters as follows; chapter one gives a general introduction into the study highlighting environmental security concerns affecting livelihoods from the global perspective narrowing down to the local and slum life in particular Mukuru area. Chapter two delve on environmental security debates and discourses expounding on its influence on livelihoods particularly in SSA and the slums therein while chapter three depicts on the role of government on environmental security issues influencing livelihoods in slums. The chapter highlights respective government institutions responsible for protection of environmental where by the policies that inform their mandates are also discussed.

This chapter entails the specific area of study which is Mukuru Slum, presentation and qualitative data analysis of the raw data as collected within Mukuru with detailed interpretation of the fact finding on the relationship between environmental security and sustainable livelihoods in Mukuru slum. The data has been categorized and detailed description of respondents' perceptions, emotions and opinion regarding environmental security and sustainable livelihoods expressed in prose form.

4.2 Mukuru Slum

Figure 4.1: Mukuru Mapping Project, 2017

Source: Simiyu E. Mukuru Mapping Project, 2017.

Initially, Mukuru area was a designated dumping site[147]. However due to rising population and high standard of living within the city, those who could not afford started make shift temporary structures and this over time led to a fast growing informal urban settlement. The villages within Mukuru as captured in the map above include; Mukuru Kwa Njenga, Mukuru Kwa Reuben, Paradise, Sinai, Kayaba, Fuata Nyayo, Jamaica, Mariguini and Kingstone.

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[147] Focused group 1 discussion which comprised of the youth, men and women residents of Mukuru Slum. 21th September 2018. Mukuru chief's Camp-Administration Block.

4.3 Environmental Security Issues in Mukuru Slum

From the literature reviewed and findings after the study, it was established that the area suffers from floods during both long and alternate short rains, prolonged drought and lack of water supply plans renders it water scarce, there is poor garbage management, perennial fire outbreaks, clogged sewer lines and drainages, last but not least heightened water and air pollution[148].

4.4 Demographic

4.4.1 Length of time working or residing in Mukuru Slum

The study aimed at finding the length of stay or working for the respondents in Mukuru slum. From the responses provided, most of the respondents have stayed or worked in the area for more than five years. Just a few were below five years of stay. This clearly indicated that the respective respondents are well versed with facts informing the study objectives pursued.

4.4.2 Means of earning a living in Mukuru Slum

From the findings, it was established that a large number of the respondents rely on casual labor where they seek a day's job mostly manual (hand work, cleaning, gardening and or house chores) be it in the industries that form a large part of the area or in the neighboring estates which include; Hazina, River Bank, Balozi, Diamond 1 and 2 extending to South C estates. However, it was clear that this daily 'vibaruas' are not sufficient enough.[149] Some engage in small scale businesses like salons, vending groceries and 'vibandas' for selling tea and mandazi. Many of the respondents were found to be jobless and surviving a day to them being a huge task.

4.4.3 Sustainability of the means of living in Mukuru Slum

Seeking to find out whether the means of living earned them satisfactory proceeds to meet daily needs, the study established that the wages are way too low in that most manage a

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[148] Focused group 1 discussion. *Environmental Security Issues*. Comprised of the youth, men and women residents of Mukuru Slum. 14th September 2018. Mukuru Promotional Centre-Social Hall.

[149] Michael Omondi, community elder. Interview held on 26th September 2018.

single meal a day and generally full course meal for many is cumbersome. Much of the little they make is aimed at meeting rent needs and some meal and mostly not balanced. It was established that this state of affairs contribute highly to malnourishment and heighted health insecurity.[150] Most of the respondents argued that for the lucky ones, the earnings are way too low to even think of saving given the rising cost of living.

4.5 Environmental Security and Livelihoods in Mukuru Slum

4.5.1 Environmental Security

The study wanted to know whether the residents understood environmental security. As per the study findings, most of the respondents did not clearly comprehend the concept environmental security and its influence on livelihoods. The responses were more leaned on the poverty levels in the slum. This was mainly informed by the general insecurity in the area to an extent that environmental safety is viewed as an issue of no immediate concern.

However, most of the respondents agreed that safety of the environmental is vital, though only when the immediate concerns of food, health, education, unemployment and shelter are met[151]. This inferred that many people in this slum give minimal attention to taking personal responsibility in taking care of their surroundings.

4.5.2 The Link between Environmental Security and sustainable livelihoods in Mukuru

The study sought to know how closely related is environmental security and sustainable livelihoods from the respondents view. The respondents indicated that the environment in the area is so insecure threatening any minimal efforts being made to safeguard it. It was noted that prolonged drought results to air pollution due to smoke and gaseous emissions and dust.

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[150] Lilian Kemunto, Community Health Volunteer in Kisii Village. Interview conducted on 28th September.
[151] Sr. Mary Githinji. Headmistress St. Marys Viwandani Secondary, Mukuru Slum. Environmental Security and Livelihoods. One on one interview.

During rains, the drainages block contaminating drinking and domestic use waters, resulting to disease outbreak mainly cholera a good example is the May-June 2018 long rains where cholera led to deaths of two residents in Fuata Nyayo and Commercial village respectively[152]. Also, environmental hazards like floods bring damages and losses that affect school going children, many cannot access their work places, and no money to treat the sick affecting productivity hence stalling efforts for sustainable livelihoods.

4.5.3 Contribution to a Secure Environment for Sustainable Livelihoods in Mukuru

The study sought to establish among the residents those who had made gainful contributions to environmental security. From the responses from two group discussions conducted, it was established that at times initiatives by churches like Our Lady Queen of Peace Catholic Church groups like youth, Catholic Men Association had at some point involved both the youth and adult members including those from the area in drainage and river cleaning activities[153]. This clearly indicted some efforts to ensure a safe environment in the area. However, these initiatives happen once in a while hence not sufficient.

On the other hand, occasionally the Nairobi County Environmental Department carry out cleaning and garbage collection activities, though they do not directly involve the residents instead rely on their employees. This has greatly resulted to lack of proper coordination and collaboration resulting to prolonged garbage menace in the area. The Community Health volunteers freely take initiatives of cleaning the drainages and sections of the Nairobi River within the area, they attempt to involve the County department and NEMA but rarely do they respond neither participate. This results to unwilling residents hence any little progress made collapses leaving the slum in a more devastating state.

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[152] Rose Muindi, resident Fuata Nyayo village in Mukuru Slum. One-on-one Interview conducted during the study in September 2018.

[153] Focused Group Discussion 2. *Contribution to a Secure Environment for Sustainable Livelihoods*. Interview Held in the Our Lady Queen of Peace Catholic Church Hall. 16th September 2018

4.5.4 Major Environmental Challenges that hinder realization of sustainable livelihoods in Mukuru

The study endeavored to understand the existing bottlenecks in attaining environmental security for facilitating sustainable livelihoods. The respondents argued that mainly the challenge is lack of spacious land for constructing habitable housing units, urban planning department having little or no attention to Mukuru slum needs. This was found to have resulted to construction of illegal temporary houses which are very vulnerable to hazards like fires and floods that are common in this area.

There is no direct cooperation between the government institutions like NEMA and WARMA that deal with environment protection and water resources management and conservation especially in this area. Not even strategies put in place to enlighten the slum residents on the skills necessary for safeguarding their environment and ensure safe drinking water to prevent disease out breaks. Only the Ministry of health that carry out campaigns on maintaining hygiene, sanitation measures and preventive measures for polio, HIV/AIDS and nutritional related illnesses[154]. However, there is no cooperation even between the institutions and or departments concerned to ensure overhaul measures for the safety and sustainable livelihoods in Mukuru.

The other key challenge noted is rising population, both in the very area of study linked to rural urban migration yielding rising population, the numbers of people is high against scarce available resources. This has resulted to growing pressure to resources like land for settlement, clean water for domestic use, the minimal available sewer lines not able to carry the capacity of Mukuru slum and its surrounding resulting to bursting sewer lines exposing waste on roads wearing out the tarmac while opening it into the few available water sources hence contaminating the water resulting to pollution. Alongside this, the responsible institutions for management of water and environmental protection are doing little to champion a habitable environment in this slum.

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[154] Lilian Kemunto, Community Health Volunteer in Kisii Village. Interview conducted on 28th September.

From the national budget as presented and provided for in the 2018 budgetary allocation, as much as there are funds allocated to health, food and general security for all, it is not clearly stipulated on the share slotted for slum upgrade. If any, the common problem of mismanagement and corruption does not allow sustainable development to see the light of the day in slums. A lot is well articulated on paper as opposed to what happens on the ground[155]. This leaves Mukuru slum characterized with the same problems and challenges year in year out.

Another bottleneck was found to be the local administration especially area chiefs who are said to be more money oriented hence allowing people to construct illegal structures on riparian land, road reserves and power lines which end up being pulled down by the county government or swept away by environmental hazards whenever they occur. This in turn hinder growth towards sustainability.

4.6 Management of Environmental Security
4.6.1 National Institutions and policy that deal with Environmental Security

The Study sought to unfold whether the respondents were aware of national institutions and policies in place responsible for ensuring environment security for sustainable livelihoods. Most of the responses indicated that, this institutions are rarely seen to be engaged in championing environmental safety in the area. Particularly NEMA was said to be heard but not on the ground[156].

On policy the respondents only pointed the most recent one on the burn of plastic bags usage where only for a few days they saw NEMA officers along the nearby shopping centers threatening the side road peddlers and kiosk owners and none of them travelled into the interior parts in the area to push the same policy agenda. Over time they seem to have coiled into their safe havens not on the ground as usual and the menace continues. This

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[155] Focused group 1 discussion. *Challenges to Sustainable Livelihoods*. Comprised of the youth, men and women residents of Mukuru Slum. 14th September 2018. Mukuru Promotional Centre-Social Hall.
[156] Focused Group Discussion 2. *Management of Environmental Security*. Interview Held in the Our Lady Queen of Peace Catholic Church Hall. 16th September 2018

clearly indicated, no awareness in the area on environmental protection initiatives and policies need to be actioned so as to enhance environmental security for livelihoods.

4.6.2 Role Played by the Institutions that deal with Environmental Security

The study wanted to establish whether the respondents understood the mandate of the existing institutions that deal with environmental protection. Largely many of the respondents were not aware of institutions like WARMA, KFS and the KMD responsible for weather forecasting and preparedness on changing weather conditions. They clearly indicated that the area and its residents are far removed on matters of environmental protection and necessarily information on climate change coupled with weather variations that pose threats to their livelihoods. Even NEMA which a few are aware of does not have initiatives on the ground to promote their mandate. The County environmental department always expect the residents to take the environmental concerns to their office desk and even by so doing they do not heed to their call.[157]The study established a communication breakdown between the institutions and the key stakeholders in the area, which affects sustainable livelihoods

4.6.3 Level of Engagements

The study wanted to establish the extent to which the respondents are involved by these institutions in ensuring a secure environment for their livelihoods to thrive for the present generation as well as the future generation. The responses provided indicated that, almost none was involved due to the absence of representatives of the specific institutions on the ground. The only department that somehow engage the residents being the Ministry of Health on health related. The campaigns involve the CHVs (Community Health Volunteers) who are involved in awareness creation. Also the NGOs like WASH international that are more unto health matters[158].

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[157] Michael Omondi. The elder and community policing volunteer. Working as the security personnel on contract in Balozi Estate.
[158] Focussed group 3 discussion with CHVs held at Mukuru Promotional Centre.

This clearly indicated a gap between the environmental protection and involving the Mukuru residents on issues of environmental security. Even when calamities like floods and fires strike, the only organization seen on the ground giving relief food and some basic needs are Red Cross who after the dust settles down are off. Meaning responsible institutions do not come in to help have in place measures for long term solutions from environmental related hazards.

4.7 Government Response
4.7.1 The Role of government on Threats of Environmental Security for Sustainable Livelihoods

The study sought to establish the government's response on environmental security initiatives especially in slums and in particular Mukuru. The respondents' perception of the government is that it had not designated the area for development related activities[159] hence always ignored. It is true many of the slums are not habitable areas for humans. However, they are here and seem like not going anywhere any soon. Drainages need to be properly elected, but nothing much done by the government to ensure the same.

The only responses they ever felt is individual politicians who offered short-lived help mainly available during campaign time. For example common known philanthropic activities by the sitting Nairobi governor Mike Mbuvi alias 'Sonko' who give both food and some necessities like blankets and toiletries when calamity strike. Some of the respondents were against such moves arguing that the politicians came in for a few days flash out money to the youth, they buy them cheap alcohol and the moment they leave the ground already addicted youth turn to stealing hence rising crimes threatening security in the area.

Clearly, it seems that long term solutions to challenges like land designated for settlement, slum upgrade initiatives and improved drainage systems are not in any communicated plan at least any respondents were aware of. They felt left out of the city housing and planning policies, exposing the area to any environmental calamity that comes along. This greatly

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[159] Focused group 3 discussion with CHVs. *Government Responses*. Held at Mukuru Promotional Centre.

hinder sustainable livelihoods. They even felt it being intentional and many respondents had assumed the status quo as the order of the day.

4.7.2 Government's Response on Environmental Security for Sustainable livelihoods

The study sought to establish whether the respondents were aware of measures taken by government to ensure environmental security in the area. There is meant to be communication at the local level engagement by either the national government but more especially through the county government on planned initiatives and measure for environmental protection to enhance safety in the area. Though the study established that, whenever engaged, they give a lot of information as required concerning their urgent needs[160] but after gathering the information, the officers did not show up again and are never available to answer the anxious participants of any implementation of the suggestions they might have made. This has made them the residents bitter not even willing to be engaged for lack of action.

On the big four agenda as articulated by the current government, many argued that even getting to know what they stand for and how they will benefit from the same was yet to happen. Whenever they hear of such and not all have access to media, they always have a feeling that it is meant for the upper class as they feel regarded as low class and do not matter. For any country to develop, no sector or area should be left out but for Kenya it is still a challenge bringing all stakeholders and this contributes to the growing gaps between the high end, middle class and slum areas.

4.7.3 Challenges Government face on Protection of Environment for Sustainable Livelihoods

The study sought to delve onto the respondents understanding of existing problems that hinder the government's effort to ensure a secure environment for sustainable living. The respondents provided indicated that one major problem is the Mukuru slum residents'

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[160] Focussed group 2 discussion. *Government Response to Environmental Insecurity*. September 2018. OLQP Catholic Church Hall.

attitude. The people in this area already feel like the government does not regard them[161]. Many have assumed a comfort zone since from birth they have faced the same insecurities and nothing practical by the government to improve their wanting living conditions. This is mainly due to empty promises made by the government officials when tragedies occur, immediately after some days it goes back to business as usual.

The study established that over time, the residents in this area have turned hostile to measures and initiatives made for their own good. A good example being the demolition of the houses along the power lines by the Kenya Power and Lighting Company (KPLC) which was meant to reduce the risk of fire out breaks and minimize radiation. Even after efforts to create awareness on the same and giving them notice they remained adamant which forces the institution to come in with heavy security to execute the demolition. After a while again more other houses were elected while residents argued that they do not have any alternative. This really frustrates resulting to the state of this slum remaining as it is and suffering the same challenges as time goes by.

Insufficient funds also contribute to inability to facilitate environmental security to sustainable livelihoods in the area[162], nothing much comes out of this area that can be returned back to help develop and improve it as compared to rural areas with resources. Slums are areas that are always resource deficient and if anything demand to be helped from scratch. This also puts a strain on resources available Kenya being a developing state. When this scarcity again brush shoulders with leaders with greed and corrupt minds, then even anything little set aside for slum upgrade end up in the pockets of a few frustrating government efforts to improve livelihood in the area and many others around Nairobi County.

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[161] Dr. Ann Omambia, Head of Climate Change Department NEMA. Challenges Government face on Protection of Environment for Sustainable Livelihoods Interview held on 13 September 2018.

[162] Simon Kemari. *Challenges Government face on Protection of Environment for Sustainable Livelihoods*. Officer Nairobi County Environment Protection Section. City Hall.

4.8 Conclusion

This chapter endeavored to explore the study findings in relation to the study objectives as stated. It reveals that in deed environmental security affects sustainable livelihoods in informal urban settlements. Environmental security emerges to be when there is proper waste handling and disposal, well established and maintained drainage systems. Supportive responsible institutions implementing the government initiatives and this in the long run yield sustainable livelihoods for the people.

However, the findings indicate that in Mukuru slum sustainable livelihoods are more of a dream than a near possible reality due to highly polluted air and contaminated water, lack of land for expansion to meet settlement needs. Crime due to joblessness and drug and alcohol addiction, lack of performing institutions within and lack of coordination and collaboration among and between main stakeholders in Mukuru slum.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the study findings, the summary of the findings, generalization, conclusion and recommendations of the researcher based on the facts established on the impact of environmental security and livelihoods in urban slums.

5.2 Summary

The study found out that majority of the respondents had lived and/or worked in Mukuru slum long enough. The study findings indicate that most of these residents are jobless, though some engage in working as casual laborers, small scale businesses including hawking to earn their daily living but proceeds are minimal. Many of these respondents were conversant with environmental insecurity issues that face them and quite a number have been affected in one way or the other.

Concerning environmental security and sustainable livelihoods, it was established that the area is characterized with unsustainable livelihoods where a large number of residents are jobless, idle, going hungry, children malnourished even some dying of poor nutrition related ailments as well as water pollution causing cholera outbreak. Much of these is as a result of lack of direct support from the government, county government to handle the rising population hence congestion such that when disaster occur many are affected and lack of accessibility contributes to huge losses and damages.

It was also established that most of the environmental hazards include fire outbreak, floods, air and water pollution, clogged drainage, sitting on open sewer lines and improper handling of waste. Much of their effects being displacements, disruptions of learning, and stalling normal daily operations, risky to health.

Regarding national institutions and policy for management of environmental calamities for sustainable livelihoods, it was established that indeed there are institutions in place including NEMA, WARMA and the County Environmental Department. However, in Mukuru slum rarely are NEMA and WARMA execute their respective mandates being the main institutions championing protection of environment and water resources. Some responses indicated that just recently the county environment cleaning department are seen gathering and collecting garbage. However, the drainage systems are poor and need agent attention to prevent flooding of sewage into houses during rains.

However, most of the respondents appeared not conversant with these institutions and what exactly is their mandate on environmental security, main reason being their absence on the ground and lack of awareness creation on environmental protection and water management. This clearly demonstrated lack of coordination and collaboration with the residents Mukuru slum.

The study established that the government seem to be having well established institutions with personnel responsible to ensure environmental security for all. However, the gap identified was the existing policies being more on paper and many of the civil servants working at the comfort of their offices rather than being on the ground to implement the government agenda. Disaster management more reactive rather than being proactive. This indicated that the government is far removed from the issues that affect livelihoods in Mukuru.

The study interrogated the residents on their opinion on what the government could do to promote environmental security for enhancing sustainable livelihoods. Much of the respondents indicated that there is need to deploy more personnel in handling of waste and if possible give opportunities to many of the jobless residents who are conversant with the place hence give adequate information on where there is urgent needs hence help the government get their priorities right when it comes to efforts to champion sustainable livelihoods for development. The responses also collectively emphasized on the government having strict measures in place for ensuring environmental security. Always

to ensure that many who are on pay role and sitting on their jobs are out and working as opposed to the way it was by the time of the study.

The study findings clearly pointed out that environmental security had a direct link to sustainable livelihoods. It emerged that, if policies on environmental protection and security were enacted then Mukuru as one of the informal urban settlements could be well developed giving room to attaining sustainable livelihoods hence minimize unemployment, rising crime, drug addiction, health insecurity and food insecurity in the area. This could in turn result to rising of the GDP hence influencing economic growth. However, given the status quo as at the time of the study, poverty is on the rise and this generalized to other urban informal settlements like Mathare and Kibera slows down intended economic growth.

5.3 Generalization of the Research Findings to other slums

From the study findings, most slums suffer the same environmental insecurity issues. From the responses as provided, some of the respondents could refer to other slums like Mathare and Kibera which when problems like floods occur they are also affected such that even residents of Mukuru slum with relatives and friends in these other slums cannot seek refuge or any help there because they are equally affected. This clearly depicts that environmental concerns in one slum are replicated to other slums could be in the city or towns in different part of Kenya. In the same line of thought, the challenges that residents in Mukuru slum face interms of unsustainable livelihoods happen to be the very concerns to residents in Kibera as well as outside Kenya like Soweto slum in South Africa and many more others in West African Countries. From literature reviewed, the differences are in terms of the geographical area coverage but issues are more less the same.

5.4 Conclusion

Mukuru slum is part and parcel of Nairobi County, it plays a key role in security and development of Nairobi as the leading urban area with a rising population many of whom reside in slums. Therefore it requires special urgent attention and the same applies to other informal settlements in the city. It is not possible to talk of a 'city in the sun' with an

implication of an area doing well, when only a few well to do stay in high end estates with a significant population in middle class residential areas while thousands are ravaging in poverty. If anything, slums are a reality in SSA that ought not to be ignored. It is high time they are part and parcel of city housing and planning initiatives such that efforts to develop a world class secure city can yield positive results.

Most of the challenges that Mukuru slum is facing are mainly due to weak governance and lack of inclusive development. Some regions of Nairobi County are well developed to an extent it appears like the slums around are hidden. The high and mighty from across the world whenever they visit they are only shown the affluent side of the city while the reality of the struggling lot is hidden. Environmental security has a significant influence on the sustainable livelihoods such that if well taken care of then the entire city and its environs will be ready to be show cased to the entire world without fear or favor.

You cannot isolate the effects of environmental security from sustainable development. Generally for an overhaul development of this city, Mukuru slum and many others ought to be included in the environmental protection plan championing environmental safety and this in the long run will yield a positive impact on the livelihoods of the people in Mukuru, improve their perception by feel part and parcel of the development initiatives hence collaborate with responsible institutions such that in the end of it all security of environment will be a personal responsibility and this will facilitate sustainable livelihoods that will generate slum upgrade in a more elaborate and easy way hence lead to an all-round developing Kenya.

The government has an opportunity to take the economy of Kenya to the next level whereby both the formal and formal residential areas being brought on board, given open space to air their concerns and there after proper prioritization embraced with good governance that will see an upgrade of the slums. Finally, it is quite disturbing learning that the same problems face the same area happening over and over again without coming up with lasting solutions. This indicate that both the residents in Mukuru, responsible institutions and the government as a whole have failed in one way or the other. Since the risks entail loss of

lives then this should be a wakeup call that something need to be done. And this is nothing but acknowledging that the area sits on an area highly vulnerable to risks and therefore urgently need alternative land to decongest it, have in place plans to improve the environmental safety of the area and finally have the adequate population within enjoy sustainable livelihoods.

5.5 Recommendations

Already institutions responsible for environmental protection for secure environmental country wide are in place, what need to be done is for the government to review their performance in as far as environmental security for slums is concerned and ensure they up their game. This will yield result by first working to improve the working relationships with the locals, be active and implement existing policies like the policy on disaster management of 2009/2013. The establishment of the disaster management Unit was a good initiative, however the rate at which they respond when calamity strike need to be revisited. It is important that this unit work with other partners as they do with the Red Cross during emergencies. The NDMU ought to work with NEMA, Nairobi County Environmental Department and the Ministry of housing and planning such that in time they collaboratively come up with proactive measures to counter environmental hazards that affect residents in slums.

On the other hand, NEMA given their mandate need to have devolved units and specifically in slums around the city creating awareness on environment protection. This will enable the residents have an insight of the significance of taking good care of their environment for failure to do so will trigger mother nature who when she strikes back the havoc causes damage beyond repair. In addition, the local administration need to be committed to their job, carry out their duties with integrity such that for designated areas not fit for human settlement they should not allow construction of structures even at the point of being lured by bribes or threat to their lives but always stay true and dedicated to serve the good interest of the government and the people under them.

There is urgent need to enhance integration of sustainable livelihoods for sustainable development from the local level up to the national legal frameworks so as to increase the capacity of the people to oversee and properly manage environmental security issues that affect them. At the slum level, there is need to have identified people representing each and every specific village in Mukuru to be trained and have the capacity to also train the rest on environmental security issues, how to prevent projected disasters and whenever they occur how to handle them and finally the measures to counter the recurrence.

From the study findings, it was recommended that more studies to be conducted to ascertain other possible factors that affect sustainable livelihoods in informal urban settlements such that the findings can contribute to establishment of a more elaborate informed approach seeking to champion sustainable livelihoods in slums.

BIBLIOGRAPHY

Abass, A. Protecting Human Security in Africa. 2010. Environmental Security in Africa. Oxford University Press.

African Union in a Nutshell. Retrieved on 6th Sept 2018.

African Union. Specialized Technical Committee 1999. Committee on Industry, Science and Technology, Energy, Natural Resources and Environment. Executive Council of the African Union.

Akokpari, J. Environmental Degradation and Human Insecurity in Sub-Saharan Africa 2012. Faculty of humanities, Department of Political. Retrieved-July 31st 2018.

Alister, D. Reformed UN formula for Making Planet greener to get first Test. Reuters. Accessed on 6th Sept 2018.

Allan, C. Contemporary Security Studies 2013. Great Britain. Oxford University Press. P. 190-207.

Ann, T. UN-HABITAT and GLTN 2008. Secure Land Rights for all. UN, HABITAT 2008, Nairobi.

Benedick, R.E. Human Population and Environmental Stresses in the Twenty First Century, Environmental Change and Security Project 2000, 6: 5-18. Woodrow Wilson Center for Scholars, Smithsonian Institution, Washington DC, USA.

Boan C., Zetter, R. and Morris T. Environmental change, livelihoods and forced migration. 2008. Refugee Study Centre Policy Brief No. 1 (RSC: Oxford).

Carius, Alexander, "Environmental Peacemaking: 2006-2007; Conditions for Success" in: Dabelko, Geoffrey (Ed.): Environmental Change and Security Report 12 (Washington, D.C.: Woodrow Wilson Center): 59–75.

Castillo, L. and Stein, A. Innovating Financing for Low Income Housing Improvement 2005. Environment and Urbanization. Issue 17 No. 1. P. 47-66.

Chamber, R. and Conway, G.R. Sustainable Rural Livelihoods 1992. Practical Concepts for the 21st Century. Otro. 292 (296). P. 33.

Chambers, Robert and Gordon Conway. Sustainable Rural Livelihoods: Practical concepts for the 21st Century. IDS Discussion Paper 296, IDS, Brighton, UK, February 1992.

Chant, S. Cities through a 'gender lens': A golden 'urban age' for women in the global south. 2003. Environment and Urbanization. 25(1).

Cheng, Anthony S.; Kruger, Linda E.; Daniels, Steven E. "'Place' as an Integrating Concept in Natural Resource Politics: 2003: Propositions for a Social Science Research Agenda" in: Society & Natural Resources, 162: 87–104.

Cyril O. Globalized images of environmental security in Africa. 2007. Review of Africa Political Economy, 27:83, 47-62.

Dasgupta, Basab, Somik V. Lall and Nancy Lozano-Gracia. Urbanization and Housing Investment 2014. Draft Report. World Bank.

Dodds, F., Strauss, M., Strong, M. Only One Earth 2012. The Long Road via Rio to Sustainable Development. London. Earth Scan.

Draft Disaster Management Policy. The Role of existing Institutional Structures under the new Policy 2015. Kenya Food Security Meeting (KFSM). Food Security 2018. Accessed 8th Sept 2018.

Durand-Lasserve, A. Security of the Tenure for the Urban Poor in Developing Cities 2000. Home Ownership Ideology v/s Efficiency and Equity. Draft Paper for Urban 21 conference. National Center for Scientific Research (CNRS)-France, University. Denis Didevot-Paris.

Elga K. Columnists. It is Time to start marketing the Big Four Agenda to Kenyans 2018. Cytonn Investment Brand and Marketing Department.

Elizabeth, C. Environmental Security 2012. A Case Study of Climate Change. Pacific Institute for Studies of Development, Environment and Security.

Elmard Omollo. Popular Version. National Environmental Policy 2012. Conference to the Environmental Management and Coordination Act-EMCA (1999), Forest Act (2005), Water Act (2002) and Wildlife Conservation and Management Act (Rev (2009). Pelum Kenya.

Enemark, S. and McLaren, R. "Preventing Informal Development – through means of sustainable land use control" 2008, FIG Working Week Proceedings, Stockholm, June 2008.

Eric van de Giessen. Environmental Security for Poverty Alleviation Program, 2011. Environmental Security Assessment p. No. 11-13.

Evelyne, B. Climate Change and Environmental Security Management in Kenya: Case Study of National Environmental Management Authority 2017. Institute of Diplomacy and International Studies. University of Nairobi. P. 82-90.

Farah, P., D. Sustainable Energy Investments and National Security 2015. Arbitration and Negotiation Issues. Journal of World Energy Law and Business. 8(6).

Fincher, R. and Iveson, K. Planning and Diversity in the City 2008; Vicki-Ann Ware, Hellene Gronda and Laura Vitis. AHURI Research Synthesis Service 2010: Addressing locational disadvantage effectively; Mitlin, D. and Satterthwaite, D. Urban Poverty in the Global South 2013.

Fox, I. Floods and the poor, reducing the vulnerability of the poor to the negative impacts of floods. 2003.

Fox, S. The Political Economy of Slums. Theory and Evidence from Sub-Saharan Africa. World Dev. 2014, 54, 191-203.

Fred, L. Smith J. Environmental Protection 2010. Is There a Better Way? Retrieved on 8th August 2018.

Fred, L., Smith J. Enhancing the Private Role for Public Goods 2015. Lands and Wildlife. Competitive Enterprise Institute. Retrieved on 8th August 2018.

Funk, C., Darenport, F., Michaelsen J. "A Climate Trend Analysis of Kenya 2010. US Geological Survey Fact Sheet 3074, 2010

Geroe, S.J.W. The Sino-Singapore Tianjin Eco-City: International Journal of Sustainable Development. Vol. 12. Issue 6. P.7 PR.987-994. August 2017.

Global Humanitarian Forum (2009).The Anatomy of a Silent Crisis. Human Impact Report Climate Change.

GOK. The Kenya Informal Settlement Improvement Program 2011. Ministry of Housing and Planning.

GOK. The Kenya Population and Housing Census Kenya National Bureau of Statistics 20101 CITIES ALLIANCE. Slum Upgrading up Close 2008. Experience from Six Cities1 KENSUP. Unpublished Raw Data on the Informal Settlement in Nairobi.

Grant, H. et al. 'UK should open borders to climate change refugees'. Bangladesh Minister, 2009. The guardian 4th December 2009.

Healy, S. (2008), Lost Opportunities in the Horn of Africa: How Conflicts Connect and Peace Agreements

Homer-Dixon T., F. Environmental Change as a cause of Acute Conflict 1991. International Security, Vol. 16, No. 2.

IFRCRCS (International Federation of Red Cross and Red Crescent Societies World Disaster Report 2001. Retrieved on August 04th 2018.

IGAD. Draft Protocol on the Establishment of Conflict Early Warning and Response Mechanisms for IGAD Member States 2003.

IGAD. Land Governance Project Pioneering African Union Land Initiative 2018. Peace Prosperity and Regional Integration

IGAD. Terms of Reference for National Consultant Study on In-State Early Warning Mechanisms and Their Potential Linkage to the IGAD CEWARN Mechanism.

Institute for Environmental Security. Environmental Security Assessment, Horn of Africa 2011. The Hague. Neitherlands.

Joseph, K., M. Head-Public Communication Unit. Ministry of Lands and Physical Planning. RMCRD Conference in Nairobi, 15th August 2018.

Journey Kenya. Slums in Nairobi, Kenya. 12 August 2014.

Kariuki Muigua. Achieving Environmental Security in Kenya 2015. Role of Kenyan Government. Retrieved August 2018.

Kaumowitz D. Forest and Rural Livelihoods in Developing Countries 2003. Center for International Forest Research.

Kenya Association of Manufacturers (KAM). The Big Four Agenda Investment Opportunity in the Manufacturing Sector 2018.Accessed on 10th Sept 2018.

Kenya Constitution. Kenya Lands Reforms Commission Act 2013. KLRC 2018. Accessed 08th Sept 2018.

Kenya Institute for Public Policy Research and Analysis (KIPPRA). Policy Monitor. Realizing the "Big Four "Agenda through Energy as an Enabler. Supporting Sustainable Development through Research and Capacity Building 2018. Issue 9 No.3.

Kenya School of Government. Unpacking the Big Four. Weekly Bulletin 2018. Vol. 7 Issue No. 20.

Krantz L. The sustainable Livelihood Approach to poverty reduction. 2001: An Introduction. Division for Policy and Socio-Economic Analysis. Sida, Sweden.

Lakeshman, D., G. International Environmental Law in a Nutshell (West, 4th ed, 2012)

Land Center for Human Rights, 2005. Water Problems in the Egyptian Countryside Between Corruption and Lack of Planning, Case Studies of Two Egyptian Villages, Land and Farmers Series, Issue No. 32

Liu, L. Sustainability 2009. Living Within one's own ecological means. 1 (4). PP. 1412-1430. Accessed August 4th 2018.

Lovgren S. "Climate change creating millions of Eco Refugees". "UN Warns". Daily Nature and Science news and headlines/ Natural Geographical news. N.P 18 October 2005.

M Chatteri et al. (2002) *Conflict Management of Water Resources*. Hampshire, Ashgate Publishing Ltd.

Mabongoje A., L. "Security for the Urban Poor: an African Regional Perspective in Proceedings of International Forum on Urban Poverty (IFUP). Third International Conference on Social Integration and Security of the Urban Poor. 1999, Towards Cities for All, Nairobi: 12-14 October 1999.

Makana J. and Thomas S., c. Impacts of selective logging and Agricultural clearing of forest structure, floristic composition and diversity and timber tree regeneration in the Ituri Forest, DRC Congo. 2006. Bio diversity and Conservation. 15 (4); 1375-1397.

Maret, S. True Community 2011. Connecting the MDGs to Public Library Services in the US. Information, Society and Justice, 4(2). P.22-55.

Mariara, J., K. and Kabara, M. 'Climate Change and food Security in Kenya. Environment for Development Paper series 19 (3) March 2015.

Marshall N. "Forced Environmental Migration: Ethical consideration for emerging Migration Policy" 2016: Ethics, Policy and Environment: 19(10) 1-18.

Mathew, Richard, Mark Halle, Jason Swetzer eds. conserving the peace 2002. Resources, livelihoods and security. International Institute for Sustainable Development and IUCN-The world Conservation Union. Winnipeg.

Matthew, R.: Sustainable Livelihoods, Environmental Security and Conflict Mitigation: 4 Four Cases in South Asia (Draft, February 2005)

Assessment for Millennium Ecosystem. Ecosystems and Safety of Humanity 2005. Synthesis. Island Press. Washington DC.

Ministry of State for Special Programs. Office of the President. Draft National Policy for Disaster Management in Kenya 2013.

Monitor org. Ensure Environmental Sustainability 2016. Millennium Development Goals. Retrieved 6th sept 2018.

Mwaura A. M. Policy Review for Zone 3,4 and 5, Nairobi, Kenya 42nd ISO CaRP Congress. 2006.

Myers, N. 'Environmental Refugees'; a growing phenomenon. 1997; population and environment. 19(2) 167-182.

Myers, N. "Few Threats to Peace and Survival of Human Community are greater than those posed by the prospects of cumulative and irreversible degradation of the biosphere on which human life depends. True security cannot be achieved by mounting buildup of weapons (defense in narrow sense), but only by providing basic conditions for solving non-military problems which threaten them. Our survival deQpends not only on military balance, but on global cooperation to ensure sustainable environment." Brundtland Commission Report, 1987

Myles W. CBE. IGAD's Role in Stability and Diplomacy in the Horn of Africa 2013. The Open University. Chatham House May 2013.

N. Myers. "Environmental Security 2000". What is New and Different? Retrieved 23rd August 2018.

Nairobi News. City Leaders Meeting 2018. Ardhi House. Nairobi.

OSCE Doc. 'Rapporteurs Report': Informal Group. 'Environmental Security'. Informal Group Environmental Security; OSCE Economic Forum on. 'Security Aspects in the field of Environment', 1999. EF DEL/87/99.

Oswald Spring et al. (eds.). Regional Ecological Challenge for peace in Africa, the Middle East, Latin America and Asia Pacific, the Anthropocene: Politik-Economic-Society-Science. 5 1007/978-3-319.

Oxfam Report, Draining and cleaning Mukuru slum project, 2012.

Paul Berthoud. Professional Life Narrative 2008. Inside the UNEP. Accessed on 6th Sept 2018.

Paul, J. Formalizing the Informal: Understanding the Position of Informal Settlements and Slums in Sustainable Urbanization Policies and Strategies in Bandung, Indonesia. Urban Regional Planning, Sydney School of Architecture, Design and Planning, University of Sydney 2017. Australia.

Population Census, Kenya 2009. National statistics.

Prof. Judy Wakhungu, OGW. Cabinet Secretary, Ministry of Environment Water and Natural Resources 2013-2017. Natural Environmental Policy 2013.

Pulse Africa. "Not to be missed; Nairobi City in the sun" April 28th 2007.

Pulwarty, R., S., and M., V., K., Sirakumar. "Information Systems in a changing Climate: Early Warnings and Drought Risk Management", Weather and Climate and Climate Extremes Vol. 3, pp.14-21, 2014.

Robin M. Formulating a Sectoral Approach to Urban Land Policy. The cause of Kenya. Land Governance in Support of the millennium Development Goals 2009. FIG-World Bank Conference. Washington D.C.

Schrijver, N. Development without Destruction 2010. The UN and Global Resource Management. United Nations Intellectual History Project Series. Bloomington, Indiana. University Press. P.116.

Sheehan, M. International Security; an analytical survey 2005. PP. 62-68. Builder, London: Lynne Rienner Publications.

Simon, D. (2007) "Cities and global Environmental change: Exploring the links". Geographical journal. 17 3 (1).

Smail Chergui. The African Unions role in promoting Peace, Security and stability: From Reaction to Prevention? 2014. Commissioner for Peace and Security, AU. Associate Fellow. Chatham House.

Smith L, Alderman H, Aduayoum D. Food Insecurity in Sub-Saharan Africa: New Estimates from Household Expenditure Surveys. Washington: Food Consumption and Nutrition Division, International Food Policy Research Institute; 2006.

The millennium Project; definitions of environmental security. (3) 5-9.

Tinkenng, E., M. Land Tenure. The Community Land Trust Experiment in Voi Kenya 2003. UN HABITAT Journal No 29 (3). P. 12-28.

Tostensden, A, Tvedten, I. and Vaa, M. (eds), Associational Life in African Cities:

Tostensden, A., Tvedten, I. and Vaa M. (Eds). Associational life in African Cities 2001. Popular Responses to the urban Crisis. Stockholm: Nordiska Afrikanstitutet.

Transparency International. Corruption Perception Index 2014. Retrieved July 31st 2018.

UN (United Nations) Millennium Development Goals 2009. UN's Statistics Division.

UN MDGs Report (2008). Global urban Observatory. State of the World Cities 2010, parts 1.3 and 4.

UN- World Urbanization Prospects 2014. Revisions United Nations 2014. New York.

UNCHS-Habitat. An urbanizing World 1996. Global Report on Human Settlement 1996. Oxford: Oxford University Press.

UNEP (United Nations Development Program). Africa Environmental Outlook, Our Environment, Our Wealth 2006. UNEP Office. New York.

UNFPA-UN (2007) Population Fund. State of the world population. Unleashing the potential of urban growth. New York.

UN-HABITAT (2006). Enhancing Resource allocation to urban development in Africa.

UN-HABITAT (2015) Urban Governance (Habitat III Issue Paper 6). Nairobi: UN Habitat-Informal settlement assessment.

UN-Habitat. The challenge of Slums. Global Report on Human settlement 2013. Nairobi.

United Nations (2000), Environmental Perspective to the year 2000 and beyond. Security and Environment Report.

United Nations Commission of Human Shelter (UNCHS). Cities in a globalizing World 2001: 14. Global Human Settlements 2001. London: Earth Scan. Though slight improvement, SSA is still badly economically leaving the slum dwellers among others vulnerable to environmental hazards and this stands a bottleneck to sustainable livelihoods.

United Nations Development Program (UNDP). Human Development Report 2016. New York: Oxford University Press.

United Nations Development Program. Multidimensional Poverty Index (MPI) 2012. Retrieved on 6th Sept 2018.

United Nations Development Programme. Environmental Justice 2014.

United Nations Development Trends Index 2011. Retrieved July 31st 2018.

United Nations Environmental Program. Fresh Water Resources in Africa 2015. UNEP. New York.

United Nations Fact Sheet. 'We can End Poverty' 2015. Planets Poor set to swell as World Bank Moves Poverty Line 2015.

United Nations General Assembly. New Urban Agenda 2015. Retrieved on 06th August 2018.

United Nations. Migration and Humanity Rights in the Wake of Climate Change 2017. UNU-EHS Publication Series Policy Report 2017. No.2. p 19-23.

Unravel. Published by Chatham House - Royal Institute of International Affairs, London, United Kingdom, 2008.

Vandemoortele, M. "The MDGs and Equity" 2010. Oversees Development Institute.

W. Rachel, Interview with Wangari Maathai, founder of the Green Belt Movement and recipient of the 2004 Nobel Peace Prize. Ronald Reagan Building & International Trade Center, May 5th 2009.

Wangari, M Environmental Change and Security Program and Africa Program. April 13th , 2009.

World Bank. Approaches to urban slums 2008; UN-Habitat (2015), Streets as tools for urban transformation in slums; Cities Alliance (2010), Building Cities; Cities Alliance, World Bank and UN-Habitat (2002), Cities without Slums.

World Bank. Planning, connecting and financing Cities-2013. Priorities for City Leaders. Washngton, DC.

Zablon, W., Bob, A. The Role of Kenya Meteorological Services in Weather Early Warning in Kenya 2015. Atmospheric Sciences. Vol. 10. 2015. P.8.

Zerbe N. Feeding the Famine? 2004. American Food Aid and the GMO Debate in South Africa. Food Policy: 29: 593-608.

APPENDICES

APPENDIX I: INTERVIEW GUIDE

1. How long have you lived/worked in Mukuru Slum?

   ....

2. What do you do for a living? ....

3. Does it adequately meet your needs? Yes……No….Explain

   …………………………………………………………………………..

   …………………………………………………………………………...

4. In your opinion, what is environmental security?

   ……………………………………………………………………………

   …………………………………………………………………………

5. Which environmental hazards do you face?

   …………………………………………………………………………..

   …………………………………………………………………………..

6. How do they affect your livelihood? …………………………………………

   ....

7. Do you know of any institution (s) that deal with environmental security?
   Yes............No..............

8. If yes, what do they do to manage environmental security in Mukuru slum?

   ....

   ....

9. How are you involved by these institutions on matters of environmental
   security for sustainability of livelihoods here?

   ....

   ....

10. Whenever you are faced with these environmental hazards, does the
    government come to your rescue? Yes…. No……...
    Explain your answer above……………………………………………………

    ………………………………………………………………………………

11. Which are the measures put in place by the government for proper

management of environmental security for sustainable development?

....

....

12. What can the government do differently to enhance a secure environment for

sustainable livelihoods in Mukuru slum?

....

……………………………………………………………………………...

Thanks for participating.

APPENDIX II: RESEARCH AUTHORIZATION

NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone:-254-20-2213471,
2241349,3310571,2219420
Fax: 254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref No. **NACOSTI/P/18/83783/23970**

Date **15th September, 2018**

Margaret Oyugi
University of Nairobi
P.O. Box 30197-00100
NAIROBI

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *"The impact of environmental security on sustainable livelihoods in Informal Urban Settlements in Kenya: Case study of Mukuru Slum in Nairobi County, Kenya"* I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending 13th **September, 2019.**

You are advised to report to **the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Nairobi County.

The County Director of Education
Nairobi County.

National Commission for Science, Technology and Innovation is ISO9001 2008 Certified

APPENDIX III: RESEARCH PERMIT

THIS IS TO CERTIFY THAT:
MS. MARGARET OYUGI
of **THE UNIVERSITY OF NAIROBI, 0-100**
NAIROBI,has been permitted to conduct
research in *Nairobi County*

on the topic: **THE IMPACT OF**
ENVIRONMENTAL SECURITY ON
SUSTAINABLE LIVELIHOODS IN
INFORMAL URBAN SETTLEMENTS IN
KENYA: CASE STUDY OF MUKURU SLUM
IN NAIROBI COUNTY, KENYA.

for the period ending:
13th September,2019

Permit No : NACOSTI/P/18/83783/23970
Date Of Issue : 15th September,2018
Fee Recieved :Ksh 1000

....
Applicant's
Signature

Director General
National Commission for Science,
Technology & Innovation

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