

**REALIZING A BLUE URBAN AGENDA FOR COASTAL CITIES IN KENYA
THROUGH SUSTAINABLE CONSUMPTION AND PRODUCTION POLICY AND
GOVERNANCE**

DRAFT SECTOR REPORT (2023-24)

ENVIRONMENT & NATURAL RESOURCES

WIOMSA Cities and Coasts Grant Supported Project

Grant No: CITIES/COASTS/OP/2020/02

ENVIRONMENT AND NATURAL RESOURCES SECTOR REPORT

LIST OF ABBREVIATIONS

Asst.	-	Assistant
Dept.	-	Department
Habitat III	-	The United Nations Conference on Housing and Sustainable Urban Development in Quito, Ecuador, on 20 October 2016

LIST OF ACRONYMS

CECM:	County Executive Committee Member
CIDP:	County Integrated Development Plan
CS:	Cabinet Secretary
EMCA:	Environmental Management and Coordination Act
EPRA:	Energy and Petroleum Regulatory Authority
NEMA:	National Environmental Management Authority
SCP:	Sustainable Consumption and Production
UNEP:	United National Environment Programme

GLOSSARY

Circular construction model, also known as circular building or circular construction: is an approach to construction that aims to minimize waste, maximize resource efficiency, and promote sustainability throughout the entire lifecycle of a building, from design and construction to operation and end-of-life.

Floating population: refers to a group of people who temporarily reside in a particular area without having permanent settlement, or commute to a place for various (non- resident) reasons such as work, education, tourism, or other temporary purposes. This term is often used in urban contexts to describe individuals who commute into a city for work or other activities but do not permanently reside there. Floating populations can impact local economies, infrastructure, and social dynamics in the areas they frequent.

Nature's rights: is a concept and a principle that advocates for recognizing legal rights and protections for ecosystems, species, and natural entities. It asserts that nature has intrinsic value and inherent rights that should be respected and upheld, similar to the rights of humans. The concept of nature's rights challenges anthropocentric views that prioritize human interests over the well-being of the environment and seeks to promote a more holistic and equitable approach to environmental stewardship.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS	2
LIST OF ACRONYMS	3
GLOSSARY.....	4
TABLE OF CONTENTS	6
CHAPTER ONE	8
INTRODUCTION.....	8
CHAPTER TWO	11
SITUATIONAL ANALYSIS	11
2.1 Situational analysis on environmental and natural resources overview in the three sites .	11
Kwale County CIDP (2018-2022)	14
2.2 INTERNATIONAL AND NATIONAL LEGAL AND POLICY FRAMEWORKS	18
2.2.1 International Legal and Policy Frameworks.....	18
2.2.2 United Nations Conference on the Human Environment (Stockholm Conference), 1972	18
2.2.3 Our Common Future, 1987	18
2.2.4 The United Nations Conference on Environment and Development (Earth Summit), 1992	19
2.2.5 The 1994 Oslo symposium	20
2.2.6 Johannesburg Declaration on Sustainable Development, and the Plan of Implementation, 2002	20
2.2.7 The United Nations Conference on Sustainable Development, 2012 and the Global 10- Year Framework of Programmes(YFP) on Sustainable Consumption and Production (2012- 2022)	21
2.2.8 Transforming Our World: The 2030 Agenda for Sustainable Development, 2015	22
2.2.9 UNEP International Declaration on Cleaner Production	22
2.3 Regional Legal and Policy Frameworks	23
2.3.1 The African 10-Year Framework Programme on Sustainable Consumption and Development (2002-2012)	23
2.4 National Legal and Policy Frameworks.....	23
2.4.1 The Constitution of Kenya 2010	24
2.4.2 Gaps Analysis	24
2.4.3 The County Governments Act, 2012	25
2.4.4 Environmental Management and Coordination Act (EMCA), 1999 (Revised Edition 2019)	25

2.4.5	The Physical Planning Act, 2019	26
2.4.6	The Energy Act, 2019.....	27
2.4.7	The Public Health Act, Cap 242.....	28
2.4.8	The Urban Areas and Cities Act, 2011.....	28
2.4.9	The Land Act, 2012.....	28
2.5.1	Kwale Quarrying Act, 2016.....	29
2.5.2	Kwale County Forest Conservation and Management Act, 2017.....	29
2.5.3	Existing Interventions.....	30
2.6	Review of Kilifi County Sub-National Framework.....	35
2.6.1	Kilifi County Environmental (Regulation and Control Act) 2016	36
2.6.2	Kilifi County Solid Waste Management Act, 2019	36
2.6.3	Kilifi Forest Conservation and Management Act, 2019	37
2.7.3	Mombasa Mangrove Forest Participatory Management Plan, 2015 - 2019	40
2.7.4	Mombasa County Solid Waste Management Policy	41
2.7.5	Mombasa Solid Waste Management Bill, 2021	42
2.8	Stakeholder Analysis	44
2.7.6	Existing Interventions.....	45
CHAPTER 3.....		47
KEY FINDINGS		47
3.1	Review of desktop Literature.....	47
3.2	Review of field based responses	52
CHAPTER FOUR.....		56
BEST PRACTICES AND LESSONS FROM OTHER JURISDICTIONS.....		56
4.1	Best practices.....	56
4.2	Observations.....	Error! Bookmark not defined.
CHAPTER FIVE		58
PROPOSED OPTIONS AND RECOMMENDATIONS		58
References.....		61
ANNEXES		Error! Bookmark not defined.

CHAPTER ONE

INTRODUCTION

The study resulting in this report is based on ‘*The New Urban Agenda*’, which was adopted at the Third United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in Quito, Ecuador, on 20 October 2016.¹ It was endorsed by the United Nations General Assembly (UNGA) at its sixty-eighth plenary meeting of the seventy-first session on 23rd December 2016. In line with the scope of this project, the study has been broken down to four sectors undertaken in four geographical sites. The sectors are: (a) Agriculture and Food Production; (b) Tourism and Hospitality; (c) Construction and Infrastructure; and (d) Environment and Natural Resources. The three geographical sites are: (a) Kwale County- Ukunda and Diani towns; (b) Mombasa County- Mombasa city; and Kilifi County- Malindi town. This sector report specifically focuses on the Environment and Natural Resources sector, across the three geographical sites.

Cities account for about sixty percent (60%) of total global domestic material consumption of raw natural materials for building and other uses, including sand, gravel, iron ore, coal, and wood.² Global population growth and a corresponding growth in human populations in cities and urban areas are predicted to increase exponentially by 2050 resulting in higher annual resource requirements.³ Populations, consumption, economic activities, social and cultural interactions are increasingly concentrated in cities, which all impact on, and pose massive sustainability challenges on the environment and natural resources.⁴

If these impacts are not well planned for in coastal cities, the adverse effects will be devastatingly severe, especially on the marine and coastal ecosystems which are vital for food security, alleviating poverty and advancing the blue economy. Therefore, unsustainable consumption and

¹ ‘The New Urban Agenda’ (*Habitat III*) <<https://habitat3.org/the-new-urban-agenda/>> accessed 17 January 2023.

² Lead authors: Mark Swilling, Maarten Hajer, Tim Baynes, Joe Bergesen, Françoise Labbé, Josephine Kaviti Musango, Anu Ramaswami, Blake Robinson, Serge Salat, Sangwon Suh., and Contributing authors: Paul Currie, Andrew Fang, Aaron Hanson, Katja Kruit, Mark Reiner, Suzanne Smit, Samuel Tabory, ‘The Weight of Cities: Resource Requirements of Future Urbanization’ (United Nations Environment Programme (UNEP) 2018) <https://www.resourcepanel.org/sites/default/files/documents/document/media/report_the_weight_of_cities_summr_y_web.compressed_230218.pdf> accessed 23 April 2024.

³ ‘Urban Development’ (*World Bank*) <<https://www.worldbank.org/en/topic/urbandevelopment/overview>> accessed 23 April 2024; ‘68% of the World Population Projected to Live in Urban Areas by 2050, Says UN | UN DESA | United Nations Department of Economic and Social Affairs’ <<https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html>> accessed 23 April 2024.

⁴ The United Nations, ‘A/RES/71/256: New Urban Agenda’.

production patterns in coastal cities, for example, through destruction of mangrove areas for development, increased uptake and consumption of fresh water resources, unsustainable use of other natural resources, increased generation of domestic and industrial wastes such as plastics, litter, sewage and effluents, and contamination of ground and surface water translates to socio-economic vulnerability which, if not addressed, will lead to further environmental pollution and degradation, biodiversity losses, increasing resource scarcity, as well as inequality and persistent poverty.

It is therefore critical that coastal cities in Kenya adopt an integrated approach that addresses the interrelated challenges of unsustainable consumption and production footprints and improve resource-use efficiencies, towards more sustainable and resilient urban futures. Hence, an urban agenda tailored for Kenya's coastal cities and urban areas is necessary. This research project terms it as the Blue Urban Agenda. The Blue Urban Agenda will focus on addressing three (3) consumption and production patterns that impede ocean sustainability. These are: (a) the unsustainable management and inefficient use of natural resources; (b) unsustainable management of chemical and other wastes; and (c) food wastage and food losses as reflected in Goal 12 of 2030 Agenda for Sustainable Development. Thus, this sector report builds on knowledge pertaining to transitions in consumption and production patterns for sustainable cities with a focus on policy and governance in the environment and natural resource sector.

The environment encompasses all living and non-living surroundings or conditions in which an organism, individual, or system exists or operates. The environment also includes the various factors that influence such surroundings or conditions. It includes air, water, soil, and biodiversity, influencing ecological processes and interactions. It serves as the habitat for life, regulates climate patterns and sustains ecosystems. Natural resources on the other hand are the physical non-human factors and components (whether renewable or non-renewable), found in nature with economic value, essential for human survival and development. They include sunlight, surface and ground water, forests, minerals, and fossil fuels and other sources of energy. Natural resources provide raw materials, energy, and ecosystem services crucial for human well-being.⁵

⁵ Article 260 of the Constitution of Kenya, 2010

In pursuit of development the coastal environment and natural resources have been exposed to both natural and human induced vulnerabilities and degradation that affect ocean sustainability.⁶ This study identifies specific vulnerabilities and degradation. With the overall goal of the project being to advance the relevance of sustainable consumption and production (SCP) policy and governance in developing and implementing a Blue Urban Agenda in Kenya coastal cities. The specific objectives are as follows:

- a) Identify the regulatory and governance gaps in the existing global, regional, national and sub-national policy framework on SCP in relation to the development and implementation of the Blue Urban Agenda;
- b) Investigate how to integrate SCP policies into coastal cities and urban areas ‘development plans, urban planning, legislation, regulatory frameworks, investments and policy decisions in the *Jumuia ya Kaunti za Pwani*(JKP) region;
- c) Present global best practice of efforts and initiatives of coastal cities that are making tangible contributions towards implementing SCP; and
- d) Provide policy options and recommendations for developing and implementing the Blue Urban Agenda in the JKP region.

⁶ County Government of Mombasa Department of Environment, Waste Management & Energy, ‘County-Climate-Change-Action-Plan.Pdf’ <<https://www.mombasa.go.ke/wp-content/uploads/2021/10/County-Climate-Change-Action-Plan.pdf>> accessed 23 January 2023.

CHAPTER TWO

SITUATIONAL ANALYSIS

This sector focuses on managing and sustaining the eco-systems and natural resources of the selected project sites by preventing, arresting and reversing the effects of environmental degradation as well as management and the sustainable utilisation of natural resources. The project sites are endowed with many resources that are the drivers of local livelihoods, as well as national and regional economic development. The resources are generally categorized as aquatic which includes fresh water, marine and coastal water ecosystems and; terrestrial ecosystems which include forests and wildlife, wetlands, rangelands, arable land and mountainous national and shared ecosystems. Other natural resources include minerals and energy resources, and rich biodiversity. These ecosystems are primary assets and a store of wealth, which if effectively harnessed, could contribute to Sustainable Development Goals (SDGs), especially SDG12.

These shared ecosystems face major threats, which include depletion of natural resources due to: the rising population pressure, expansion in human activities; over-exploitation, unsustainable agricultural practices, over-fishing, pollution including both point and non-point sources, and rampant conversion and destruction of the coastal ecosystems. These threats, if not mitigated in a timely manner, may have significant negative ecological, environmental, and social impacts. Development activities in various productive and social sectors including those in agriculture and livestock production, energy generation, industrial and infrastructure development and health pose negative impacts to the environment and may lead to the degradation of the environment and depletion of its rich natural resource capital.

2.1 Situational analysis on environmental and natural resources overview in the three sites

Mineral resources

The County is rich in mineral resources. Some of the already discovered minerals in the County include Titanium (rutile, ilmenite, zircon) at Nguluku and Shimba Hills; Gemstones at Kuranze; niobium, phosphates at Mrima Hills and Samburu; Silica Sands at Waa, Tiwi and Ramisi; Zinc, Lead and copper at Mkang'ombe, Mwache, Dumbule and Dzitenge; Baryte at Lunga-lunga; Coal

at Maji ya Chumvi; Sandstones at Mariakani; Limestone at Shimoni and Waa; and coral rocks at the coastline.

Forestry and agroforestry

As per the CIDP, there are no artificial forest plantations in the County. It however has one rainforest, Shimba Hills Forest. Kwale County is also home to indigenous forests known as the *Kaya* forests, which are maintained by the *Miji Kenda* council of elders.

Many of the County's indigenous forests are used as a source of construction wood and timber, as well as charcoal on which over 90 percent of rural households depend. Further, mangrove forests support bee keeping, provide shelter for various fish species, and their poles are also used in construction and to make fishing traps. The County is promoting agroforestry to reduce consumption pressure on the indigenous forests and the mangroves.

2.1.1 Kilifi County

Environmental degradation in the County is attributed to solid waste such as plastics, food waste, logging and charcoal burning, poor mining and sand harvesting practices. The CIDP acknowledges the need for the County to come up with waste management and quarry rehabilitation measures to promote biodiversity conservation.

The County's fragile ecosystem such as the Shimba Hills ecosystem consisting of Shimba Hills national Park and the Mkurumudzi is Kenya's richest herpetofauna area. However, between 2010 and 2016, the CIDP indicates that the County had lost approximately 490 ha of its forests.

According to the CIDP, the County has made considerably good progress in acquiring good solid waste collection infrastructure like trucks, compactors, and bins, and the securing to dumping sites. Solid waste management challenges identified in the CIDP are mainly on solid waste collection and handling, including challenges in managing personnel, lack of adequate PPEs, lack of modern technology in waste management, and an underpowered community on waste management.

The CIDP's five-year priority for solid waste management therefore was to achieve the agenda of waste as a resource, community capacity building and sensitization on solid waste

management, investing in PPPs for the conversion of waste to energy, improving waste handling PPEs, investing in modern waste management technology, and engaging qualified waste management personnel.

The county is rich in both surface and underground water resources, including Rivers Sabaki, Kombeni, Mwandeje, and Nzovuni which drain into the Indian Ocean. The CIDP indicates that there is therefore a big potential for construction of multi-purpose dams to meet the county's water consumption demand. Despite this, the county remains a water stressed county, with an estimated general daily water gap of 80,884 cubic metres per day in 2018. Malindi Sub-County has the highest daily water demand at 30,637 m³/d.

As per the CIDP, initial funding support in the sector focused on the development of water infrastructure such as pipelines, under the previous CIDP, leading to a 63.3% improvement in water provision to the county's residents. The CIDP acknowledges that subsequently, more effort is required towards water conservation in terms of consumption, and reducing water wastage by promoting water recycling and reuse.

2.1.2 Kwale County

[illegible]

Kwale County CIDP (2018-2022)

One of the key objectives of the County’s CIDP is to promote environmental conservation and sustainable natural resource use.

The CIDP outlined the following as development priorities under the environment and natural resources sectors:

One of the key objectives of the County's CIDP is to promote environmental conservation and sustainable natural resource use.

The CIDP outlined the following as development priorities under the environment and natural resources sectors:

- 14

- e) Pollution control
- f) Establish a mineral community trust fund as a benefit-sharing mechanism for the management of the resource on behalf of the community
- g) Adoption of best practices in waste water management and wetland conservation to protect the Indian Ocean's marine ecosystem.
- h) Encouraging the use of standard fishing gear to protect fish breeding grounds.
- i) On rocks and limestone, the County's priority was to regulate quarrying activities to promote environmental conservation.
- j) Regulating the use of forest resources.



Figure 3: Signboard of the proposed construction and landfill in Kinondo dumpsite in Kinondo ward, Kwale county

Source: Author



Figure 4: A section of the Kinondo dump site, Kwale dedicated to pharmaceutical waste.



Figure 4: Kinondo dump site.



Figure 5: Attempts to convert waste into compost Kinondo dump site.

2.1.3 Mombasa County

Mombasa county comprises six (6) constituencies namely: Changamwe, Jomvu, Kisauni, Nyali, Likoni and Mvita.⁷

The County has vast access (65 km²) to open water and 40km² of the Exclusive Ecological Zone (EEZ), a high potential fishing ground. However, communities adjacent to the ocean are unable to leverage on this due to lack of appropriate fishing gear and vessels, and occasional pirates attack. Some of the 14 fish landing sites in the County risk encroachment as is common along and near the beaches making them inaccessible.

Mangrove forests form a large portion of the county's forest cover, which is an approximate total area on 300ha. Additionally, agroforestry covers approximately 138ha of the county. Woodlots are common in areas like Likoni and Changamwe sub-counties, despite tree framing not being common in the county.

65% of the county's water is supplied by MOWASCO from Mzima Springs in Taita Taveta County, Marere, and Sabaki/Baricho in Kilifi County and Tiwi Boreholes in Kwale County. More

⁷ 'The National Assembly Constituencies and County Assembly Wards Order, 2012 - LN14_2012.Pdf' (n 33).

residents rely on borehole water which has a high percentage of fecal contamination. Approximately, only 74% of the county's population has access to safe water for consumption.

Limestone mining by Bamburi Cement in Kisauni sub-county is the only notable mining activity in the County. There is also coral blocks extraction in some parts of the county, although minimal and almost negligible.

Environmental degradation in the County

The CIDP identifies poor solid waste management and disposal as one of the major contributors to environmental degradation. Only 17 per cent of the county is connected to the sanitation and sewerage system of the City Council of Mombasa at Kipevu Sewerage Plant. Large amount of untreated sewerage is therefore discharged to the Indian Ocean, while solid waste is dumped at the Mwakirunge Dumpsite.

Environmental degradation has highly undermined the capacity of the county's vast natural resources to support its increasing population, leading to diminishing land productivity, reducing fish quality and quantity, and poor air quality.



Figure 6: Garbage at Mwakirunge dumpsite



Figure 7: Garbage at Mwakirunge dumpsite. There are old and sprouting domestic shelters around the dump site.

2.2 INTERNATIONAL AND NATIONAL LEGAL AND POLICY FRAMEWORKS

2.2.1 International Legal and Policy Frameworks

Since the 1980s, discourse and action towards easing development pressure on the environment and natural resources by integrating environmental conservation in economic development has gained momentum. Sustainable utilization of natural resources and sustainable development are now key ingredients in addressing the triple planetary crisis of environmental pollution, loss of biodiversity, and climate change.

Deliberations on and efforts towards economic development and environmental integration therefore create the basis for Sustainable Consumption and Production (SCP), whose aim is to decouple economic growth and human well-being from resource use and environmental impact. Some of the key international developments and instruments supporting sustainable consumption and production patterns are highlighted below:

2.2.2 United Nations Conference on the Human Environment (Stockholm Conference), 1972

The concept of environmentally conscious development was a key agenda in the 1972 Stockholm Conference, which was the first international conference to address environmental concerns. The Stockholm Declaration⁸ recognises the need for sustainable use of resources for the benefit of current and future generations. It further provides that States should adopt an integrated and coordinated approach to development planning, ensuring that development is compatible with the need to protect and improve the environment for the benefit of their population.⁹

2.2.3 Our Common Future, 1987

This report by the World Commission on Environment and Development defined sustainable development as development which meets the needs of the current generation without compromising the ability of future generations to meet their own needs.¹⁰ This then made it

⁸ Declaration of the United Nations Conference on the Human Environment, available at <https://documents-dds-ny.un.org/doc/UNDOC/GEN/NL7/300/05/IMG/NL730005.pdf?OpenElement>

⁹ Principle 13

¹⁰ Report of the World Commission on Environment and Development: Our Common Future, Paragraph 27, available at <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>

necessary that resource use must be sustainable, biodiversity protected, and the environment conserved in the processes of economic development.

2.2.4 The United Nations Conference on Environment and Development (Earth Summit), 1992

The Earth Summit saw the adoption of perhaps the most important initial international instruments towards decoupling economic development from environmental degradation, and natural resource depletion.

The Rio Declaration on Environment and Development

The Rio Declaration¹¹ contains key principles which have since been adopted in subsequent international, regional and national efforts towards sustainable development. Principle 4 states that in order to achieve sustainable development, environmental protection has to constitute an integral part of the development process and cannot be considered in isolation from it. Further, Principle 8 states that the elimination by States of unsustainable patterns of consumption and production is key to achieving sustainable development and a higher quality for all people.

Agenda 21

Chapter 4 of Agenda 21 makes provisions on unsustainable patterns of consumption and production. It encourages States to promote efficiency in production processes and reduce wasteful consumption in the process of economic growth, while developing national laws and policies that will encourage transition towards more sustainable patterns of consumption and production.

It highlights some key measures through which sustainable consumption and production patterns can be achieved including:

- a) Increased efficient use of energy and energy resources.
- b) Reducing generation of waste by encouraging a recycling culture and reducing wasteful packaging, It proposes the development of a criteria by governments and international organisations, for the environmental impact assessments for products and processes throughout their life cycle.

¹¹ A/CONF.151/26 (Vol. I) Report of the United Nations Conference on Environment and Development, Annex 1, available at https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF.151_26_Vol.I_Declaration.pdf

- c) Adoption of sustainable public procurement in government purchasing policies, and the adoption of environmentally sound pricing, as a way to expose the environmental costs of a product or process.

Agenda 21 recognises that a transition towards SCP will require the concerted effort of governments, producers and consumers, while taking into account the critical role of women and households as consumers whose purchasing power can be leveraged on.

The Convention on Biological Diversity (CBD), 1992

The Convention requires States to develop strategies, plans or programmes for the conservation and sustainable use of biological diversity, and integrate the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.¹²

It further requires state parties to integrate sustainable use of biological resources into national decision making, adopt measures relating to the use of biological resources to avoid or minimize adverse impacts on biodiversity, and endeavour for cooperation with the private sector in coming up with methods for sustainable consumption of biological resources.¹³

2.2.5 The 1994 Oslo symposium

It defined Sustainable Consumption and Production as the use of services and related products, which respond to basic needs and bring better quality of life while minimizing the use of natural resources and toxic material as well as the emissions of waste and pollutants over the lifecycle of the service or product so as not to jeopardize the needs of future generations.

2.2.6 Johannesburg Declaration on Sustainable Development, and the Plan of Implementation, 2002

The Johannesburg Declaration recognises that changing consumption and production patterns and protecting and managing the natural resource base for economic and social development as overarching objectives of and essential requirements for sustainable development.¹⁴

¹² Article 6

¹³ Article 10

¹⁴ Article 11

The Plan of Implementation acknowledges that a fundamental shift in societal consumption and production pattern is key in achieving global sustainable development.¹⁵ It calls upon all stakeholders to encourage and promote the development of a 10 –Year Framework of Programmes to support the regional and national initiatives, to accelerate the shift towards SCP patterns, and where appropriate, delinking economic growth and environmental degradation. This can be achieved through improved efficiency and sustainability in the utilisation of resources and production processes and reducing resource degradation, pollution and waste. The Plan of Implementation proposes among others, the following actions towards achieving and promoting SCP:

- a) Adopting and implementing policies and measures on the polluter-pays principle;
- b) Employing science-based approaches such as life-cycle analysis;
- c) Raising awareness on SCP;
- d) Increasing investment in cleaner production and eco-efficiency;
- e) Establishing and supporting cleaner production programmes and centres;
- f) Integrating SCP patterns into sustainable development policies and strategies; and
- g) Enhancing corporate environmental and social responsibility and accountability

As a response to the 2002 call for SCP in Johannesburg, the Marrakech process on SCP was launched in 2003, which was an international process to support national and regional initiatives towards SCP in Africa, and support the implementation of Africa’s 10 YFP on SCP.

2.2.7 The United Nations Conference on Sustainable Development, 2012 and the Global 10-Year Framework of Programmes(YFP) on Sustainable Consumption and Production (2012-2022)

Twenty years after the Earth Summit, a global 10-year framework of programmes for sustainable consumption and production was adopted in 2012 at the UN Conference on Sustainable Development. The objectives of the global 10-YFP on SCP include providing support regional and national policies and initiatives to accelerate the shift towards SCP, contributing to resource efficiency and decoupling economic growth from environmental degradation, while creating new job/market opportunities and contributing to poverty alleviation. The Programmes would also

¹⁵ Plan of Implementation of the World Summit on Sustainable Development, Paragraph 14, available at https://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf

provide financial and technical assistance and capacity building to developing countries in order to support the implementation of SCP activities at the regional and national levels. Further, the Programmes would encourage developed countries to accelerate changes in consumption and production patterns and adopt more sustainable lifestyles and innovation to achieve absolute decoupling. The Framework of Programmes would also serve as a platform for information and knowledge sharing on SCP tools, initiatives and best practice, hence enhancing cooperation and development of new partnerships.

Key objectives of the Framework of Programmes include increasing efficiency and sustainability in resource use and production processes; reducing resource degradation, pollution and waste; and promoting lifecycle approaches.

2.2.8 Transforming Our World: The 2030 Agenda for Sustainable Development, 2015¹⁶

Sustainable Consumption and Production is an integral component towards achieving the sustainable development goals. The 2030 Agenda outlines SCP as one of its 17 sustainable development goals, and calls upon states to work towards the targets: implement the 10 Year Framework of Programmes on SCP; reduce waste generation through reduction, recycling and reuse; reduce per capita global waste by half by 2030; achieve sustainable management and efficient natural resource use by 2030; promote sustainable public procurement; create awareness on sustainable lifestyles; and develop tools to monitor sustainable tourism.

2.2.9 UNEP International Declaration on Cleaner Production

The UNEP International Declaration on Cleaner Production is a voluntary and public statement of commitment to the practice and promotion of Cleaner Production. Cleaner Production is a preventative environmental management strategy which promotes eliminating waste before it is created to systematically reduce overall pollution generation and improve efficiencies of resource use.

¹⁶ UN General Assembly, *Transforming our world : the 2030 Agenda for Sustainable Development*, 21 October 2015, A/RES/70/1, available at <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N15/291/89/PDF/N1529189.pdf?OpenElement>

2.3 Regional Legal and Policy Frameworks

2.3.1 The African 10-Year Framework Programme on Sustainable Consumption and Development (2002-2012)

The Programme's key priority areas were energy, habitat and urban development, water and sanitation, and renewable resource-based industries. Under these key priority areas, the following specific needs were identified: Technology transfer and assistance for efficient use of water; promoting integrated solid waste management (ISWM); promoting energy efficiency and renewable energy technologies for industry, agriculture and households; sustainable urban mobility; sustainable urban development, including the promotion of sustainable building design and construction; expansion of value chains for agricultural products and by-products which would go a long way in reducing food loss and food waste; and promoting sustainable public procurement.

Some of the projects and activities implemented under the Africa 10 YFP on SCP, and related to Kenya include:¹⁷ **(SCP in Africa document)**

- a) Sustainable buildings policies for developing countries
- b) Africa Eco-labeling mechanism
- c) Shift towards sustainable tourism
- d) The comprehensive Plastic Waste Management Strategy for the City of Nairobi, 2006

2.4 National Legal and Policy Frameworks

Kenya has several environmental and natural resources laws and regulations at the national and county levels, which inter alia provide the legal framework for the governance, planning, and environmental management of her urban areas, aiming to promote sustainable and inclusive urban development and improve the quality of life for urban residents. Some of the key laws and policies are set out below.

¹⁷ UNEP, Sustainable Consumption and Production in Africa 2002-2012, pp 14-34, available at https://wedocs.unep.org/bitstream/handle/20.500.11822/8779/SCP_AFRICA_Final_with_cover.pdf?sequence=3&isAllowed=y

2.4.1 The Constitution of Kenya 2010

The Constitution's embodiment of the principle of intergenerational equity necessitates the need for sustainable utilization of natural resources. Article 42 guarantees every person the right to a clean and healthy environment, which demands sustainable consumption and production patterns such as sustainable waste management. Article 10 provides for sustainable development as one of the key principles for good governance while Further, Article 69 creates obligations on the State with respect to the environment, including an obligation on sustainable utilisation of natural resources. Article 60 requires that sustainable use shall be a key principle in land use governance and management.

Further, the fourth schedule to the Constitution which allocates powers and functions between the National government and counties allocates the following roles to the National Government: disaster management; ancient and historical monuments of national importance; energy policy including electricity and gas reticulation and energy regulation; and tourism policy and development. It then allocates the following roles to county governments:

- a) Agriculture and fisheries;
- b) County health services, including, refuse removal, refuse dumps and solid waste disposal; control of air pollution,
- c) County transport, including county roads; and
- d) County planning and development, including: statistics; land survey and mapping; boundaries and fencing; housing; and electricity and gas reticulation and energy regulation.

2.4.2 Gaps Analysis

Notably, in addition to the traditional anthropocentric justifications for sustainable consumption and production in respect of the environment and natural resources, these Constitutional provisions present traces of justifications favouring nature's rights. There is however need for interventions that focus more deliberately on prioritisation of nature's rights.

Discussions with various stakeholders revealed that while the counties are happy with allocation of the roles, they were disgruntled by the relatively low and delayed corresponding financial allocations by the national government. For instance, waste disposal requires large scale infrastructure investment. This places a significant strain on the county resources thereby

hampering their ability to develop and implement effective SCP strategies. The National Government respondents on the other hand while acknowledging the resource constraints explained that the constraints were because the National Government was equally constrained.

There is apparent need for the counties to implement strategies that assured them of more financial and technical independence from the National government.

2.4.3 The County Governments Act, 2012

This national legislation outlines the powers and functions of county governments including those assigned to them under Article 186 and the Forth Schedule of the Constitution of Kenya.¹⁸ County governments are responsible for the administration of urban areas at the local level in the areas of agriculture, planning, natural resource management, and environmental conservation. The Act provides for county planning, under which County Integrated Development Plans (CIDPs), county sectoral plans, county spatial plans, and county municipal plans should be developed.

2.4.4 Environmental Management and Coordination Act (EMCA), 1999 (Revised Edition 2019)

EMCA is the principal law on environmental management and conservation in Kenya. It embodies intergenerational equity and sustainable development as some of the key guiding principles for environmental conservation in the country. The Act governs various areas which would have an impact on sustainable consumption and production such as waste management, pollution, and environmental impact assessment. It further outlines projects for which Environmental Impact Assessment studies must be conducted before they are licensed for construction.¹⁹ This is supposed to project and mitigate any potential negative environmental impact of a project.

EMCA in relation to County Governments

The Act requires county governments to establish County Environmental Action Plans, which shall be integrated into a national environmental action plan.

¹⁸ Section 5

¹⁹ Second Schedule

These plans shall contain an analysis of natural resources within the county; have an analytical profile of these resources' uses and value; recommend appropriate legal and fiscal incentives to encourage environmental protection integration by businesses; recommend ways to create awareness on sustainable use of environmental and natural resources; set out operational guidelines for the planning and management of the environment and natural resources; identify trends in urban development and strategies to mitigate their negative impacts on environmental and natural resources, propose guidelines for the integration of environmental protection in county development planning; identify and recommend policy and statutory measures for preventing, controlling or mitigating adverse impacts in the environment.²⁰

Compliance with these Plans shall be monitored by the National Environmental Management Authority (NEMA).²¹

Further, the Act requires county governments to establish County Environmental Committees which shall be responsible for proper environmental management within respective counties, and in developing strategic environmental action plans every five years²²

The Act requires all policies, plans and programmes for implementation - including at the county level –to be subjected to strategic environmental assessments.²³ Additionally, the Act gives county governments the powers to make legislation relating to all matters required or permitted by EMCA.

²⁴

2.4.5 The Physical Planning Act, 2019

Among the Act's objectives is providing a framework for equitable and sustainable use, planning and management of land. it embodies the constitutional requirement of sustainability in land governance and management. This law regulates physical planning and land use management in Kenya, including the preparation of development plans, zoning regulations, and subdivision control within urban areas. It aims to promote orderly and sustainable urban development.

²⁰ Section 41

²¹ Section 41B (1)

²² Section 30

²³ Section 57A

²⁴ Section 147A

2.4.6 The Energy Act, 2019

The Act provides for the efficient, economic and cost-effective production and use of energy, and the promotion of energy efficiency and conservation at both the production and demand sides of the energy value chain. On buildings and construction, the Act requires the development and adoption of energy conservation building codes.²⁵ This will promote sustainable energy consumption in the construction sector.

The Act mandates the Energy and Petroleum Regulatory Authority (EPRA) to coordinate the development and implementation of a national energy efficiency and conservation action plan, in consultation with relevant statutory authorities and other stakeholders, and to create awareness and disseminate information on the efficient use of energy and its conservation.²⁶ The Authority is also mandated to coordinate the development and implementation of a national energy efficiency and conservation programme, including the designation of buildings, factories, and energy appliances by types and quantities of energy use, and methods of energy utilization, in order to promote efficient energy use and its conservation. The Authority is further mandated to conduct energy audits and inspections on buildings and factories to promote energy conservation, and makes provisions on energy managers and auditors, including their qualifications. It also requires that designated buildings and factories make submit annual energy utilization reports.

To promote energy conservation, the Act empowers EPRA to issue energy saving certificates to consumers whose consumption is below the prescribed norms and standards. The Act also requires the Cabinet Secretary to make energy efficiency and conservation regulations.

County governments may amend energy conservation building codes to fit local climatic conditions. They are also required to create awareness on energy efficiency and consumption, direct compliance on energy conservation and efficiency, and establish an energy conservation and efficiency Fund.²⁷

²⁵ Section 190 (n)

²⁶ Section 56

²⁷ Section 194

2.4.7 The Public Health Act, Cap 242

This law regulates public health and sanitation standards in Kenya, including provisions related to water quality, waste management, and disease control in urban areas.

2.4.8 The Urban Areas and Cities Act, 2011

This legislation provides for the administration and governance of urban areas and cities in Kenya. It establishes urban areas and cities boards to oversee urban planning, development control, and service provision in designated urban areas.

2.4.9 The Land Act, 2012

This legislation governs land tenure, management, and administration in Kenya. It addresses issues such as land ownership, registration, and land use planning, which are integral to urban development and land management in urban areas.

2.5 Review of Sub-National Legislation (Kwale County)

2.5.1 Kwale Quarrying Act, 2016

The Act makes provisions on common mineral harvesting in the County. It establishes a Technical Mineral Harvesting Committee, and Common Mineral Resource Management Associations, whose core mandates include ensuring that common mineral harvesting in the county is done in a sustainable manner. The Associations are mandated to designate common mineral harvesting sites in the county. The Act prohibits common mineral harvesting on river banks and requires harvesting from riverbed to be undertaken in a way that ensures the common mineral is retained to ensure water retention.

2.5.2 Kwale County Forest Conservation and Management Act, 2017

The Act makes provision for sustainable utilization and management of the county's forests, and operationalizes the national forest management and conservation Act. It also mandates the County Forest Division to require residential and commercial estate development within the County to include in their plans, the provision of tree planting and other green zones to cover at least ten percent of the land area to be developed.

The Act provides for incentives for forest conservation in form of: A County Community Forestry Programme; a County Reforestation Programme; a County Programme for craft apprenticeships and vocation training for school-leavers in forest resource-based enterprises; a permanent forest sink initiative and, alternative energy initiatives including energy efficient fuel wood cooking devices. These initiatives and programmes shall be funded by a county fund established by the respective CEC. For example, under the county community forestry programme, grants shall be given to community based organisations, private sector, and forest adjacent communities to support their forest management initiatives. Under the Permanent Forest Sink Initiative, landowners will be able to benefit from carbon sequestration functions on their land and forests through carbon trading initiatives. The Act further provides for the establishment of a county forest management and conservation Fund.

Gaps

- The Act does not make specific reference to mangrove forests.
- It is not elaborate on how to reduce pressure and overreliance on forest resources by development activities.

- There is no waste management law, policy or regulation for Kwale County online. There is however a 2021 tender advertisement for the development of a solid waste management policy and plan for the county that demonstrates positive strides.

2.5.3 Existing Interventions

The Kwale County Government has a specific department called, ‘Environment and Natural Resources’.²⁸ The Kwale County department’s vision is for a well-managed environment where land, mining and natural resources are utilized sustainably to create wealth for the citizens of the county.²⁹ Its mission is to create an enabling environment for accelerated investments on land, mining and natural resources to achieve rapid industrialization of the county.³⁰

The strategic goals for the Department are: (a) to attain sustainable land management and development; (b) to increase forest cover for a sustainable development in a clean and secure environment; and (c) to manage mineral resources for the County Development and community empowerment. The Department derives its mandate from the major sub-sectors, i.e., lands, mining, environment and natural resources.³¹

On the land sector sub sector, the department’s mandate includes lands policy management, physical planning, land transactions, survey and mapping, settlement matters, rural settlement planning i.e. eco-village, land reclamation, county spatial data and land information system, administration of public land in the county.

On the mining sub sector, the department’s mandate includes mineral exploration, inventory and mapping of mineral resources in the County, and County level mining policy and management mining, policies on the management of quarrying and mining areas, management of health and safety standards in mines.

On the Environment and natural resources sub sector, the department’s mandate includes Environmental management, forest development and management (including re-afforestation and

²⁸ Kwale County Government, ‘Environment & Natural Resources’
<https://kwalecountygov.com/kwale/index.php?option=com_content&view=featured&Itemid=935> accessed 18 January 2023.

²⁹ *ibid.*

³⁰ *ibid.*

³¹ *ibid.*

agro-forestry), conservation and protection of wildlife and marine ecosystems, water catchment area conservation and coordination of climate change affairs,

The County also has deliberate interventions at all levels, including those set out below:

Ministry's Mandate	Ministry's Mitigation Strategy	Ministry's Given Indicators
Develop a mineral resource map for Kwale County	Produce a resource map indicating details of the mineral types in Kwale County.	Resource map for mineral deposits in the County
	Gazette all the mineral deposit sites identified	Gazette notices for deposit sites
	Make land accessions on vulnerable areas that are identified to be rich in mineral deposits	Land accession documents for vulnerable deposit sites
Formulate and implement mineral resources development and exploitation policy Promote and implement mechanisms for sustainable mining activities.	Develop a policy document that guide surveying, prospecting, and mining of minerals	Relevant policy documents
	Develop guidelines for artisanal mining and community engagement in mining	Relevant guidelines document
	Establish a mining task force to monitor miners adherence to policies and guidelines	Operating task force
Ensure rehabilitation/restoration of all mining sites as per the EMP in the EIA.	Maintain records of mining activities including the EMP	Updated mining activity records and follow up plans
	Progressive monitoring of the mining and rehabilitation/restoration as per the EIA/EMP	
Environment		
Develop relevant policies and guide lines for the environmental issues.	Produce policy document for conflict resolution mechanisms;	Respective policy documents

	• Produce policy for wildlife damage/loss compensation; • Produce policy for natural resource access and utilization (including minerals, oil & gas); • Produce guidelines for benefit sharing accruing from natural resources • Produce guidelines for development activities and engagement	• Respective guidelines documents
Establish sensitization and community awareness campaigns to enlighten the community on environment and related agenda.	• Mobilize community awareness programs through County administrators to inform community on their rights and responsibilities in environmental management and utilization • Develop educational materials with information on rules and regulations governing the environment. • Produce policy briefs to summarize different policies, guidelines and processes related to environment	• Better informed community in environment issues • Increased PFM activities • Increased community benefits from sustainable conservation • Better conserved forest and other natural landscapes • Educational posters and brochures • Operational committees on environment

	• Use local media to inform communities on environmental issues, processes and laws • Establish community committees charged with environmental education, management and utilization. • Support community groups (CFAs) to participate in PFM activities (Forest Management Plan; Agreement Plan; Business plan	
Identification, demarcation and fencing protected areas to discourage straying wild life.	• Survey protected areas • Develop resource map for the protected areas • Fence all the forest reserves, national reserves and kaya forests	• Resource maps • Protected/fenced boundaries
Develop tree growers initiatives to cater for timber, poles and fuel resource needs as a buffer for the indigenous forests.	• Establish tree growers' associations with defined benefits • Develop commercial tree nurseries to serve tree growers demands • Avail credit facility for tree growers to encourage tree farming as an agri-business • Undertake vocational training for tree growers in farming and business skills	• Registered tree growers' associations • Increased number of commercial tree nurseries • Loan facility for tree growers • Training programs for tree growers

Rehabilitate degraded forest areas and other landscapes as per historical ecological constituents	• Undertake inventories on the establish degraded areas • Literature review on historical floral and faunal composition of degraded areas • Develop rehabilitation plan and monitoring system for each degraded area	• Inventory data (benchmarks) • Research output on flora and fauna of affected areas • Monitoring plan in place
Land		
Update agro-ecological zones for the County land area to inform relevant socio-economic activities	• Research action to review the agro-ecological data • Develop updated maps indicate ‘new’ boundaries of the agro-ecological areas • Revise socio-economic activities advice as per the updated agro-ecological information	• Updated agro-ecological maps • Reviewed socio-economic action plan
Adjudicate the relevant land for distribution to native communities.	• Develop database of squatters and landless persons in the County • Establish settlement scheme in favor of the deserving native community members • Issue title deeds to beneficiaries of the settlement scheme • Effect gender balance in the beneficiary selection	• Database of squatters and landless persons • Successful implemented settlement schemes • Persons issued with title deeds
Establish sensitization and community awareness campaigns to enlighten the community on land acquisition process and management.	• Mobilize community awareness program through the Chief’s office to inform community on land issues (acquisition, documents and levies).	• Community knowledgeable on land issues (conservation and utilization)

	• Develop educational materials with information on land use and development. • Produce policy briefs to summarize different land policies and legislation • Use local media to inform communities on best practices in land management • Establish community committees charged with conflict resolution on land issues. • Support farmer groups to engage in conservation agriculture	• Posters and brochure on land information • Policy briefs on land policies and legislation • Local media materials on land issues • Vibrant community committees mitigating conflicts on land issues
Establish taskforce to investigate past land dealings and injustice, for correctional action, and irresponsible office bearers taken to task.	• Establish county land commission equivalent • Audit of land ownership and legality in acquisition • Prosecution of corruption and other malpractices among individuals	• County land issues taskforce • Transparent land transactions • Prosecution if need arise
Relevant County executive office fully mandated to transact land issues.	Land allocations through consultation with the County executive office	Consultative engagements between County office, Land Commission, and Lands office

Table 3:

2.6 Review of Kilifi County Sub-National Framework

Kilifi County has seven (7) sub-counties, each of which is also an electoral constituency in Kenya. Malindi is one of the electoral constituencies within Kilifi town, the rest are: Ganze, Kaloleni,

Kilifi North, Kilifi South, Magarini, Malindi, and Rabai.³² Malindi constituency was also awarded Municipality status in the year 2018. Kilifi County has a department known as, ‘Health Services and Sanitation’.

2.6.1 Kilifi County Environmental (Regulation and Control Act) 2016

The Act makes provisions on regulating air pollution, noise pollution, and public nuisances. It establishes sub-county environmental committees, whose mandate includes insuring proper environmental management at the sub-county level.³³ The Act mainly focuses on noise pollution, air pollution and public nuisances, and is silent on solid waste management in the County.

2.6.2 Kilifi County Solid Waste Management Act, 2019

The Act introduces the concept of shared responsivity in waste management between the county government, waste generators, waste service providers and premise owners and occupier. It also introduces a solid waste management charge³⁴ and an environmental levy.³⁵ The charge is to be paid by waste generators to fund waste management in the County, while the levy will be imposed on ratable property, to be applied to waste management in the County.

The Act mandates the CEC to develop guidelines for waste material recovery through reduction, re-use, recycling and composting of waste by various stakeholders in waste management. If well implemented, this will be a great opportunity to address waste generation in the County.

The categorizes waste into municipal, market, construction and demolition, industrial solid waste, agricultural, clinical, plastic, hazardous, junk and electronic waste. It further provides for colour coding of waste collection containers to facilitate waste segregation, and requires the CEC to make waste segregation regulations.

Opportunities

³² ‘The National Assembly Constituencies and County Assembly Wards Order, 2012 - LN14_2012.Pdf’ <https://kenyalaw.org/kl/fileadmin/pdfdownloads/LegalNotices/2012/LN14_2012.pdf> accessed 23 April 2024.

³³ Section 6

³⁴ Section 7

³⁵ Section 8

- a) On waste generation reduction, and reuse, the Act provides a strong foundation for the adoption of these measures. The CEC should come up with regulations for their implementation, and in doing so, consider the best practices proposed in this report.
- b) In addition, the principle of shared responsibility in waste management could be an effective approach towards achieving sustainable waste management in the County.
- c) Further, the waste management levy and charge introduced by the Act could also be an effective way of applying the ‘polluter pays’ principle in waste management at the county level.

2.6.3 Kilifi Forest Conservation and Management Act, 2019

This is an Act to ensure sustainable development and management of forest resources in Kilifi County. It makes provisions on classification of forests into county, community, and private forests, formulation of forest management guidelines which shall set standards for forest management within the county, establishment of urban green spaces, formulation of wood fuel regulations by the CEC within six months of the enactment of the Act to ensure sustainable production of wood fuel and fair trade, community participation in forest management, incentives for forest management among others. Forestry Directorate established under the Act is responsible for its implementation. The Act requires that the ecosystem approach shall be used in forest management in the county.

The Act allows for the granting of user and commercial rights in the utilization of county forests (Dakatcha Woodland, Mwangea Hills, Kizungu Hills, Nzovuni Forest, Kachororoni Gorge, and Kaya Forest). It prohibits any person from undertaking commercial use of forests and forest resources without a licence.

It introduces a licensing regime from commercial consumptive and non-consumptive use of forest resources, and prohibits the commercial use of county forests and their resources without a licence. For instance, commercial timber harvesting in county forests shall be subject to a timber contract between the user and the county government.

The Act introduces the concept of chain-of-custody in the trading of forest resources which will identify the origin of and ensure that all commercial forest products have been obtained through licensed activities.

Gaps and Opportunities

- a) There is no specific reference to mangrove forests as a fragile ecosystem within the County, under the classification of forests.
- b) On the other hand, the provisions on chain-of-custody, if well implemented can help curb illegal harvest of forest resources, contributing to sustainable use of forest resources.

2.7 Review of Sub-National framework (Mombasa County)

2.7.1 Mombasa County Environmental Sanitation and Health Act, 2017

Among other things, the Act addresses waste management and food hygiene. It requires the County to develop a waste management policy, and an integrated waste management plan for effective implementation of the Policy. The integrated plan shall contain individual plans on household, industrial, electronic, commercial, medical, and hazardous waste. For sustainability and effective implementation of the integrate plan, the Act requires the county government to integrate the waste management plan and strategy in its CIDPs. So far, the County has a Solid Waste Management Policy adopted in 2019, which makes extensive policy proposals on solid waste management. There is also a solid waste management Bill of 2021, which is yet to be passed into law.

Figure 8: Heaps of food waste at Kongowea market



Figure 9: Open air food trade at Kongowea market

2.7.2 Mombasa County Environmental Sanitation and Health Act, 2017

Among other things, the Act addresses waste management and food hygiene. It requires the County to develop a waste management policy, and an integrated waste management plan for effective implementation of the Policy. The integrated plan shall contain individual plans on household, industrial, electronic, commercial, medical, and hazardous waste. For sustainability and effective implementation of the integrated plan, the Act requires the county government to integrate the waste management plan and strategy in its CIDPs. So far, the County has a Solid Waste Management Policy adopted in 2019, which makes extensive policy proposals on solid waste management. There is also a solid waste management Bill of 2021, which is yet to be passed into law.

Figure 8: Heaps of food waste at Kongowea market



Figure 9: Open air food trade at Kongowea market

Gaps and Recommendations

- a) Although the Act also makes provisions on food hygiene in terms of public health, it is silent on sustainable management of food waste.
- b) The Act does not provide for the establishment of a county environmental committee as required under EMCA. This committee should be an umbrella environmental body at the county level, under which other sub-committees can be established.
- c) From the discussions with the various respondents, there seems to be a disconnect between the county trade department and its environment department in respect of who is supposed to handle the waste at the market. The trade department is the one that licenses vendors and collects the respective monies from them. This has left a vacuum leading to huge accumulation of food waste at various dumping points within the markets. There is need for a streamlining of the roles between the departments. This can be done within the law as well as through policy and administrative interventions.

2.7.3 Mombasa Mangrove Forest Participatory Management Plan, 2015 - 2019

This Plan was developed to encourage participatory and community management of forest resources, in a bid to reduce the consumption pressure on mangroves by surrounding communities for wood fuel, building timber, and even charcoal burning for commercial purposes. It anchored

on the national Forest Management and Conservation Act. Subsequently, the national government developed the National Mangrove Ecosystem Management Plan, 2017-2027.

The County's mangrove management plan proposed various programmes for the five-year period, including a forest extension program, with the objective of reducing household pressure on mangrove forest resources by promoting artificial forests and agroforestry.

Gaps and Recommendations

- a) There is a lack of clear monitoring, evaluation, and accountability mechanisms to evaluate the progress and afterlife impact of such periodic plans, for sustainability of impact. This will make it easy for continuity of objectives into subsequent plans, and effective application of lessons learnt.
- b) There therefore should be a provision in the County CIDPs, requiring mandatory Monitoring and Evaluation on all county environmental, developmental, and natural resource management plans, with periodic reporting on implementation progress, to promote effective implements and tie individual plans and strategies to the implementation of the CIDPs.

2.7.4 Mombasa County Solid Waste Management Policy³⁶

The policy identifies solid waste to include food, agricultural, and construction waste. E-waste, construction and junk waste constitute 14% of the waste stream, while organic waste - which includes food waste - constitutes an estimated 68% of waste streams. Organic waste, especially from food markets such as Kongowea and Marikiti, is the most common form of solid waste generated in the county.

To promote sustainable solid waste management, the Policy proposes segregation and separation of waste at source as a policy measure. However, it lacks clear incentives towards repurposing food waste, for instance, by placing economic value on organic waste. Further, although the policy also proposes the adoption of incentives to encourage recycling and reuse, it does not make clear provisions on how this should be actualized.

³⁶YC", "itemData": {"id": 7, "type": "webpage", "title": "County-Clim ate-Change-A

The policy requires construction and demolition waste to be transported to designated areas approved by the county department for solid waste management. However, beyond this, the policy lacks provisions on reduction and repurposing of construction and demolition waste.

Gaps

- a) Lack of clear incentives towards repurposing food waste, for instance, by placing economic value on organic waste.
- b) Lack of clear provisions on how to actualize proposed recycling and reuse incentives.
- c) The policy lacks provisions on reduction and repurposing of construction and demolition waste.

Recommendations

- a) The County should make it a requirement for construction projects in the County to have clear mitigation measures on reduction of construction waste as part of their environmental management plans required under the EMCA.
- b) The County Environmental Act be amended to incorporate the provisions of the 2019 solid waste management policy.
- c) Provision of clear strategies on the actualization of proposed recycling and reuse incentives.
- d) Development or adoption of clear incentives towards repurposing food waste, for instance, by placing economic value on organic waste.

2.7.5 Mombasa Solid Waste Management Bill, 2021³⁷

The Bill seeks to address the collection, treatment, transportation, and disposal of solid waste in the County, and contribute to sustainable utilization of natural resources through waste prevention, material recovery and recycling. It establishes sub-county solid waste management committees which shall be in charge of, among others, providing a platform for consultative and participatory waste management, and coordinating public and private sector solid waste production services at the sub-county.

"tion-Plan.pdf", "URL": "https://www.mombasa.go.ke/wp-content/uploads/2021/10/County-Climate-Change-Action-Plan.pdf", "author": [{"literal": "County Government of Mombasa Department of Environment, Waste Management & Energy"}], "accessed": {"date-parts": ["2023", 1, 23]}}

The Bill provides for the separation of dry waste from wet waste at source by requiring waste provision service providers to avail receptacles for waste separation and prohibiting transfer of unseparated waste. Failure to separate waste will attract either a maximum of 2 months' imprisonment or a fine of ten thousand Kenya shillings. The Bill also requires dry waste to be treated and recovered, while wet waste shall be disposed in a composite site or a landfill.

Gaps

- a) No provisions for re-use of wet waste, which included agricultural waste).
- b) No provision on further separation of dry waste, i.e, plastic waste from construction waste, from e-waste, etc.
- c) Also, the Bill is silent on measures to encourage reduction of waste generation.
- d) It also lacks measures for encouraging reuse of wet waste by placing an economic value on the waste, besides composting.

Recommendations

- a) Encourage wet waste reuse, including as alternative sources of energy. As Counties work on developing county energy plans, the county should integrate the use of waste as a source of energy in its alternative energy plans and interventions.
- b) Waste separation at source. Volume reduction decreases the disposal cost. Separation also helps in recycling.

2.7.6 Mombasa County Climate Change Action Plan 2020-2024

The plan is intended to provide guidance on solutions to some of these impacts through a systematic planning process. This plan sets out various key components of sustainable consumption and production in relation to the environment and natural resources, which include specific county objectives, specific interventions to be undertaken, expected outcomes, key performance indicators, time frames and key actors. This approach is effective as it is both measurable and specific. It also demonstrates the multi stakeholder approach which is critical for attainment of the deliberate interventions proposed.

The specific interventions proposed include: development of climate change legislations; enhancing the climate change directorate in implementing climate change functions; Enhance the county's capacity in monitoring the impact of climate change and Mainstreaming climate change. More specific interventions proposed in this plan include: develop climate change finance policy; develop climate change associated bills; recruiting staff; training staff in climate change; establish dedicated offices and personnel for climate change; train staff in monitoring the impact of climate change; development of impact assessment tools; undertake surveys on consumption, production and utilisation of natural resources as well as climate impact; establish a repository for relevant data and information; to create awareness of the local community; mitigation and adaptation measures; equip the local community with necessary tools for coping with global disruptions; rehabilitation of mangrove ecosystems; rehabilitation of coral reefs; rehabilitation of abandoned quarries; rehabilitation of degraded community forests; rehabilitation of rivers and wetlands; establishment of eco-park in the terrestrial ecosystem and in marine ecosystem; tree planting along roads; greening of roundabouts; adoption of agroforestry on farms; tree planting in institutions; train staff on clean energy; building the information and resource capacity of communities to use alternative clean energy solutions; Installation of solar panels in county infrastructure; incentivize the production and sell of solar panels; sensitize the community on sustainable waste management; develop a sustainable waste management system ; enhance the county's capacity to implement the sustainable management system; develop pollution control laws, regulations and policies and develop enforcement capacity and community buy in; and incorporate SCP activities in all the sectors at the county.³⁸

2.8 Stakeholder Analysis

The various stakeholders in Mombasa County have identified its rapid urbanisation as well as a floating population from other counties as a major contributor to its environment and natural

, "schema": "https://github.com/citation-style-language/schema/raw/master/csl-citation.json"} County Government of Mombasa Department of Environment, Waste Management & Energy (n 2).

³⁸ ADDIN ZOTERO_ITEM CSL_CITATION {"citationID": "yFUjhLJW", "properties": {"formattedCitation": "\u00a0Environment, Waste Management and Energy \u00a0Mombasa County\u00a0\u00217\u00a0 <https://web.mombasa.go.ke/environment-waste-management-and-energy/> accessed 19 January 2023.", "plainCitation": "Environment, Waste Management and Energy – Mombasa County' <https://web.mombasa.go.ke/environment-waste-management-and-energy/> accessed 19 January 2023.", "noteIndex": 45}, "citationItems": [{"id": 17, "uris": ["http://zotero.org/users/4972032/items/RSZ9PNHK"], "itemData": {"id": 17, "type": "post-weblog", "language": "en-US", "title": "Environment, Waste Management and Energy – Mombasa County", "URL": "https://web.mombasa.go.ke/e

resources challenges. Additionally, Mombasa County being an island is one of the most impacted ecosystems by climate change. Some of the effects experienced so far include:

- a) extreme weather, including more intense rainfall affecting the land, coastline, the sea and tourism patterns;
- b) rising sea-levels threatening habitable land and particularly coastal infrastructure and causing increased chance and scale of coastal flooding; and
- c) adverse impact on the natural resource base, including water resources and inshore waters.

2.7.6 Existing Interventions

Mombasa County also has a specific department of, ‘Environment, Waste Management and Energy’, which is one of the ten departments in the county.³⁹ Another relevant department is the department of, ‘Water, Sanitation & Natural Resources’.⁴⁰ Each of the departments are headed by a County Executive Committee Member (CECM).⁴¹ Each department also has one County Chief Officer who is the accounting officer of the department.⁴²

nvironment-waste-management-and-energy/", "accessed": {"date-parts": [{"2023", 1, 19}]}}, "schema": "https://github.com/citation-style-language/schema/raw/master/csl-citation.json"} ‘Environment, Waste Management and Energy – Mombasa County’ <https://web.mombasa.go.ke/environment-waste-management-and-energy/> accessed 19 January 2023.

³⁹ ADDIN ZOTERO_ITEM CSL_CITATION {"citationID": "FH6LxGod", "properties": {"formattedCitation": "\u0000\u00216{} Water, Sanitation & Natural Resources \u0000\u00211{} Mombasa County\u0000\u00217{} <https://web.mombasa.go.ke/water-sanitation-natural-resources/> accessed 19 January 2023.", "plainCitation": "‘Water, Sanitation & Natural Resources – Mombasa County’ <https://web.mombasa.go.ke/water-sanitation-natural-resources/> accessed 19 January 2023.", "noteIndex": 46}, "citationItems": [{"id": 16, "uris": ["http://zotero.org/users/4972032/items/VSBY2HNN"], "itemData": {"id": 16, "type": "post-weblog", "language": "en-US", "title": "Water, Sanitation & Natural Resources – Mombasa County", "URL": "https://web.mombasa.go.ke/water-sanitation-natural-resources/", "accessed": {"date-parts": [{"2023", 1, 19}]}}, "schema": "https://github.com/citation-style-language/schema/raw/master/csl-citation.json"} ‘Water, Sanitation & Natural Resources – Mombasa County’ <https://web.mombasa.go.ke/water-sanitation-natural-resources/> accessed 19 January 2023.

⁴⁰ ADDIN ZOTERO_ITEM CSL_CITATION {"citationID": "btyok1VY", "properties": {"formattedCitation": "\u0000\u00216{} Environment, Waste Management and Energy \u0000\u00211{} Mombasa County\u0000\u00217{} (n 45).", "plainCitation": "‘Environment, Waste Management and Energy – Mombasa County’ (n 45).", "noteIndex": 47}, "citationItems": [{"id": 17, "uris": ["http://zotero.org/users/4972032/items/RSZ9PNHK"], "itemData": {"id": 17, "type": "post-weblog", "language": "en-US", "title": "Environment, Waste Management and Energy – Mombasa County", "URL": "https://web.mombasa.go.ke/environment-waste-management-and-energy/", "accessed": {"date-parts": [{"2023", 1, 19}]}}, "schema": "https://github.com/citation-style-language/schema/raw/master/csl-citation.json"} ‘Environment, Waste Management and Energy – Mombasa County’ (n 51).

⁴¹ ‘Environment, Waste Management and Energy – Mombasa County’ (n 51).

⁴² ‘Environment, Waste Management and Energy – Mombasa County’ <https://web.mombasa.go.ke/environment-waste-management-and-energy/> accessed 19 January 2023.

Mombasa County has listed the following directorates within the Environment, Waste Management and Energy department: Human Resource & Administration; Environmental Compliance; Solid Waste Management; Energy; and Climate Change.

CHAPTER 3

KEY FINDINGS

3.1 Review of desktop Literature

Vulnerability to Climate Change- Extreme weather, including more intense rainfall affecting the land, coastline, the sea and tourism patterns: Mombasa's annual average temperature has traditionally been 30°C while the average low has been 21.3°C.⁴³ The highest recorded temperature annually has been 37.6°C.⁴⁴ January is the warmest month in the year with a temperature of 32°C and the lowest month is July. Mombasa experiences seasonal variation in rainfall. The rainfall patterns have been traditionally characterized of long and short seasons with annual average precipitation of 1260mm. The long rains occur in April to June at an average of 1,040 mm and correspond to South Eastern monsoon winds. While the short rains begin at the end of October until December at an average of 240mm. The short rains correspond comparatively to dry North Eastern Monsoon winds. The annual rainfall for the county has traditionally been at an average of 640mm. It has been observed that since the early 1960s, both minimum (night time) and maximum (daytime) temperatures have been on an increasing (warming) trend.⁴⁵ The minimum temperature has risen generally by 0.7 – 2.0oC and the maximum by 0.2 – 1.3oC, depending on the season and the region of the country.⁴⁶ It is projected that the mean surface temperature across the country will increase by 1-1.5°C by 2030, 1.5-2.0°C by 2060s, 1.5-5.0°C by 2090s. Thus, rising temperatures trend is expected to continue in Kenya in all seasons.⁴⁷ Rainfall has become irregular and unpredictable, and when it rains, downpour is more intense. The frequency and magnitude of extreme weather events is projected to increase with far reaching impacts across the country, including Mombasa County.⁴⁸

Rising sea-levels threatening habitable land and particularly coastal infrastructure and causing increased chance and scale of coastal flooding: Mombasa is highly vulnerable to sea level rise because it lies between sea level and about 45 metres above sea level.⁴⁹ The low-lying

⁴³ County Government of Mombasa Department of Environment, Waste Management & Energy (n 2).

⁴⁴ *ibid.*

⁴⁵ *ibid.*

⁴⁶ *ibid.*

⁴⁷ *ibid.*

⁴⁸ *ibid.*

⁴⁹ *ibid.*

areas of the County are already experiencing serious coastal-beach erosion as a result of the rise in sea level, negatively impacting on the County's and the livelihoods of the residents. Approximately, sea level has been rising at a rate of about two millimetres per year. It is therefore estimated that about 17% of Mombasa, or 4,600 hectares of land area, will be submerged with a sea-level rise of only 0.3 metres. Consequently, there will be large areas that may be rendered uninhabitable as a result of flooding or water logging or will be agriculturally unsuitable due to salt stress. Sandy beaches and other features, including historical and cultural monuments such as Fort Jesus, several beach hotels, industries, the ship-docking and human settlements could be negatively affected by sea-level rise. Other impacts that are already being experienced, include: increased coastal storm damage; sea-shore erosion; saltwater intrusion into estuaries and freshwater aquifers and springs; changes in sedimentation patterns; decreased light penetration to benthic organisms leading to loss of food for various marine fauna; and loss of coral reefs.

Natural Resource base: Mombasa County has a rich ecosystem that extend from the coastal, inshore, and deep sea. This ecosystem provides important goods and services such as tourism, water resources, provision of food, provision of wood and non-wood forest resources, and as habitats for fish, coral reefs and other aquatic and terrestrial organisms. While the ecosystem is important for protection of the coastline from erosion, it is being adversely impacted by climate change.⁵⁰

Water resources: Mombasa is highly dependent on trans-basin transfer of water i.e., Mzima springs, *Baricho* water works and *Marere* boreholes and the ground water aquifers and boreholes spread across the entire County. At least three permanent springs, four water pans and a number of bore wells are operated by private investors, NGOs and CBOs accounting for about 10,360m³ per day. The projected piped water supplies for the County by the year 2035 is in the range of between 150,000 to 200,000m³. The County frequently faces prolonged dry spells and droughts as well as flooding exacerbating the already worse water problem, which will have a wide range of implications for household food security, hygiene and well-being. The increasing temperature and changing rainfall in terms of reducing amounts and its unpredictability has negative impacts on provision of clean water. The adverse impacts of climate change on water resources are already being experienced, and are expected to result in severe flooding and intrusion of salt water in

⁵⁰ County Government of Mombasa Department of Environment, Waste Management & Energy (n 2).

aquifers and ground waters. The impacts of climate change on water resources, in turn, affect all major sectors of the economy.

Mangroves and coastal forests: Mangroves and coastal forests provide essential functions and services. The total area of mangroves in Kenya is estimated at 61,271 ha with Mombasa County accounting for about 6% (3,771 ha) of the total cover. The mangrove forests occur within a number of distinct coastline geophysical categories of drowned river valleys at Mombasa and Mtwapa protective outcrops of coral limestone. Mangroves are important as nursery ground for many commercial fisheries. It is also a habitat for invertebrates and migratory birds. Mangroves are important for the protection of the shoreline from storms and waves, and also act as carbon sinks. Mangroves also offer protection to sea grass beds and coral reefs by filtering sediments. Tudor Creek mangrove forest in Mombasa has been affected by changes in inundation duration frequency as well as salinity levels caused by sea level rise thus reducing its productivity. Increased flooding has caused change in species composition and intensity resulting loss of fish and coastal erosion.

Inshore waters: Mombasa inshore waters are important for life processes of marine organism, the hatcheries, nurseries, spawning and reproduction areas for fish. The county depends on artisanal fishing on inland waters as a provider of resources and employment. High temperatures have made the habitats unsuitable for fish and species which have migrated to other areas, leading to a decline in fishing activities for the fishermen and limited resources. Acidification of the ocean as a resulting of absorption of CO₂ from the atmosphere affects productivity. The coral reef is found from shallow inshore waters of < 1.5 m to about 25-45m depth. Coral reefs are a harbour to rich biodiversity of birds, fish, crustaceans, molluscs, echinoderms. The rich biodiversity provides a range of goods and ecological services such as raw materials, nutrient cycling, bioremediation, it supports people's livelihood through fishery, tourism and cultural heritage. Whereas coral reefs are valuable in protecting the coastline they are increasingly being threatened extreme temperatures that causes bleaching and acidification, thereby disrupting the health and functioning of coral reefs. Increased atmospheric carbon concentrations have caused an increase in acidity in surface waters which lowers calcium carbonate deposition rates and fertilizes algae creating competition with coral reefs and causing nutrient pollution. Increases in rainfall have caused contamination on the coastal reefs making them more vulnerable to climate change. Seagrass beds occur in sheltered tidal flats, lagoons and creeks and provide ecological services such as nutrient

cycling, organic carbon production and export, they serve as coastal canaries, sediment stabilization and enhance biodiversity. Seagrass beds provide important habitats for a diverse array of associated fauna and flora. They serve as nursery grounds and as foraging areas for turtles and fish.

Numerous fish and invertebrates seek refuge from predators in seagrasses. As a result of climate change, increasing global warming has altered the growth rate of seagrass. Further, sea level rise has increased water depth and reduced light reaching the seagrass thus reducing productivity. Sediments and nutrients run off resulting from floods have led to loss of seagrass and a redistribution of existing habitats.⁵¹

- a) ***Absentee landlords:*** Along the coastal strip and the coastal uplands, a lot of land is owned by absentee landlords. This has significantly led to squatter settlement problems. The trust and government land within these areas have since been adjudicated and government settlement schemes established. In the drier areas of the Nyika Plateau in *Kinango, Kasemeni, Samburu Ndavaya* and some parts of *Lunga Lunga*, land is held in trust and under group ranches. Land is viewed as communal asset where every member of the community has the right to use it. In most areas adjudication has not been done. Most of the group ranches currently are non-functional and this has resulted in unplanned human settlements in the land. The land is also used for small scale farming, mining and quarrying as well as settlements.
- b) ***Mean Holding Size:*** Land as a resource is evidently under-utilized in Kwale County. According to 2005/06 Kenya Integrated Household Budget Survey (KIHBS) the main holding size is 4.4 acres.
- c) ***Percentage of Land with Title Deeds:*** Only 22.5 per cent of the land in the county has title deeds. Most land in Kinango, Msambweni and Matuga Sub-counties do not have title deeds. Most of the farmers are squatters who may be evicted at any time thus limiting the farmer's capacity to use land for sustainable development. Consequently, this has led to poor land use systems leading to environment degradation which further limits the exploitation of county

⁵¹ *ibid.*

potentials. Further, the lack of titles limits farmers' ability to access credit facilities as they cannot use the land as collateral. Fish production has also been hampered by the illegal acquisition of fish landing sites by unscrupulous private developers. The few fish landing sites that are not yet grabbed are at risk of being illegally acquired as they lack proper documentation.

- d) **Incidence of landlessness:** There is a high incidence of landlessness and squatters in Kwale County. Most households are landless specifically in *Matuga* and *Msambweni* constituencies. Such households are clearly vulnerable because of their low incomes and inaccessibility to land.

The key priorities of this sector are set out below, together with some of their corresponding vulnerabilities and causes.

Vulnerabilities / Degradation	Causes	Study objective
(a) Overexploitation of natural resources	Unsustainable extraction, consumption, management, and inefficient use of natural resources, such as minerals, fossil fuels, and freshwater. Overexploitation causes depletion of finite resources, habitat destruction, biodiversity loss, soil degradation, and disrupts ecosystems undermining the long-term sustainability of ecosystems.	Sustainable natural resource use, management, and biodiversity conservation Sustainable production and consumption patterns. Reduce the economic development pressure and reliance on natural resources
(b) Pollution and contamination of air, water, and soil.	Unsustainable management of wastes and chemical runoff from industrial activities, agriculture, transportation, and waste disposal adversely affecting ecosystems, wildlife, and communities, compromising the quality of natural resources and ecosystems. Inadequate waste management practices	
(c) Degradation of ecosystems and disruption of	Habitat loss, biodiversity decline, and carbon emissions arising from logging and other unsustainable land use practices, such as monoculture	Supporting adaptive capacities and resilience to the negative impacts of production and consumption

vital ecological processes	agriculture and land conversion for infrastructure projects (arising from urban development).	Strengthening the resilience and sustainable management of all ecosystems
(d) Degradation and loss of ecosystem services	Unsustainable consumption and production practices diminishes the capacity of ecosystems to support life and provide vital benefits such as pollination, water purification, carbon sequestration, and flood regulation to society.	
(e) Exacerbated existing vulnerabilities and ecosystems disruptions	The impacts of climate change, including rising temperatures, extreme weather events, sea-level rise, and shifts in precipitation patterns, pose severe threats to the environment and natural resources, water cycles, and agricultural productivity, affecting biodiversity, food security, and human well-being.	Climate change management
(f) Exacerbated social inequities and environmental justice concerns.	Disproportionate impact of environmental degradation and resource depletion on marginalized communities and vulnerable populations leading to conflicts, inequalities and tensions over land, water, and natural resources.	
Cross cutting objective	Developing and harmonising standards, framework and regulation on consumption, production, and waste management	

Table 1
Source: Author

3.2 Review of field based responses

Coastal tourism which is a major foreign currency earner for Mombasa County has its backbone on the diverse wildlife and biodiversity resources, rich cultural heritage, and the scenic coastal landscape.⁵²

,"schema":"https://github.com/citation-style-language/schema/raw/master/csl-citation.json"} County Government of Mombasa Department of Environment, Waste Management & Energy (n 2).

⁵² Mombasa County Sessional Paper No. 1 of 2019 on Solid Waste Management

⁵² Available at <https://www.mombasaassembly.go.ke/wp-content/uploads/2021/04/The-Mombasa-County-Solid-Waste-Management-Bill-2021.pdf>

⁵² ADDIN ZOTERO_ITEM CSL_CITATION

{"citationID":"ITxdQe6M","properties":{"formattedCitation":"County Government of Mombasa Department of Environment, Waste Management & Energy (n 2).","plainCitation":"County Government of Mombasa Department

Over the years to date, Mombasa County has experienced its share of adverse effects relating to environment and natural resource degradation ranging from droughts, floods, storm surges, and increased incidences of communicable diseases. Consequently, there have been related social-implications such as displacement, loss of life and livelihoods as well as economic implication such as damage to infrastructure and productive assets.

The project team made numerous field and site visits to Ukunda/Diani and Kwale Town and its surrounding- peri-urban areas in Kwale County, Msambweni and Shimoni areas of Kwale County, Malindi and Kilifi towns, as well as Magarini in the hinterland of Kilifi County, and Mombasa City and peri-urban areas in Mombasa County, including Mwakirunge dumpsite in Kisauni constituency.

In Kwale, local sites visited included the Kinondo municipal dumpsite (Ukunda), while in Kilifi County the project team visited Mtwapa Retail Food Market and Oloitytip Retail Market. In Mombasa City the project team also visited Mombasa City's Kongowea Market and peri-urban areas. We undertook focus group discussions(FGDs) in Ukunda/Diani, Kwale town, including Ukunda municipality dumpsite, and Malindi and Kilifi towns, Oloitytip Retail Market, Mtwapa Retail Market (Kilifi County). The manager Diani-Ukunda municipality and the NEMA officers in charge of environment in Kwale and Kilifi Counties provided a lot of information during FGDs with them. In Mombasa, 2no FGDs were held in Kongowea Market.

Respondents from this region, especially those working with the County government identified a significant floating population that commutes to Mombasa during the day and back to their respective counties in the evening, leaving behind their various respective wastes for Mombasa to deal with.

Gaps:

of Environment, Waste Management & Energy (n 2).", "noteIndex":44}, "citationItems":[{"id":7, "uris":["http://zotero.org/users/4972032/items/QDFMR

- A floating population presents several challenges from a waste management perspective, including:
 - Leads to a significant increase in waste generation, thereby straining existing waste management infrastructure and services, leading to overburdened collection systems and overflowing bins
 - Places resource constraints upon local governments and waste management authorities in managing waste generated by a floating population, including limited funding, staffing, and technical expertise. Addressing the waste management needs of transient populations requires adequate resources and investment in infrastructure, equipment, and personnel.

Recommendation:

- Waste management systems must be flexible and adaptable to accommodate seasonal fluctuations in population and waste volumes, which can pose logistical challenges.

A key cross cutting observation is that delayed action on mitigation and adaptation strategies will increase costs and potential liabilities to County governments in a range of areas, in particular planning and infrastructure management and risk management.

3.3 Summary of key findings

- a) Most of the current interventions are anchored on and tilted towards anthropocentric considerations. These unfortunately often prioritize human needs and interests without adequately considering the intrinsic value and rights of nature. While these interventions may promote resource efficiency, waste reduction, and environmental protection to some extent, they may fall short of addressing the root causes of environmental degradation and sustainability challenges. Here are some reasons why anthropocentric interventions may be less effective than interventions focused on nature's rights:
 - a. Incomplete consideration of environmental impact: In EIA, anthropocentric interventions may prioritize human well-being and economic interests over environmental concerns, leading to trade-offs and compromises that result in continued degradation of ecosystems and natural resources. By failing to recognize

the intrinsic value of nature, these interventions may overlook the long-term consequences of environmental degradation on ecological integrity, biodiversity, and ecosystem services.

- b. Limited scope of responsibility: Anthropocentric interventions tend to assign responsibility for environmental protection and sustainability primarily to humans, governments, and institutions, rather than acknowledging the rights and agency of nature itself. This narrow focus may lead to fragmented and piecemeal approaches to conservation and management that fail to address the systemic drivers of environmental degradation and resource depletion.
 - c. Failure to address structural inequities: Anthropocentric interventions may exacerbate existing social and environmental inequalities by prioritizing the interests of privileged groups and ignoring the needs and rights of marginalized communities and future generations. By neglecting the rights of nature, these interventions may perpetuate injustices and inequalities in access to natural resources, environmental risks, and decision-making power.
 - d. Lack of holistic understanding: Anthropocentric interventions often view nature as a means to human ends, rather than recognizing it as a complex and interconnected system with intrinsic value and rights of its own. This reductionist perspective may overlook the inherent interconnectedness of ecological processes, the importance of biodiversity for ecosystem resilience, and the ethical imperative of respecting the autonomy and integrity of nature.
 - e. Inadequate legal and policy frameworks: Anthropocentric legal and policy frameworks may lack robust mechanisms for protecting nature's rights and ensuring accountability for environmental harm. Without legal recognition of nature's rights, anthropocentric interventions may struggle to enforce environmental regulations, hold polluters accountable, and prevent ecosystem degradation effectively.
-
- b) When well-planned, built in a compact urban form and supported with high quality public transport, urban coastal cities offer the most sustainable form of human settlement.
 - c) The waste management levy and charge
 - d) Forest conservation incentive programmes

- e) Deliberate promotion of community participation in SCP

CHAPTER FOUR

BEST PRACTICES AND LESSONS FROM OTHER JURISDICTIONS

This section discusses best practices: (a) globally; (b) regionally; (c) nationally; and (d) locally where cities can borrow from each other.

4.1 Best practices

4.1.1: United States' Environmental Protection Agency's Initiatives for Solid Waste Management Systems

Inadequate solid waste management systems present serious risks to human health, the environment, and economies around the world. Cities around the world are working hard to address these challenges. The U.S. Environmental Protection Agency (EPA) Guide highlights best practices and examples across multiple waste topics. The Guide⁵³ covers a diverse set of important topics for city-level decision makers including stakeholder engagement, waste management planning and economics, waste collection and transportation, prevention, minimization, and recycling, landfill design and operation, and energy recovery. EPA works to

⁵³ <https://www.epa.gov/international-cooperation/best-practices-solid-waste-management-guide-decision-makers-developing>

ensure that waste is managed in a manner that is protective of human health and the environment through a number of international initiatives. EPA's efforts to sustainably manage waste include supporting the reduction and prevention of waste generation, promoting and facilitating the reuse and safe recycling of waste, and controlling imports and exports of hazardous waste between the United States and other countries.⁵⁴

EPA also participates in the Commission for Environmental Cooperation (CEC)'s North American Initiative on Food Waste Reduction and Recovery and the North American Initiative on Organic Waste Diversion and Processing. Through these initiatives, the CEC works to identify areas where the United States, Canada, and Mexico can reduce, recover, and divert food and organic waste before it arrives at a landfill or is incinerated. These efforts help prevent and reduce wasted food.⁵⁵

4.1.2 Management of Food waste prevention in Hong Kong

Approximately 3,600 metric tonnes of food are wasted daily in Hong Kong. Food waste represents approximately 40 percent of all solid waste that is collected and transported to be landfilled, which results in excess use of fuel, landfill capacity, and labor. Much of this food waste comes from supermarkets, which typically discard produce that do not meet consumer preferences. PARKnSHOP, which operates nearly 300 supermarkets in Hong Kong, has been working to reduce food waste while also addressing another social concern: providing food for underprivileged populations. PARKnSHOP started its partnership with local nongovernmental organization, Food Angel, in July 2012 to launch the "Food Rescue for the Needy." Through this program, the supermarket delivers surplus food to the NGO that would otherwise be wasted, and the NGO distributes it to individuals or families in need. Since 2012, PARKnSHOP has donated more than 3,100 tonnes of food that would otherwise have been landfilled (PARKnSHOP Undated)⁵⁶

⁵⁴https://www.epa.gov/sites/default/files/2020-10/documents/master_swmg_10-20-20_0.pdf)

⁵⁵ Ibid

⁵⁶ https://www.epa.gov/sites/default/files/2020-10/documents/master_swmg_10-20-20_0.pdf)

4.1.3 Sao Paulo Brazil's Organic Waste in La Pintana

The City of São Paulo developed an organic waste management strategy in 2016 to complement their pre-existing integrated waste management plan that is based on four pillars: the separate collection and transport of organic waste, the small-scale treatment of organic waste, communications with stakeholders, and the creation of economic instruments to motivate various actors. The strategy is tailored to the city's particular waste management practices and needs, and it presents a detailed approach for systematically building an organic waste management program from the bottom up⁵⁷

CHAPTER FIVE

PROPOSED OPTIONS AND RECOMMENDATIONS

This research advocates for a paradigm shift towards recognizing and upholding the inherent rights of nature in legal, political, and societal systems. This will promote a more holistic, equitable, and sustainable approach to environmental governance that respects the integrity, dignity, and agency of the natural world, effectively leading to more effective and transformative strategies for achieving sustainability, conserving biodiversity, and preserving the health and well-being of ecosystems for current and future generations.

Land Tenure and Sustainable Resource Management:

- a) Secure land tenure systems
- b) Enhanced scope and higher level of multi - stakeholder involvement in environmental and natural resource management, including national and county government agencies, NGOs, community groups, and businesses.

Community Initiatives and Waste Management:

⁵⁷ Ibid

- c) Encourage community initiatives geared towards reducing, re-using and recycling. This has a threefold effect of keeping communities healthy, earning a living and protecting natural resources.

National and County Strategies for Environmental Conservation:

- d) Develop and regularly assess national and county strategies to reduce the severity of environmental degradation through efforts and intervention in restoring the environment.
- e) Integrate environmental conservation in economic development plans at all levels.

Collaboration and Harmonization:

- f) Deliberately harness a collaborative approach on the needs for county government and the residents to play a vital and working harmoniously and strategically in addressing the unpredictable adverse effects to the environment and natural resources.
- g) Enhance collaboration among National agencies and city leaders during policy design.
- h) Multi sectoral, multi- agency, cross-cities collaboration on connected and related issues. This engagement should also include working closely with practitioners, such as architects, to determine how they can help make cities more sustainable.
- i) Adopt action plan which provides a pathway towards more sustainable and resilient institutions and communities in the face of climate change as well as reduce carbon emissions through adoption of appropriate technologies founded on sound research.

Climate Change Mainstreaming and Planning:

- j) Mainstreaming of climate change initiatives into county development plans and programmes.
- k) Develop strategic long-term and smart transformation counties and national plans towards low carbon, climate resilient urban coastal cities.
- l) Regular careful reviews of the features of the urban coastal cities and deliberate, targeted preparation for future pandemics and shocks.
- m) The national urban policy should deliberately examine the multifaceted SCP challenges facing urban cities in Kenya.

- n) Embark on pragmatic and innovative programmes for the project sites including developing blue and green spaces, electric transportation, and building climate resilient infrastructure.

Infrastructure Restoration and Development:

- o) Restoration of activities and infrastructure destroyed under various circumstances such as post-election violence and the COVID-19 pandemic.

Holistic Development and Cooperation Frameworks:

- p) Enhanced efforts in climate change mitigation, social protection, digital economy and other arenas.
- q) Robust analysis and development of strategic development cooperation frameworks multi-sectoral, more inclusive and more focused on urban issues.
- r) Using existing institutional mechanisms to strengthen the engagement of local governments in intergovernmental processes, and building bridges between the New Urban Agenda and the Sustainable Development Goals.

Behavioural Change and Corporate Responsibility:

- s) Deliberate engineering of behavioral change, both within the individual and the largest corporations operating nationally as well as within the site urban cities.

References

County Government of Mombasa Department of Environment, Waste Management & Energy, 'County-Climate-Change-Action-Plan.Pdf' <<https://www.mombasa.go.ke/wp-content/uploads/2021/10/County-Climate-Change-Action-Plan.pdf>> accessed 23 January 2023

'Environment, Waste Management and Energy – Mombasa County' <<https://web.mombasa.go.ke/environment-waste-management-and-energy/>> accessed 19 January 2023

Kwale County Government, 'Environment & Natural Resources' <https://kwalecountygov.com/kwale/index.php?option=com_content&view=featured&Itemid=935> accessed 18 January 2023

Lead authors: Mark Swilling, Maarten Hajer, Tim Baynes, Joe Bergesen, Françoise Labbé, Josephine Kaviti Musango, Anu Ramaswami, Blake Robinson, Serge Salat, Sangwon Suh., and Contributing authors: Paul Currie, Andrew Fang, Aaron Hanson, Katja Kruit, Mark Reiner, Suzanne Smit, Samuel Tabory, 'The Weight of Cities: Resource Requirements of Future Urbanization' (United Nations Environment Programme (UNEP) 2018) <https://www.resourcepanel.org/sites/default/files/documents/document/media/report_the_weight_of_cities_summry_web.compressed_230218.pdf> accessed 23 April 2024

'The National Assembly Constituencies and County Assembly Wards Order, 2012 - LN14_2012.Pdf' <https://kenyalaw.org/kl/fileadmin/pdfdownloads/LegalNotices/2012/LN14_2012.pdf> accessed 23 April 2024

‘The New Urban Agenda’ (*Habitat III*) <<https://habitat3.org/the-new-urban-agenda/>> accessed 17 January 2023

The United Nations, ‘A/RES/71/256: New Urban Agenda’

‘Urban Development’ (*World Bank*)
<<https://www.worldbank.org/en/topic/urbandevelopment/overview>> accessed 23 April 2024