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Faculty of Law- Centre for Maritime Studies/Fish Force Academy

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

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Abbreviations and Acronyms

AFREC	The African Energy Commission
ADP	Annual Development Plan
ASEAN	Association of Southeast Asian Nations
ARBE	Agriculture, Rural Development, Blue Economy and Sustainable Environment
ASDPD	Agricultural Sector...
AU	African Union
BMUs	Beach Management Unit(s)
CAADP	Comprehensive Africa Agriculture Development Programme (CAADP)
CEC	County Executive Committee (Member)
CIDP	County Integrated development plan
CSR	Corporate Social Responsibility
EMCA	Environmental Management and Coordination Act
EMS	Environmental Management System
EPR	Extended Producer Responsibility
FGD	Focus group discussion
EU	European Union
FAO	Food and Agriculture Organization
FGDs	Focus group discussion(s)
GHG	Greenhouse Gases
GoK	Government of Kenya
GHG	Greenhouse gas
IBC	International Building Code
IgCC	International Green Construction Code
JKP	Jumuiya ya Kaunti za Pwani
KCEP	Kenya Crops Enhancement Programme
KEFRI	Kenya Forest Research Institute
KMSFED	Kenya Marine...
MEAs	Multilateral Environment Agreements
MMF	Marginal Mixed Farming
NGOs	Non-Governmental Organization(s)

PPEs	Personal Protective Equipment
PPPs	Public Private Partnership(s)
SCP	Sustainable Consumption and Production
SDG	Sustainable development goal(s)
SEZ	Special Economic Zone
SPV	Special Purpose Vehicle
TRA	Tourism Regulatory Authority
UN DESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN-Habitat	The United Nations Human Settlements Programme
WIO	Western Indian Ocean
UNSD	United Nations Sustainable Development
UNWTO	United Nations World Tourism Organization
USAID	United States Agency for International Development
USA	United States of America
WCED	World Commission on Environment and Development
WIO	Western Indian Ocean
WTTC	World Travel and Tourism Council

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CHAPTER ONE

INTRODUCTION AND CONTEXT

In 2016, participating governments at the Third United Nations Conference on Housing and Sustainable Urban Development adopted the *New Urban Agenda* (“the Agenda”)² which sets out a new global paradigm for urban governance and sustainable development³. Kenya domesticated the Agenda in 2017 to contextualize the realities and complexities of its urban areas. The Agenda contains an implementation strategy for the period 2016-2036 with eight (8) priority action areas for all cities and urban areas, including addressing unsustainable consumption and production patterns.

Cities account for about 60 percent of total global domestic material consumption of raw materials for building and other uses, including sand, gravel, iron ore, coal and wood. Global population growth and a corresponding growth in human populations in cities and urban areas are predicted to increase exponentially until 2050⁴ resulting in higher annual resource requirements. Populations, economic activities, social and cultural interactions, as well as environmental and humanitarian impacts, are increasingly concentrated in cities, which all pose massive sustainability challenges in terms of housing, infrastructure, basic services, food security, health, education, decent jobs, safety and natural resources, among others.

In coastal cities, the impacts of this growth if not well planned for will be more severe because of resultant adverse effects on marine and coastal ecosystems which are vital for food security, alleviating poverty and advancing the blue economy. Therefore, unsustainable consumption and 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

² The New Urban Agenda represents a shared vision for a better and more sustainable future. If well planned and well managed, urbanization can be a powerful tool for sustainable development for both developing and developed countries.

³ The New Urban Agenda was endorsed by UN Habitat III, and subsequently by the United Nations General Assembly (UNGA) on 20 October 2016 in Quito, Ecuador (UNGA Resolution 71/256). The UN Habitat III had high level participation of Heads of State and Government, ministers, sub national and local governments, parliamentarians, civil society, indigenous peoples and local communities, private sector, professionals and practitioners, the scientific and academic community and other relevant stakeholders.

⁴ It is estimated that by 2050 the world’s urban population may nearly double, making urbanization one of the 21st century’s most transformative trends.

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 important that coastal cities in Kenya reduce natural resource consumption and waste production footprints, and improve land-use efficiencies so that negative environmental impacts are minimized. Therefore, 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) unsustainable consumption and production patterns that affect ocean sustainability. These are; the unsustainable management and inefficient use of natural resources, unsustainable management of chemical and other wastes, and food wastage and food losses as reflected in Goal 12 of 2030 Agenda for Sustainable Development. Thus, this research project builds on knowledge pertaining to transitions in consumption and production patterns for sustainable cities with a focus on policy and governance.

1.1 Statement of key objectives

The **main aim** of this research project is to investigate how to integrate sustainable consumption and production (SCP) in Kenya's coastal cities and urban areas, mainly through the coastal counties' development plans, urban planning, legislation, regulatory frameworks, investments and policy decisions. In this regard, the research will analyze global, regional, and sub-national national frameworks on SCP with a view to address policy, legal and institutional gaps and possible interventions. It will also seek to present good practices on how SCP policy and governance can support the development and implementation of the *Blue Urban Agenda* for Kenya's coastal region, and also present possibilities for replication elsewhere in the Western Indian Ocean (WIO) region.

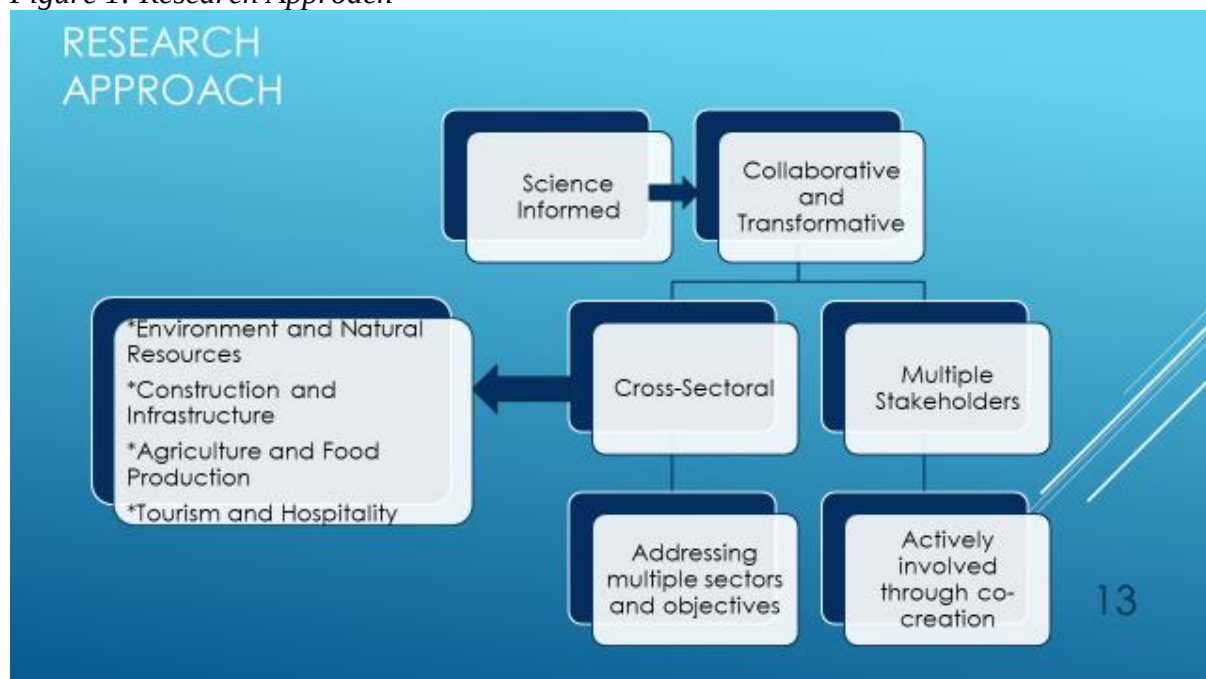
The goal of the project is to highlight the relevance of sustainable consumption and production (SCP) policy and governance in developing and implementing a Blue Urban Agenda in Kenya coastal cities. The specific objectives are to:

- 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 good practice examples 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.

1.2 Approach and Methodology

The research project is designed to be science-informed, cross-sectoral, actively involving stakeholders through co-creation processes, and transformative by simultaneously addressing multiple sectors and objectives. It also uses a mixed methodological approach encompassing doctrinal and qualitative research methods, and will utilize desktop and field studies, as well as both primary and secondary sources. Figure 1 below illustrates this.

Figure 1: Research Approach



1.3 Application of Results and Outcomes

In terms of **application**, the results and outcomes of the project are expected to provide innovative policy and governance pathways for SCP that will aid Kenya’s coastal cities and urban areas in the coastal region to develop and implement a sustainable *Blue Urban Agenda* for the country, with possible replication elsewhere in the WIO region.

1.4 Scope (geographical and thematic)

In terms of **geographical scope**, as guided by comments provided in the previous Grantees Meetings in 2020 and 2021, the project is focused on **three key locations: Mombasa City in Mombasa County, Ukunda/Diani in Kwale County, and Malindi municipality in Kilifi County.**

Moreover, in terms of thematic scoping, the project focused on four (4) sectors, namely **agriculture and food production, construction and infrastructure development, tourism and hospitality, and environment and natural resources.** All of these sectors somewhat inter-sect, and they all respond in significant ways to the SCP theme.

On the matter of thematic scoping, the project Team made **responses to the last Grantees meeting** held in December 2021. In the first instance, we considered positively the idea of reducing the number of targeted sectors. Consequently, we opted to drop one sector, namely **manufacturing and processing**, leaving us with four targeted sectors. The aspects of this sector that were of immediate concern to the project include packaging materials and plastics. These would be carried into the environmental and natural resources, tourism, agriculture and construction and infrastructure sectors.

1.5 Limitations

There were two key disruptions which operated as limitations to the timely implementation of this project. These were the Covid- 19 pandemic which set in late 2019 and early in the beginning of 2020, and ravaged the world into 2021 and 2022. The pandemic led to massive shut downs and restriction of movements, including to university and institutional premises and project sites. The other was the political and electioneering period in Kenya which disrupted quarters 2, 3 and 4 of 2022. This meant that both national and county governments were in flux and transition, and it was difficult to meaningfully engage with policy makers and higher officials during this period.

Consequently, we asked for a no-cost extension of up to six (6) months to enable us complete the work and mitigate the time lost during the Covid-19 disruption and the recent political transition in Kenya arising from the August 2022 General Elections. Thus, it may be that our project will stretch to at least June 2023 or thereabout, to enable full completion of project activities.

1.6 Sustainable Consumption Criteria

Secondly, we have developed sustainable consumption criteria and will measure sustainable consumption against that criteria. The key elements of the criteria include efficiency in use of natural resources, minimal or zero generation of wastes, reduced material footprint, responsible management of chemical and other wastes, and circularity. We have also developed a theory of change that helps explain our concept of SCP. In this regard, “Sustainable consumption and production” refers to “the use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations”.

This research adopted the definition of SCP as ‘the use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of future generations’⁵ as illustrated in *Figure 2* below.

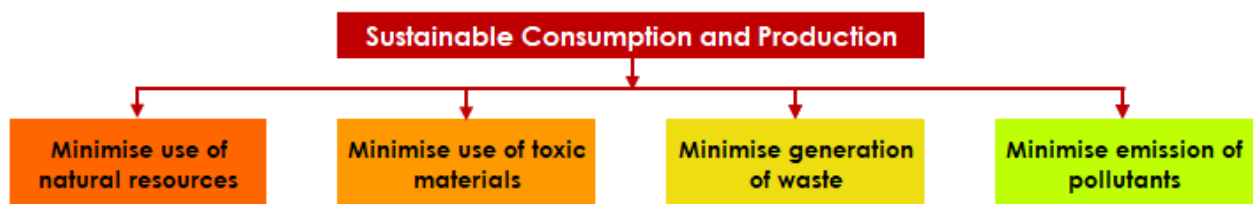


Figure 2: Elements of SCP
Source: Author (2024)

1.7 Theory of Change

Our theory of change is anchored in the reality that currently, the world is consuming more resources than ever and exceeding the planet’s capacity to regenerate. In the meantime, waste generation and pollution is increasing, and the gap between rich and poor continues to increase. With the understanding that SCP is about doing more and better with less, as well as de-coupling economic growth from environmental degradation, thus achieving sustainability, crucially, SCP can contribute substantially to poverty alleviation and the transition to low carbon and green economies, including in Kenya’s coastal cities, and by extension to the rest of the WIO region. This can substantially be achieved through SCP policy, legislative and other governance interventions in the respective coastal counties, and by extension to other JKP counties and the country at large.

1.8 Involvement of policy/decision makers

⁵ UNEP, The ABC of SCP: Clarifying Concepts on Sustainable Consumption and Production (2010) 44
<https://sustainabledevelopment.un.org/content/documents/945ABC_ENGLISH.pdf> accessed 14 December 2024

On involvement of policy and decision makers, our methodology is co-creative and collaborative. We shall actively engage with policy makers both at the National Government and County Government levels through targeted interviews, focused group discussions, dissemination forums, cross sectoral forums and other engagements. We have leveraged on our familiarity with the county governments of Kilifi, Mombasa and Kwale, as well as the relevant sector ministries at the national level to proactively engage with policy makers. We shall develop relevant drafts of concept notes/papers or policy briefs as part of our engagements with and integration of policy makers, and seek their input during development and finalization of the final outputs.

We agree that it is necessary and desirable to institutionalize the initiative rather than depend on individuals. And we shall endeavor to achieve this in our project. However, the option of a memorandum of understanding(MoU) or a cooperation agreement may not be feasible in the project at this stage for various reasons, including the relatively short span of the project as a whole and more so the remaining period; the relatively protracted and complex process of entering into MoU or other formal engagement between or among public entities or agencies such as the public universities, research institutions, national sector ministries or state department, or county governments. The MoU or cooperation agreement route is more suitable for longer span and multiple projects that are primarily bilateral rather than shorter term singular projects such as ours.

Fortunately, there are already existing MoUs or cooperation between the University of Nairobi and the County Government of Mombasa, and others. We shall utilize any existing frameworks to anchor and institutionalize our project and its outputs and outcomes.

1.9 Concept of Circular Economy

This project embraces the concept of circular economy, which aims to reach the maximum efficiency in the use of finite resources, the gradual transition to renewable resources, and recovery of the materials and products at the end of their useful life. Moreover, it targets to rebuild all available types of capital, including financial, human, social, and natural. Essentially, a circular economy describes a regenerative economic system, that also promotes “zero waste” approaches.

The principles enumerated above, in relation to the circular economy concept are embedded within the SCP indicators. Hence, the review will consider if the identified indicators in relation to a particular sector embody the key concepts identified for a circular economy to exist. The concept and application of the circular economy should enable us to progressively address the persistent problems of waste management, energy generation and food production and consumption, including food waste, in the coastal cities targeted in this project, and ultimately help achieve the preferred futures anticipated by the circular economy model.

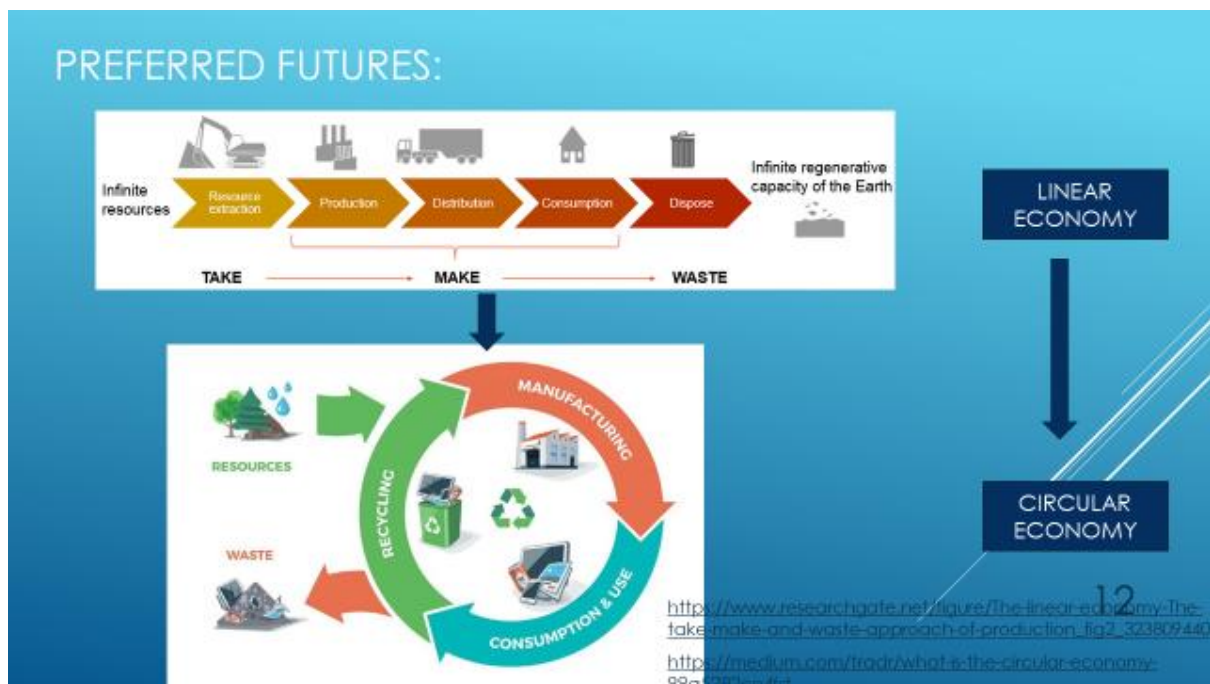


Figure 3: Circular economy model

The proposed circular economy model proposed in this research is demonstrated under *Figure 3a* below as follows;



Figure 3a: Summary of circularity in the three key sectors
Source : Author, 2024

1.10 Cumulative progress of project implementation activities

Notwithstanding the disruptions caused by the Covid 19 pandemic, and to a lesser extent the political and electioneering period in Kenya, the project has been **under implementation** and has **achieved significant milestones** during the period 2021-22. The highlights include extensive preliminary and follow up field and site visits to all the three project counties and sites, extensive and detailed literature/desktop reviews, meetings and engagements with a wide range of different stakeholders and respondents, and a very successful Stakeholders Inception Meeting in October 2021 in Mombasa. The Vice Chancellor of the University of Nairobi graced and officiated the Stakeholders Inception Meeting. Moreover, as part of dissemination and public engagement, the Project Team in November 2021 participated in a week-long regional planners' convention held in Malindi, and made a presentation on the project.

During 2022, we have also substantially engaged targeted stakeholders through focused group discussions(FGDs), and deepened literature and desktop reviews. We attended the Annual Grantees Meeting and the 12th WIOMSA Scientific Symposium held in Port Elizabeth South Africa in October 2022. We also have substantially developed the key project outputs, including this synthesis report, sector specific reports, and concepts of policy

and legislative proposals to enhance SCP in coastal counties in Kenya. The synthesis report covers key themes such as situational and gap analysis of relevant legislative, policy and governance frameworks, proposed interventions to integrate SCP in the governance frameworks both at the county and national levels, best practices from other jurisdictions that would provide learning and lessons for Kenya, and recommendations and options to enhance SCP in the country. Specific outputs are attached as annexes to this report.

In summary therefore, the following key milestones have been achieved:

- ✓ Startup activities, including a very successful Stakeholders Inception Meeting in October 2021 in Mombasa officiated by the Vice Chancellor of the University of Nairobi;
- ✓ Attended Annual Kenya Institute of Planners (KIP) Convention, November 2021;
- ✓ Attended Annual Grantees Meeting December 2021; extensive and detailed literature/desktop reviews, including situational analysis of unsustainable production and consumption in the three counties of concern, gap analysis on existing policy, legal and other governance frameworks, as well as global best practices 2021-22
- ✓ Draft reports and write-ups, including - 2022; extensive preliminary and this draft synthesis report and sector reports return field and site visits to all the three counties and cities in focus during June 2021-December 2022; meetings and engagements with a wide range of different stakeholders and respondents, June 2021- December 2022; numerous focused group discussions(FGDs) in all the counties/cities of concern- April-December 2022
- ✓ Annual Grantees Meeting 2022 and 12th WIOMSA Scientific Symposium
- ✓ Prepared and presented several required including annual reports for 2021 and 2022, special status reports.

The key stakeholders already engaged include the Mombasa County Government, Kilifi County Government, Kwale County Government, *Jumuiya ya Kaunti za Pwani (JKP)* and various national Government and State agencies, private sector, civil society and local communities, technical experts and academic institutions, among others.

1.11 Stakeholder Inception Meeting October 2021

This was held on 12th October 2021, towards partial implementation of the project objective of cross-sectionalism and active involvement of multiple stakeholders.

Demographic	Variables
Academy	University of Nairobi • Vice Chancellor • Dean-Faculty of Law • Campus Director Project Research Team: University of Nairobi - 4 JKUAT -1 Kenyatta University – 1 KMFRI-2
Community based organizations	Community Based Environmental Conservation (COBEC) – Kilifi Oceans Alive Trust – Kilifi South Coast Residents Association (SCRA)
County governments	Kwale – C.E.C.M- Tourism Kwale – Senior Fisheries Officer Kwale – Director Tourism Kilifi – Director Tourism Kilifi – Asst. Director - Agriculture, Livestock and Blue Economy Kilifi – Chief Officer Housing, Urban Planning and Development Kilifi – Urban Planner Kilifi – County Attorney Mombasa – Fisheries Officer Mombasa – Chief Officer – Agriculture Mombasa – Chief Officer – Water
State agencies	• Kenya Marine and Fisheries Research Institute (KMFRI) – Director- General and Director, Socioeconomics & Research Program Coordinator • National Construction Authority: NCA -1 – General Manager • Kenya Forest Service -1 - Forester ▪ 1 – Mangrove focal point ▪ • National Environment Management Authority (NEMA) -1 - Environmental Officer •
Media	TV-1 Newspapers -2

Local representatives	community	4
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Table 1: Demographic Characteristics of the Participants
Source: Author



Figure 1: Project inception meeting at PrideInn, Nyali, on 12th October 2021
Source: Author

CHAPTER TWO

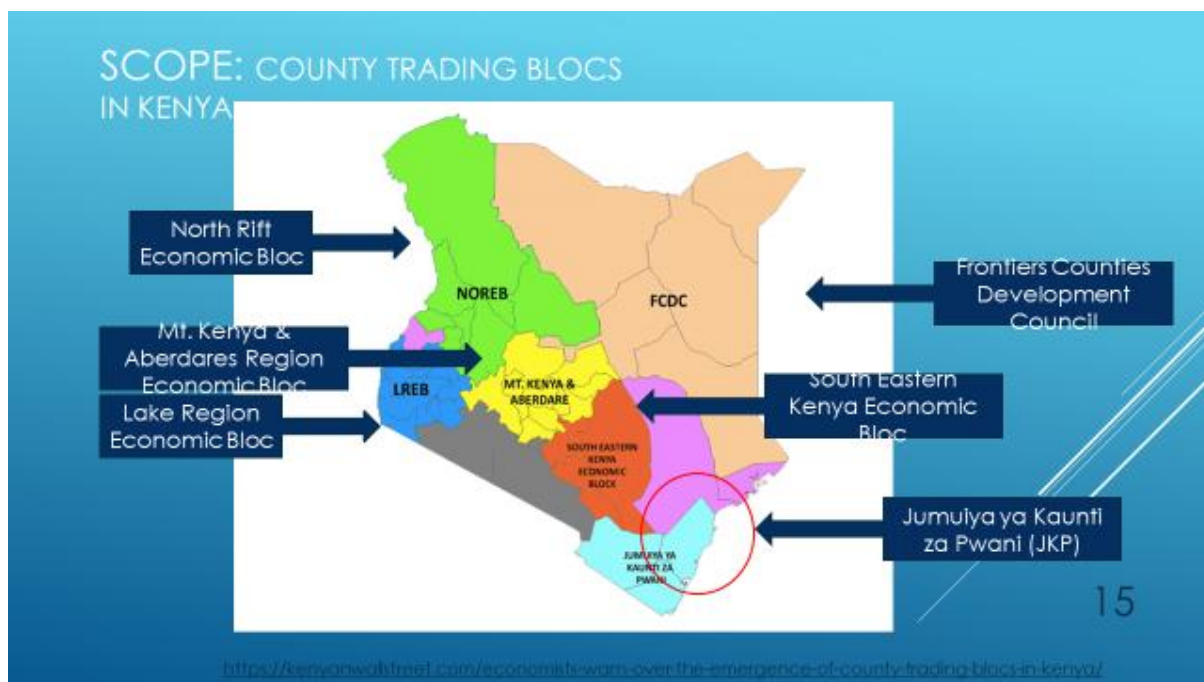
SITUATIONAL AND GAP ANALYSIS ACROSS THE SITES AND SECTORS OF CONCERN

This chapter responds to *Broad Activity/Objective No1: to conduct detailed literature/document reviews as part of gap analysis of SCP relevant international, regional, national and sub- national frameworks, including policy, legal and institutional frameworks.* It focuses on both the sites and sectors of concern in the study.

2.1 Overview of Selected Project Sites

As mentioned in Chapter one, the project is focused on **three key locations: Mombasa City in Mombasa County, Ukunda/Diani in Kwale County, and Malindi municipality in Kilifi County.** The locational maps are presented below.

Figure 5: Map of county economic blocs, depicting JKP



As can be seen, the counties and sites of interest in this project are all within the *Jumuiya ya Kaunti za Pwani (JKP)*. Thus the choice of the project counties and sites was both strategic and pragmatic. However, of course the JKP has a national context, in which devolved units typically belong to regional economic blocks of proximate, geographical and sometimes cultural likeness.

Map 1 below presents the JKP region as a whole, with a level of detail to help provide the geographic context of the study.

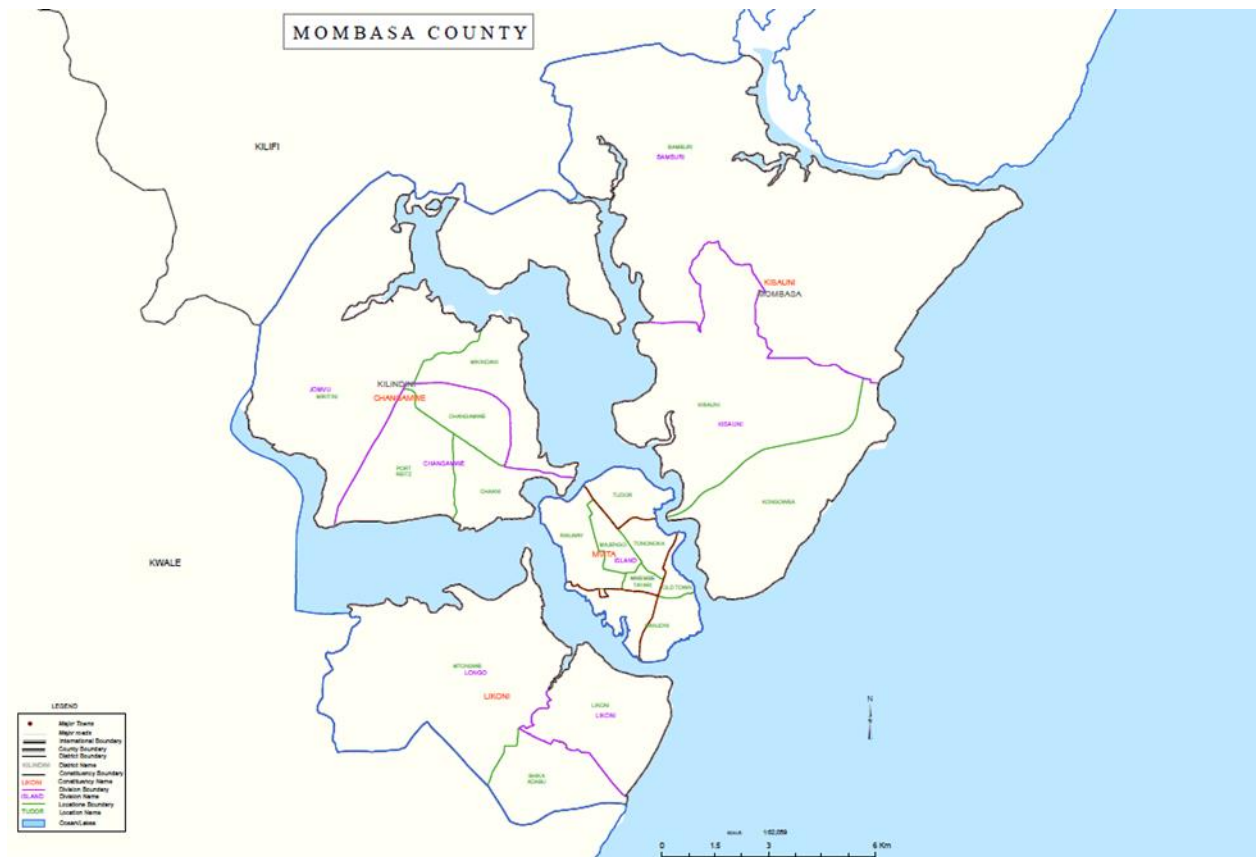
Figure 5: Jumuiya ya Kaunti za Pwani (JKP)



Map 1: Map of the JKP Economic Bloc

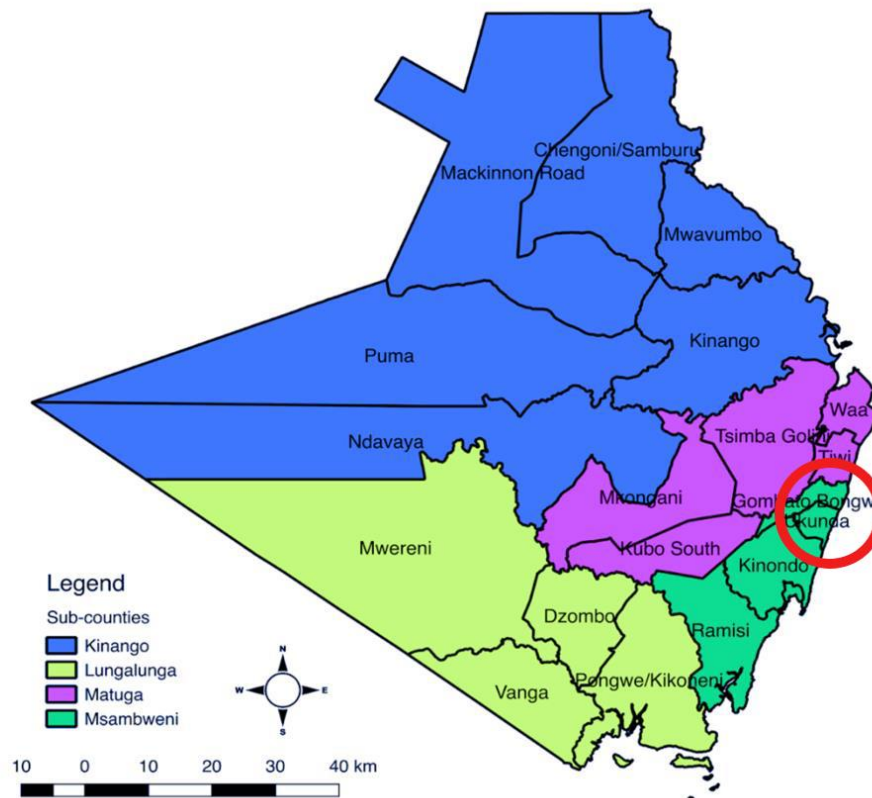
Source: <https://goblue.co.ke/>

Mombasa city has the highest urban population in the JKP region and significant levels of pressures from urbanization and economic activities. It is also an economic hub for neighboring counties and characterizes the challenges of sustainable consumption and production in a rapidly urbanizing coastal city.



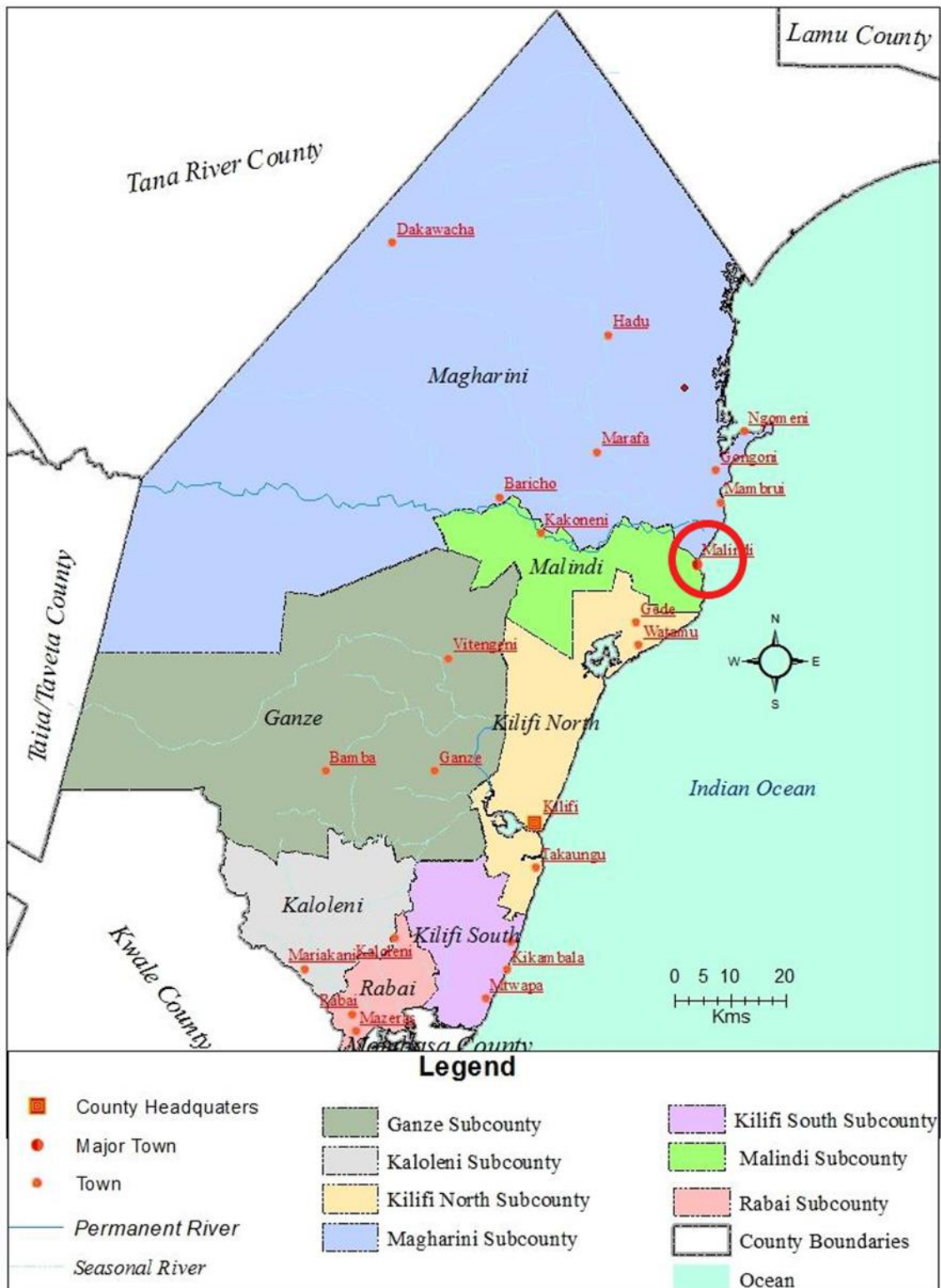
Map 2: Administrative Units in Mombasa County
Source: Mombasa CIDP (2018-2022)

Ukunda/Diani Municipality in Kwale County is selected due to its increasing population and urbanization pressures against its pristine natural features that make it a major tourism hotspot. In this regard, the study aims to identify the conflicts between spatial expansion of town centers for tourism. It is a relatively small city/town compared to Mombasa and even Malindi. It has both scenic ocean and beach front and a rather pristine peri-urban hinterland with high agricultural potential including crop and animal production.



Map 3: Administrative Units in Kwale County
Source: Adapted from Kwale CIDP (2018-2022)

Malindi Municipality in Kilifi County is selected due to its place as a major tourism hotspot, increasing commercial activities and urban sprawl and informal settlements. Malindi municipality has fine, long and expansive ocean front beaches that are pristine. It also has an expansive peri-urban area that has mixed uses including residential, crop farming and animal production, as well as eco-tourism potential.



Map 4: Administrative Units in Kilifi County
Adapted from Kilifi County CIDP 2018-2022

2.2 Overview of Selected Sectors

2.2.1 Agriculture and Food Production

The JKP region is made up of 6 counties namely; Kwale, Mombasa, Kilifi, Tana River, Lamu and Taita Taveta altogether occupying approximately 79,968.1 km² area coverage and account collectively for 17% of the Kenyan population (KEFRI, 2016). An estimated 75% of the coastal areas of Kenya lies in the arid or semi-arid zone (Muli, 2013). Kenya's coastal land is 25% non-agricultural, 50% is suitable for ranching and 25% is suitable for crop farming (Waaijenbergh, 2000)

The main crops farmed in the agricultural areas are cashew nuts, sisal, cassava and millet. Irrigation farming contributes a high percentage of the coastal agriculture, the main crops being sugarcane and rice. Majority of the farming is rain-fed which means crop production is seasonal, where there is abundance of food during the rainy season and scarcity during the dry season.

Agricultural activities along the Kenyan coast produce both food and non-food products for subsistence and commerce, and traditional shifting cultivation and slash and burn farming practices are still widespread. Livestock production contributes significantly to the Kenyan coastal economy, and there are at least 85 ranches within the coastal region, 25 of which are operational. Livestock production is mainly concentrated on the marginal land of the coastal region, which accounts for some 69 percent of the total coastal area. For example, the pastoral communities in Tana River County graze large herds of cattle in the lower ridges of the Tana River basin, and often into the neighboring counties such as Kilifi. However, Kilifi and Kwale counties have significant livestock production.

The main food crops grown on the Kenyan coast include cassava, sweet potatoes, maize, coconut, cowpeas and rice, which are grown in irrigated areas, marshes and floodplains. Vegetables and tropical fruits such as citrus, mangoes, bananas, pineapples and watermelons are grown for both subsistence and export. Other crops, which are mainly grown for export, include cashews, bixa and sisal. The average farm size on the Kenyan coast is between 6 and 8 ha, and tree crops (cashews, coconuts, citrus and mangoes) occupy about 50 percent of the coastal arable land.

Coastal agriculture is usually undertaken in low-lying and saline-prone soils where spatial competition with urban growth is an increasing problem. This land is usually sandwiched between land and sea. Coastal agriculture is thus more susceptible to climate change and anthropogenic disturbance compared to inland farming system such as temperature changes, erratic rainfall, sea-level rise, salinity, tidal processes, water stresses, waterlogging and land use changes such as increased population and pollution. According to USAID (2018), a sea level rise of 30 cm is estimated to threaten 17 percent (4,600 hectares) of Mombasa with inundation. This would greatly affect the limited available agricultural land for the coastal residents.

The coastal counties of Mombasa, Kwale and Kilifi have significant production and processing of agro products. These include food processing and distribution/retail, crop production and especially fruits and vegetables, horticulture, cereals, livestock and animal husbandry, meat products, fisheries, poultry, etc. Crop and animal production is especially found in Kilifi and Kwale counties, which also have a lot of agricultural space in urban and hinterland areas. Agro processing including milling, fruit processing, fish processing, water processing and packaging, among others, is most established in Mombasa city, with less such establishments in Malindi and Ukunda/Diani.

Just like in other ASAL areas of Kenya, irrigation plays a key role in agriculture in the coastal areas. The main sources of irrigation water are the rivers that pass through these areas. Irrigation of crops such as sugarcane and rice in the coastal areas have contributed to construction of a sugarcane factory in Kwale County and a rice miller in Tana Delta area. The main source of water for these irrigation activities are the surface water bodies such as rivers, shallow wells, springs, water pans, dams and boreholes.

In Kwale county, agriculture as a source of income accounts for 80.6% of all household incomes. The sector employs about 62,681 in the county.⁶

Kilifi county is classified as an arid and semi-arid area and 65% of Kilifi faces seasonal water shortage. Residents of those areas opt for rain water harvesting or depend on pans for regular

⁶ Kwale County Government website Available at https://kwalecountygov.com/kwale/index.php?option=com_content&view=featured&Itemid=839

supply of water for domestic and livestock use. The water pans however often dry up during the dry spells. The county has four main livelihood zones including 44% Marginal Mixed Farming (MMF) of the population, 22% cash cropping/dairy, 11% Mixed Farming and 2 % ranching. Other livelihood zones include 3% fishing and mangrove, 14% formal employment and 2% forest/tourism and casual labour. Main food crops grown in Kilifi include cassava, maize, cow peas, rice, and green grams. Fruits such as mangoes and bananas are also grown, as are horticultural crops including cashew nuts and coconuts (Kilifi County, 2017).

The agricultural sector is a large consumer of the natural resource base, including land, forests and woodlands, water especially for irrigation, energy, and packaging material. It has high intake of inputs such as preservatives, fertilizers, and animal feeds. It has significant environmental impact including from agro chemical wastes from pesticides and herbicides, industrial discharges and fumes from food processing, food retail losses and wastes, throw away and food wastes, among others. As would be shown in subsequent sections post-harvest food losses both on farm and in the markets and other value chains are significant problems across the coastal counties of Mombasa, Kwale and Kilifi. It would be interesting to undertake a whole value chain analysis of agriculture and food production, and especially on food losses and wastes. In addition, most of the agricultural sector activities are regulated by law, policy and other governance frameworks.

2.2.2 Tourism and Hospitality

This sector of concern includes catering establishments and outlets, large and small hotels, historical and cultural sites, nature conservancies and animal sanctuaries, tourist facilities and service providers. Tourism and hospitality is easily the flagship sector of the coastal region as a whole, and especially for the ocean front counties such as Mombasa, Kwale and Kilifi. Tourism as a sector has also high consumption of natural and other resources such as land and space especially ocean and beach fronts, vast ranges and woodlands, and strategic urban locations. It also is large on food and water consumption as well as energy and detergents, etc. Tourism has generally high environmental and socio economic impact. Adverse effects include sewerage and waste water generation, pollution, solid waste (plastics and micro-plastics, bottles, soap and detergents, packaging material, textiles and fabrics. In this sector as well, it would be interesting to undertake a whole value chain analysis. In addition, most of the tourism activities are regulated by law, policy and other governance frameworks.

Kenya's tourism offers memorable products in its three major product lines of safari, coastal, and business and conference travel. As at 2022, it was estimated that tourism visitations in Kenya can be attributed to interest in attractions such as national parks and game reserves, museums and national heritage and cultural sites, coastal and beach vacations, cruise tourism, sports tourism, health and wellness visits, Meetings, Incentives, Convention and Exhibitions (MICE) tourism, and the coastal cultural experience⁷. Notably, the three study sites under investigation provide facilities for the various typologies of tourism for both domestic and international visitors.

Cultural heritage tourism activities cut across each of these product lines and, in particular, offer potential to develop further as the next distinct product line. Safari tourism is dependent on natural and wildlife assets, which are typically remote and difficult to access, and is highly seasonal with peaks and valleys tied to animal migration patterns. It has limited capacity given the fragility of ecosystems and the sensitivities of the animal population (WB, 2010).

Kenya's coastal tourism offering ranges from the mass-packaged tourism of Mombasa's large coastal resorts to sleepy and culturally rich destinations, such as Lamu Island, appreciated by more independent tourists. Coastal tourism offers the allure of a relaxed beach experience with the potential for day trips to nearby animal parks and cultural sites. Mombasa, Kwale and Kilifi counties are famous destinations for both local and foreign tourists.

Kenya has set out to diversify and improve coastal products by attracting new investments in existing as well as new hotels with emphasis on 4-5 star hotels; increasing bed capacity to cope with the projected growth in tourist arrivals; constructing two resort cities; and promoting Kenya as an international tourist destination, with a unique coastline. Moreover, Kenya Vision 2030 commits to intensify conservation of coastal, mangrove and marine wildlife resources and to initiate coastal zone and marine assessment; that will involve assessing the potential opportunities provided by Kenya's coastal ecosystem and to produce a databank to be used by investors and regulatory agencies. Tourism was identified as key sector under the economic pillar of the MTP III (2018-2022).

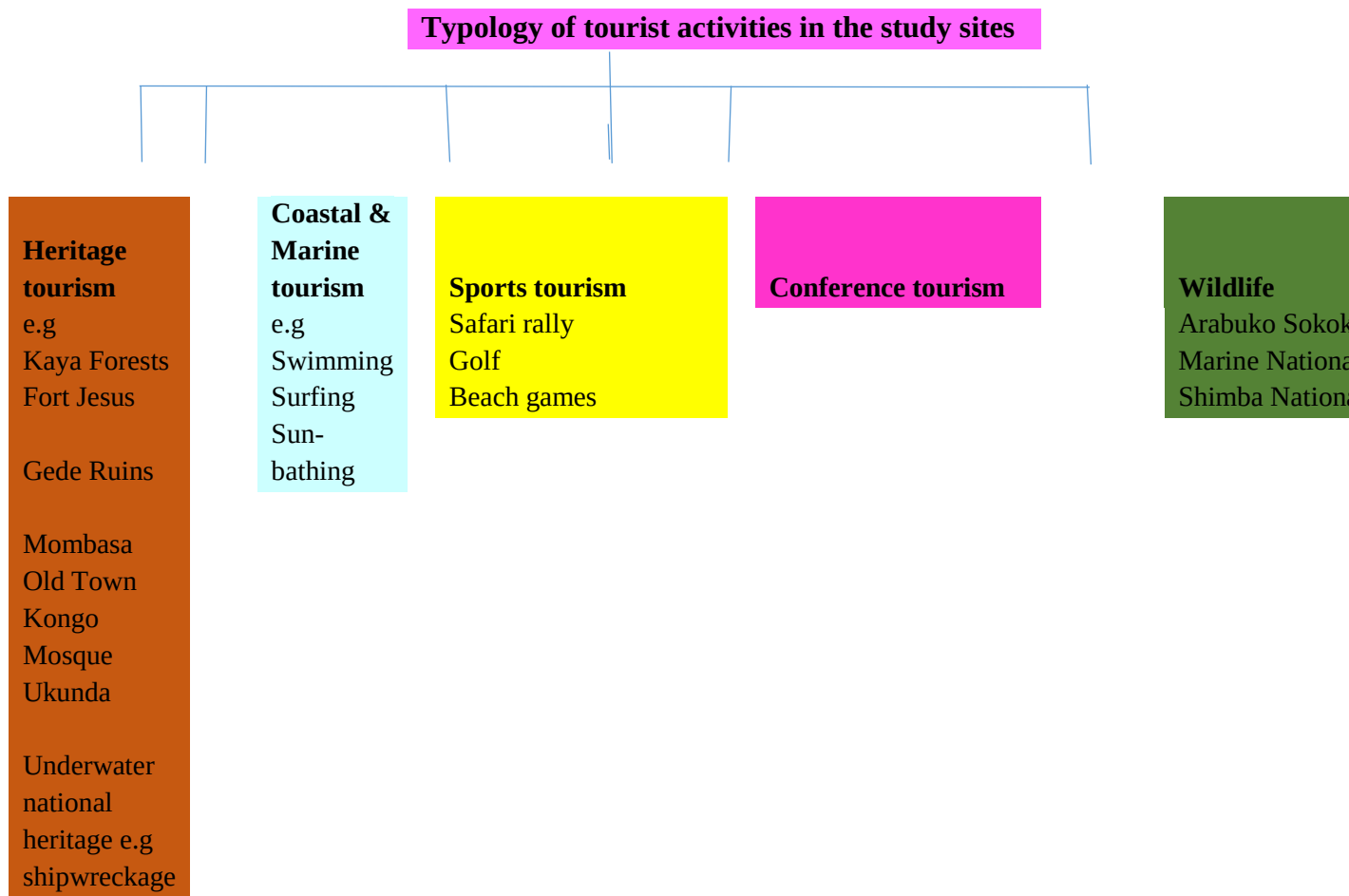
⁷ Ministry of Tourism, Wildlife and Heritage 'Annual Tourism Sector Performance Report 2022' (2022) at page 4 Available at <https://www.tourism.go.ke/wp-content/uploads/2023/02/ANNUAL-TOURISM-SECTOR-PERFORMANCE-REPORT-2022-2.pdf> Accessed on 9th January 2024.

Kenya aims to be a top 10 long haul tourist destination offering a high-end, diverse, and distinctive visitor experience, and in this regard has specific flagship programmes/projects to be implemented. These include coastal beach tourism. This entails improvement of beach products and enhancement of priority beach nodes (popular beach areas) used by visitors. Specific initiatives include: Mombasa waterfront development (Mama Ngina Drive and Jomo Kenyatta Public beach); development of little theatre in Mombasa; development and implementation of a beach Strategy; Cruise Ship Programme; Incentive Programme to Drive Tourists; establishment of Hotel's Refurbishment Fund; development of Shanzu Creek Tourism Development City; tapping into the blue economy; and attraction of international hotel brands to invest in the coastal region.

Another flagship project is Tourism Infrastructure and Enabling services, which entails lobbying for prioritization of development of key road networks serving key tourism circuits such as Malindi – Watamu beach road, Mombasa – Malindi Dual carriage among others. Concomitantly, the Air Growth Strategy will be implemented to maximize the air travel potential for Kenyan tourism.

Coastal tourism refers to land-based tourism activities including swimming, surfing, sunbathing, and other coastal recreation activities taking place on the coast for which the proximity to the sea is a condition including also their respective services. Coastal tourism covers various activities, patterns, and infrastructure. It includes many tourism, recreation, and entertainment-oriented activities such as swimming, snorkeling, diving, beaches, recreational fishing, various water sports, cruises, sports competitions, recreational and sailing boats, etc. A critical sub-sector of coastal tourism, global cruise tourism has experienced massive growth in recent years, with a total 75% of growth in passenger numbers from 2008 to 2018.

Figure 7: Typology of tourism in the three study sites



Coastal tourism in Kenya is dominated by mass tourism involving the movement of large numbers of international tourists to often all-inclusive enclave beach resorts along Kenya's coast. The tourism chain relies on the natural environment as a key driver of tourism activities. The sequence of activities involved in tourism also generates waste that degrades the natural environment. The tourism sector is a significant consumer of natural resources in the form of tourist's sites and natural resources that support the sector. For example, tourism in the three sites relies on natural resources such as mangrove forests, terrestrial forests, beaches, wildlife among others as key attraction sites. In the same breadth, the tourism sector is equally a consumer of natural resources as it utilizes energy and water resources within tourism establishments such as hospitality facilities. In turn, tourism and hospitality activities in the coastal region consume a lot of energy while at the same time generating waste. The linkages between the tourism economy and the environment are important and ought to be understood in order to ensure tourism sustainability and resilience.

Sustainable consumption and production in the tourism and hospitality sector activates the need to examine waste management and sourcing for raw materials in the sector. Changing patterns of behavior and consumption suggest that tourism, as end user and driver of demand, that can serve as powerful agents of change. Coastal and marine tourism is highly dependent on the quality of coastal and marine ecosystems to attract visitors. Unsustainable consumption and production patterns that strain the natural assets is puts the sustainability and viability of the industry at risk. Exploring and capitalizing on opportunities for tourists to support sustainable and regenerative forms of tourism through consumption, activities and funding will play an important role in transforming destinations and the industry at large towards a more sustainable model.

Unsustainable consumption and production trends in the tourism sector are linked to human activity and the use of natural resources. Human activity leads to degradation of the ocean ecosystems, loss of biodiversity, over consumption of energy resources, decline of native marine species and pollution. This in turn results in diminished marine life and biodiversity as well as compromised air quality making it less attractive for tourism. Coastal cities and specifically the study sites face threat of destruction of attraction sites such as mangrove areas for development, disposal of solid waste, and unsustainable use of other natural resources. This yields in generation of water waste and solid waste through land based pollutants. Tourism is also sensitive to the qualities of the natural and human environment. Loss of the

attributes which make a site or region attractive to tourists can spell economic disaster to the industry and those who depend on it.

Mangrove forests are key tourism attraction sites. Malindi prides itself in magnificent resources such as fringing reefs, corals, sea grass beds, marine mammals and high fish diversity that is attributed to the mangrove cover. The Mida Creek forest has a high diversity of mangrove species that provide refuge to bird species which are a key tourist attraction.⁸ In Ukunda Diani, the mangrove forests sustain beekeeping that produces high quality honey and provide shelter to some fish species and oysters.⁹

Mangroves are under threat from over harvesting and other factors. Urban areas such as Tudor Creek in Mombasa have lost nearly 80% of the vegetation cover through harvesting of fuel wood.¹⁰ Other threats include conversion of mangrove areas to other land uses, pollution, rising infrastructure and development leading to human encroachment and increasing demand for mangrove resources. A 2023 technical report by the Kenya Forestry Research Institute revealed that exposure to raw sewage in urban and peri-urban areas in the Kenyan Coast has contributed to the loss of mangrove biodiversity.¹¹ The report cited mangrove in the areas of Kilifi, Tudor, Kilifi creek and Tudor among others as those which have suffered loss owing to sewage effluent exposure.¹² This demonstrates the contribution of human activity such as tourism have on the degradation of tourism sites and attractions.

Shoreline change is a natural process of evolution of coastal areas.¹³ It is as a result of natural processes such as sedimentation but is further exacerbated by human activities.¹⁴ Changes in land use in the Kenyan Coast has had major impacts on the environment and attractiveness of tourism sites. Increased sediment load and accumulation of sediment as well as shoreline

⁸ County Integrated Development Plan, Malindi (2018) At page 33

⁹ County Integrated Development plan, Kwale County 2018-2022 Available at <https://repository.kippra.or.ke/bitstream/handle/123456789/417/2018-2022-Kwale%20County%20CIDP.pdf> Accessed on 21st January 2024

¹⁰ May Livere 'Mangrove restoration: Sustaining mangroves for better livelihoods along the Kenyan Coast' (2020) Available at <https://www.unsustainablemagazine.com/mangrove-restoration-kenya-sustaining-mangroves-for-better-livelihoods/> Last Accessed on 21st January 2024

¹¹ Chemuke Wekesa, J. Ndufa & P. Tuwei 'Mangrove deaths in Kenya: Causes and recommended management interventions' (2023) Available at <https://kefri.org/assets/publications/tech/MangrovedeathinKenya.pdf> Accessed on 4th April 2024

¹² Ibid p. 4

¹³ UNEP Nairobi Convention 'Shoreline changes in the Western Indian Ocean region' At page 16 Available at <https://nairobiconvention.org/clearinghouse/sites/default/files/Shoreline%20Changes%20in%20the%20Wio%20Region.pdf> Accessed on 25th April 2024

¹⁴ Ibid p.16

changes have had ecological impacts on attractiveness of beaches and hotels. Coastal erosion and beach accretion have significantly affected tourism activities in the study sites.¹⁵

Management of solid waste, increased pollution from land based pollutants, sewage, solid waste, single use plastics and water waste poses a severe challenge to coastal tourism Kenya. The most common types of solid waste generated from tourism and hospitality activities include; drink bottles including caps, disposable toiletries, paper, carton, single use plastics form drink bottles including caps, plastic straws, toiletry utilities, food packaging, cigarette butts , food waste from kitchen and restaurants and sanitary waste.¹⁶ Additionally, research has estimated that switching to the use of dispensers in hotels can reduce the cost of consumables by 50-70%.¹⁷

Hotels and accommodation facilities have high levels of water consumption based on occupancy levels and facilities. Tourists need and consume water within accommodation facilities, when participating in water tourism activities such as ski, when using spas, wellness areas or swimming pools.

The tourism industry is fueled by significantly high levels of energy. The energy consumption in the sector is also linked to the emissions that are linked to the sector. Tourism activities that require energy include transport, accommodation, food processing and recreational activities such as boat rides. Greater energy efficiency in the sector will help reduce the carbon footprint hence making tourism environmentally sustainable.

2.2.3 Construction and Infrastructure

This sector includes development of commercial and industrial buildings, residential housing, institutional developments, public infrastructure like roads, rail, power, health, water and sewerage infrastructure, airports, religious establishments and other amenities. Construction and infrastructure developments are labour intensive, highly impactful socio-economically, as well as large consumers of natural resources including land, stones and blocks, asbestos, sand, ballast, murram, timber and wood products, water and energy. These activities also generate enormous wastes including waste water, dust and fumes, oils and chemical wastes, debris, waste wood, litter, plastic wastes, soil and rocks, etc. It also fits well in the

¹⁵ Ibid p. 18

¹⁶ M. Muthini , M.P. Tole & D.Otieno ‘Solid waste pollution loads in beach hotels on the Kenyan South Coast’ (1994)

¹⁷ Available at <https://kureproducts.com/cost-savings> Accessed on 23rd April 2024

production-consumption paradigm, and it would be interesting to undertake a whole value chain analysis. In addition, most of the construction and infrastructure activities are regulated by law, policy and other governance frameworks.

A number of JKP flagship projects have been identified in the *Jumuiya ya Kaunti za Pwani 2030 Development Blueprint* to drive the region's socio-economic growth and catapult the region into middle economy status. These projects have been categorized under three pillars - the *Jumuiya Economic Pillar*, the *Jumuiya Social Pillar* and the *Jumuiya Foundation and Enablers Pillar*. Construction and Infrastructure development projects have been identified within all three pillars, cutting across seven out of ten sectors (Agribusiness, Food and Nutrition Security, Trade and Industries, Blue Economy, Urbanization, Health and Education, Land Resource Development, and Infrastructure).

2.2.4 Environment and Natural Resources

This includes the coastal and marine environment, coastal forests and woodlands, water bodies, landscapes and seascapes, air and atmosphere, etc. The natural environment and its various components are vital life support systems and provide invaluable ecosystem services. Some of the pressing problems facing coastal cities include pollution from various sources and media, affecting water, air and land quality, human health and wellbeing, climate change and variability, degradation and modification of habitats and ecosystems, etc. Waste management, especially sewage and solid wastes are urgent and pressing environmental problems. Waste management in Kenya's cities, and especially coastal cities, is a ticking time bomb if not adequately addressed. Perhaps what is needed are not more or bigger dumpsites, but smarter solutions to address the value, quality and usability of waste, or the "residual resource value" of waste. This project will review the environment and natural resource sector and the other sectors of concern through the lens of sustainable consumption and production policies and governance.

Kwale 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; Coral rocks at coastline. Recent oil and gas exploration at Kwale offshore did not yield commercially viable deposits.

Kwale County is also rich in forestry and agro-forestry. As per the Kwale 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 so as to reduce consumption pressure on the indigenous forests and the mangroves.

In general, environmental degradation in Kwale 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.¹⁸

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.¹⁹ However, the CIDP indicates that between 2010 and 2016, the CIDP the County had lost approximately 490 ha of its forests.

2.3 Review of SCP Relevant Legal, Policy and Other Governance Frameworks

This section provides brief reviews of SCP relevant legal, policy and other governance frameworks at the global and regional, as well as the national and sub national levels. The focus is more on governance gaps that militate against sustainable consumption and production in Kenya's coastal cities. There is emphasis on the national and sub-national frameworks, primarily those covering Mombasa, Kwale and Kilifi counties, across the sectors of concern.

2.3.1 Construction and development

There are several policy documents that guide development of coastal urban areas at the national and county levels including the National Spatial Plan, The National Land Policy,

¹⁸ Pg 32

¹⁹ Pg 33

National Urban Development Policy, Integrated Coastal Zone Management Policy, and county integrated development plans (CIDPs) and county spatial plans for the counties of concern. Further, as a regional economic bloc, the *JKP* counties have harmonized their policy frameworks through the *Jumuia 2030 Blueprint* that includes coastal urbanization as a key pillar. In addition, coastal cities and municipalities operate within the framework of binding county integrated development plans that guide and inform all planning, development and implementation of key programmes. The CIDPs of the various counties typically cover the sectors of concern herein, including agriculture and food production, construction and infrastructure developments, tourism and hospitality, and environment and natural resources.

The Constitution of Kenya 2010 provides the overarching framework for planning and land use in general. Under Article 66(1) The State may regulate the use of any land, or any interest in or right over any land, in the interest of defence, public safety, public order, public morality, public health, or land use planning. Article 66(2) provides that Parliament shall enact legislation to make further provision for the operation of the Article.

The Constitution declares that all land in Kenya belongs to the people of Kenya collectively as a nation, as communities and as individuals (Article 61). The constitution also classifies land in three categories: public land²⁰, community land²¹ and private land²².

Elsewhere, the Constitution speaks directly to sustainability, including in production and consumption of the environment and natural resources. Article 69(1) (a) states as follows: “ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources and ensure the equitable sharing of the accruing benefits”. Further, Article 69(1)(b) obliges the State to “work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya”. Moreover, “every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources”.

²⁰ The Constitution of Kenya 2010, Article 62

²¹ Ibid, Article 63

²² Ibid Article 64

All the counties and project sites have a mix of public, community and private land, and this has implications on the planning and utilization of these spaces. The Constitution is also quite clear on the sustainability imperative.

Key legislations include County Government Act 2012, the Urban Areas & Cities Act, 2011 (as amended by Act No 3 of 2019) and the Physical Planning Act (Cap 286), and various sector laws relevant to agriculture and food production, construction and infrastructure developments, tourism and hospitality, and environment and natural resources. However, these legislations do not directly address sustainable production and consumption as such.

2.3.2 Agriculture and food production

Some of the international legal instruments relevant to SCP and agriculture and food production, including food loss and waste include the FAO (2014) *Building a Common Vision for Sustainable Food and Agriculture*; FAO (2015) *Global Initiative on Food Loss and Waste*; and FAO 2019: *The State of Food and Agriculture*. FAO 2017: Policy Measures for Managing Quality and Reducing Post Harvest Losses in Fresh Produce Supply Chains in South Asian Countries, Rome. World Bank 2011: Missing Food: The Case of post-harvest losses in Sub Saharan Africa, World Bank²³. In general, these frameworks are soft law in nature and do not have firm and binding commitments on agriculture and food production, as well as on food loss and waste. However, their policy orientation, especially on food loss and waste, are quite commendable.

Elsewhere, the African Union (AU) frameworks also address SCP in agriculture and food systems in general. The Department of Agriculture, Rural Development, Blue Economy and Sustainable Environment (ARBE) leads the efforts to promote sustainable environmental management and agricultural development by boosting member states' rural economy, development and agricultural transformation by supporting the adoption of measures, strategies, policies and programmes on agriculture. The Department promotes the implementation of Agenda 2063 continental frameworks such as Comprehensive Africa Agriculture Development Programme(CAADP); promoting agricultural and rural development, promoting policies and developing strategies and programmes to ensure food security and nutrition; helping member states to achieve sustainable growth and improved

²³ World Bank, Other Operational Studies 2824, Washington DC; UNSD 2018: Goal 12, New York, USA, United Nations Statistics Division

livelihoods through sound environmental and natural resources management, and promoting multilateral environmental agreements (MEAs) Land Policy Initiative, climate and disaster risk reduction, among others.

The African Union (AU) Malabo Declaration, adopted in June 2014 in Malabo, Equatorial Guinea, reaffirms previous commitments related to agriculture, food and nutrition. Among others, the AU Heads of State and Government recommitted to the principles and values of the CAADP process. They also committed to enhancing financial investments in agriculture, both public and private. In this regard they upheld the earlier commitment to allocate at least 10% of public expenditure to agriculture and to ensure its efficiency and effectiveness. On a commitment to end hunger, the Declaration states as follows:

“We commit to ending hunger in Africa by 2025, and to this end we resolve: a) to accelerate agricultural growth by at least doubling current agricultural productivity levels, by the year 2025. In doing so, we will create and enhance the necessary appropriate policy and institutional conditions and support systems to facilitate: • sustainable and reliable production and access to quality and affordable inputs (for crops, livestock, fisheries, amongst others) through, among other things, provision of ‘smart’ protection to smallholder agriculture; • supply of appropriate knowledge, information, and skills to users; • efficient and effective water management systems notably through irrigation; • suitable, reliable and affordable mechanization and energy supplies, amongst others.

b) to halve the current levels of Post-Harvest Losses, by the year 2025;

c) to integrate measures for increased agricultural productivity with social protection initiatives focusing on vulnerable social groups through committing targeted budget lines within our national budgets”.

National frameworks reviewed include: National Food Safety Policy 2013, and its revised draft 2021; National Agricultural Policy; Veterinary Policy 2020; National Fisheries Policy; National Policy on Prevention of Anti-microbial Resistance; Food and Nutrition Security Policy (2011; Kenya Health Policy 2014-2030. These policy instruments deal generally with food production, food safety and nutrition security, but less directly with food waste and food losses.

Some of the food laws of relevance herein include: Crops Act 2013, which mandates the Agricultural Food Authority to regulate safety of crops and crop products, handling,

transportation, processing, packaging, preservation, conservation and market standards of food crops and crop products.

Other SCP relevant laws reviewed include the Agriculture and Food Authority Act 2013; Agriculture, Drugs and Chemical Substances Act cap 254; Dairy Industry Act; Fisheries Management and Development Act 2016; Kenya Plant Health Inspectorate Service Act No 54 of 2012; Pest Control Products Act cap 346; Fertilizers and Animal Foodstuffs Act cap 345; Meat Control Act cap 356; and Animal Diseases Act cap 364); Biosafety Act No 2 of 2009 and the Public Health Act, among others.

In general, these laws, while dealing with production and food safety, do not adequately or directly address food wastage and food losses; and they have overlaps and ambiguities; some are rather old and have not been updated for long; and implementation and enforcement mechanisms are generally weak. The Crops Act does not adequately address domestic food safety governance, which has direct and serious implications on protection of public health and trade in food.

The reviewed sector institutional mandates responsible for agriculture and food processing include the Ministry of Agriculture and Livestock; Ministry of Industry, Trade and Cooperatives; Ministry of Water, Sanitation and Irrigation, the Ministry of Mining, Blue Economy and Maritime Affairs (State Department of Fisheries and Blue Economy), among others. Key national institutions and agencies include Agriculture and Food Authority, National Biosafety Authority, Kenya Agricultural and Livestock Research Organization, Kenya Dairy Board, Kenya Bureau of Standards, Kenya Fisheries Service, Kenya Plant Health Inspectorate Service, and Pest Control Products Board.

In general, these institutions' mandates often overlap and even conflict, and create production and related inefficiencies that lead to food waste and losses and compromise national food safety control systems.

For the devolved system of government, relevant frameworks include county specific frameworks such as county integrated development plans, county spatial development plans, policies, laws and regulatory frameworks relevant to agriculture and food processing, for each of the counties of concern: Mombasa, Kwale and Kilifi.

Key institutional mandates include the Council of Governors, county executive committees and directorates in charge of agriculture, livestock and fisheries, cooperatives and trade, health.

2.3.3 Tourism and hospitality

The governance structure for tourism is categorized in two limbs namely, governance framework relating to tourism services such as hospitality and transport and the governance relating to the tourist attractions and sites such as museums, parks, beaches and other attractions. As a service industry, tourism is governed by a myriad of laws and policies. At the global scene, the UN specialized agency that deals with tourism is referred to as the UN World Tourism Organization (UNWTO). Several deliberations have been adopted with regards to sustainable tourism under the auspices of the UNWTO including the Djerba Declaration, Davos Declaration and Glasgow Declaration for Climate Action in Tourism in 2021.

Tourism in the three study sites heavily relies on the quality of coastal and marine ecosystems to attract visitors. At a global scale the United Nations Framework Convention on Climate Change (UNFCCC) requires member states to science based national climate action plans, referred to as nationally determined contributions (NDCs). Under the Convention on Biological Diversity (CBD) Contracting Parties developed and adopted guidelines that address sustainable tourism. The guidelines address tourism in vulnerable terrestrial, marine and coastal ecosystems and habitats of major importance for biological diversity and protected areas, including fragile riparian and mountain ecosystems. At the regional level, the African Union has adopted the African Blue Economy Strategy provides guidance to member states and other institutions for coherent formulation of their national and institutional blue economy strategies.

Regionally, the East African Classification Criteria for Classification of Hotels and Restaurants are applicable in so far as rating of hotels in the East African sub-region. At a national scale, the Constitution of Kenya, 2010 stipulates the different mandates for the national and county governments in supporting tourism development.

The Tourism Act No. 28 of 2011 regulates service providers in the industry at the national level. Other relevant legislation governing service providers of tourism services at a national level are; Hotel and Restaurants Act Cap 494, Alcoholic Drinks & Control Act, Food Drugs

and Chemical Substances Act, Films and Stage Plays Act Sustainable Waste Management Act No. 31 of 2022 in so far as management of waste generated by tourism service providers is concerned,

Other key statutes that provide regulations on the development of tourists' attraction sites include: the National Museums and Heritage Act No. 6 of 2006, Wildlife Conservation and Management Act Cap 376, Forests Conservation & Management Act Cap 385, Kenya Fisheries Management and Development Act Cap 378, Environmental Management and Co-ordination Act, No. 8 of 1999, Sustainable Waste Management Act No. 31 of 2022. Key policy documents adopted to support the existing legislative frameworks include: the Kenya Vision 2030, the National Tourism Policy, Kenya National Climate Change Strategy (KNCCRS)2020, Tourism Strategy for Kenya 2021-2025, the National Environment Policy, 2013. Sub-national legislative frameworks include Mombasa County Local Tourism Act, 2017, Kilifi County Tourism Act, 2016, Kilifi County Solid Waste Management No. 7 of 2019 , Kilifi County Water and Sanitation Act, No.6 of 2016, Mombasa County Water and Sanitation Act, No. 2 of 2016 *inter alia*.

The Tourism industry is fragmented with multiple sectors and institutions governing different ambits of the sector. Due to the fragmentation in terms of regulation, the service industry in the tourism sector falls short of coming up with common thematic strategies for ensuring SCP in the sector as a whole.

2.3.4 Environment and natural resources

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.²⁴ Some of the key international developments and instruments supporting sustainable consumption and production patterns are highlighted below.

The concept of environmentally conscious/sustainable development was a key agenda in the 1972 Stockholm Conference, which was the first international conference to address environmental concerns in a comprehensive and concerted manner. The Stockholm Declaration²⁵ recognizes 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, to ensure that development is compatible with the need to protect and improve the environment for the benefit of their population.²⁶

The famous Brundtland Report on Sustainable Development, 1987 prepared by the World Commission on Environment and Development(WCED)²⁷ 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.²⁸ This then made it imperative that resource use must be sustainable, biodiversity protected, and the environment conserved in the processes of economic development.

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*²⁹ 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 shall 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 requisite to achieving sustainable development and a higher quality of life for all people.

²⁴

²⁵ 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>

²⁶ Principle 13

²⁷

²⁸

²⁹ 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

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 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 organizations, for the environmental impact assessments for products and processes throughout their life cycle.³⁰
- 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.

Another key outcome of the Rio Earth Summit was *Agenda 21*, which recognizes 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.³¹

Finally, the Convention on Biological Diversity (CBD), which is the premier international legal instrument on biodiversity protection and is a binding instrument, 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.³² 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.³³

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³² Article 6

³³ Article 10

On its part, the 1994 Oslo Symposium 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.

The Johannesburg Declaration on Sustainable Development, and the Plan of Implementation, 2002 recognised 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.

The Plan of Implementation acknowledges that in order to achieve global sustainable development, a fundamental shift in how societies produce and consume is indispensable.³⁴ 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 utilization of resources and production processes and reducing resource degradation, pollution and waste .³⁵

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.

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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.

Twenty years after the Earth Summit, a global 10-year framework of programmes for sustainable consumption and production³⁶ was adopted in 2012 at the UN Conference on Sustainable Development (2012-2022). 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 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; promoting the adoption of lifecycle approach.

The 2015 UN Agenda for Sustainable Development³⁷ addresses Sustainable Consumption and Production as an integral component towards achieving the sustainable development goals. The 2030 Agenda outlines SCP as one of its 17 Sustainable Development Goals (SDGs), 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;

³⁶ A/CONF.216/5, A 10 Year Framework of Programmes on Sustainable Consumption and Production Patterns available at <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N12/378/75/PDF/N1237875.pdf?OpenElement>

³⁷ 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>

reduce per capita global waste by half by 2030; achieve sustainable management and efficient natural resource use by 2030; promote sustainable public procurement; increase awareness on sustainable lifestyles; and develop tools to monitor sustainable tourism.

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.

Several regional frameworks also are relevant to SCP regarding environment and natural resources. The African 10-year Framework Programme on Sustainable Consumption and Development. 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 the promotion of sustainable public procurement.



Figure 1: Milestones in International Environmental Law
Source: Author (2024)

Of national frameworks, the **Constitution of Kenya 2010**'s embodiment of the principle of intergenerational equity necessitates the need for sustainable utilization of natural resources. Article 10 provides for sustainable development as one of the key principles for good governance while Article 42 guarantees every person the right to a clean and healthy environment, which in itself demands sustainable consumption and production patterns such as sustainable waste management. Further, Article 69 creates obligations on the State with respect to the environment, including an obligation on sustainable utilization of natural resources. Article 60 requires that sustainable use shall be a key principle in land use governance and management.

The County Governments Act, 2012 makes provisions on the powers and functions of county governments³⁸ including those assigned to them under Article 186 and the Forth Schedule of the Constitution of Kenya, which include agriculture, planning, natural resource management, and environmental conservation. It provides for county planning, under which County Integrated Development Plans (CIDPs), county sectoral plans, county spatial plans, and county municipal plans should be developed.

The **1999 EMCA (as amended 2019)** is the principle law on environmental protection in Kenya. It embodies intergenerational equity and sustainable development as some of the key guiding principles for environmental conservation in the country. The Act further provides on various areas which would have an impact on sustainable consumption and production such as waste management and pollution. It further outlines projects for which Environmental Impact Assessment studies must be conducted before they are licensed for construction.³⁹ This is supposed to mitigate any potential negative environmental impact of a project.

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

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.⁴⁰ Compliance with these Plans shall be monitored by the National Environmental Management Authority (NEMA).⁴¹

³⁸ Section 5

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Laws, regulations and policies on SCP at the global, regional, national and sub-national level can be summarized as presented in *Figures 9-12* below.

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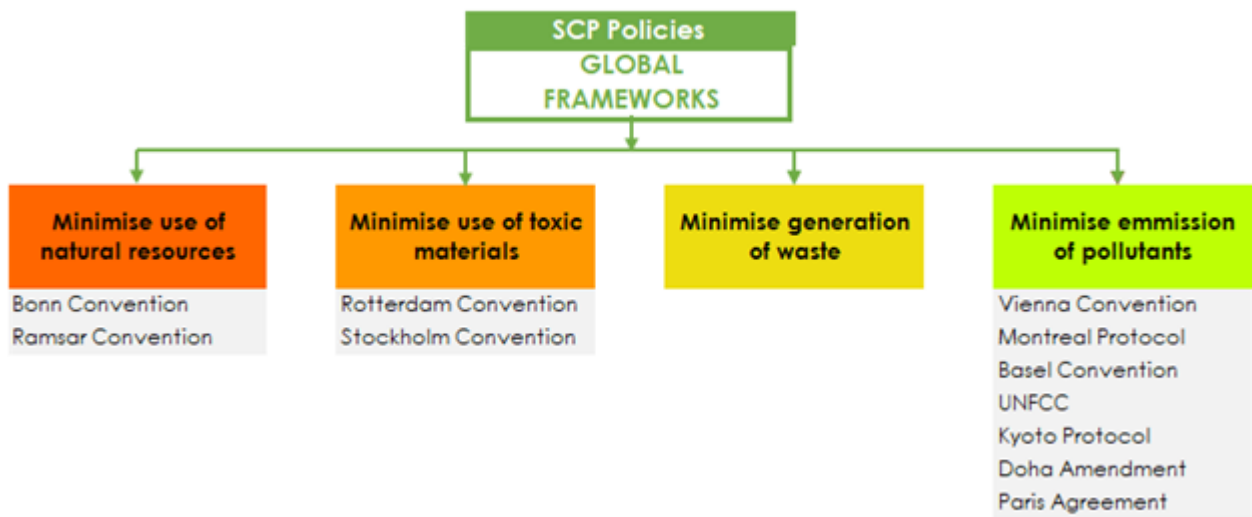


Figure 2: Analysis of sampled Global Frameworks addressing different elements of SCP
Source: Author (2024)

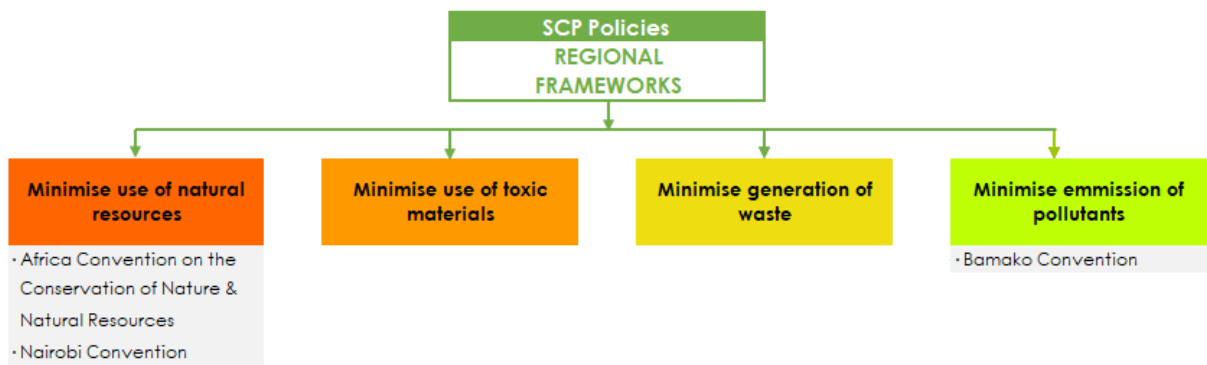


Figure 3: Analysis of sampled Regional Frameworks addressing different elements of SCP
Source: Author (2024)

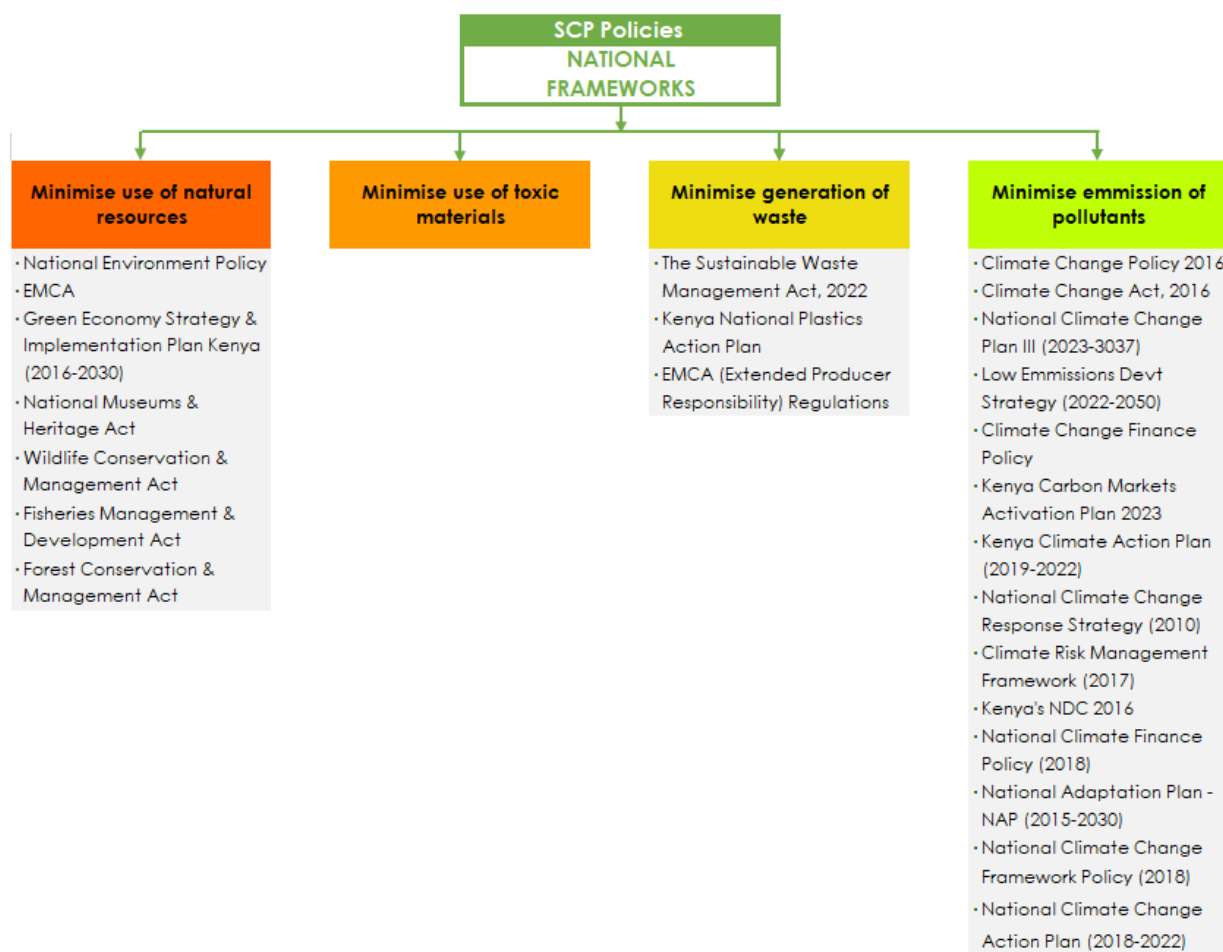


Figure 4: Analysis of sampled National Frameworks addressing different elements of SCP
Source: Author (2024)

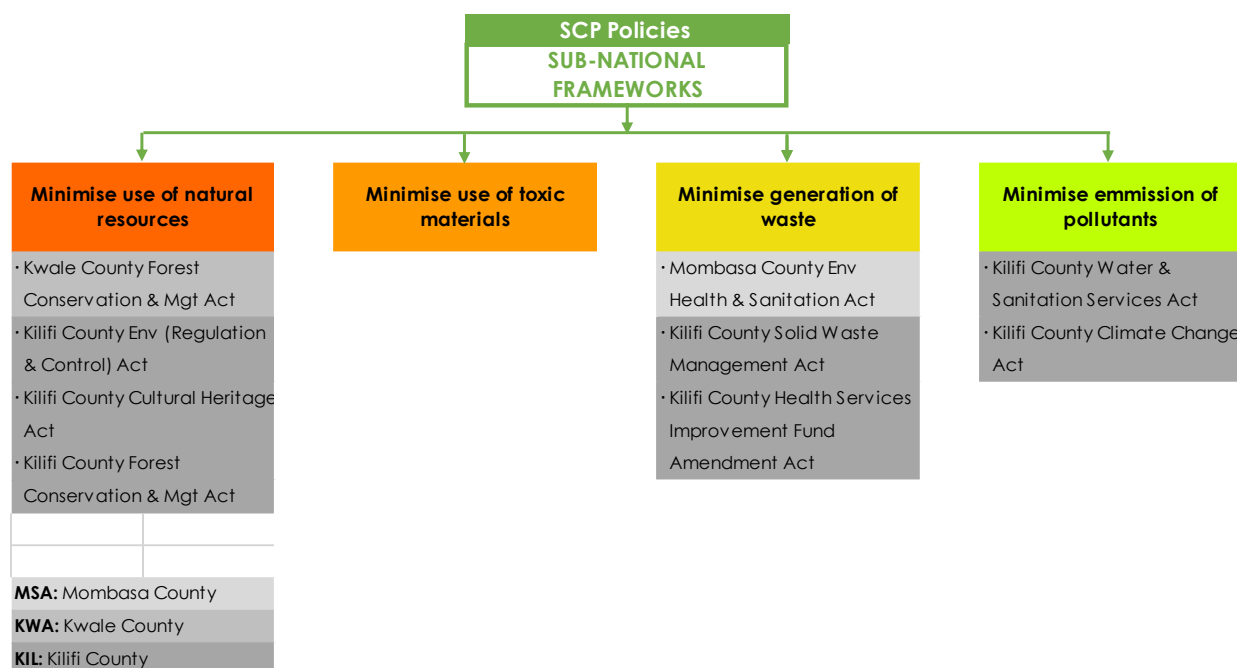


Figure 5: Analysis of sampled Sub-National Frameworks addressing different elements of SCP
Source: Author (2024)

In general the analysis of desktop reviews identified the following gaps in terms of the available legislations and policies:

- The policies and legislations do not ‘speak to each other’ that is, there is no integration;
- In some cases, policies relevant to the implementation of legislation have not been developed;
- There are gaps in terms of not having legislations that have provisions geared towards ensuring the development of sustainable/green infrastructure;
- Lack of awareness of the legislations and policies that are already in force;
- Lack of or poor implementation;
- Weak legal and regulatory framework for SCP;
- Lack of policy documents to guide most of the county functions;
- Lack of a projects implementation framework;
- Weak link between the CIDP, ADPs and budgets;
- SCP frameworks identified do not take into account the Life Cycle Approach/Perspective in decision-making and development processes.

CHAPTER THREE

KEY FINDINGS

3.1 Key Findings

This chapter presents the key findings across the four sectors of concern, based on desktop studies and the field visits/focus group discussions. Under *Broad Activity No 2*, we were to investigate how to integrate SCP policies and governance frameworks into the counties' integrated development plans, policies, spatial plans, strategies and other county level frameworks.

This has been carried out through desktop studies and numerous and extensive field and site visits to Kwale-Ukunda Diani, Mombasa, and Kilifi-Malindi during the period 2021-22. **Annex XX** provides the list of field and site visits. We have also held numerous focus group discussions(FGD), office and field meetings and consultations with county governments and particularly at directorate/sector level, relevant sector agencies, other stakeholders and communities. The schedule of FGD and other office meetings is provided as **Annex XX**. We derived important feedback both from the respondents and through deductive observations and interactions.

There are numerous images covering the project sites. There are also documents received from the county governments, especially those under development currently or recently, including Kwale County Spatial Plan, and Diani Municipality maps, etc. Expression of interest to develop Kwale county irrigation policy was made by the directorate of agriculture. From National Construction Authority, documents received include service charter, Contractor registration and checklists, etc.

Ongoing policy or regulatory processes provide a perfect entry point for the various interventions proposed in this project.

3.1 Agriculture and Food Production

3.1.1 Analysis of Desktop Reviews

In understanding the concept or notion of food loss and waste, it has been argued that it can appear to be deceptively simple, but there is no commonly agreed definition of food loss and waste. The various definitions often reflect the different problems that stakeholders or

analysts focus on or associate with food loss and waste. Consequently, analysis of food loss and waste is hampered by lack of a common definition ⁴² The Food and Agriculture Organization (FAO) defines food loss and waste as the decrease in quantity or quality of food along the food supply chain. “Food losses” occur along the food supply chain from harvesting/slaughter/catch, upto but not including retail level. “Food waste” occurs at the retail and consumption level. However, food diverted to other economic uses, for example animal feeds, or inedible parts of food, are not considered as food loss or waste. The difference between food loss and food waste aligns well with the distinction implicit in SDG 12.3. It is also apparent that food loss or waste has been typically measured in physical terms using tonnes as reporting units.

According to the 2019 FAO report entitled ***“The State of Food and Agriculture: Moving Forward on Food Loss and Waste Reduction”*** ⁴³ the need to reduce food loss and waste is firmly embedded in the 2030 Agenda for Sustainable Development. Food loss and waste reduction is considered important for improving food security and nutrition, promoting environmental sustainability and lowering production costs. However, according to the report, efforts to reduce food loss and waste will only be effective if informed by a solid understanding of the problem. Indeed, the report is substantially about understanding the problem of food loss and waste on a global scale, including constraints of data and methodology. While the reduction of food loss and waste appears as clear and desirable objective, actual implementation of it is not simple and its complete elimination may not be realistic. The need to reduce food loss and waste presents new insights on what is known and what is not, and provides guidance on how to target interventions and policies depending on policy makers’ objectives and the information available (FAO 2019).

The report provides new estimates of the percentage of the world’s food lost from production up to the retail level. The report also finds a vast diversity in existing estimates of losses, even for the same commodities and for the same stages in the supply chain. The report affirms that clearly identifying and understanding critical loss points in specific supply chains – where considerable potential exists for reducing food losses – is crucial to deciding on appropriate measures. The report provides some guiding principles for interventions based on

⁴² FAO (2019) The State of Food and Agriculture: Moving Forward on Food Loss and Waste Reduction

⁴³ Ibid

the objectives being pursued through food loss and waste reductions, which may primarily include: improved economic efficiency, food security and nutrition, or environmental sustainability.⁴⁴

The critical loss points, presented as potential direct causes and indirect drivers of food loss and waste, include agricultural production and harvest/slaughter/catch, storage and transportation, processing and packaging, whole and retail, and consumption (households and food services). At the stage of *agricultural production and harvest*, food loss occurs when produce is left in the fields due to quality standards or sharp drop in prices, poor production and agronomic practices and choices such as crop or seed varieties, machine or human damage, and poor harvesting scheduling, among others⁴⁵

At the stage of *storage and transportation*, another critical loss point, suppliers and consumers may fail to have adequate or appropriate storage to enable them to optimize the timing of marketing and marketing decisions. Storage provides stability for producers by helping prevent losses. However, the lack of refrigerated warehouse spaces or other cold storage facilities, especially in Sub-Saharan Africa and elsewhere in the global south, significantly increases food losses. Transportation introduces a time gap between various stages of the food supply chain, from production to consumption. The time gap increases the risk that food products, especially perishable ones, may be damaged or lost either due to excessive heat or cold, damage in transit, contamination, or the like⁴⁶.

At the stage of *processing and packaging*, the amount of food lost depends in large part on the type of raw material and the nature of the processing operations. Lower income countries, including Sub-Saharan Africa, often suffer from inadequate or non-existent processing facilities especially for products that are highly perishable such as milk and fish, seasonal such as mangoes and other fruits. As a category, fruits and vegetables are generally highly perishable, and once harvested need to be handled and packaged with care, using appropriate practices to maintain their quality. Transport is a critical loss point in the supply chains of fruits and vegetables, owing largely to inadequate use of bulk packaging and poor temperatures and humidity management. Losses occur from mechanical damage evidenced

⁴⁴ Ibid

⁴⁵ Ibid

⁴⁶ Ibid

by bruising, distortion in the shape of produce, cracking and punctures, which leads to discoloration, accelerated ripening, weight loss due to increased transpiration and accelerated decay, which all lead to economic losses⁴⁷.

Another critical loss point is *wholesale and retail*. The causes of food waste at this stage are linked to the limited shelf life of perishable foods, private quality standards of buyers, and variability of demand, especially for fresh produce. Actions and decisions taken by retailers often dictate those of their suppliers. Storage conditions, packaging quality and handling practices greatly impact on the quality, shelf life and acceptability of food products⁴⁸.

Finally, according to the FAO report, the *consumer and food services* is a critical loss point. Food waste by consumers is a problem especially associated with and reported in high income countries, and only to a smaller extent in low and middle income countries. Indeed, emerging economies are increasingly faced with this problem. The higher the household wealth, the more food consumers waste. Growing incomes and demographic and cultural changes over the past decades have led to changes in eating habits which often favor convenience. Consumer waste is particularly highest in perishable foods, such as animal products (14-37%) and fruits and vegetables (9-20%). In this regard, most consumer waste studies take place in high income countries where the problem is particularly acute, and especially in the United States of America (USA) and Europe)⁴⁹

Of the most critical loss points, in Africa, the highest levels of loss for cereal grains and legumes are consistently at the harvesting and on farm storage stages, regardless of location or climate. This also applies for roots, tubers and fruits, which are also impacted at the packing (handling and treatment operations) and transportation. The causes of harvesting losses frequently reported by farmers include attacks by pests and insects and the effects of diseases, adverse climatic conditions such as heavy rains during harvesting, inappropriate timing of the harvest and lack of labor or funds. Inadequate or inappropriate storage facilities and poor handling practices are among the main causes of on farm food losses. For fruits, the most frequently reported causes of loss during harvest relate to the stage of maturity, timing and scheduling, poor sorting, handling and harvesting methods, adverse climatic and weather

⁴⁷ Ibid

⁴⁸ Ibid

⁴⁹ Ibid

conditions, diseases and attacks by insects and birds. Losses during packing and transportation were mostly associated with poor handling, inadequate storage conditions and inappropriate packaging⁵⁰.

A first estimate of overall food loss throughout the FAO report concludes that globally, 13.8% of all food is lost from post-harvest up to but excluding retail and beyond. However, while the food loss estimates help draw attention to the problem and incite action, effective interventions to reduce food loss and waste must be based on more detailed information regarding where it occurs in the food supply chain, for which foods and in which regions it occurs, and the extent of the problem and underlying reasons⁵¹. This means that there are huge data and information gaps that ought to be filled in order to help better understand the problem and design appropriate responses.

The report also urges that a business case be made out, with system of incentives, investments and regulations which should be established, especially to enable private actors to reduce food loss and waste. It argues that actors in the food supply chain are driven by self-interest: producers aim to maximize profits and consumers their well-being. As rational decision makers, they reduce food losses or waste as long as the benefits outweigh the costs. The report also states that completely eliminating all food loss and waste is unrealistic as the costs would be exorbitant⁵².

There is a persuasive case for public sector involvement in the food loss and waste management, based on both business case and economic case. There are tangible benefits of public sector investment in this regard, including food and nutritional security, environmental sustainability and mitigation of climate impacts, and increased productivity and economic growth. The business case for reducing food losses and waste, where incentives and adequate information can encourage the private sector to reduce food loss and waste in their own interest, should be completed by an economic case for waste. The economic case goes beyond the business case, and focuses on the broader benefits that can accrue to society from reducing food loss and waste, and this may include improved incomes for other actors in society, improved food security and nutrition, and environmental sustainability.

⁵⁰ Ibid

⁵¹ Ibid

⁵² Ibid

The FAO 2019 Report also finds that both global and national estimates of food loss are important to monitor progress over time, but additional information is needed to understand the variability of food loss and waste percentages across different contexts and at critical loss-points along the food supply chain. Also, information on the location, extent and underlying causes of food loss and waste is fundamental in drawing up strategies aimed at food loss and waste reduction. Moreover, representation of food loss and waste data is imbalanced. Most studies focus on fruits, vegetables, cereals and pulses at the farm level, and these are mostly from Central and Southern Asia, Sub-Saharan Africa and Eastern and South Eastern Asia. The report also finds that loss and waste percentages are generally higher for fruits and vegetables than for cereals and pulses, especially in situations where cold storage or processing conditions are inadequate. The wide variability of food loss and waste across commodity groups and supply chain stages, particularly in Sub Saharan Africa and Eastern and South Eastern Asia, points to the need for improved data collection to inform targeted reduction strategies.⁵³

The **UNEP (2021) Food Waste Index Report**⁵⁴ complements the **FAO (2019) Food Loss Index**. The *Food Waste Index* covers the later stages of food's journey – food waste – occurring at household, food service and retail levels.

According to **UNEP (2021) Food Waste Index Report**,⁵⁵ which focuses on a global scale, food waste reduction offers multi-faceted wins for people and planet, improving food security, addressing climate change, saving money and reducing pressures on land, water, biodiversity and waste management systems. Yet this potential has until now been woefully under-exploited. This potential may have been overlooked because the true scale of food waste and its impacts have not been well understood.

According to the UNEP Report, global estimates of food waste have relied on extrapolation of data from a small number of countries, often using old data. Few governments have robust data on food waste to make the case to act and prioritize their efforts. Sustainable

⁵³ Ibid

⁵⁴ UNEP (2021) Food Waste Index Report 2021

⁵⁵ Ibid

Development Goal 12.3 (SDG 12.3) captures a commitment to halve food waste at the retail and consumer level and to reduce food loss across supply chains.

The **UNEP (2021) Food Waste Index Report** aims to advance progress on SDG 12.3 in two ways: firstly, it presents the most comprehensive food waste data collection, analysis and modelling to date, generating a new estimate of global food waste. Country-level food waste estimates have been calculated, and while confidence intervals for estimates vary by region and by sector, they offer new insight into the scale of the problem and into the substantial prevention potential in low-, middle- and high-income countries. • Secondly, the report publishes a methodology for countries to measure food waste, at household, food service and retail level, in order to track national progress towards 2030 and to report on SDG 12.3. Countries using this methodology should generate strong evidence to guide national strategies on food waste prevention, food waste estimates that are sufficiently sensitive to pick up changes in food waste over two- or four-year intervals, and that enable meaningful comparisons among countries globally.

According to Inger Andersen, the Executive Director of UNEP, “If food loss and waste were a country, it would be the third biggest source of greenhouse gas emissions. Food waste also burdens waste management systems, exacerbates food insecurity, making it a major contributor to the three planetary crises of climate change, nature and biodiversity loss, and pollution and waste. This is why Sustainable Development Goal 12.3 aims to halve food waste and reduce food loss by 2030”⁵⁶

In support of this vital target, UNEP’s first *Food Waste Index Report (2021)* provides insights into the scale of food waste and a methodology that enables countries to measure baselines and track progress in meeting the SDG target. The report estimates that food waste from households, retail establishments and the food service industry totals 931 million tonnes each year. Nearly 570 million tonnes of this waste occurs at the household level. The report also reveals that the global average of 74 kg per capita of food wasted each year is remarkably similar from lower-middle income to high-income countries, suggesting that most countries. From both the UNEP 2021 *Food Waste Index Report* and the FAO 2019 report, Kenya is not

⁵⁶ Ibid

among the “List of countries officially reporting data on food loss to FAO for at least one year between 1990 and 2019”.

An earlier publication by FAO (2014)⁵⁷, *Building a Common Vision for Sustainable Food and Agriculture*, states that FAO’s ultimate vision is that of “a world free from hunger and malnutrition, where food and agriculture contribute to improving the living standards of all, especially the poorest, in an economically, socially and environmentally sustainable manner”. Its focus is on food security, elimination of poverty, sustainable management and utilization of natural resources. FAO’s Strategic Objective No 2 is to assist member countries in identifying and implementing policies, strategies and technologies that contribute to sustainable and enhanced provision of products and services from agriculture, forestry, and fisheries. The common vision and coordinated approach towards sustainable food and agriculture that is knowledge based, as well as being responsive to the needs of member states. It envisions a higher but more sustainable agricultural production, at 60% by 2050, and 100% in developing countries if it is to meet current demands of consumption. It calls for technological innovation and improvements leading to significant gains in agricultural production and productivity.

The FAO 2014 proposes that just like the Green Revolution in South Asia, farming systems should use high yielding varieties, irrigation and high levels of chemical inputs, and thereby practice agricultural intensification that allows farmers to feed the world, but save millions of acres of land from conversion to farmland thereby saving an unquantifiable quantity of ecosystem services and avoid the release of estimated 590 billion tonnes of carbon dioxide into the atmosphere⁵⁸

According to the FAO 2014 Report, the current trajectory of growth in agricultural production and productivity is unsustainable. Food production on land and in aquatic systems already dominates much of the global terrestrial surface, and has major impacts on the Earth’s ecosystems. Agricultural production systems and the policies and institutions that underpin global food security are increasingly inadequate. – The world’s food systems are

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⁵⁸ Burney et al 2010:

headed towards an unprecedented confluence of pressures over the next 40 years⁵⁹, and if the trajectory is sustained will seriously compromise long term global capacity to produce both food and economic benefits needed for food security. Consequently, some of the anticipated trends include inadequate diets and unsustainable consumption patterns, as well as increased poverty, inequities, hunger and malnutrition and the reality that current food production and distribution are failing to feed the world. Unfortunately, financial and environmental resources are being spent to produce food that is lost or wasted. There are also challenges with loss of biodiversity, climate change and stagnation in agricultural research, which undermine agricultural production and productivity.

FAO defines the sustainable agricultural development as “the management and conservation of the natural resource base, and the orientation of technological change in such a manner as to ensure the attainment of continued satisfaction of human needs for present and future generations. Sustainable agriculture conserves land, water and plant and animal genetic resources, and is environmentally non degrading, technically appropriate, economically viable and socially acceptable” (FAO 1988).

The FAO reports that initiatives such as “local production for local consumption” and government procurements from family farmers for school meals programmes have been very effective in increasing production and incomes, while improving food security in Brazil and other countries (Ministry of Agrarian Development 2011). Sustainability, therefore, is much more than ensuring protection of the natural resource base. To be sustainable, agriculture needs to meet the needs of present and future generations for its products and services, while ensuring profitability, environmental health, and social and economic equity. Sustainable agriculture would contribute to all four pillars of food security- availability, access, utilization and stability, in a manner that is environmentally, economically and socially responsible over time. As agriculture depends largely on the services provided by ecosystems, to be sustainable, it must minimize negative impacts on ecosystems and the environment in general, while optimizing production by protecting, conserving and enhancing natural resources and using them efficiently. It must also strike a balance between protecting agro-ecosystems and meeting society’s growing needs by offering decent and resilient livelihoods for rural populations. There is therefore a need to provide a clear understanding of what is

⁵⁹ Foresight UK, 2011

sustainable food and agriculture, as well as the most appropriate strategies and approaches to its implementation⁶⁰

The FAO 2014 provides a conceptual model for sustainable agriculture and food systems. In this respect, agriculture is the mechanism that utilizes natural resources (land, water, biodiversity, forests, fish, nutrients and energy) and environmental services and transforms them into agricultural products (food, feed, fibre, fuel) and the associated economic and social services (food security, economic growth and poverty reduction, health and cultural values). The institutions that govern agricultural production, because they determine what is produced, who produces it, with which types of technology and practices, and the level of returns, are all key levers for regulating the type and distribution of the products and services that can be derived from agriculture. Achieving sustainability in food and agriculture is envisioned as an on-going process of identifying and striking a balance between agriculture's social, economic and environmental objectives and between agriculture and other sectors of the economy⁶¹.

The interactions and tradeoffs with human and natural systems within both and over time, have gained the most attention, including the human systems' level of consumption which has grown to unprecedented levels, leading to rapid depletion of natural resources and the disruption of ecosystem services through, for example, climate change and biodiversity loss. In this respect, what is envisioned is greater production efficiency, which includes tradeoffs between use of natural resources and ecosystem services. Tradeoffs also occur in space when allocating areas for agriculture, recreation and conservation⁶² (FAO 2014).

The conceptual model underpinning the FAO 2014 Vision has five interlinked components. These include environmental services (climate, nutrient cycling, biodiversity, water cycles, coastal protection); natural resources (land, oceans, water, genetic resources, forest resources, aquatic systems, nutrients, energy); agriculture (crops, livestock, forestry, fisheries, aquaculture); agricultural production (food, feed, fiber, fuel); and economic and social services (growth, poverty reduction, employment, stability, health and nutrition. The *Vision*

⁶⁰ FAO (2014): Food Loss Assessment: Causes & Solutions: Case Studies in Small Scale Agriculture and Fisheries Sub Sectors-banana, maize, milk, fish. Global Initiatives, Rome

⁶¹ Ibid

⁶² Ibid

also vouches for cross sectoral integration and synergies as between the agriculture and food sub sectors-crops, livestock, forestry, fisheries, and aquaculture. However, the excessive separation of the sub-sectors often creates a “silo syndrome” in which these sub-sectors compete with each other for space, political support and natural resources, thus resulting in conflicts and in sub-optimal allocation and management of resources. It is more desirable to have a holistic vision of sustainability which looks beyond simply balancing tradeoffs and explore, as well, opportunities in creating synergies that would reduce or even reduce conflict and competition. Synergies between livestock and crop production are especially significant. Crops provide fodder and feed and grasslands contribute to sequestration of some of the greenhouse gases emitted by livestock, In turn, livestock produces manure that contributes to crop productivity.⁶³

Some of the key principles for sustainability in food and agriculture articulated, which are all inter connected, include: improving efficiency in the use of resources (“getting the right mix”); protecting and improving rural livelihoods, equity, and social well-being; enhancing resilience of people, communities and ecosystems; and enhancing responsible and effective governance mechanisms.⁶⁴ To actualize these principles, some of the suggested examples of key policies and practices include getting genetically diverse portfolio of crops, livestock, forestry or aquaculture, practicing conservation agriculture, judicious use of organic and inorganic fertilizers, improved soil moisture management, improved water productivity and integrated pest management. Others are: use of better practices for biodiversity protection such as *in situ* and *ex situ* conservation of plant genetic resources; use better practices for soil management including land rehabilitation; use better practices for water management including irrigation and prevention of water pollution, and set payments for using and for providing environmental services such as pollinators and carbon sequestration.

On the national front, Kenya’s Climate Smart Agriculture Strategy 2017-2026 states that “Climate change is real and has become an impediment to sustainable development globally. Climate change will have a range of positive and negative impacts in agriculture depending on the regions of the world. The negative impacts are expected to be more adverse in developing countries, particularly those in sub-Saharan Africa such as Kenya which has

⁶³ FAO (2014): Food Loss Assessment: Causes & Solutions: Case Studies in Small Scale Agriculture and Fisheries Sub Sectors-banana, maize, milk, fish. Global Initiatives, Rome

⁶⁴ Ibid

experienced increasing temperatures from 1960's coupled with increased frequency and intensity of extreme weather events such as El Niño and La Niña. Effects of the negative impacts will include declining agricultural productivity and loss of crops, livestock, fish and investments in agriculture due to changing temperatures and precipitation regimes and increased frequency and intensity of extreme weather events.

Further, according to the Strategy, fisheries and aquaculture are affected through acidification of the water bodies, changes in water temperatures and circulation patterns which alter the physico-chemical properties of the fish habitats and ultimately the productivity. Agriculture is not only impacted upon by climate change but also contributes to the problem. The country's agriculture is predominantly rain-fed and therefore vulnerable to climate change particularly changes in temperature regimes and precipitation patterns, and extreme weather events. This leads to, among others, unsustainable land and agricultural water management. Kenya's greenhouse gas (GHG) emissions were estimated to be 73 million tons of carbon dioxide equivalent (MtCO₂ e) in 2010 and are expected to rise to 143 MtCO₂ e in 2030 unless appropriate mitigation actions are taken.⁶⁵ (GoK 2017).

According to the Strategy, **Agriculture is the largest source of GHG emissions; it was responsible for one-third of Kenya's total emissions in 2010.** Agricultural emissions are likely to increase from 20 MtCO₂ e in 2010 to 27 MtCO₂ e by 2030, largely driven by livestock methane emissions and land use change, which account for 90% of agriculture emissions and 30% of overall national emissions. Weak policies, legislations, enforcement, and overlap of mandates among institutions involved in regulation coupled with poor coordination and collaboration among institutions and stakeholders in climate smart agriculture (CSA) have contributed to the country's inability to effectively address vulnerability and GHG emissions.⁶⁶

3.1.2 Analysis of Field Based Responses (Site visits and FGDs)

From the series of targeted field/site visits and focus group discussions (FGDs) conducted during 2021-22, there were various useful responses and findings. The research team focused mainly on county departments and directorates of agriculture and trade (Kwale, Mombasa and Kilifi), retail/wholesale food markets, and landfills/dumpsites. We also covered large sections of peri-urban Ukunda/Diani, Mombasa, and Malindi. The focus on the departments

⁶⁵ GoK 2017: Kenya Climate Smart Agriculture Strategy 2017-2026

⁶⁶ Ibid

and directorates was because we needed to discuss with policy makers and managers of the sector, while retail and whole markets enabled us to address food trade and food loss and waste. This also applied to the focus on dumpsites/landfills. Peri-urban areas have potential for peri urban farming and food production as part of the circular economy proposed for the coastal cities.

In Kwale County, the directorate briefed us that there are three ecological zones in the county, including mixed agriculture zone with food crops such as maize and root crops, pastoral/livestock zone and the marine/coastal zone. The county also produces fruits including citrus and paw paw, industrial crops such as sugar cane, bixa and coconut. Soils are generally fertile and rainfall is reasonable (600-1700mm). Some of the projects supported by the county government have registered progress. These include two farm tractors per ward to help farmers prepare their land, provision of seed for one acre per farmer- and covering at least 300 farmers per ward. There are also extension services in the wards. The national Government through the NARUD Project supports farmers with provision of seed, while the ASDPD supports value addition, including in local poultry, green grams, tomatoes and cow-peas. The KCEP supports the maize value chain, as well as cow peas. The KMSFED project deals with the blue economy.

There is also support for small scale micro-irrigation where farmers are supported with materials to develop and conserve irrigation water in water pans.

However, the key challenge is sustainability of the government supported projects and interventions. Food production in Kwale does not supply sufficiently to meet local demands. Most of the food in food markets in Kwale is sourced from Kongowea market in Mombasa and from across the border in Tanzania.

Key challenges that undermine agricultural production in Kwale include technical capacity for key strategic and operational support services like staff for extension services. Training opportunities are not adequate, while financial resource allocations are typically small and inadequate.

Moreover, other key challenges include diseases and pests especially the army worm, which reduces food production and increase the load of food losses; post-harvest losses which are up to 40% at farm level; high cost of farm inputs like seeds and fertilizers; climate change

and unreliable rains; and declining soil fertility especially because of use of chemicals and fertilizers.

Among the key interventions suggested to ameliorate the challenges include: employing new officers to address capacity gaps and to set aside funds for training requirements; enhance water harvesting and small irrigation schemes; cold storage for fisheries; capacitation of beach management units (BMUs) including through fishing boats. Others are improved breeds, mass vaccination, construction of cattle dips; establishment of produce collection centres for produce like fruits and maize, as well as establishment of major markets at Kombani/Mwembe, Ukunda and Samburu. Other proposed interventions include contract farming between the county government and private companies e.g. Feast Foods Ukunda; planned memorandum of understanding (MoU) between the County Government of Kwale, private companies and the Kenya Commercial Bank (KCB). There is a coconut factory in Ukunda, a mango factory, and one for bixa in collaboration with national Government, and sugar cane farming which includes out growers.

While Kwale county cannot at present satisfy its food requirements, with the foregoing interventions it is feasible to significantly improve food production. With the hybrid seed in use, there is greater scope for achieving higher levels of production.

Also, while the volumes of waste in Ukunda are a matter of concern, Ukunda's spatial plan should provide for organized markets for fresh produce, green spaces and cultural sites.

Kwale's abattoirs/slaughter houses are located in the livestock zone, including along the Mombasa-Nairobi highway, and along the Kwale/Kilifi boundaries, often concurrently with the main livestock markets at Mwangulu, Kinango, Samburu.

We also found that, in general, pressing needs for Kwale's agriculture include inputs, value addition, and food losses on farm. Another expressed need is for small scale irrigation, and a county irrigation policy. Good potential and opportunities for agricultural production lie in agro-forestry particularly casuarina trees, dairy farming especially in Msambweni, Lunga Lunga and Matuga, poultry, and bee keeping.

We noted unsegregated food waste in the Kinondo landfill/dumpsite on the outskirts of Ukunda. Food waste originates in the retail markets, households and hotels and catering

establishments, among others. According to the management of Ukunda/Diani Municipality, the land fill is designed to handle segregated waste, and there are plans for recycling of waste. Remarkably, the Kinondo landfill/dumpsite is secured by a high concrete wall, and is large by local standards.

Agricultural production in Kilifi county is also significant, according to the directorate of agriculture, cooperatives and trade. There is great scope for livestock production, including dairy, beef and mutton. Crop production, like for Kwale, includes cereals and pulses, fruits, and vegetables. There is also scope for irrigation, including in the peri-urban areas of Malindi, Kilifi and others.

Mombasa, with clearly the least amount of available arable land, has potential for kitchen farming for vegetables and fruits, mushroom farming and dairy production, and poultry. Ironically, Mombasa has the highest market demand for food owing to the large population in the city. Consequently, most of the food in Mombasa comes from up country counties, and its largest markets like Kongowea and Mwembe Tayari supply food to other neighboring counties. Therefore, while it is comparatively low on agricultural production, Mombasa is tops on consumption and waste generation. Mombasa is also tops on food processing and command of the food supply value chain.

The field/site visits to and FGDs at the wholesale and retail food markets in Mombasa and Kilifi counties yielded interesting results and responses. At Kongowea, (20/22-09-2022) which is the largest retail/wholesale food market in Mombasa city and by extension the whole of the coastal region, we established that it is a large and busy food market with complex food operations on both sides of the supply-consumption divide, and a county governance system that sectorally places the market in the department of trade, while leaving waste management including food waste, to the department responsible for environment. Our observations were that there are significant levels of food waste.

However, there were no data sets or information on amount of food waste recorded. This is partly due to shortage of cold storage facilities, as some of the existing ones are privately owned and operated on a tenancy basis. There are also public coolers for rent. There are also few satellite markets, which places additional pressure on Kongowea and somewhat leads to unintended food losses. Also, the market has both whole sale and retail sections, and

designated sections for particular produce for example tomatoes, bananas, cereals etc. Stalls traders pay token amounts to the county for operating space (Ksh 800), and those who operate within the market but outside the building (open air) pay smaller daily amounts.

Structural problems in the market that contribute to food waste include power interruptions especially in the upper floors, broken pipes and leaking roofs which affect foodstuffs during rains, inadequate cold storage facilities especially important for ripening bananas and tomatoes. Other challenges include market politics and governance problems, and widespread general market and food waste. Although, thankfully, demand is rising for animal feeds especially for green maize husks and remnants of vegetable like cabbages, food waste is a major and ubiquitous problem, especially fruits and vegetables. Open air sales contribute to food waste mainly due to hot weather/sunny conditions. Some of the produce that is easily lost is spinach and other vegetables, mangoes, oranges, tomatoes and melons.

The suggested interventions to address food waste at Kongowea include cold storage facilities, de-congestion and de-centralization by establishing or expanding other satellite markets such as Markiti, Majengo and Mwembe Tayari. The latter will enhance access to fresh produce in a timely manner. Others are efforts to encourage, educate and enforce “under the shed” stalls to avoid food waste, as well as modelling Kongowea into a robust and modern market with superior facilities and customer experience. Finally, what is needed is a systematic data base to track food waste in order to inform timely and effective interventions, with a view to meeting the commitments made under SDG 12.3 as well as the county government of Mombasa.

3.2 Tourism Sector

3.2.1 Analysis of desktop literature

Unsustainable tourism trends in the tourism sector are undeniable. Evidence presented by different studies demonstrates that unsustainable trends in the tourism sector have increased the carbon footprint. During the 2008 Davos Conference on Climate Change and Tourism it was observed that carbon dioxide emissions from the tourism sector’s transport, accommodation and other activities are estimated to account for between 4 and 6% of total emissions.⁶⁷ A survey conducted by Hotel Energy Solutions in 2011, showed that SME s in

⁶⁷ UNWTO ‘Climate change and tourism: Responding to global challenges’ 2008 Available at <https://www.e-unwto.org/doi/epdf/10.18111/9789284412341> Accessed on 19th March 2024

the hotel industry, including individually owned and managed facilities are generally less active with environmental and energy issues than chain-affiliated hotels.⁶⁸ Another 2018 report projected that the tourism industry has increased emissions to 9%.⁶⁹ At the local level the research has shown that stress exerted by tourism activities on natural resources such as water, land and marine ecosystems impacts on the carbon footprint in the industry.⁷⁰ On waste management, studies in the sector have revealed that a typical hotel establishment emits solid waste comprising of 46% food and non-recyclables, 25% paper, 12% cardboard, 7% plastic, 5% glass and 5% metal.⁷¹ The study recommended that the waste emitted from hotels can be halved by recycling and reducing use of single use plastic and could also serve as a side revenue-earning practice from payments made by recycling firms.

In the local context, the 2017 State of the Coast Report observed that encroachment by tourism infrastructure is one of the key issues that have led to environmental degradation.⁷² Shoreline erosion is also intensified by activities along beaches and shorelines.⁷³

According to a 2022 report by Ellen McArthur foundation, having a restorative and regenerative tourism economy requires the sector to move from a linear economy model to a circular economy model as proposed by the overarching objective of this project.⁷⁴ In providing practical steps to the way forward, a 2019 report by UNWTO and UNEP observed that SCP policies must go beyond the decision-making towards incorporating other phases of implementation to include corporate environmental and social responsibility, eco-labelling, certification, sustainable procurement, eco-design and environmental impact assessment.⁷⁵

⁶⁸ Hotel Energy Solutions ‘Factors and initiatives affecting energy efficiency use in the hotel industry’ (2010) at page 3 Available at <https://www.e-unwto.org/doi/pdf/10.18111/9789284415021> Accessed on 26th April 2024.

⁶⁹ Lenzen, M., Sun, Y Y., Faturay, F. et al., ‘The carbon footprint of global tourism. Nature Climate Change’ 8 (2018) 52, 528. Available at: <https://doi.org/10.1038/s41558-018-0141-x> [Accessed 19th January 2024]

⁷⁰ M. Ikiara & C.Okech ‘Impact of tourism on the environment in Kenya: Status and policy’ (2002) Available at <https://repository.kippira.or.ke/bitstream/handle/123456789/2578/DP19.pdf?>

⁷¹ Ibid

⁷² Ibid p. 52

⁷³ Ibid page 51

⁷⁴ World Travel & Tourism Council & Harvard Learning Insights ‘Circular economy: Leading circularity in travel and tourism’ 2022 Available at <https://wttc.org/Portals/0/Documents/WTTC-Harvard-LearningInsight-CircularEconomy.pdf> Accessed on 23rd April 2024

⁷⁵ UNEP & UNWTO ‘Baseline Report on the Integration of Sustainable Consumption and Production Patterns into Tourism Policies’ (2019) At Page 6 Available at <https://www.e-unwto.org/doi/epdf/10.18111/9789284420605> Last accessed on 24th January 2024

At the local level, Peter Osiako's study on the impact of environmental friendly patterns on coastal beach hotels at the Coast paints a need to tailor make SCP practices at the local level.

A research conducted in 2005, demonstrated that sustainable tourism as an emerging trend in marketing tourists destinations.⁷⁶ The study showed that establishments that marketed and advertised as eco-friendly sites were twice as likely to attract environmentally conscious customers as compared to those that failed to adopt sustainable patterns. Another research conducted in 2010, showed that tourists prefer booking and staying in eco-friendly hotels as opposed to regular hotels.⁷⁷

The Blue Tourism Initiative is a global multi-stakeholder innovation program focused on the environmental management, governance and planning of coastal and maritime tourism in three marine regions: the Mediterranean, the Western Indian Ocean and the Caribbean.⁷⁸ The report noted the profound linkage between the use and management of natural resources and the main activities including coastal artificialization, marine pollution, and biodiversity loss.⁷⁹ The report therefore recommends several pathways towards ensuring sustainable tourism practices.

In addressing the broader SCP trends in tourism a report by UNCTAD noted that tourism activity, attractiveness, economic gain and resilience of the industry was firmly linked to steps taken to ensure sustainability of the sector. The study suggested that the four aspects are important parameters in achieving sustainable tourism trends.⁸⁰ The four parameters include transport efficient systems, energy efficiency, green house carbon emissions through

⁷⁶ H. Goodwin & j. Francis 'Ethical and responsible tourism: Consumer trends in the UK' (2005) 9(3) Journal of Vacation Marketing 271,284

⁷⁷ Han, H., Tzang, L., & Sheu, C. 'Application of the theory of planned behavior to green hotel choice: Testing the effect of environmental friendly activities.' (2010) 31 Tourism Management, 325-334

⁷⁸ Blue Tourism Initiative 'Towards Sustainable Blue Tourism: Trends, Challenges and Policy Pathways' (2023) Available at https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Rapport/202306-blue%20tourism_0.pdf Accessed on 7th April 2024

⁷⁹ National Environment Management Authority 'State of the Coast Report for Kenya -Enhancing Integrated Management of Coastal and Marine Resources in Kenya' at page 51 Available at https://www.nema.go.ke/images/Docs/REPORTS/SOC%202nd%20Edition%20final%20report_19%2010%202017.pdf Accessed on 24th January 2024

⁸⁰ L.Cernat & J.Gourdon 'Is the concept of sustainable tourism sustainable? Developing the sustainable tourism benchmarking tool' (2007) Available at https://unctad.org/system/files/official-document/ditctncd20065_en.pdf Last Accessed on 24th January 2024

accommodation and carbon sequestration through partnerships with conservation firms as a way of offsetting greenhouse contribution.

3.2.2 Analysis of field based responses

The Project Team met and engaged county government officials responsible for tourism in Kwale, Kilifi and Mombasa. These included the CEC responsible for Tourism in Kwale County, CEC responsible for Tourism in Kilifi, and the Deputy Governor Mombasa County. The team also met and engaged with the directors responsible for tourism in the counties. In general, tourism a flagship sector for the three coastal counties that directly and indirectly employs thousands of people. We also gathered that this sector was most affected by the Covid 19 pandemic. The counties are pursuing a vision of sustainable tourism development, which includes environmental, socio-cultural and economic aspects. Such a vision would be anchored in relevant and responsive policy, legislative and regulatory frameworks. They also spoke about diversification of tourism products and offerings, including community based and cultural tourism, among other product developments. More interactive products such as surfing and other water sports have great potential for growth, Also, what is gaining currency is internet based booking and use of private accommodation facilities commonly referred to as AirBnBs. However, it was also clear that the traditional beach based tourism was under increasing pressure, partly because of poor diversification of products.

Waste management problems were also affecting the sustainability of the sector. Hotels and catering establishments typically produce a lot of solid waste including food wastes, and waste water. According to the respondents, a waste recycling policy is needed. Also needed is enhanced capacity of the industry regulator, the Tourism Regulatory Authority(TRA). Fortunately, TRA uses East African Classification Standards.

Other key challenges affecting coastal tourism sector is financial sustainability, infrastructure challenges such as access roads, power, waste management, regulatory and policy gaps, among others. Some suggested interventions would include waste water recycling plants in hotels and catering establishments, as well as reduction of waste generation, recycling and reuse of some of the solid waste generated by hotels and catering establishments. In this regard, it would be desirable to discourage use of plastics in hotels and catering establishments, recycle plastics and provide for waste collection centres. Others are better regulation of home stays in conjunction with industry players such as Kenya Association of Hotel Keepers and the Kenya Association of Tourist Operators Finally, county government officials readily acknowledge that it would be difficult to re-organize the coastal cities in

focus here: Ukunda, Diani, Mombasa and Malindi because of vested and pre-existing commercial, ownership and other interests. However, the ideals of pre-emptive conservation, alternative livelihoods and sustainable tourism should be pursued.

One of the respondents, Mombasa beach hotel is owned and managed by the Kenya Safari Lodges and Hotels. It is a public funded entity. It was established in 1970 and has spanned more than 50 years in the hospitality space in Mombasa.

- **Use of plastic products:** The hotel is already working to phase out plastic products such as water bottles, soap sachets, straws, cosmetic supplies etc. The hotel is already working internally to phase out the use of such single use plastics. The hotel management further stated that the industry regulator (Kenya Tourism Board) has already signaled intentions to oblige the hotel industry to comply with the no single use plastics policy.
- **Managing solid waste:** Mombasa Beach Hotel is already doing monthly beach clean-ups as part of their corporate social responsibility engagements. The hotel engages all staff in the cleanup exercise. The hotel also sorts and segregates solid waste on site which is collected by thrice a week.
- The hotel management also noted that Kenya Wildlife Service (KWS) has also increased marine patrols and coordinating beach clean-ups especially in areas surrounding marine parks and reserves.

Another respondent in Malindi, provided responses. This is a privately owned enterprise comprising of accommodation facilities.

- **Use of single use plastics:** The hotel management revealed that the establishment had not shifted to using eco-friendlier suppliers to visitors' rooms such as soap and body lotion dispensers. The establishment is still using other single use plastics such as straws. The management indicated that there are plans to shift to using more environmentally friendly alternatives. The respondents pointed out that the Covid-19 pandemic and the subsequent blow of the pandemic to the tourism industry had posed a setback on the plans to completely phase out the use of single use plastics in the hotel.
- **Management of solid waste:** The hotel reported that it had adopted the segregation of waste in categories of food waste, broken bottles, plastic and other waste. The waste is then collected twice or thrice a week.

The respondent sampled from the South Coast region, Baobab Beach Resort and SPA is a private, five star rated hotel situated in Ukunda Diani. It is a privately owned hotel establishment.

- **Use of plastic products:** The hotel respondent informed the team that the hotel supplies water in the rooms using glass bottles. For the room utilities such as soap and lotion, the hotel has installed refillable dispensers in the rooms hence eliminating the use of single use plastics in the rooms. The hotel also collects used bar soap which is collected for purposes of recycling.
- **Management of waste water:** The hotel has a waste water recycling system under development.
- **Change of linen and towels:** Linen used in the rooms which includes bedding and towels are changed every two days. The hotel also informed us that as a deliberate water conservation step, the hotel placed
- **Recycling options:** The hotel has made arrangements for recycling of waste bar soaps that are used in the facility.
- **Segregation of waste:** All waste generated in the different units within the facility is collected and segregated. The wet garbage is stored in the wet garbage room awaiting collection for onward handling.
- **Menu:** The hotel has adopted a no food waste menu by way of buffet serving.

The summary of findings is as follows:

- ✚ Hotel establishments are aware of the need to adopt sustainable practices within their hotel establishments.
- ✚ Some hotels have initiated plans to phase out single use plastics in their establishments. However, the adoption of such sustainable practices is a costly exercise and as such hotels have faced setbacks.
- ✚ Hotels have put in place waste segregation mechanisms. Waste generated in hotels is sorted out and segregated into plastics, organic waste (mostly food waste), broken glass and other waste. The waste is later collected by other entities. However, the waste is later dumped at dumpsites such as Mwakirunge dumpsite/landfill in Mombasa county for example.
- ✚ The decision and motivation to adopt sustainably friendly practices is not mandatory and is privately driven by the hotel establishments and which is greatly motivated by the profit maximization that it yields. While this is the case, individual hotel establishments put in place different measures depending on their financial

capabilities seeing that some measures such as installation of water desalination systems are capital intensive.

3.3 Construction and infrastructure development sector

3.3.1 Analysis of desktop literature

The legal and policy framework governing the construction and infrastructure sector is robust at the global, regional and national level in matters concerning identification of development priorities. Moreover, Mombasa, Kwale and Kilifi Counties continue to actively define and refine their local development priorities through their CIDPs, the Mombasa Gate City Master Plan, the Kwale Municipal Plan (2023-2032) and the Kilifi County Spatial Plan (2021-2030) respectively.

The need for development priorities to be tempered/regulated by SCP governance frameworks cannot be underscored. To this end, this research sought to scrutinise existing global, regional, national and sub-national SCP Frameworks against the backdrop of the different elements of SCP, while also taking into consideration their application throughout the life cycle of construction and infrastructure projects (from cradle to grave).

Having recognized that local environmental challenges have trans-boundary effects, world leaders have banded together since 1972, and held a series of global engagements which have set the global agenda adopted by many nations in the effort to bridge the gap between development and environment. These engagements have laid the foundation for the evolution of the concept of sustainable development.

According to a 2014 report by the Intergovernmental Panel on Climate Change (IPCC) the building and construction sector accounts for 30% of global energy use and a commensurate level of GHG emissions.⁸¹ Similarly, a 2022 working group report models different global scenarios for existing buildings and buildings yet to be built and projects a net zero GHG emissions in 2050 if policy packages, which combine ambitious sufficiency, efficiency, and eco-friendly measures, are effectively implemented.⁸² The UN Habitat proposes interventions to make construction more environmentally friendly. In a 2015 report the UN

⁸¹ United Nations Intergovernmental Panel on Climate Change (IPCC) 'AR6 Climate Change: Mitigation of Climate Change, Buildings' (2014) Available at https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter9.pdf Accessed on 9th February 2023

⁸² United Nations Intergovernmental Panel on Climate Change (IPCC) 'Climate Change 2022: Mitigation of Climate change' (2022) Available at https://report.ipcc.ch/ar6wg3/pdf/IPCC_AR6_WGIII_SummaryForPolicymakers.pdf Accessed on 9th February 2023

Habitat proposes interventions *inter alia*: the use of energy efficient sources, use of recyclable material, waste management, use of renewable energy and resilient and low carbon infrastructure.⁸³

The Kenya Building Research Centre (KBRC) has conducted research to build the knowledge base on a sustainable built environment in Kenya. In 2019 the Centre published reports that mapped out the building materials in the coastal region. In Kilifi County, the report reveals that the common building materials included; ballast, washed sand, palm trees (*makuti*), casuarina trees, brick, mazera stone, coral blocks, hard core stones and to a minimal extent interlocking blocks.⁸⁴ The report also notes that traditional building materials such as *makuti* and coral stones are being replaced by modern materials such as precast products and bricks.⁸⁵ The report also addresses and encourages the use of alternative technologies due to the threat of depletion of locally available natural materials.⁸⁶ A similar study in Kwale County reveals the common building materials include; pit sand, river sand, white sand, coral stone, *makuti*, hard core and ballast.⁸⁷ In Mombasa County, the commonly used material for building include: balcony balustrades, bricks, building stones, cabro, cement, chips blocks, cinder blocks, coral reef stones, glass, limestone, *makuti*, metal windows, terrazzo chips and doors. In Mombasa specifically, the report observes that the traditional and modern building materials used within the region have shaped the local architecture of the area and the unique identity for the area.⁸⁸

Generally, the reports in the three counties observe that, firstly, the use of locally available materials for construction is common in the three counties. Secondly, the materials are made available through large industries, small cottage industries, fabricating, sand harvesting, and quarrying. Thirdly, the construction materials are produced for in-county use and use by other counties (including inter-county export in the counties under study). Fourthly, building materials in the coastal region have been changing over time with a slow paced replacement

⁸³ UN Habitat 'Green Building interventions for social housing' (2015) Available at [https://unhabitat.org/sites/default/files/download-manager-files/Green%20Building%20Interventions%](https://unhabitat.org/sites/default/files/download-manager-files/Green%20Building%20Interventions%20Report.pdf) Accessed on 9th February 2023

⁸⁴ Kenya Building Research Centre 'Mapping of Building Materials in the Coastal Region: Kilifi County' (2019) Available at <https://kbrc.publicworks.go.ke/wp-content/uploads/2020/02/Building-Material-in-Kilifi.pdf> Accessed on 9th February 2023

⁸⁵ Ibid at p. 44

⁸⁶ Ibid at p. 44

⁸⁷ Kenya Building Research Centre 'Mapping of Building Materials in the Coastal Region: Kwale County' (2019) at p. 10 Available at <https://kbrc.publicworks.go.ke/wp-content/uploads/2020/02/Building-Material-in-Kwale.pdf> Accessed on 9th February 2023

⁸⁸ Ibid p. 6

of traditional building materials such as *makuti* and coral stones with modern technologies. Lastly, the three reports call for the use of modern technologies and sustainable building designs due to the threat of depletion of natural resources posed by the use of traditional building materials.

While progress has been noted in the generation of SCP policy and legal instruments for the construction and infrastructure sector, with frameworks on the emission of pollutants taking the lead, a lot of work still needs to be done to accelerate the generation of other SCP frameworks, particularly in the area tackling the minimisation of the use of toxic materials.

3.3.2 Analysis of field based responses

The field work research is based on findings from the different stakeholders and players in the construction sector within the three sites. The findings are based on site visits and Focus Group Discussions(FGDs) with National Government offices and County governments.

In general, we observed that in all sites of concern, construction works, especially of commercial buildings and residential units were many and diverse. In Mombasa City, there were numerous high rise buildings containing commercial premises and residential premises. It would appear that sooner than later Mombasa city's skyline will be full of skyscrapers. To a lesser extent, this is also the case in Malindi and Ukunda/Diani. Equally noticeable were expanding infrastructure facilities, including roads and bridges, as well as recreational facilities including public parks.

The constructions typically used conventional building materials, including stones, sand, concrete, cement, wood and timber products, water, and electricity. These were noticeable both from the active construction sites and the timber, wood, sand and stone and hardware yards in the cities and surrounding areas. We also observed stone quarries which provide sand stone products. There were also several yards holding construction waste and used materials that were for resale. In general, though, it appears that construction waste was not as ubiquitous as normal consumption solid waste including food waste. In most cases the scaffolding and formwork materials were wood and timber, as well as fabricated metal. As usual, construction and infrastructure developments consume lots of water and electricity, in turn producing waste water, chemical wastes and fumes.

In general, most of the housing and buildings construction works were private sector dominated, while infrastructure developments were contracted public works.

In July and September 2022, the Project team met the Director of Urban and Physical Planning, Kwale County, together with other officers. The officers pointed out that there have been previous attempts to plan Diani. In 1972, in line with tourism promotion plans, land was alienated to the Commissioner of Lands for tourism. This led to displacement and a feeling of deprivation among the local community. In 2011 to 2012 the County worked on developing a 10-year Zoning Plan which was approved in 2013, but which has since lapsed. The development of the Urban Development Plan is currently on-going and seeks to identify public spaces, conservation areas and protection of the beach front. The Kwale County Spatial Plan was approved in June 2022. It incorporates targeted interventions for the area including: natural resources conservation, environmental protection and sustainability. Of particular interest would be the provision of public amenities such as green parks and recreational facilities, and better planning and protection of beach front spaces in line with maintaining the iconic reputation of Ukunda/Diani as a globally known tourism hub.

The Diani municipality also hosts important cultural and aesthetic sites and resources, such as the Kongo Mosque, and some kaya forests, which require protection from encroachments such as from construction and infrastructure developments. The Kongo Mosque area, which is the intersection between River Kongo and the ocean, is proposed as the largest water front facility with sports and leisure facilities, as Diani Municipality is just about three years since establishment, some of its planning instruments such as Strategic Plan were not ready, while the County Spatial Plan was only recently adopted. Many of its operational policies are not yet in place. There are also some key infrastructure facilities that are not yet in place, particularly the sewage system. Kwale Water and Sewerage Co has a wastewater treatment plan within Ukunda/Diani. However, there is consideration for new technologies to deal with sewage, such as biodigesters. In future, building requirements in the area may include biodigesters, partly to protect the water table. On the supply side, 11 boreholes on higher ground are underway to supply water to Diani municipality to supplement the Marere supply.

At the same time Diani municipality urban spatial planning is underway. Some of the key milestones in this respect include the Partial Development Plan (PDP), which accommodates the Diani settlement scheme, provision for green spaces, though this is quite a tough issue to realize. Under the PDP, the government is to provide infrastructure and amenities such as

roads and accesses, green spaces. After the PDP, the survey plan for the Diani municipality is anticipated. In the context of the PDP process, roads and green areas, including kayas have been taken into private titles, or otherwise encroached. All the encroached public spaces would need to be reclaimed. One important approach to be pursued in the protection of public and green spaces is local community involvement.

On construction waste, the respondents observed that most of it is being absorbed into new construction, and the incidence of it is quite low.

3.2.2 National Construction Authority

On 21/09/2022 the project team had a meeting with the National Construction Authority (NCA) Deputy Regional Co-ordinator (Coast Region) and a team of officers at their Mombasa offices. The project team later met another team of NCA officers in the Malindi NCA office and conducted a detailed FGD. The mandate of the NCA is to regulate, streamline and build capacity in the construction industry. At the regional level, Senior Compliance Officers deal with technical registration of contractors, skilled workers and site supervisions. Within their research mandate, NCA conducts research on materials, new technologies, new innovations and new construction practices. The Agency disseminates research findings through conferences and research papers. The respondents also highlighted that NCA at the regional level supports training for the officers, and carries out compliance operations in the field offices. The Agency also encourages foreign contractors to transfer their skills that are useful for new technologies.

With regards to new technologies, the respondents highlighted that under the NCA Regulations (2014) new technologies such as the use of CBS panels in place of walls made of stone are contemplated. The use of concrete blocks also reduces noise and dust pollution. The use of interlocking blocks also improves efficiency. The respondent pointed out that this is most common in hotels, cottages and small Airbnb facilities. The respondent however pointed out that NCA only plays a regulatory role but clients have the last word on their resources and materials. Additionally, NCA as a regulator, has no role in how contractors deal with construction waste which is the role of NEMA. With regards to construction waste, some is resold while others are reused by developers

The field visits highlighted certain issues that were common in all the research sites. These were the following:

- ❖ The presence of old and dilapidated infrastructure,
- ❖ Unplanned structures that have been erected
- ❖ Urban sprawl/ Unplanned settlements;
- ❖ Inadequate recreational facilities;
- ❖ Poor road conditions;
- ❖ Lack of maintenance
- ❖ Lack of drainage systems or blocked drainage systems
- ❖ Mixed Developments;
- ❖ Inadequate housing units

In general, the following findings and observations can be made from the desktop and field studies:

- The NCA as the industry regulator, deals with the policy framework on construction and related areas has been mandated to enforce during implementation phase. In line with this overarching mandate, NCA conducts research on environmentally efficient construction practices, and to this end has developed the National Construction Research Agenda (NaCRA). However, the Agency lacks the mandate to enforce regulations on environmentally friendly construction practices as recommended by the agency. The contractors and clients have the discretion to decide the material to be used in construction. That mandate is domiciled with the Kenya Bureau of Standards (KEBS)
- The NCA lacks a mandate to address waste management generated from the construction industry. This mandate is left to the National Environmental Agency (NEMA) to address the management of such waste.
- The NCA has recommended adoption of environmentally efficient practices that minimize the waste generated by the industry.
- There is a need for a multi-agency approach in addressing waste control and management in the construction industry.
- There is a need to complete the development of planning frameworks in the respective counties, including spatial plans and land use planning instruments.

- Sustainable construction and infrastructure can be delivered well when all three pillars (economic, environmental and social) are considered together, while also ensuring infrastructure services are resilient and can be equitably accessed. Moreover, all relevant stakeholders have to collaborate in planning, design, delivery and management.

3.4 Environment and Natural Resources

3.4.1 Analysis 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.⁸⁹ The highest recorded temperature annually has been 37.6°C.⁹⁰ 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.

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.⁹¹ The low-lying 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.

⁸⁹ County Government of Mombasa Department of Environment, Waste Management & Energy (n 2).

⁹⁰ *ibid.*

⁹¹ *ibid.*

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.⁹²

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 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

⁹² County Government of Mombasa Department of Environment, Waste Management & Energy (n 2).

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.⁹³

⁹³ *ibid.*

3.4.2 Analysis of field based responses

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 Oloitiptip 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, Oloitiptip 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:

- 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.

It was observed that waste management systems should 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.

CHAPTER 4

BEST PRACTICES AND LESSONS FROM OTHER JURISDICTIONS

This chapter addresses *Broad Activity 3: Study of global best practices on SCP*

4.1 Agriculture sector

4.1.1 Good Practices from the EU

The key interventions by EU are on tackling climate change and driving urban action that reduces greenhouse gas emissions and climate change risks, while increasing the health, wellbeing and economic opportunities of urban citizens.

The EU Commission (2010): Making our Cities Attractive and Sustainable: how the EU contributes to Improving the Urban Environment, cites the thematic strategy on the urban environment, creating an integrated approach concentrating on urban areas; the Leipzig Charter on Sustainable European Cities, the renewed sustainable development Strategy for the EU which calls for the creation of sustainable local communities with a high quality of life, attention to urban transport and greater cooperation between urban and rural areas.

The renewed Lisbon Strategy sets as a priority the high quality of urban environments to make Europe a more attractive place in which to invest and live. The Europe 2020 Strategy builds on the Lisbon Strategy and sets out a broader approach aimed at achieving a resource efficient Europe, which means decoupling economic growth from the use of resources, supporting the shift towards a low carbon economy, increasing the use of renewable energy sources, modernizing the transport sector and promoting energy efficiency actions that will affect Europe's cities. The strategy promotes best practices and fosters the ethic of sharing of experiences among local governments to make their cities more sustainable.

The EU acts in several ways including setting out policies and adopting legislation, including on minimum quality standards, encouraging cooperation and providing financial resources.

EU is focusing on efforts to make European cities and towns clean and healthy, green and pleasant, efficient and sustainable, well managed and democratic. Key interventions include provision of safe drinking water, waste water management in compliance with EU Bathing Water Directive and the Water Framework Directive.

Other measures include forcing the closing down of unsanitary landfill sites and building of recycling and composting stations, as well as promotion of green and pleasant spaces such as green parks, quiet streets and recreational parks, protection of urban heritage, restraining urban sprawl which undermines planned land use and instigates increased use of natural resources, and promotion of green infrastructure projects. The EU also promotes agriculture, forestry and nature conservation around cities and towns.

4.1.2 Good Practices from EU in Agriculture and Food Production

The EU is committed to the global fight against food loss and waste. Food waste prevention was singled out as a priority area in the EU Circular Economy Action Plan, adopted in 2015 (39, 40). This called on the European Commission to establish a multi-stakeholder platform dedicated to food waste prevention. The EU Platform on Food Losses and Food Waste, established in 2016, brings together all key actors representing both public and private interests from farm to fork to advance EU progress towards SDG Target 12.3. Members include international organizations (FAO, UN Environment, the Organization for Economic Co-operation and Development), EU institutions, experts from EU Member States, and stakeholders from the food supply chain, including food banks and other NGOs.

The Platform aims to support all actors in defining measures to prevent food waste, including possible recommendations for EU-level action, sharing best practices and evaluating progress. With the support of the EU Platform on Food Losses and Food Waste, the European Commission has adopted EU guidelines to facilitate food donations and the redirection of food no longer fit for human consumption into feed. It has developed a food waste measurement methodology and is working to improve date labelling practices. Measurement is critical to food waste prevention. Revised EU waste legislation adopted in May 2018 has introduced specific measures which will provide the EU with new and consistent data on food waste levels.

On 3 May 2019 the European Commission adopted a Delegated Act laying down a common food waste measurement methodology to help Member States quantify food waste at each stage of the food supply chain. Based on a common definition, the methodology will ensure coherent monitoring of food waste levels across the EU. The Delegated Act was expected to come into force in 2019. EU Member States are expected to provide data separately for five stages of the food supply chain: primary production, processing and manufacturing, retail and

other distribution of food, restaurants and food services, and households. This covers the scope of both sub-indicators proposed to measure progress towards SDG Target 12.3 – the FLI and the FWI. The collected data will contribute in a significant way to reporting for both indices. The European Commission’s Reflection paper, “Towards a sustainable Europe by 2030”, highlights the importance of pursuing the EU Action Plan to fight food waste to strengthen the sustainability of our food systems. The “Recommendations for action in food waste prevention” were expected to be adopted by the EU Platform on Food Losses and Food Waste by the end of 2019, and were expected to make an important contribution to this redesign of EU food systems.

The EU also promotes agriculture, forestry and nature conservation around cities and towns. (UNEP 2021)

4.2 Tourism sector

4.2.1 Sustainable consumption and production practices to curb water wastage

Tourism activities call for increased demand for water in various facets such as accommodation and water driven tourism activities. While demand increases, the available water resources will continue to decline in many regions because of the depletion of non-renewable fossil water resources. It is therefore inevitable to examine suitable measures to minimize depleting the water resource while maximizing the quality of tourism products.

- ❖ **Kilifi and Mombasa County Water and Sanitation Act:** The Directorate established under the Act has a mandate to create awareness on sustainable use of water resources and conservation. The Directorate is also expected to develop strategies and policies that encourage treatment of waste water for reuse. The Counties can make such express provisions under their legislation which then obligates the respective Agencies to develop laws on treatment of waste water. The Act also leverages water conservation measures on establishing robust public-private investment for developing innovative water conservation and recycling infrastructure. Similarly, Mombasa county establishes a Directorate with mandates akin to those of the Kwale Agency. The public-private partnerships can also extend to involvement of organizations such as Jumuiya ya Kaunti za Pwani as a key stakeholder in tourism and SCP in the three study sites.

- ❖ **South Africa, Capetown:** Adopting practices in kitchens such as changing cooking practices, use of efficient dishwashers and pre-rinse spray valves with smaller nozzles to achieve higher water velocity.
- ❖ **European Model:** A research conducted by UNEP and the European Environmental Agency, sampled hotels in Asia. The research report revealed that a lot of waste water produced by hotels can be economically treated to increase the supply of water available.

4.2.2 Sustainable consumption and production practices to ensure energy efficiency

The tourism industry has potential to reduce the carbon footprint emitted through energy wastage. The tourism industry players should create energy efficient strategies for sustainable development.

Private led initiatives: UNWTO conducted a baseline report on energy efficient use in the sector. The report revealed that leading chain of hotels Radisson Hotels and Hyatt chain of hotels have adopted the following energy efficient strategies include:

- ✓ Use of renewable energy sources
- ✓ Sensitization of staff on energy efficiency
- ✓ Installation solar heating systems
- ✓ Using energy saving bulbs
- ✓ Smart building designs, that allow for natural lighting energy-efficient appliances including lighting and motion sensors.

4.2.3 Sustainable Consumption and Production practices to reduce food losses

❖ Local procurement of food supplies

An earlier study conducted by UNEP suggested that sustainable tourism practices require the involvement of host communities towards building resilient tourism trends.⁹⁴ The report pointed out that making tourism more sustainable is not just about controlling and managing the negative impacts of the industry.

Tourism is in a very special position to benefit local communities, economically and socially, and to raise awareness and support for conservation of the environment. From this backdrop,

⁹⁴ United Nations Environment programme & World Tourism Organization 'Making Tourism more sustainable: A guide for policy makers' (2005) At page 11 Available at https://wedocs.unep.org/bitstream/handle/20.500.11822/8741/-/Making%20Tourism%20More%20Sustainable_%20A%20Guide%20for%20Policy%20Makers-2005445.pdf Last Accessed on 21st January 2024

community involvement in reducing unsustainable consumption and production patterns is inevitable. Additionally, in line with this projects theme on circularity, local sourcing reduces food water and food losses in the agricultural and food processing sector.

Some of the suggested practices include sourcing food products from the local markets and farms. This entails sourcing food from small scale and large scale farm inputs from the local markets depending on the seasonality of the products. This then means that food produce in farms is not lost seeing that there is ready market for the farm produce. This model has been adopted in other jurisdictions.

Seychelles: A study in Seychelles in 2010 aimed at prioritizing ways of retaining tourism spending and income within local communities focused on promoting the use of local produce in hotels. Recommended action included building strong links between the tourism and agriculture trade bodies and networks and generally increasing levels of information on sources of supply. This has been achieved through planning policies that encourage geographical clustering among farmers and tourist's establishments.

Gambia: The food supply chain initiative 'Gambia is Good', linking coastal hotels with small local farmers, was established through donor funding in 2005 and involved two British NGOs, Concern Universal and the Travel Foundation. It is often quoted internationally as an example of good practice.⁹⁵ A key aspect of the project is how it has addressed the issue of giving hotels confidence that the produce supplied will be of a good quality and reliably available. The Gambian experience has emphasized the significance of supplying the right quality, quantity and continuity in strengthening local.

European Union Model: The European Union model also recommends for local sourcing. The EU model suggests that where availability of local, seasonal and certified products may be limited hotel establishments can possibly shift from one large supplier to a number of smaller suppliers.⁹⁶ It may be necessary to sign longer-term contracts with smaller (local) businesses to build up capacity for particular products over time. The European Charter envisages that local food as well as local services should be promoted as a way of achieving

⁹⁵ J.Mitchell & J.Faal 'The Gambian tourist value chain and prospects for pro-poor tourism' (2008) At page 22 Available

<https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=989e3dfafce191f8b28505bbe559c4ba80203c03> Last accessed on 21st January 2023

⁹⁶ D.Styles, H.Schonboger & J.G Martos 'European Commission Best environmental management practice in the tourism sector, Green sourcing of food and drink products' (2013) Available at <https://susproc.jrc.ec.europa.eu/> Last accessed on 22nd January 2023

sustainable practices in the tourism space. The Charter anticipates to promote this by using tourists' establishments and attractions to profile and facilitate the distribution of the area's typical produce.

❖ **Recycling inedible food**

Food waste can be transformed into high quality compost for trees and plants. Many hotels and restaurants are increasingly utilizing compost bins that can facilitate the degradation of organic waste and turn it into compost for their gardens. For instance, the Tower Hotel in Perthshire (Scotland) are recycling their organic waste (i.e., vegetable and fruit peelings, eggshells, coffee bags, etc.) on site and turning it into a fertilizer for gardens and biofuels in the form of biogas.

-Agritourism

-Readily available tourism market produce

-Helps reduce farm food losses

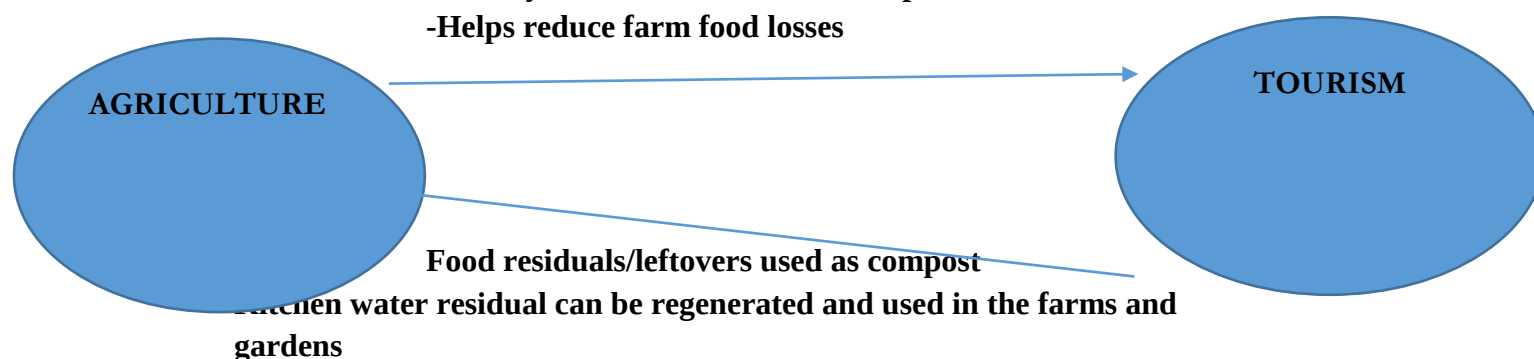


Figure 1.15 Summary of circular economy in the agricultural and tourism sector

4.2.4 Sustainable Tourism Label Classification/ Boost certification programme

❖ **Seychelles experience: Seychelles Sustainable Tourism Label**

Seychelles Sustainable Tourism Label (SSTL) as adopted by the Government of Seychelles sought to ensure continuous sustainability of the country's most vital sectors; tourism and the natural resources it depends on, the environment.⁹⁷ The SSTL aims to have participating hotels operate under the following basic principles:

- Develop and implement a sustainability policy;
- Monitor energy, water, and waste over time;
- Take steps to conserve resources;
- Promote local and small-scale businesses;

⁹⁷ Seychelles Tourism Board 'The COAST Project Sharing Results on the Seychelles Sustainable Tourism Label (SSTL)' Available at The SSTL Website <http://www.seychelles.travel/sstl/index.php/certified-hotels>

- Contribute to community development and conservation activities.

The expected benefits for Participating establishments include:

1. Marketing Related benefits

- ✓ Certification provides operators with a competitive advantage over other uncertified enterprises for marketing purposes;
- ✓ Certified properties are highlighted in the Seychelles Tourist Board stay guide;
- ✓ Certified properties have the right to use the Label on their website and marketing materials;
- ✓ Responsible hotels are promoted at periodic trade fairs;
- ✓ Certified properties are listed on the SSTL website;
- ✓ Guest satisfaction is likely to increase with the communication of sustainability achievements of the enterprise;

2. Cost savings Related benefits

Generally, utility costs are likely to decrease due to increase awareness, monitoring and use of improved technology;

- ❖ Swedish experience: Sweden has developed classy, imaginative sustainable lodging. Sweden is renowned for its style and architecture as well as its love of nature and it brings both together to create sustainable and chic accommodation. The Swedish state has as its vision: “Sweden by 2030 is the world’s most sustainable and attractive destination based on innovation”. It’s not just at a national level that there is a concerted and tangible focus on sustainability.

4.2.5 Imposition of levy and charges

Tourism taxation and levying specific charges is a tool that has been used to distribute the costs associated with tourism and SCP practices that promote sustainable tourism.⁹⁸ The Tourism Act sees fiscal policy as a critical point for promoting sustainable tourism practices and a deterrence for unsustainable tourism practices. The Act provides that the Finance docket in consultation with the tourism docket may recommend tax rebates for government incentives in the form of taxes to promote sustainable tourism. This practice has cascaded down to Kilifi County.

⁹⁸J. Durán-Román, P. Cárdenas-García, & J. -Fernández, ‘Tourist Tax to Improve Sustainability and the Experience in Mass Tourism Destinations: The Case of Andalusia (Spain)’ (2021) 13 (42) Sustainability Available at <https://dx.doi.org/10.3390/su13010042> Accessed on 24th January 2024

- ❖ **Kilifi County:** The Act further prescribes the imposition of a solid waste management levy to all persons that generate solid waste for the purposes of meeting the cost of solid waste management. This means that tourism and hospitality establishments as generators of waste are included in this pool of revenue allocation that helps aid the county in waste management. In addition, the Act sets out an environment levy payable in respect to a ratable property in the county for the purposes of waste management and dealing with improvement of the quality of the environment generally.
- ❖ **Fiji experience:** There is a budgetary policy of a 10% levy for all tourists that reinforces Government's efforts in ensuring the right to a clean environment. The levy is charged for prescribed visitor services to support environmental and climate adaption projects. In addition, all tourism development projects need to comply with the sustainability requirements within the Green Growth Framework, an innovative tool that integrates sustainable development as a basis for economic planning in order to ensure long-term growth and resilience.
- ❖ **Balearic Island, Spain:** The sustainable tourism tax was institutionalized in 2016 and is applied to all stays in tourist accommodation across the Balearic Islands. The eco-tax provides revenue for a fund established to promote sustainable tourism, and is channeled into important initiatives to counteract the impact of tourism on the islands.

4.2.6 Diversification of tourism products

Sustainable diversification of tourism products refers to the process of expanding and varying the range of tourism offerings in a way that is environmentally, socially, and economically sustainable. It involves creating new and innovative tourism products that meet the needs and preferences of different market segments while minimizing negative impacts on the environment and local communities. The diversification of tourism activities is essential for social sustainability and human development, as it promotes economic development, employment, and income generation. Agro tourism is a niche form of tourism that involves any form of agricultural operation where visitors tour places to experience farm excursion activities and agricultural activities.⁹⁹ The UNWTO refers to this form of tourism as rural tourism. It is characterized by landscapes and land uses

⁹⁹ United Nations World Tourism Organization 'Tourism and rural development: A policy perspective-UNWTO Member States Survey on Tourism for Rural Development' (2023) at page 3. Available at <https://www.e-unwto.org/doi/epdf/10.18111/9789284424306> Accessed on 24th April 2024

where agricultural activities prevail.¹⁰⁰ This form of tourism is also characterized by experiential products and authentic activities based on the predominant agricultural activities in the area.¹⁰¹ Agro-tourism is a niche form of tourism that involves activities that are linked to agricultural based operations or activities that bring visitors to farms, plantations or ranches. This form of tourism, as opposed to wildlife tourism, involves interactions at the farms where the tourists get to see different farm settings, different crops being grown, and processing at the farm both for crops and livestock.¹⁰²

The three study sites are bestowed with agricultural products that are unique and that have potential as agro tourism products. According to the 2017 State of the Coast report, fifty-six percent of (56%) of Kilifi land is agriculturally viable. The major agricultural activities in the area includes coconut farming, cashew nuts, mangoes, citrus fruits, cassava and fish production.¹⁰³ Mombasa county is characterized by land with different land tenures ranging from public land, private land and community land.¹⁰⁴ Even with the varied land tenures the County has agricultural activity that includes coconut, cashew nuts, sesame seeds, sunflowers and fishing. Kwale area where Ukunda study site lies equally has agricultural operations including coconut farming, cashew nuts, mangoes, citrus fruits, cassava, bixa and fishing.¹⁰⁵

In South Africa, Western Cape province, agro tourism is prominent in vineyards and wine making factories. The place is known to offer experiential activities through a combination of tours, hospitality services and accommodation. The Western Cape Farmstay has outdoor pools and sunning terraces, on-site spas and farm-to-table restaurants. The accommodation facilities come with beautiful views of the surrounding countryside and cosy lounges where visitors sit and interact with like-minded travelers

¹⁰⁰ Ibid at p. 11

¹⁰¹ Ibid

¹⁰² Ibid at p. 17

¹⁰³ National Environment Management Authority 'State of the Coast Report for Kenya -Enhancing Integrated Management of Coastal and Marine Resources in Kenya ' at page 51& 102 Available at https://www.nema.go.ke/images/Docs/REPORTS/SOC%202nd%20Edition%20final%20report_19%2010%202017.pdf Accessed on 24th January 2024 .) See also National Environment Management Authority 'State of the Coast Report-Towards integrated management of coastal and marine resources in Kenya' (2007)at page 34 Available at <https://aquadocs.org/bitstream/handle/1834/7215/ktf0378.pdf?sequence=2&isAllowed=y> Accessed on 24th January 2024.

¹⁰⁴ State of the Coast Report (2017)Ibid at page 104.

¹⁰⁵ State of the Coast Report (2007) Ibid at page 34.

over fireplaces and wine tasting. It offers a focus on the natural, healthy living, part of creating a spiritual and authentic.¹⁰⁶

4.2.7 Extending Extended Producer Liability (EPR) to the tourism sector

The tourism sector is a private sector led and managed sector. Holding responsibility to tourism operators who engage in unsustainable tourism practices. Cabo Verde Island, the polluter pays principle (PPP) is established in the National Strategic Plan for Waste Management. It is controlled and monitored by the National Environment Department (DNA). The industry is responsible for the financial burden of the pollution costs. Cabo Verde has in place the Extended Producer Responsibility (EPR) along the supply chain to prevent extensive pollution and reduce the impact on PPP. EPR and PPP are generally recognized in the legislation about waste management.

4.3 Construction and infrastructure development

4.3.1 Integrating environmental and social considerations in the construction and infrastructure projects.

- ❖ **Europe** – the European Commission published a research report by the Sustainable Consumption and Production Unit of the Institute for Prospective Technological Study, outlining best environmental management practices for the building and construction sector. Some of these practices are highlighted below:
 - (i) **Land/Physical planning which protects biodiversity** such as wildlife, and fragile ecosystems.
 - ❖ **Green / sustainable procurement:** establishing criteria for the green procurement of construction services, both for public and private sectors. These could include considering: energy performance of buildings; whether any renewable energy will be produced in the new/renovated building; recyclability of construction material; environmental friendliness of construction material; proposed water saving measures; environmental performance of the construction site; eco-design of the building structure, i.e., is the building designed to require zero daytime lighting to reduce energy consumption?; how the contractors will handle construction and demolition waste, among others.
 - (ii) The use of environmentally friendly heating and cooling systems.

¹⁰⁶ <https://www.ebookers.ie/Western-Cape-Agritourism.d6051468-aaAgritourism.Travel-Guide-Accommodation> Accessed on 24th January 2024

- (iii) Using better designs to prevent and reduce waste generation during construction.
- (iv) Require the use of environmental selection criteria for construction material evaluating, for example the sustainability of the material supply chain, and material recyclability at the end of the building lifetime.
- (v) Require the establishment of specific environmental management plans where all the measures to prevent, control and monitor construction pollution and natural resource use are contained.
- (vi) Training construction personnel on environmental management requirements and practices.
- (vii) Environmental monitoring of construction sites
- (viii) Require the formulation of site waste management plans consisting of actions for different types of waste; expected amount of every type of waste; resource allocation to waste management; responsible parties, among others.
- (ix) Waste segregation

According to a recent study, integrating waste management and other environmental and social considerations in construction is crucial in promoting sustainable practices in the construction industry, which is an extremely natural-resource intensive industry. These would include: mitigation of water wastage and enhancement of efficient water use in construction sites; regulations of green practices for all types of projects, formally monitored for compliance; and requiring a good waste management strategy and practice.¹⁰⁷

4.3.2 Sustainable Procurement in the Construction Industry

Although sustainable procurement was listed as a best environmental management practice in the construction industry, a recent study indicated that sustainable procurement for government construction projects still faces obstacles due to lack of training and awareness on sustainable procurement processes, and lack of policies governing sustainable procurement¹⁰⁸

¹⁰⁷ Willar D and others, “Sustainable Construction Practices in the Execution of Infrastructure Projects” (2020) 10 Smart and Sustainable Built Environment 106
<https://www.emerald.com/insight/content/doi/10.1108/SASBE-07-2019-0086/full/pdf> accessed January 26, 2023

¹⁰⁸ Ibid

4.3.3 The ASEAN Countries Sustainable Urbanization Strategy

This strategy promotes an integrated approach to urban planning. It provides a framework for sustainable urbanization, focusing on mobility, building and construction, and urban climate resilience. The building and construction sub-area focuses on improving efficiency and sustainability in the construction sector by promoting *energy efficiency in buildings, modular buildings, sustainable construction material, and smart buildings and construction*¹⁰⁹

4.3.4 Inter-American Development Bank: the four dimensions of infrastructure sustainability

According to the Inter-American Development Bank, sustainable infrastructure should embody four sustainability dimensions: economic sustainability, social sustainability, environmental sustainability, and institutional sustainability. Under environmental sustainability, infrastructure projects should take into account climate and natural disasters, pollution prevention and control, efficient use of natural resources, and conservation of the natural environment.¹¹⁰

4.3.5 UN-DESA Integrated Strategy for Sustainable Cities 2013

The Integrated Strategy for Sustainable Cities¹¹¹ elaborates four pillars for cities' sustainability. Pillar 1 on social development includes green housing and buildings, water and sanitation, green public transportation, green energy access, recreation areas and community support. Pillar 2 is on environmental protection, while Pillar 3 includes green productive growth, production and distribution of renewable energy, technology and innovation. Pillar 4 on effective urban governance includes decentralization and planning, and reduction of inequities. This is relevant to infrastructure development in cities (See Figure 13). Some of the relevant sub-areas include:

- **Mobility.** This sub-area includes actions promoting the access, affordability and efficiency of transport as well as reducing transport-related pollutants (such as greenhouse gas emissions). It includes the development of public transport infrastructure, ride sharing, smart transport solutions, and more efficient internal combustion engines.

¹⁰⁹ See the ASEAN Countries Sustainable Urbanization Strategy, available at <https://asean.org/book/asean-sustainable-urbanisation-strategy/>. Accessed on 8th February 2023

¹¹⁰ See the Inter-American Development Bank, the four dimensions of infrastructure sustainability, available at <https://publications.iadb.org/en/what-sustainable-infrastructure-framework-guide-sustainability-across-project-cycle>

¹¹¹ UN-DESA Policy Brief No 40, [Department of Economic and Social Affairs | Economic Analysis \(un.org\)](https://un.org/publications/department-of-economic-and-social-affairs-economic-analysis). Accessed on 8th February 2023

- **Building & construction.** This sub-area focuses on improving the efficiency and sustainability of building usage and construction (e.g. optimizing building space through shared offices, building energy efficiency, modular buildings, sustainable construction materials, smart buildings and construction).
- **Urban resilience.** This sub-area focuses on promoting urban resilience against disaster risks and potential impacts of climate change (e.g. city flood defences, early warning systems).

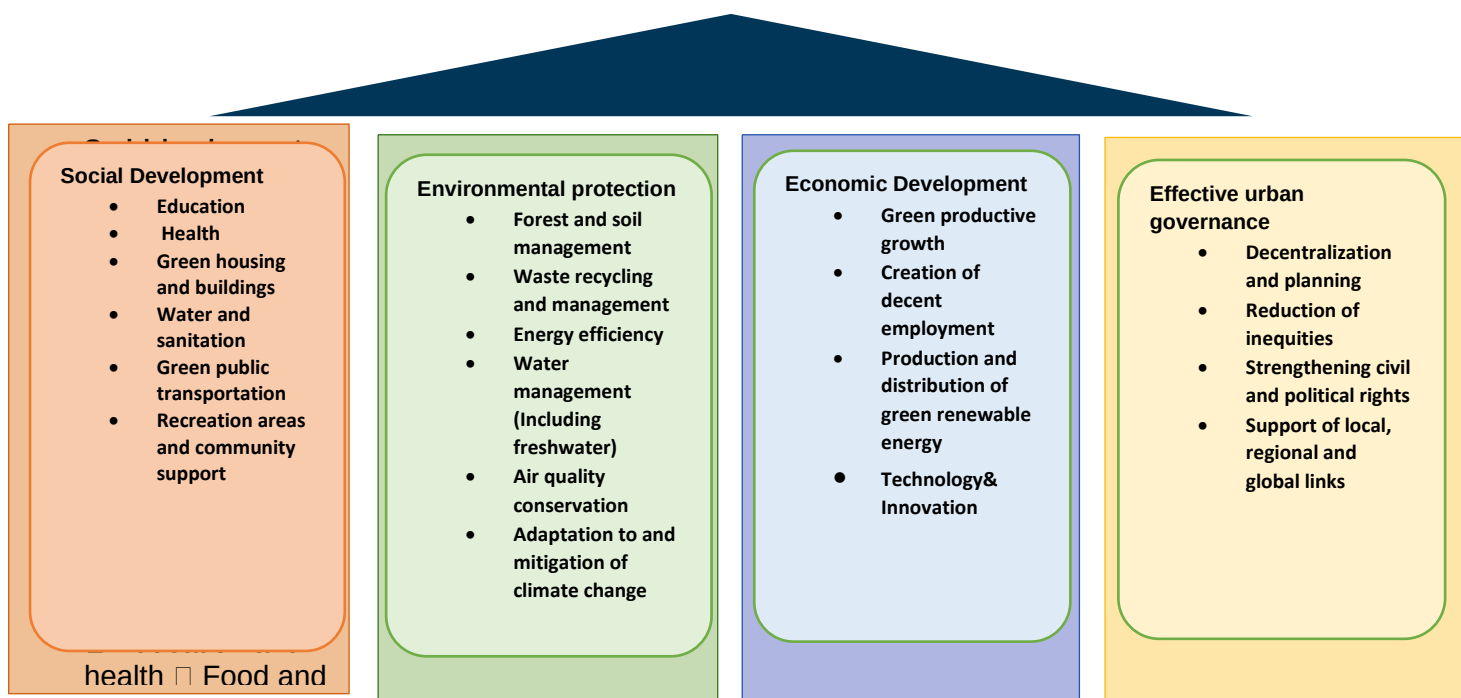


Figure 6: Infrastructure development in cities
Source: UN-DESA (2013)

4.4 Environment and Natural Resources

4.4.1: 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 Guide¹¹² covers a diverse set of important topics for city-level decision makers including stakeholder

¹¹² <https://www.epa.gov/international-cooperation/best-practices-solid-waste-management-guide-decision-makers-developing>

engagement, waste management planning and economics, waste collection and transportation, prevention, minimization, and recycling, landfill design and operation, and energy recovery. EPA works to 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.¹¹³

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.¹¹⁴

4.4.2: 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

¹¹³https://www.epa.gov/sites/default/files/2020-10/documents/master_swmg_10-20-20_0.pdf)

¹¹⁴ Ibid

2012, PARKnSHOP has donated more than 3,100 tonnes of food that would otherwise have been landfilled (PARKnSHOP Undated)¹¹⁵

4.4.3 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 up¹¹⁶

¹¹⁵https://www.epa.gov/sites/default/files/2020-10/documents/master_swmg_10-20-20_0.pdf)

¹¹⁶ Ibid

CHAPTER 5

PROPOSED OPTIONS AND RECOMMENDATIONS

5.1 Introduction

This section provides the synthesis of policy options and recommendations.

5.2 Proposed policy options

Based on the foregoing studies, key policy options and governance proposals and recommendations summarized generically and per sector include:

5.2.1 Information

Information involves influencing people through the transfer of knowledge, education and counselling. It covers information and awareness campaigns, skills training, social norm campaigns, educational efforts and, prompts and labelling, feedback, self-commitment and ICT tools as cross-cutting category.

5.2.1.1 Information and awareness raising campaigns

One of the most important tools that both national and county governments should consider in the provision of knowledge and shaping public values, attitudes or behaviors and to shift consumption patterns towards more sustainable food practices is the use of public campaigns that intend to increase knowledge and awareness about food waste. These campaigns include different elements, and the most often used ones include “informational interventions” that aim to increase awareness, knowledge and skills (Stöckli et al. (2018); Osbaldiston and Schott (2012)).

A small number of reviewed academic studies on informational interventions against consumer food waste show an impact of these informational campaigns on actual food waste. Among them was a study by Young et al. (2018) which showed that a e-newsletter used by a UK retailer resulted in 19% reduction in self-reported food waste in the home. Another (small scale) intervention study by Schmidt (2016) that focused on providing action knowledge (e.g. planning grocery shopping in advance), using a public commitment and a goal setting-technique, resulted in a 12% perceived (self-reported) reduction in food waste in the home.

5.2.1.2 Social norm campaigns

Campaigns that aim to influence social norms exploit the tendency of individuals to conform to the majority, shaping behaviour by giving them information about the behaviour or attitudes of the majority of their reference group (Burchell et al. , 2013). This can be done through modelling. Modelling refers to establishing new norms surrounding behavioral issues such as food waste, e.g. promoting taking leftovers to lunch at work or a waiter always proactively offering doggy bags in restaurants. It can also demonstrate a desired target behaviour, e.g. in a video portraying certain practices or through giving comparative feedback. People follow social norms out of needs for belonging and status. People with weaker bonds to social circles, and those with weaker senses of self are more likely to follow the perceived broad societal norms. This is important to understand when tailoring campaigns to target groups (Umpfenbach, 2014).

Various campaigns and interventions that aim to promote health-related or pro environmental behaviours through the use of social norms showed great success. For example, Goldstein et al. (2008) observed a 44% increase in towel re-use in a hotel among their social norm group compared to a control group when giving participants the information that the majority of people that stayed in this hotel room before did reuse their towels. Research in this area with regard to food waste is scanty and more research in Kenya is highly recommended.

Campaigns that employ social norms as a means to change individual behaviour seek to correct people's misperceptions about the prevalence of the undesired behaviour (Schultz et al. 2007). This approach should also be applicable to foster the reduction of food waste in general in individual households. The strong influence of social norms suggests a need to work with existing social groups or social influencers that practice and/or support certain

desired behaviours, to create new norms or to portray the existence (or transformation) of a social norm.

5.2.1.3 Education/ Skill training

Interventions can aim at increasing people's abilities and skills that are necessary to engage in food waste practices. A survey by van Geffen et al. (2017) showed that four (4) practices seem to have a particularly strong influence on food waste namely planning of food shopping and use, impulse buying, getting an overview of the food in stock, cooking precisely, and using leftovers. These practices might therefore be particularly relevant for skill training on how to plan a meal, how to pro-long self-life and estimate food safety, how to increase inventory overview or cook creatively, and use of measurement devices. To change consumer behaviour, schools can play an important role. Changing how schools and students were taught about food waste in a Portuguese school resulted in a 33% waste reduction from main dishes (Liz Martins et al., 2016).

5.2.2 Prompts

A study by Stöckli et al. (2018) established that prompts are relatively more effective in changing behaviour compared to informational interventions. . Prompts are verbal or written messages designed to remind people to perform a target behaviour (Osbaldiston and Schott, 2012). Prompts work best when they are worded politely, when they address an easy to perform behaviour and when they are placed at the location where the behaviour takes place (Stöckli et al. 2018).

5.2.3 Feedback

Feedback refers to providing information about the frequency and/or consequences of a target behaviour, in this case the amount of food wasted. Feedback can be individual (e.g. a printed sheet of one weeks food waste amount per household) or done in comparison to others (see subchapter on social norm campaigns). Using feedback mechanisms is known from the energy sector through smartmeters. First experiments to use this concept through “smart bins” or a “grumpy bin” taking pictures of the food thrown away **showed mixed results and no lasting effect** (Stöckli et al. 2018). Feedback can also be given including rewards (praise or special privileges) or penalties (negative consequences for a target behaviour, e.g., financial penalties).

5.2.4 Commitment

In general, commitment is giving a pledge to change behaviour, asking people to agree to perform a target behaviour. Signing pledges or promise cards increase the likelihood of a person performing the behaviour to which they have committed and can be linked back to people's desire to behave, and appear to behave, consistently. There have been some examples¹¹⁷ in the form of an online pledge to reduce food waste, though yet without an evaluation (Stöckli et al., 2018). General literature from pro-environmental behaviour change experiments suggest that **commitment is an intervention type with moderate effectiveness, though still higher than informational interventions** (Osbaldeston and Schott, 2012). General consumer behaviour literature also suggests that **commitment works best when public (e.g. pledges posted online), specific, and when people are already motivated to perform the target behaviour** (Stöckli et al., 2018).

5.2.5 Crosscutting: Apps and ICT tools

A special case for information instruments are **apps**: These are partly also used in public campaigns. Apps can target motivation, opportunities, and ability. Their effectiveness is still not well analyzed

5.2.6 Regulations

According to Vedung (1998), regulations are “measures undertaken by governmental units to influence people by means of formulated rules and directives”. The relationship between government and addressees is authoritative, meaning the addressees are obligated to act in the way stated by the government.

With regard to food waste, regulation offers the opportunity to influence consumer food waste behaviour through regulations on date marking, requirements for packaging, or prohibition for certain practices as well as regulation on consumer education.

5.2.6.1 Requirements within public procurement regulation

The set-up of (green) public procurement rules, for food provision in e.g. hospitals, school, and public canteens, can be influenced by public policy and thereby reduce food waste.

Through **progressive public procurement rules**, public bodies and governments can **act as powerful role models**. They can set standards that for example relate to size portions, staff

¹¹⁷ by the NGO “feedback” and as part of the Australian “FoodWise” campaign

training¹¹⁸ or availability of dishes during daytime – all having an impact on food waste and providing consumers with the opportunity to reduce food waste.

In the EU, it is now expected that the development of non-binding Green Public Procurement (GPP) criteria for food and catering services is completed towards the end of 2018. The Commission's Communication on Green Public Procurement (GPP) sets voluntary criteria for the **basis of voluntary EU-wide targets**¹¹⁹.

5.2.6.2 Regulation about waste collection and recycling

Waste regulation, requirements for separate waste collection, potentially combined with fees (“pay as you throw”)¹²⁰ and recycling of organic waste has an influence on how much consumers waste and what happens to consumer food waste. Collection schemes for food waste can be mandated as part of waste management regulations. Regulation can also mandate the provision of bins and bags to consumers, as this increases participation in separate food waste collection (Gibbs and Hogg 2008). Requirements on separate collection bins facilitate the recycling of food waste, and hence have an indirect impact on consumer food waste.

There is also some evidence that the act of waste collection could increase awareness of food waste, and increased awareness leads to lower food waste. However, the literature is not conclusive on this. There is some evidence that this effect may occur at least in the short term in the context of behaviour change experiments, but in the long-term and in everyday situations there is not yet conclusive evidence (WRAP 2011).

5.2.7 Economic Instruments

Economic instruments do not oblige addressees to take the measures involved. Instead, they choose by themselves whether to take action or not. However, economic instruments such as fees, taxes or subsidies make it cheaper or more expensive in terms of money, time, effort, and other resources to pursue certain actions (Vedung, 1998). Economic instruments in general are a **tool to shift consumption patterns** towards more sustainable food practices (Reisch et al. 2013; Schanes et al., 2018).

¹¹⁸ Also, issues like influencing the curricula for e.g. cooks’ education and putting food waste on this agenda are options for Member States to pursue. This may improve e.g. the abilities of chefs to use create tasty dishes using all parts of a food product, even those that are so far often still discarded. This may reduce food waste in the value chain, and is related to consumer acceptance.

¹¹⁹ In cooperation with Member States the Communication sets the minimum levels required and provides legal guidance to Member States.

¹²⁰ See (Wunder et al. 2018) for a discussion how waste regulation can effect food waste.

However, only few public approaches are known in which **fees and taxes** are used to reduce food waste (e.g. **incentives for donating food** in Italy, **penalties for supermarkets** wasting food in France) and research about their impact is lacking (Schanes et al., 2018). In the private sector, examples are known where restaurants **charge consumers for leftovers**. Making waste more expensive – e.g. through **Pay-as-you-throw schemes** that charge households for personally generated waste – is another option. Evaluations from the United States, Sweden, Canada, Japan, Taiwan, Korea, Thailand, Vietnam and China, where this scheme is used show that this is an effective measure to reduce food waste (Chalak et al. 2016; Schanes et al., 2018). Providing financial resources for research projects can also be considered as an economic instrument. Overall, the **price of food** and its share in household income plays a role for food waste behaviour in general.

5.2.8 Combination of measures

Overall, the international evidence suggests that **food waste prevention benefits will be derived from a combination of measures** (Cox et al. 2010). Which policy instrument is actually used very much depends on an analysis of challenges and opportunities in the specific regional context and can mix different instruments (in parallel or in subsequent steps). For example, if it turns out that in a given country date marking is confusing because “use by” marking is frequently used on a product that should be better labelled with a “best before” mark and if that confusion significantly contributes to waste, then one could choose different types of measures. The portfolio may include education campaigns on how to interpret date labelling, or school trainings on how to use senses to detect if a food product is still good to eat. In parallel, policy makers may also want to negotiate for a voluntary agreement with the relevant actors, aiming for a change of date marking. If this is not successful, a change of regulations might be considered.

5.2.9 Circular Economy Model

The National Government and Coastal County Governments, and all major sector players need to adopt a circular economy model where all food and feed losses go back to the farm in the case of agriculture translating to zero waste. The circular economy is a model of production and consumption which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended. When a product reaches the end of its life, its

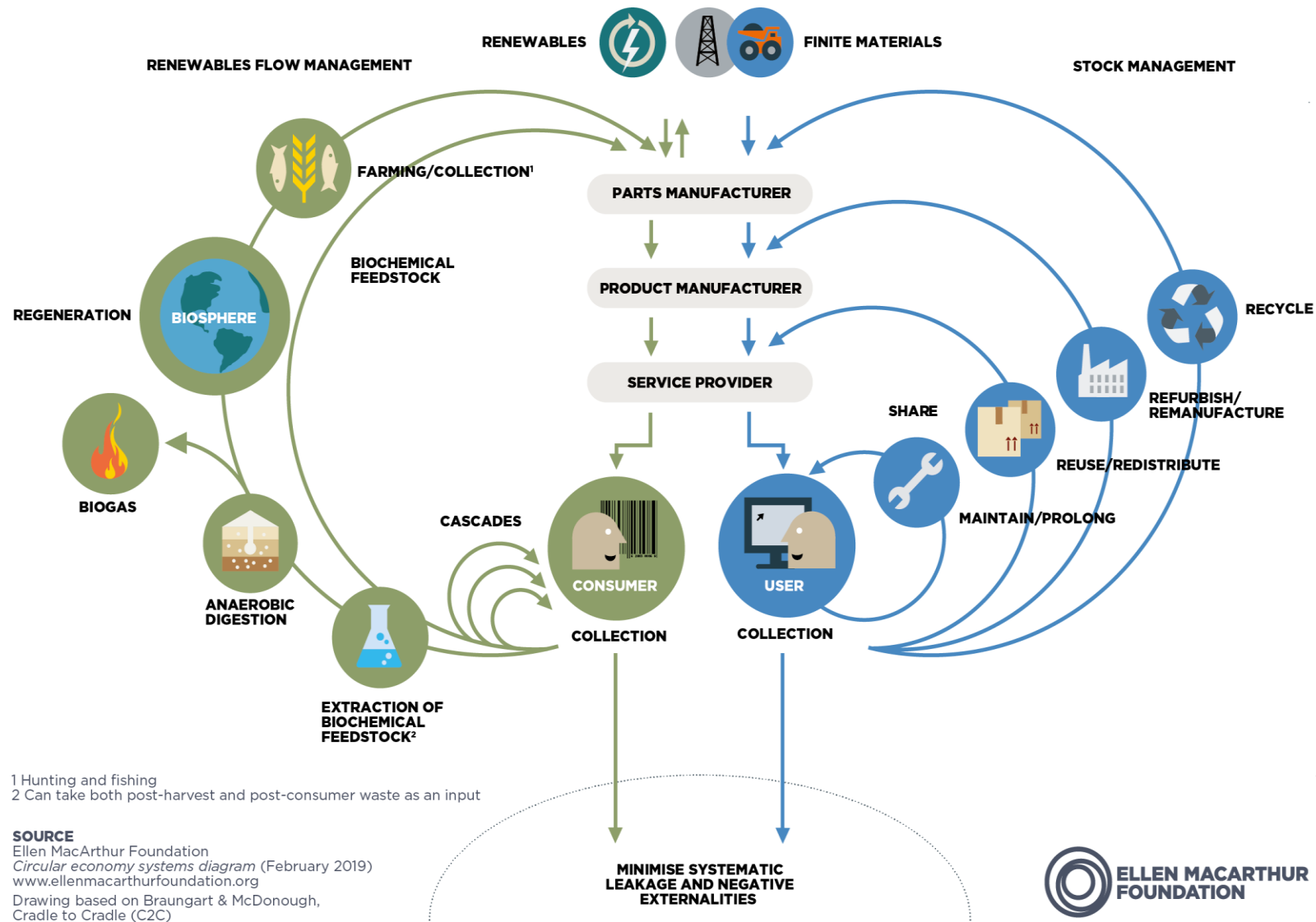
materials are kept within the economy wherever possible. These can be productively used again and again, thereby creating further value. This is a departure from the traditional, *linear* economic model, which is based on a take-make-consume-throw away pattern. This model relies on large quantities of cheap, easily accessible materials and energy. Also part of this model is planned obsolescence, when a product has been designed to have a limited lifespan to encourage consumers to buy it again.

Lacy et al (2020) have argued in part that the Path to Transformation Is Circular. They partly present environment-related issues as social and business issues, and indicate the general point that solutions to problems lie in the understanding of the broader issues of sustainability and resource usage. They emphasize the pragmatic side of the circular economy. Tonneli and Cristoni (2019) found that the circular economy is the pragmatic approach that can help society change the current path of natural exploitation we witness to and fear. Janić and Jovčić (2016) have also expressed a similar attitude in their research, establishing a fact that, in the last fifteen years, the weight of discussion about the consequences of global climate changes has been changing and that the standpoint is not always connected with ecology, but rather with the economy. Stahel (2019) also considers that the circular economy rebuilds all kinds of capital (financial, manufactured, human, social or natural) and seeks options for all organizations.

The authors emphasize the fact that only one part of the global problem will be solved if carbon emissions are reduced through “energy efficiency, zero-carbon production, and renewable energy” (Lacy et al. 2020), whereas to solve the overall problem, both production and consumption of energy must be perceived. The above-mentioned environmental, social and business issues, as well as many others (e-waste, food waste, plastics...) must be approached instantly, which many governments have recognized and accordingly have created proactive targets/ measures. The role of regulation bodies is recognized as important in various areas.

Figure 15 is a schematic presentation of this model by Ellen MacArthur Foundation.

Fig1: Circular Economy by Ellen MacArthur Foundation



5.2.9.1 Strengthen Peri-urban farming

Urban and peri-urban farming systems (UPUFS) provide food and nutrition security for vulnerable urban populations and supply selected commodities across all regions of Africa, responding to urban unemployment and poverty as well as expanding domestic demand.

- UPUFS achieve higher yields with more limited space than rural agriculture due to availability of inputs including nutrients and labour; they recycle nutrients of which there is a surplus in urban areas.
- Productive urban household backyard and irrigated open space farms are commercializing, especially in perishables like dairy and small-scale horticulture, helping build resilient cities that can adapt to climate change.
- New policies and institutions must address food and nutrition insecurity due to lack of space in high-density urban slums as well as the opportunities UPUFS present for the intensification and modernization of the agriculture sector

5.2.2 Enhance Urban Community involvement and participation

Community involvement and participation can help to ensure that services are relevant and responsive to local conditions and meet the real needs of users such as the establishment of farming clubs and communities, especially youth and women groups. Through mobilization and empowerment of farmers through involving them right from the planning phase, projects implemented will be more sustainable in many respects. planning and implementation of activities. Agricultural Programs to enhance community involvement and participation seek to among other things:

- ✓ Facilitate farmers in identification of problems, their potentials and opportunities and in the process prioritize them
- ✓ Empower farmers to analyze their problems, their root causes and in the process propose sustainable solutions
- ✓ Involve farmers in the formulation of action plans
- ✓ Support farmers to mobilize resources to implement their action plans
- ✓ Encourage farmers to carry out monitoring and evaluation the activities they implement

5.2.3 Promote Regenerative agriculture and tourism

Regenerative agriculture, including low carbon agricultural practices, value addition and food processing-intensification and modernization of the agriculture sector

5.2.4 Enhance Public Private partnerships (PPPs)

Public private partnerships in food production and consumption value chains

5.2.5 Develop socially inclusive Tourism and Hospitality products

Develop segmented tourism products that are socially inclusive . Entrench community involvement and participation through community based tourism, co-conservation efforts, marketing campaigns, etc. Branding Kenya tourism to connect the coastal and hinterland tourism, including wildlife and safari.

5.2.6 Construction and infrastructure Development

- ✓ Propose and plan model coastal cities-Malindi, Mombasa and Ukunda/Diani.
- ✓ Towards zero construction waste, through RRRR- reuse, recycle, restore, return, etc
- ✓ Apply smarter technologies in construction and infrastructure developments, including those that use less water, sand, stones, energy, etc
- ✓ Provide incentive schemes to discourage of single use wood products such as formwork, scaffolding, props, etc.
- ✓ Encourage or enforce use cleaner energy solutions
- ✓ Adopt low carbon construction technologies

5.2.7 Enhance Environment and Natural Resources Management

- ✓ Entrench regulatory measures towards zero waste especially plastics and single use packaging
- ✓ Apply RRRR and avoid larger dumpsites, establish smarter dumpsites and refills, including mandatory sorting of waste at source.
- ✓ Encourage and promote greater community involvement and participation in urban environmental protection initiatives- clean ups, tree planting and gardening, awareness and public education, environmental branding, etc
- ✓ Public and private institutions to be obliged or otherwise incentivized to to keep environmental standards in public spaces, private property
- ✓ Introduce and enforce greater regulation of chemical and hazardous waste management.

- ✓ Adopt Source to sea (S2S) approaches in plastic waste management, which focuses on the life cycle approach-design, production, distribution and consumption
- ✓ Introduce regulatory measures to move from linear to circular economy, including extended producer responsibility(EPR)

5.2.8 Data and information Gaps

National and county governments need to undertake studies to fill data and knowledge gaps, including development of methodologies and tools for measuring food loss and waste and other waste. There are huge data and knowledge gaps in the entire spectrum of SCP sectors of concern: agriculture and food processing, tourism and hospitality, construction and infrastructure development, and environment and natural resources. Aim at making and sustaining incremental gains in data and knowledge.

5.2.9 Investments in Capacity building

National and county governments should make major public investments in capacity development and enhancement across the SCP sectors of concern and their associated ecosystems, including through developing both business case for key interventions such as waste management including food loss and waste. Persuasive business cases would appeal to key stakeholders in the respective value chains, while economic case will demonstrate the overall benefits to communities and the country.

5.3 Sectoral Policy Recommendations

This section summarizes the specific sector specific policy recommendations that the research proposes.

5.3.1 Agriculture and food processing

- ✓ National and county governments should undertake studies to fill data and knowledge gaps, including development of methodologies and tools for measuring food loss and waste and other waste. There are huge data and knowledge gaps in the entire spectrum of SCP sectors of concern: agriculture and food processing, tourism and hospitality, construction and infrastructure development, and environment and natural resources. Interventions should aim at making and sustaining incremental gains in data and knowledge.

- ✓ National and county governments should adopt and implement circular economy frameworks and solutions- across the spectrum of the SCP sectors of concern herein, including agriculture and food processing, emphasizing on the inter linkages, convergences, possible tradeoffs and integrated approaches. In this regard, there should be closer multi-sectoral and inter-sectoral synergies and integrated approaches.
- ✓ National and county governments should make major public investments in capacity development and enhancement across the SCP sectors of concern and their associated ecosystems, including agriculture and food processing, through developing both business case and economic case for key interventions such as waste management including food loss and waste. Persuasive business cases would appeal to key stakeholders in the respective value chains, while the economic case will demonstrate the overall benefits to communities and the country.
- ✓ On enhancing agricultural and food production, it is recommended that governance and policy frameworks should be developed or enhanced as follows: Strengthen peri-urban farming in the hinterlands across the agricultural sub sectors- crop, livestock and fisheries; Promote community involvement, public awareness and participation, including establish farming clubs and communities, especially youth and women groups; Promote regenerative agriculture, including low carbon agricultural practices, better agronomic and soil management measures; Promote value addition and food processing;
- ✓ Food waste and food losses management- reduce food losses both on farm and in the markets and along the value chain, including cold room storage in major municipal markets, improved supply systems, etc.
- ✓ Explore irrigation potential especially for vegetables and horticultural produce in peri-urban areas.
- ✓ Public private partnerships in food production and consumption value chains.
- ✓ Increased county and national government financial allocations to food production and food loss management.
- ✓ Commercialize agricultural and food wastes, including through undertaking value chain analysis of key crops which yield significant losses and wastes. For example, coconut husks that are the byproducts of the consumption of “*madafu*” and coconut, are largely left on ocean beaches and city streets and market areas without regard that they may have other, secondary values. Coconut “wastes” could be commercialized

through value addition and application or use as ornaments and decorations, baskets and door/floor mats, charcoal briquettes, office and domestic accessories as desktop organizers/ pen and pin holders, flower vases, or even calabashes.

- ✓ Raise awareness and public information on the benefits of reducing food loss and waste.
- ✓ In terms of the National Agricultural Policy 2021, County governments should promote appropriate on farm storage and community commodity banking, as well as the evaluation and documentation of post- harvest losses.
- ✓ Introduce regenerative agriculture and better agronomic and soil management measures

5.3.2 Tourism and hospitality

- ✓ Interventions in the governance of tourism. Interventions in the governance of tourism would be geared towards, promoting policy and national cohesion among the different tourism actors. Additionally, the sound governance frameworks will also address multilevel tourism strategies among the two levels of government that would yield in better collaboration and decision making. Governance interventions will also boost the tourism sector by ensuring that the multilevel players such as the County Governments, Tourism Authority, KWS, NMK and industry players are aligned to government's priorities on sustainability in the energy sector.
- ✓ Integrate sustainable tourism strategies and plans in key policy documents such as the Kenya's Marine Spatial Framework which is currently under development.
- ✓ Revise existing policy to integrate and include sustainable tourism strategies in the formulation and implementation of regional, national and local level policy
- ✓ Revise the hotel classification and standardization guidelines to integrate sustainable tourism measures as part of the classification parameters.
- ✓ Revise the hotel classification and standardization guideline.
- ✓ Boost the eco-tourism certification: The Country's eco-tourism certification program is run by Eco-Tourism Kenya. The Eco-rating Certification is an approach that evaluates a tourism accommodation facility on its environmental, economic and socio-cultural performance against a set criteria. The initiative is private sector led. Sustainability is an issue of public concern. Governments have many of the tools that can be used to make a difference such as the power to make regulations and offer

economic incentives, and the resources and institutions to promote and disseminate good practice.

- ✓ Monitoring and evaluation mechanisms for the tourism sector: The Ministry of Tourism should put in place planning and monitoring mechanism for oversight on matters relating to eco-tourism practices in order to bolster a resilient sector. Currently Eco-Tourism Kenya is the umbrella body that manages the eco-tourism rating scheme. The National Tourism Strategy proposes that the Ministry of Tourism in collaboration with Eco-tourism Kenya. While the National Tourism Strategy recommends that the national environment agency (NEMA) involvement of technical expertise drawn from the sector will further buttress the mechanism in place.
- ✓ Incentivize the adoption of SCP trends in the tourism industry: The tourism sector largely consists of privately run institutions. Governments have many of the tools that can be used to make a difference such as the power to make regulations and offer economic incentives, and the resources and institutions to promote and disseminate good practice. The Tourism Act brings into focus various aspects relating to promotion of sustainable tourism including research, monitoring and imposition of tax policies that incentivize tourism development. Section 106 of the Act calls for collaboration between the tourism sector and fiscal policies for purposes of tax rebates for sustainable tourism development and imposition of tax disincentives to deter unsustainable tourism activities. Fiscal incentives work to encourage tourism sector players to engage in desirable sustainable tourism actions in exchange to minimizing taxes for the business enterprises.
- ✓ Additionally, certification of establishments that promote sustainable tourism and developing incentives for certified establishments as is the case in Seychelles will go a long way in encouraging establishments to adopt sustainable tourism trends.
- ✓ Entrench community involvement and participation through community based tourism, co-conservation efforts, marketing campaigns, etc
- ✓ Branding Kenya tourism to connect the coastal and hinterland tourism, including wildlife and safari.
- ✓ Adopt incentive measures towards elimination of plastics and single use packaging e.g for soap and detergents, water, straws etc
- ✓ Diversification of tourist products

- ✓ Tourism in Kenya is a largely private enterprise model. Involving the private sector is therefore inevitable. Governments should provide an environment that enables and encourages the private sector, tourists and other stakeholders to respond to sustainability issues. Possible areas of collaboration include but are not limited to; development of low consumption water technologies, recycling facilities, solid waste management initiatives in dumpsites and landfills and development of water treatment plants.

5.3.3 Construction and infrastructure developments

- ✓ Clearly define SCP Targets for the construction and infrastructure sector in the JKP region as a baseline for all subsequent SCP interventions, and set out clear timelines and reporting guidelines for their implementation
- ✓ Propose and plan Model Coastal Cities in the three project sites
- ✓ Develop Construction Waste Management Regulations to manage construction, demolition and maintenance wastes generated by the construction and infrastructure sector. This shall enhance the move towards zero construction waste, through RRRR (Reduce, Reuse, Recycle/Restore and Return)
- ✓ Apply smarter technologies in construction and infrastructure developments, including those that use less water, sand, stones, energy, etc. To this end, develop a Construction Data Management Policy to manage Smart Cities Data; digital platforms for transparency and develop platforms for sharing building materials data, tracking resource use, and promoting transparency in sustainable construction practices.
- ✓ Provide incentive schemes to discourage single use wood products such as formwork, scaffolding, props, etc.
- ✓ Encourage or enforce use of cleaner and sustainable energy solutions. To this end, develop Waste-to-Energy Regulations to beef up the existing County legal frameworks on solid waste management
- ✓ Develop a Construction Materials Research Policy to boost and plug into NCA's National Construction Research Agenda (NaCRA). It will encourage research into and the uptake of the adoption of low carbon construction technologies, the re-use of construction waste as aggregates, clean construction technology for modular construction, and reduce the proliferation of toxic construction materials in the JKP region

- ✓ Implement green certification systems for new constructions and develop a Coastal City Green Index for coastal cities that is adaptive to the conditions peculiar to the JKP region
- ✓ Develop a Water and Sanitation Policy for the JKP region that integrates rainwater harvesting in urban planning to reduce freshwater usage and mitigate flood risks through design (porous paving and rain gardens). This policy is to be enacted through JKP Urban Design Guidelines and Building Codes that will define the standards for new buildings, and for retrofitting existing buildings
- ✓ Develop and enforce a Bio-based and Recycled Materials Strategy that will encourage construction using bamboo, recycled plastic, and locally sourced materials, reducing reliance on virgin resources and promoting circular economy
- ✓ Develop Modular Construction Guidelines that will decrease waste, enhance resource efficiency, and enable faster, cleaner construction. These should be piloted in the affordable/adequate housing initiatives defined in Kenya Vision 2030, JKP Vision 2030, and the CIDPs
- ✓ Develop a Green Infrastructure Policy for JKP, and develop Green Infrastructure Guidelines for the JKP. This will integrate green roofs, vertical gardens, and bioswales into buildings to manage storm water, improve air quality, and provide habitat for local wildlife.
- ✓ Development of Climate-Resilient Infrastructure and investment in infrastructure resistant to rising sea levels, floods, and extreme weather events, safeguarding coastal communities and minimizing future rebuilding costs. To achieve this a Green Corridor Project is proposed that will entail greening the roads in the Mombasa Metro area and harnessing the potential of roads and highways as the most abundant source of urban open space
- ✓ Encourage investment in linear urban forests and tree schemes along roads and highways through the development of a Green Transport Carbon Credits Program to be implemented along roads and highways, that will mirror the proposed JKP carbon credits through mangrove forests conservation.

5.3.4 Environment and Natural Resources

- ✓ Entrench regulatory measures towards zero waste especially plastics and single use packaging
- ✓ Apply RRRR and avoid larger dumpsites, establish smarter dumpsites and refills, including mandatory sorting of waste at source.

- ✓ Encourage and promote greater community involvement and participation in urban environmental protection initiatives- clean ups, tree planting and gardening, awareness and public education, environmental branding, etc
- ✓ Public and private institutions to be obliged or otherwise incentivized to keep environmental standards in public spaces, private property
- ✓ Introduce and enforce greater regulation of chemical and hazardous waste management.
- ✓ Adopt Source to sea (S2S) approaches in plastic waste management, which focuses on the life cycle approach-design, production, distribution and consumption
- ✓ Introduce regulatory measures to move from linear to circular economy, including extended producer responsibility(EPR)

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