

# **Unleashing the potential of the private sector to drive green growth and job creation in Kenya**

## **Revised Draft Report**

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July 2, 2020

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## Acronyms and Abbreviations

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AfDB	African Development Bank
CSP	Concentrated Solar Power
CMA	Capital Markets Authority
DFI	Development Finance Institution
DP(s)	Development Partner(s)
ECA	UN Economic Commission for Africa
EGM	Expert General Meeting
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GE	Green Economy
GESIP	Green Economy Strategy and Implementation Plan 2016-2030
GHG	Greenhouse gas
GoK	Government of Kenya
FiT	Feed-in-tariff
ICT	Information and Communications Technology
IFC	International Finance Corporation
ILO	International Labour Organization
IRA	Insurance Regulation Authority
KAM	Kenya Association of Manufacturers
KBA	Kenya Bankers Association
KEPSA	Kenya Private Sector Alliance
KNBS	Kenya National Bureau of Statistics
KNPC	Kenya National Cleaner Production Center
KWh	Kilowatt-hour
MTP	Medium Term Plan
MSMEs	Micro Small and Medium Enterprises
MWh	Megawatt-hour
NCCAP	National Climate Change Action Plan
NEMA	National Environment Management Authority
NSE	Nairobi Securities Exchange
PV	Photovoltaics
SDGs	Sustainable Development Goals
SHP	Small hydro power
SEZ	Special Economic Zones
SMEs	Small and Medium Enterprises
SWH	Solar water heaters
ToR	Terms of Reference
UN	United Nations

## Acknowledgements

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## Definition of key terms

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<b>Green Business/Enterprise</b>	Profitable business activity that is low carbon, climate resilient, and contributes to efficient use of natural resources, reduces or eliminates waste and pollution or contributes increased availability, quality, or productivity of water, forests, land and other natural assets ( <i>UNECA definition</i> )
<b>Green Economy</b>	An economy that results in improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities ( <i>UNEP 2011 definition adopted by GESIP</i> )
<b>Green Growth</b>	Economic growth that entails increased and efficient production and competitiveness while at the same time ensuring climate resilience and maintenance or increase in the quality, quantity and productivity of natural assets ( <i>UNECA definition</i> )
<b>Green Jobs</b>	Decent jobs that contribute to preserve or restore the environment ( <i>ILO definition</i> )
<b>Green Procurement</b>	Purchasing products and services that cause minimal adverse environmental impacts. It incorporates human health and environmental concerns into the search for high quality products and services at competitive prices ( <i>general definition</i> )
<b>Private Sector</b>	Organisations or firms that engage in profit-seeking activities and have a majority private ownership (i.e. not owned or operated by the government). It includes financial institutions and intermediaries, multinational companies, small, and medium-sized enterprises, cooperatives, individual entrepreneurs, and farmers which operate in the formal and informal sectors ( <i>UNECA definition adapted from Morgado &amp; Lasfargues (2017)</i> )
<b>SMEs</b>	Comprise both formal and informal businesses concentrated in urban and peri-urban areas that have 10-100 employees, and an annual turnover of more than KES 500,000 to KES 5 million per year ( <i>Kenya Institute for Public Policy Research and Analysis definition (KIPPRA), 2014</i> )



## Executive Summary

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This study provides an account of a mix of primary data collected from interviews and questionnaire-based surveys and secondary data from various sources in Kenya to analyse the needs, mechanisms and modalities that the private sector can be an engine for green growth and job creation. This is done by analysing the four-focus sector's (Agriculture, Energy, Manufacturing and Waste Management) drivers, barriers and opportunities while identifying best practices to provide a knowledge base for policy recommendations, peer-learning opportunities and platforms, whether existing or new, that can facilitate exchange of experiences.

This study aims to assist the private sector, sectorial associations, practitioners, training institutions, policy makers and other stakeholders in agriculture, energy, manufacturing and waste management sectors to adopt green practices in their value chains to promote green growth and job creation in Kenya.

The study is a product of a collaboration between the Ministry of Environment and Forestry and the United Nations Economic Commission for Africa (ECA) It is based on broad-based research, which included interviews and consultations with stakeholders across Kenya's private sector and secondary data and information from desk review with a focus on agriculture, energy, manufacturing and waste management sectors.

A key message in this study is that catalyzing private sector investments that create green growth and jobs is essential in achieving the country's *Vision 2030* and *Big Four Agenda*. This implies that private sector growth must be realized from green investments and business opportunities set in a conducive and enabling environment. This includes having a clear understanding of green economy terminologies and the green economy plan for the country, Green Economy Strategy and Implementation Plan 2016-2030 (GESIP). More so, there already exists several green frameworks at sectorial level that require interpretation on the role that private sector plays in their implementation. It was clear from the interviews that despite having knowledge of these sectorial green frameworks, private businesses have not well captured the essence of them and are not clear on the entry points they can leverage on.

The relationship between green growth and the sectors of the economy, with a focus in the four study sectors, is complex. There is a nexus relationship across these four sectors that highlights high dependency between the sectors to realize green business advancement. The most important sector from the nexus relationship was energy and waste management sectors. This is because these sectors are drivers and enablers of green practice integration across the sectors. For energy, this is promoting use of renewable energy sources and adopting energy efficiency measures. For waste management, it is in the integration of the 3Rs principle - Reduce, Reuse, and Recycle in businesses processes.

To catalyze the private sector involvement in green investments, there needs to be a shift in the pattern of development from high to low carbon investments. These investments are needed to provide access to essential services like electricity, intensify agricultural production sustainably, and promote a circular economy. However, high initial investments costs have been associated with green practices in the economy – whether it be installing heat recovery systems in manufacturing businesses or promoting recycling of agricultural waste, all these green activities requires large initial sums of capital investments. Couple this with a lack of green financing/investment flows in the economy, results in a backstop for green business advancement. Although these challenges can be resolved, they must be actively addressed with a

conducive environment if green growth needs to be achieved and the translated job creation areas.

Given the additional financial costs associated with green practices, attracting investment and advancing the green agenda with private businesses requires public support to boost commercial viability. This support can be offered through policies, fiscal instruments, financial incentives and/or capacity building and training. While there are a number of roles that development partners can play in order to promote such investment and business opportunities, we argue that there is a strong practical case. The case being that external financial support may be needed to provide the policy credibility needed to attract international investors to these markets and sectors. The key point is that green investment will require some sort of investment mix such as leveraging private investment such as debt and equity to increase profitability and/or reduce different risks associated with the green business investors are prioritized, therefore, they will need to be partnered with public investments to make projects viable.

The private sector needs to be at the forefront in the development and implementation of green policies at the macro level to include their business interests and environmental challenges they face. More so, the private sector plays a key role in development of markets hence a key agent in adoption of green value chains and markets for green products and services. This can be achieved by promoting green business models, influencing corporate behavior and actively reviewing their risk assessment criteria to improve access to finance for green technology development.

## Key Messages

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**Change, despite being negative, can be catalytic for local development** as seen with increased local innovation and technologies in the manufacturing space following the COVID-19 - production of ventilators, personal protective equipment (PPEs) and prototypes for medical swabs.

**First mover advantage is key in promoting the green agenda** post COVID-19 pandemic by taking advantage of the KES 540 million set aside under the stimulus package for the greening Kenya campaign. By positioning themselves as the leader in innovations, as seen in manufacturing, and promoter of green supply chains, the private sector can leverage on this green investment.

**Employment multiplier factors should drive greening of value chains** over past strategies for generating jobs via trade in physical goods and capital investment. Job creation will be achieved if current technologies such as market led agricultural extension and advisory service (AEAS) are accepted, digital skills are enhanced, local expertise is nurtured, SMEs participation in international markets, and stimulated domestic consumption by financing both informal and formal economies.

**Stimuli, whether internal or external, is required to prove the business case** for green businesses. Internal stimuli from experts and incubated business models and external stimuli in the form of grants and technical assistance aid in making the case for green business. More so, their profitability is hinged upon increased resource efficiency and demand for the green product and/or service.

**Green job creation cannot be achieved without the informal economy** considering they generate the larger share of employment across the four focus sectors. Private sector needs to

leverage on the informal economy diversity's position, especially in waste management, agriculture and manufacturing, to contribute to green growth and increase the capacity of green jobs in the economy.

**Establishment of a green public procurement framework** is the key policy missing in advancing green businesses. This is because it will mandate government to be a procurer and consumer of green products and services and thus catalyze demand from private businesses.

**Green financing is not only necessary but a vital element** for green business advancement. Without attention to this challenge and lack of green financial incentives, expensive technologies, inadequately proven business models, and lack of consumer awareness, then private green businesses will not succeed which will in turn threaten green growth.

**Despite business size, green investment/opportunities scale up is conditional on** partnerships, monitoring and reporting activities, financial viability and sustainability of business models, adoption of digitization mechanisms, enabling environment for private green investors, competitiveness, flows from foreign direct investments (FDIs), and intellectual property (IP) protection.

**Multi-stakeholder approach with public and private sector, CSOs, academia and research institutions, and financial institutions** is the base for a robust peer learning platform. The platforms can feed into each other – sectorial to national, and utilize a special purpose vehicle under the Presidency's office. This will not only bolster the green agenda but will mobilize demand of green investment/opportunities with the private sector.

**Leverage on business associations as entry points** for peer learning platforms for exchange and transfer of knowledge and skills. Since most private businesses are members of business associations it follows that they are logical starting points in establishing sectorial platforms and for insights in implementation of Nationally Determined Contributions (NDCs) at sectorial level.

## 1.0. Chapter 1: Introduction

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### 1.1. Background and Context

The green economy has become the foundation for Kenya’s goal towards sustainable development. This is highlighted by the green economy being anchored into the Constitution 2010 under Articles 42 that *recognizes a clean and healthy environment as a right*, Article 60 (c) calling for *sustainable and productive management of land resources*, and Article 69 (a)-(h) declaring that the *State shall ensure sustainable exploitation, utilization, and protection of genetic and biological diversity, establish a system for environmental impact assessment, and achieve and maintain a tree cover of at least 10 per cent of the land area*. Thus, the Constitution has provided overall guidance for the conceptualization and development of Kenya’s green economy programme. It is further integrated into the country’s ambitious development plan, *Vision 2030*, which aims to attain and sustain a GDP growth of 10 percent per annum in the short to medium term by creating a *“just, cohesive and equitable social development in a clean and secure environment”*. Further to this, Kenya developed a Green Economy Strategy and Implementation Plan (GESIP) 2016-2030 that outlines the guiding principles to transition to a *low carbon, resource efficient, equitable and inclusive socio-economic transformation* of the country’s businesses. This transformation is underpinned to five thematic areas – sustainable infrastructure, building resilience, sustainable natural resource management, resource efficiency, and social inclusion and sustainable livelihoods. Six principles – sustainable consumption and production (SCP), equity and social inclusion, resource efficiency, polluter-pays-principle, precautionary principle, and good governance guide these thematic areas. It is within these five thematic areas and six guiding principles that the economy is required to operate in to achieve green growth.

Under these three guiding frameworks for greening the Kenyan economy, the private sector has been highlighted as a key driver to attaining these goals. There has been a general consensus that attainment of sustained growth in a clean and secure environment cannot be achieved by working in silos, but working together with the private sector. This is further confirmed with international and regional agreements such as the 2030 Agenda for Sustainable Development, the Addis Ababa Action Agenda, Paris Agreement 2020, and AU Agenda 2063 emphasizing the critical role that the private sector need to play to achieve these development outcomes. This critical role is realized by having the private sector as drivers of green growth, creators and transformation of jobs, promoters of green supply chains, source of green investment, and as leaders in innovation in clean technologies and resource efficiency.

However, for a successful transition to green growth pathways, there is a need for finance and investment which will undoubtedly shift the way that the private sector invests. The expected infrastructure financing gap in Kenya between 2016 to 2040 illustrates the scale of resources still needed - a financing gap of USD 39 billion across various sectors in the economy. If these needs are considered with SDGs, the financing gap triples<sup>1</sup>. The private sector, both businesses and financiers, can help to bridge this investment gap through sustainable infrastructure. In particular, financiers from institutional investors’ entities such as pension funds, insurance companies and investment funds have sizeable capital that is to the most part, large and highly

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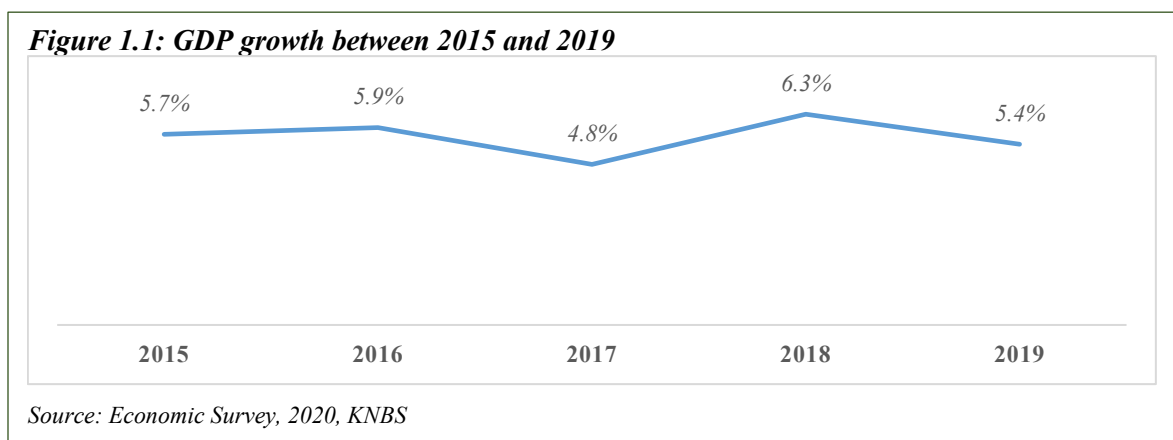
<sup>1</sup> [https://s3-ap-southeast-2.amazonaws.com/global-infrastructure-outlook/countrypages/GIH\\_Outlook+Flyer\\_Kenya.pdf](https://s3-ap-southeast-2.amazonaws.com/global-infrastructure-outlook/countrypages/GIH_Outlook+Flyer_Kenya.pdf)

underutilized. In Kenya, such entities hold approximately KES 4.5 billion (KNBS, 2019). However, most of these investments are not green.

Besides being a source of finance, the private sector plays a critical role as a source of innovation which can be tailored to suit the green agenda and as a channel for implementation of development activities through their business networks and understanding of local needs and capabilities. The private sector is also a driver of both negative and positive environmental changes. Hence, by engaging the private sector in driving green growth, environmental concerns can be embedded in their businesses and thus drive positive environmental changes. For example, agricultural investments large scale food production has had significant negative environmental impacts such as land degradation. However, if the private sector aims to green their agricultural supply chains, they can turn the hand in these negative impacts by applying supply chain pressure to conform to green inputs and outputs.

### 1.1.1. Toward sustainable development in the country

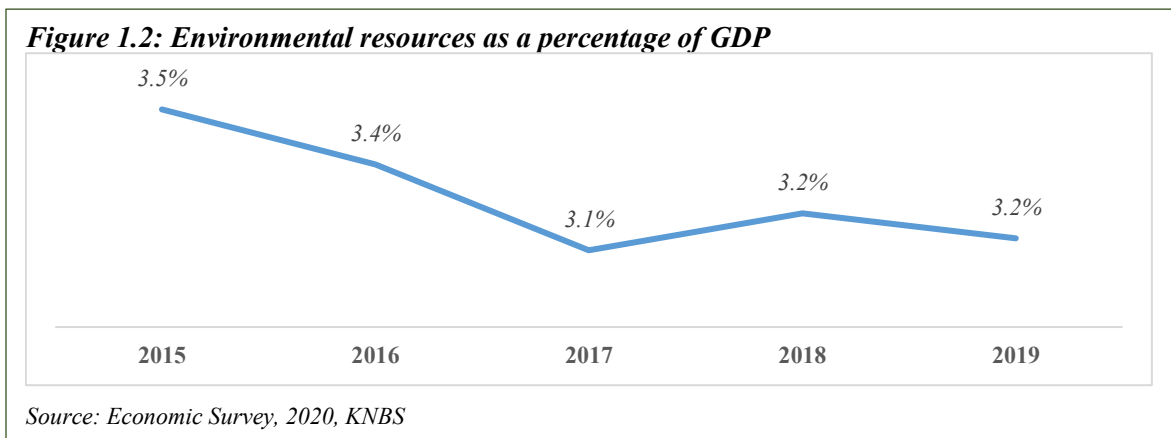
Economic activity in Kenya has been moderately stable over the past five years with the lowest low estimated at 4.8 percent in 2017 (figure 1.1). This 5-year low was attributed to poor rains, reduced credit growth to the private sector and political uncertainty from an election-induced environment. The pickup after this in 2018 saw a remarkable growth at an estimated 6.3 percent in 2018 triggered by improved rains and eased political tensions from the concluded elections. However, this growth dropped in 2019 to an estimated 5.4 percent mainly due to unfavorable weather and reduced government investment. The outlook for 2020 is dire following the COVID-19 pandemic that is expected to contract economic growth to 1.5 percent, or 1 percent under a worst-case scenario, against a previously expected 6 percent growth. This growth contraction is driven by large negative impacts on the services sector - transport, retail trade, tourism, industrial sector - manufacturing and construction, and agriculture sector.



However, the growth witnessed up to 2019 has not been inclusive against a backdrop of increased poverty and unemployment (approximately 9.3 percent of total working age population) levels, and a large informal sector where over four-fifths of the total employment. The low unemployment rates are characterized by low investments in sectors that have a high capacity to create job opportunities. More so, given the expanding youth population, labor supply is high but skill development and entrepreneurial activity is low (AfDB, 2020). Despite a decline in poverty levels, from 46.8 percent in 2005/06 to 36.1 percent in 2015/16 (KNBS, 2018), the country will not be able to eradicate poverty by 2030 with this current pace. Kenya needs to accelerate inclusive growth, positive economic growth coupled with increased average

consumption for the poor and low inequality between different population groups, in order to hasten the reduction of poverty levels.

Despite aiming to achieve inclusive growth, the country cannot make significant gains in sustainable economic growth without looking at the environment the country operates. Nearly 50 percent of GDP in Kenya is susceptible to climate change shocks (*AfDB, 2020*). This makes environment sustainability significant to Kenya meeting Agenda 2030 goals. So far, significant gains have been seen from policies in improving the environment with a notable framework, GESIP, adopted to guide how the country can follow a green development pathway. In 2019, there has been mixed performance in the selected indicators on environment and natural resources – increased expenditure on water and related services<sup>2</sup> by 47.3 percent, significant increase in from government forest plantation from 141.6 thousand hectares in 2018 to 147.6 thousand hectares in 2019, declined mineral produced by 5.5 percent, declined earnings from fishing industry by 7.8 percent, extended long rains (March to May) season leading to a prolonged dry season, and declined wildlife population from unfavorable weather conditions in the rangelands in 2019. More so, environmental audits conducted by National Environment Management Authority (NEMA) on completion of projects on their adherence to environmental standards have been increasing over the years with an average growth rate of 17 percent for the 2015-2019 period. Figure 1.2 presents the environmental resources<sup>3</sup> gross value added as a percentage of GDP.



#### 1.1.1.1. Development challenges facing Kenya

Many of the development challenges facing Kenya are of its own making while others are generally influenced by external shocks from the region and international environment. The main challenge in Kenya in 2020 is a slowed inclusive growth despite substantial investments in infrastructure development. A key challenge to the private sector, specifically for SMEs, is lack of tax breaks to private businesses by doubling taxation efforts - introduction of a 3 percent patriotism tax for small and medium enterprises (SMEs) and 15 percent presumptive tax on mobile money increasing transaction costs (*GoK, 2020a*). These doubled taxation efforts were introduced against a backdrop of impending debt repayments, an ever-expanding public wage bill, and missed revenue targets. The tax constraint further chokes the SME sector that accounts

<sup>2</sup> Including waste management services

<sup>3</sup> Comprised of forestry and logging, fishing and aquaculture, mining and quarrying, and water supply

for more than 80 percent of businesses with a GDP contribution of 30 percent and highest proportion of employment in the country (KNBS, 2017).

Stagnation of main GDP earners in the economy, agriculture and manufacturing, has been challenging for Kenya’s growth and job creation. Unemployment runs at around 11 percent of total workforce and doubles for the youth is still a challenge. Couple this with stagnation in agriculture and manufacturing sector portrays a lack of job creation areas for the 9 million more jobseekers who will enter the market by 2025. has not kept pace with the growing working-age population (AfDB, 2019). Despite the unemployment levels, more jobs are being created in the informal economy with the private sector being tasked to create more jobs. However, these jobs being created in the informal economy are largely concentrated in low-productivity sectors that require low skills further creating a gap between skilled and un-skilled labor. Another challenge is the lack of transparency in government procurement which presents a potential danger to economic prospects both in the short term and the long term.

The country aims to solve its economic challenges through the country’s development blueprint – *Vision 2030* covering the period 2008 to 2030. This was further accelerated with the *Big Four Agenda* to guide industrialization targets outlined in *Vision 2030*. Successful implementation of this agenda will see significant positive shifts in economic activity. However, to achieve this, a solid platform driven by a resolved electoral process, improved private sector confidence and strong private consumption is needed. This highlights the key role that the private sector plays in driving GDP to create capital, innovation and technologies and job creation. If this is aligned to GESIP principles and coupled with a conducive policy and regulatory environment to facilitate private sector investments, then green growth and job creation can be achieved.

## 1.1.2. Overview of the selected sectors and development in the country

### 1.1.2.1. Development context of the country

Kenya has witnessed substantial growth spurred by increased agricultural production, acceleration in manufacturing activities, continuous growth in the transport sector, and a vibrant service sector. GDP shrunk to 5.4 percent in 2019 from 6.3 percent in 2018 (KNBS, 2020a). Table 1.1 provides an overview of some macroeconomic data. Inflation grew to 5.4 percent in 2019 from 4.7 percent in 2018 largely due to reduced food prices from favorable weather conditions and positive monetary policy initiatives. Total domestic credit to the private sector grew by 6.5 percent in 2019 (*Ibid*).

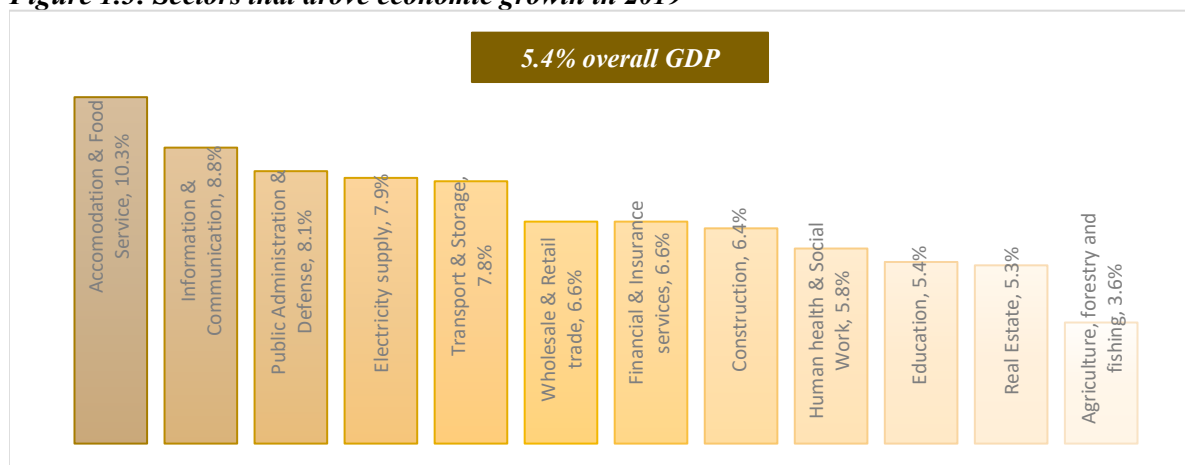
**Table 1.1: Macroeconomic overview of the country**

Population (millions, 2019)	47,564,296
GDP per capita (KES), 2019	106,244
GDP growth (average over 2015-2019)	6.2%
Inflation rate 2019	5.2%
Domestic credit to private sector, percentage of GDP, 2018	28.3%
Total tax rate (percentage from commercial profits)	16.6%
Fiscal deficit (percentage of GDP, 2018)	-9.9%
Net official development assistance received (percentage of gross national income), 2018	4.1%
Gross domestic savings (percentage of GDP), 2018	4.5%

Gross capital formation (percentage of GDP)	16.8%
Current account (percentage of GDP), 2019	-5.8%
Unemployment rate (percentage)	5.4%
Urbanization rate (percentage)	43.0%
<i>Source: Author's compilation based on KNBS, 2020a</i>	

Economic performance of the country was marked by a 5.4 percent GDP decrease in 2019 as compared to a 6.3 percent increase in 2018. Overall, growth has been steady over the years since 2014 at 6.2 percent. GDP growth in 2019 was mainly attributed by growth in various sectors – accommodation and food services by 10.3 percent, information and communication by 8.8 percent, public administration and defense by 8.1 percent, electricity supply by 7.9 percent, transport and storage by 7.8, wholesale and trade by 6.6 percent, financial and insurance activities by 6.6 percent, construction by 6.4 percent, education by 5.4 percent, real estate by 5.3 percent, and agriculture, forestry and fishing by 3.6 percent, (KNBS, 2020a).

**Figure 1.3: Sectors that drove economic growth in 2019**



*Source: Author based on Economic Survey 2020, popular version, KNBS*

Employment growth rates in the country have been relatively steady with a 2 percent growth in 2019 that was mainly attributed from the public sector. A further breakdown of employment share found that informal employment has the highest employment share over formal employment highlighting the significant role that the informal economy in Kenya plays in job creation. (KNBS, 2020a). This is an interesting statistic as it shows that most of the working age population are in the informal sector and it is where jobs are created – over 768 thousand jobs in the informal economy over 68.4 thousand in formal economy and 10.5 thousand in self-employment. The breakdown is shown in table 1.2.

**Table 1.2. Employment share breakdown**

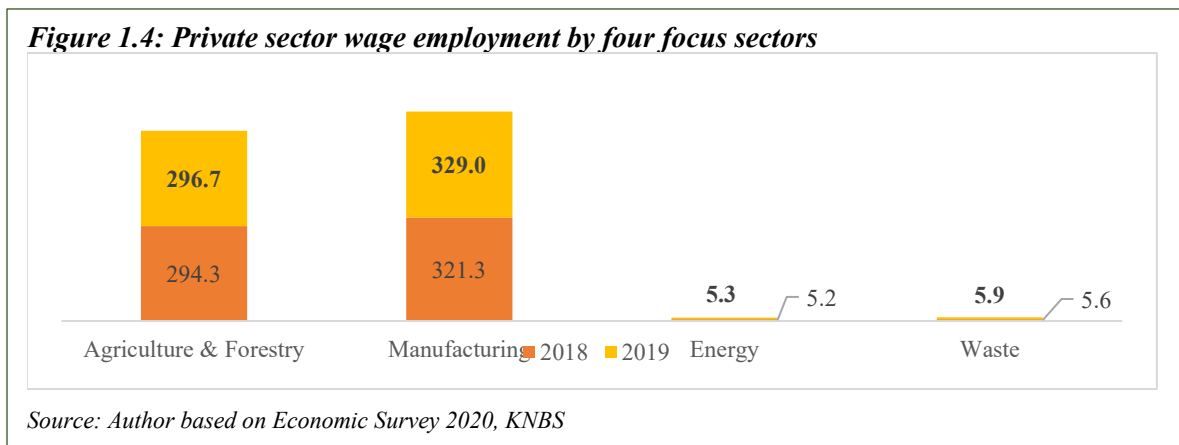
Employment breakdown, in '000s	2018	2019	Growth, %
<b>Total employment<sup>^</sup></b>	<b>2,859.9</b>	<b>2,928.3</b>	<b>2%</b>
Private sector	2,017.0	2,063.1	2%
Public sector	842.9	865.2	3%
<b>Share of employment</b>	<b>100.0%</b>	<b>100.0%</b>	



Employment breakdown, in '000s	2018	2019	Growth, %
Informal	82.6%	83.0%	0%
Formal	16.5%	16.1%	-2%
Self employed	0.9%	0.9%	0%

*Source: Author based on Economic Survey 2020, KNBS  
^ total employment outside small-scale agriculture and pastoralist activities*

Focusing on the sectors under this study, the share of wage employment is highest in the manufacturing sector that recorded a 0.8 percent growth from 2018 and followed closely by the agriculture sector that recorded a 2.4 percent growth from 2018. Despite having the lowest wage employment, the waste management sector had the highest growth, 5.4 percent from the previous year, 2018 – see figure 1.4. This shows a keen contribution of employment growth by the private sector and thus their key role in driving job creation.



#### 1.1.2.1.1. COVID-19 and its implications

The corona virus outbreak was declared a Public Health Emergency of International Concern by the World Health Organization (WHO) in January 2020 following an unknown pneumonia detected in Wuhan, China in December 2019. In February 2020, the new corona virus disease was dubbed, COVID-19. As at May 22<sup>nd</sup> 2020, in Africa, there have been over 99,977 cases reported, 3,095 fatalities and 39,336 recoveries<sup>4</sup>. In Kenya, there have been 1,197 cases reported from a total of 55,074 samples tested, 50 fatalities and 380 recoveries<sup>5</sup>.

The pandemic has slowed down economic progress following lock down directives, social distancing measures, and curfew restrictions in major towns in Kenya. This resulted in an economic slowdown with the private sector being affected the most. More so, these containment measures are costly to livelihoods and jobs which is further aggravated by a large informal sector, that accounts to nearly three quarter of the employment, high poverty rate, and youth unemployment. Due to a general fear of the effects of COVID-19 such as reduced cashflow and business avenues, most businesses have either shut down, laid of staff or offered unpaid leave, or implemented remote working conditions. This has led to an increase in unemployment especially for the informal economy where most youth hold jobs. Owing to a decline in production and

<sup>4</sup> [africanews.com](http://africanews.com)

<sup>5</sup> <https://www.health.go.ke/kenya-covid-19-cases-hits-1161-nairobi-friday-may-22-2020/>

demand, and general fear of a recession, the government introduced an economic stimulus program to save the economy. A summary of the impact of the COVID-19 pandemic on focus sectors and/or areas and the economic stimulus program planned for the economy has been presented in table 1.3.

**Table 1.3: Impact of COVID-19 pandemic and consequential economic stimulus for the economy**

Sector/Area	Impact	Economic stimulus program
<b>Economy</b>	<ul style="list-style-type: none"> <li>Revised economic growth from 6.2% to 2.5% in 2020.</li> <li>Reduced incomes and food insecurity in Nairobi with 95% of population reporting reduced incomes with 28% experiencing hunger.</li> <li>65% of borrowers are most likely to default on loans in 2020 with 7 banks having restructured KES 17 billion loans. Also, 67% of borrowers have sought for a one-year extension on their loans.</li> </ul>	<ul style="list-style-type: none"> <li>Planned expenditure of KES 53.7 billion as a stimulus package to support businesses hit by the COVID-19 pandemic.</li> <li>KES 540 million for the greening Kenya campaign.</li> </ul>
<b>Private sector</b>	<ul style="list-style-type: none"> <li>52% of SMEs and 58% of micro-enterprises have laid off workers with the most affected economic sectors being agriculture, tourism, transport and manufacturing.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced corporate income tax rate from 30% to 25%</li> <li>Reduced turnover tax rate for SMEs from 3% to 1%.</li> <li>Reduced VAT on all goods from 16% to 14%.</li> <li>KES 10 billion to fast-track outstanding VAT refunds and SMEs pending bills.</li> <li>KES 6 billion targeting SME Credit Guarantee scheme.</li> </ul>
<b>Jobs</b>	<ul style="list-style-type: none"> <li>43.2% of workforce were absent from work with lockdown measures as the main factor.</li> </ul>	<ul style="list-style-type: none"> <li>100% income tax relief for persons earning below KES 24,000 per month.</li> <li>Reduced tax rate for top band individuals from 30% to 25%.</li> <li>KES 5 billion to hire local labor to rehabilitate access roads and footbridges.</li> </ul>
<b>Agriculture</b>	<ul style="list-style-type: none"> <li>Increased demand for fresh produce from European countries have been impeded by heavy rains and high freight charges<sup>6</sup>.</li> <li>Planned importation<sup>7</sup> of 4 million bags of maize to replace strategic grain reserves that have been deemed unfit for human consumption. An additional 2 million bags of yellow maize will also be imported for animal feed. This has been met by resistance by farmers and millers.</li> <li>Tea, coffee and horticulture exports dropped by 40%, translating to an annualized loss of KES 150 billion.</li> <li>40% of formal jobs and 10% of informal jobs are at risk</li> </ul>	<ul style="list-style-type: none"> <li>KES 3 billion to supply farm inputs through e-vouchers, targeting 200,000 small-scale farmers.</li> <li>KES 1.5 billion to assist flower and horticultural producers to access international markets</li> </ul>

<sup>6</sup> <https://www.freshplaza.com/article/9218165/rainfall-thwarts-kenyan-fresh-produce-exports-as-eu-orders-rise/>

<sup>7</sup> <https://allianceforscience.cornell.edu/blog/2020/05/kenya-prepares-to-import-maize-in-the-midst-of-covid-19-pandemic/>

Sector/Area	Impact	Economic stimulus program
<b>Manufacturing</b>	<ul style="list-style-type: none"> <li>• 23% of manufacturers have shifted their focus or increased production of essential goods such as personal protective equipment (PPEs), bedding, sanitizers, disinfectants, canned foods and immunity boosting products, hospital beds, and ventilators.</li> <li>• 42% of manufacturers are operating at less than half production capacity.</li> <li>• For MSMEs, their average utilized capacity stands at 37%.</li> <li>• 76% of logistic businesses are facing difficulties in locally sourcing or importing raw materials.</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritization of economic support to the textile and garment sector that has encouraged production of medical equipment for domestic and export markets.</li> <li>• KES 600 million to enforce the “Buy Kenya Build Kenya” policy to promote purchase of locally manufactured goods.</li> </ul>
<p><i>Source: Author’s compilation based on various surveys: How COVID has hit incomes of Nairobi’s poor, Business Daily (2020, May 14; Spillovers and Feedback Loops: The Banking Industries Response Scenarios to the Effects Of Covid-19 Pandemic, KBA (2020); KEPSA Business Survey Report on Effects of COVID-19, KEPSA (2020); Survey on socio-economic impact of COVID-19 on households, KNBS (2020b); The impact of COVID-19 in the manufacturing sector, KPMG/KAM (2020); Corona to cut farm exports by Sh150bn, Business Daily (2020, May 7); GoK [@StateHouseKenya], 2020, May 25.</i></p>		

Overall, COVID-19 pandemic has slowed down, and in some sectors, put a complete stop economic activity. All sectors of the economy have suffered while others have gained a competitive advantage such as IT enabled services. The pandemic has actually shone a light on the inefficiencies that our linear economy poses on socio-economic progress. It has also highlighted the dependencies of sectors - how each sector does not operate independent of another, either directly or indirectly. It has showcased the need for a circular economy that green development pathways can offer for sustainable development in the long run.

Despite having a projected rebound of 5.1 percent economic growth in 2021 (*World Bank, 2020*), this cannot be achieved by continuing with business as usual. This prompts a discussion on the measures private sector can take to advance the green agenda by re-adjusting their business models to one with green frameworks such as sustainable consumption and production and resource efficiency, look for new markets where premium price can be attained and reorganize their supply chains to be more efficient. More so, at a time like this, private green businesses need to achieve a delicate balance between the premium price that green products and services attract and a green market in a declined demand environment.

### **1.1.2.2. Agriculture sector**

The agriculture sector is mainly divided into two subsectors, crop and livestock. The crop subsector in Kenya is generally divided into five main crops – cereals (includes maize, wheat, barley, rice and other cereals), horticulture (includes cut flowers, vegetables and fruits), temporary industrial crops (pyrethrum, sugarcane, tobacco and cotton), other temporary crops (pulses, potatoes and others), and permanent crops (coffee, tea and sisal). Under cereals, wheat has consistently had the highest production at KES 13.4 million as at 2019 and has had the highest average growth rate of 25 percent; under horticulture, cut flowers has consistently had the highest production of KES 104.1 million as at 2019 but fruits has had the highest average growth rate of 20 percent; under temporary industrial crops, sugar cane has consistently had the highest production of KES 17.6 million as at 2019 but pyrethrum has had the highest average growth rate of negative two percent; and under permanent crops, tea has consistently had the highest production of KES 104.1 million as at 2019 but sisal has had the highest average growth rate of seven percent (*KNBS, 2020a*).

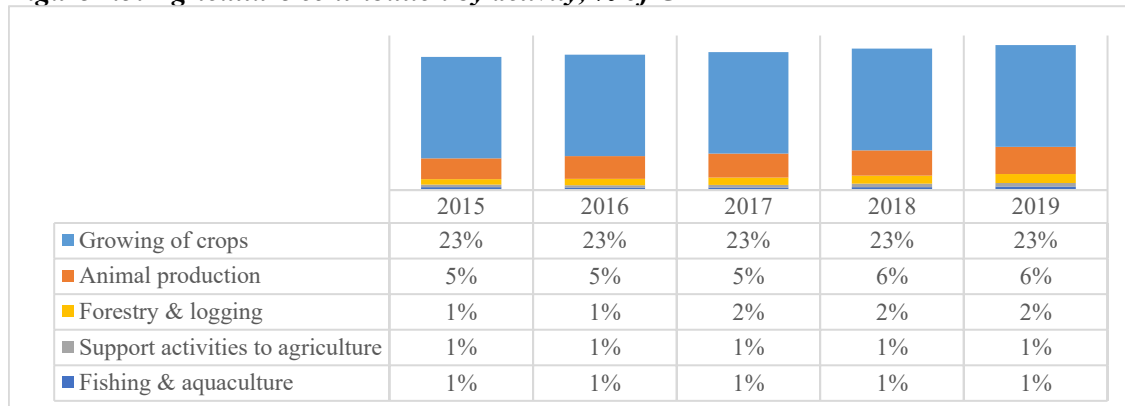
The livestock subsector is generally divided into dairy and beef livestock subsectors. The dairy industry contributes 40 percent of the livestock subsector GDP while beef takes up the larger part of the contribution. The beef industry, mainly composed of cattle, goats and sheep, has consistently had the highest production of KES 114.9 million as at 2019 but chicken and eggs has had the highest average growth rate of 14 percent. Despite the dairy industry comprising of 40 percent of livestock GDP, it has had the lowest average growth rate at negative one percent (KNBS, 2020a).

The main challenge in the agriculture sector in Kenya is feeding its 95 million people by 2050 (GoK, 2013) without detrimental effects to ecosystems and human health while under the conditions of higher average global temperature and climate change.

#### 1.1.2.2.1. Contribution to economic growth

The agriculture sector economic performance decelerated to 3.6 percent in 2019 from 6.1 percent recorded in 2018 mainly due to drought during the first half of the year that was followed by high rainfall in the second half of the year. The agriculture sector’s contribution to GDP currently stands at 34.1 percent as at 2019 and has been steadily increasing since 2013 where it stood at 26.4 percent. The crops subsector contributes the largest portion to agricultural GDP at 70percent in 2019 with an average growth rate of eight percent from 2013 to 2019. The agricultural output in the country has grown over the years recording a growth of 18 percent since 2013. An estimated 8 percent of agricultural goods are exported. (KNBS, 2020a).

**Figure 1.5: Agriculture contribution by activity, % of GDP**



Source: Author based on Economic Survey 2020, KNBS

#### 1.1.2.2.2. Employment status and social well being

The wage employment of the sector stands at 12 percent of the total wage employment and has been steady since 2017. The private sector is the largest wage employer in the agriculture sector by 88 percent (KNBS, 2020a). The agriculture sector output is largely represented by smallholder farmers with approximately 62 percent of Kenya’s total employable population, about 28 million, either directly or indirectly depend on agriculture for their livelihood. This includes farmers and off-farm employment related to agriculture such as agri-businesses. Out of the 28 million, about 32 percent of them are said to be farmers with informal employment taking up a larger percentage of the share, about eight times the formal employment share. Despite this share, agriculture employment growth is low, at 2.3 percent (GoK, 2018b). Hence to transform the sector to create green jobs, there is a need to transform the sustained behavior of the small holder segment of the sector.

#### 1.1.2.2.3. Financing/Investment requirements

The agriculture sector, based on Kenya's National Agriculture Investment Plan (NAIP) 2019-2024 – the country's five-year agricultural investment plan tied to the ten-year Agriculture Sector Transformation and Growth Strategy (ASTGS), requires KES 440 billion with about half of the funds to be dedicated to agricultural-specific investment with the latter for agricultural supportive costs such as power, roads and infrastructure. NAIP expects 80 percent of the agriculture-specific investments to be drawn from the private sector to develop agro-processing facilities and arable land. This translates to funding of approximately KES 35 billion per year by the private sector. The KES 440 billion investment is expected to increase agricultural GDP by 33 percent to translate to KES 3.9 trillion contribution (*GoK, 2019b*). There is also a further expected funding of KES 167.31 billion to fund the Kenya Climate Smart Agriculture Implementation Framework 2018-2027 (KCSAIF) aligned to MTP III priorities with the funding divided into two terms – KES 83.04 billion for 2018 to 2022 and KES 84.27 billion for 2023 to 2027. The funding is expected to be sourced from the GoK, bilateral and multilateral DPs, Climate Finance (CF), Adaptation Fund (AF), Green Climate Fund (GCF), and the private sector (*GoK, 2018c*).

Despite these investment requirements, commercial financing of agriculture sector is constrained with only 3.9 percent of total commercial lending being advanced to the sector (*KNBS, 2020a*). This illustrates that private lending does not reflect the needs and importance of agriculture to growth in the country.

#### 1.1.2.2.4. COVID-19 and its implications

The agriculture sector had faced challenges even before the COVID-19 pandemic from desert locust invasion in December 2019 and heavy rains experienced in October 2019. Following the first confirmed COVID-19 case in March 2020, the government called for closure of produce markets with an aim to contain the spread of the virus. This disrupted food delivery which is highly dominated by small, independent transporters that link producers with consumers. In urban areas, produce markets that serve consumers and smaller retailers faced disruption with majority of them shifting to e-commerce to deliver produce directly to consumers. Others opted to sell their produce from car boots along major roads to ensure their livelihood is sustained following further closure of hospitality venues<sup>8</sup>. The effect of the COVID-19 pandemic continues to be dire for the agriculture sector following loss of revenue from limited demand of agricultural exports of coffee and horticultural products. There has also been closure of live animal markets because of the risky environment it runs and fear of contamination. This has also led to a drop exports of sheep and goats.

#### 1.1.2.3. Energy sector

The energy sector has over the past years been highly dependent on thermal energy to power the country in case of power outages. However, in 2019, the country was able to rely on renewable energy from wind power that increased almost fourfold to 1,562.7 GWh thanks to the Lake Turkana Wind Power Project (LTWP). Hence, the total electricity generated, including imported power, increased by 3.9 per cent to 11,620.7 GWh in 2019. This led to an increased installed electricity capacity increased to 2,818.9 MW in 2019 from 2,711.7 MW in 2018 driven by increased wind power and geothermal power, a 25 percent increase to 828.4 MW. This brings

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<sup>8</sup> Car-boot market thrives during pandemic, [Standard Media](#)

power generation from renewable energy at 95 percent of installed capacity. Despite increased power demand, 3.9 percent, power transmission and distribution losses accounted for 29 percent of total power generated (KNBS, 2020a).

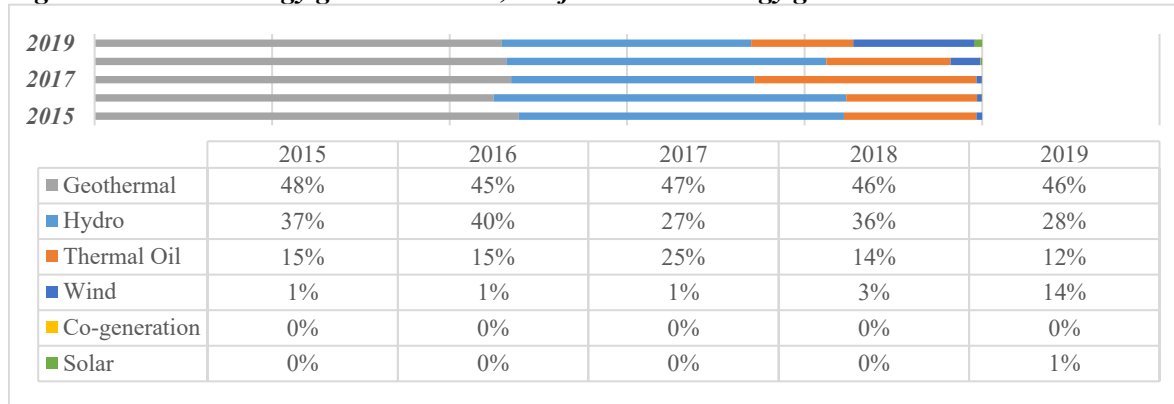
Reference to MTPIII projections, the government aims to install an additional 5,221 MW by 2022 with renewable energy sources contributing to about 42 percent of the projections - 93MW from hydro power, 913MW from geothermal power, 800MW from wind power, 157MW from biomass power, and 442MW from solar power. Out of these expected additional power generation, Independent Power Providers (IPPs) are expected to deliver 70 percent of the capacity (GoK, 2018d). However, participation by the private sector in energy is quite low despite introduction of the Feed-in-Tariffs (FiT) in 2008 that sought to accelerate energy expansion by encouraging private sector participation and investments. In spite of further revision to the tariffs, in 2010 and later in 2012, the tariffs rates still do not reflect the costs for private sector investments.

The main challenge in energy is in its efficiency throughout the value chain from generation to transmission and distribution and storage. A key challenge in expansion of installed capacity, with heavy reliance on IPPs to deliver 70 percent of the proposed new capacity, is in the lack of adequate transmission and distribution infrastructure, and the high investment costs that the set tariffs still do not account for.

#### 1.1.2.3.1. Contribution to economic growth

The energy sector’s contribution to GDP currently stands at 1.7 percent as at 2019 and has been steadily increasing since 2013 where it stood at 1.1 percent. The generated hydro power energy is the largest contributor at about 30 percent to the overall energy output. The local energy output recorded a growth of 32 percent since 2013. An estimated one percent of total energy used is imported. Electricity supplied was largely produced locally, about 98 percent with 88.5 percent of this being renewable. Out of the total supplied electricity, domestic, commercial and industrial consumer jointly accounted for 93 percent of total domestic demand in 2019. (KNBS, 2020a).

**Figure 1.6: Local energy generation mix, % of total local energy generation**



Source: Author based on Economic Survey 2020, KNBS

#### 1.1.2.3.2. Employment status and social well being

The wage employment of the sector is relatively steady at one percent of the total economy, with employment in the public sector steadily at 5 percent of total energy labor. However, decentralized renewable energies have created 10,000 direct jobs and 15,000 indirect jobs in

2017/2018 with women and youth accounting for 23 percent and 41 percent respectively of direct jobs. This is estimated to grow to 17,000 direct jobs and 30,000 indirect jobs by the year 2023 depending on mini-grid penetration, a 70 percent increase. The top three skills from 10,000 direct jobs were sales and distribution at 41 percent, management and business administration at 22 percent and after-sale services at 15 percent. This trend is expected to change by 2023 with sales and distribution dropping to 38 percent, management and administration increasing to 24 percent and after-sale service remaining the same at 15 percent (*Power4All, 2019*).

#### 1.1.2.3.3. Financing/Investment requirements

The energy sector, based on the Scaling-up Renewable Energy Program (SREP) investment plan for Kenya, 2011 requires approximately KES 2.8 billion (*USD 928 million with the reported exchange rate of 83*) to scale up its renewable energy plans targeting 400MW of geothermal power comprising of 86 percent, hybrid mini-grid systems comprising of 7 percent, and solar water heating component carrying the latter 7 percent. Out of the total requirement, the sector expects the private sector, developers and Kenya Electricity Generating Company (KenGen) to contribute 11 percent of the total required funding. It is interesting to note that the 61 percent of the funding requirement will be sourced from development partners while 23 percent will be sourced from government. This highlights a high reliance of foreign funds to scale up renewable energy in the country. More so, there is a financing gap of 5 percent that is solely under solar water heating component implying that only 2 percent of the required funding for solar water heating component has been covered in the investment plan (*GoK, 2011*).

Between 2005 and 2010, about KES 210 billion financed 36 projects and/or programmes from donors in the form of grants, mixed grants and loans. Out of this financing, 90 percent was represented by concessional lending. The projects and/or programmes are mixed with 51 percent on power generation, 20 percent on transmission, 13 percent on distribution and the latter on other sector-wide needs (*World Economic Forum, 2012*). Private sector financing has been stimulated by introduction of a Climate Innovation Centre that finances proof of concept grants, venture capital as either equity and/or debt and investment facilitation using a global network of investors. The aim is to help in transitioning clean technologies and companies through development and demonstration to scale up.

#### 1.1.2.3.4. COVID-19 and its implications

Energy is a vital component in providing the necessary power to operate various industries – from healthcare to sanitation to communication services. A disruption in energy services can cause a halt in business operations especially now where most businesses are operating remotely and depend on consistent power. This hardship was felt in Kenya in May 9, 2020 when a national power outage was experienced following a system disturbance. This has exposed the main issue with having a central grid system that the country relies and further highlights a need for a decentralized grid system that provides power with little or no interruptions.

In the same turn, power consumption dropped in the industrial sectors. The reduced industrial activity was linked to softened demand from closure of hotels, restaurants, eateries and catering businesses. However, with the increase in the demand for essentials such as foodstuffs, sanitizer and soap, it is expected that power consumption from industrial sectors may increase<sup>9</sup>. Interestingly, at this time, investments in renewable energy have remained profitable while those

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<sup>9</sup> *Corona cuts electricity use by 14 pc, [Business Daily](#)*

in fossil fuel projects have tanked which shows that the Lamu coal plant for Kenya could be a nonworthwhile venture.

However, there is an expected redirect of funds to livelihood issues which may cause a drop in investment levels in renewable energy projects. The most affected energy source during the COVID-19 pandemic is fossil fuel which may be a blessing for a green development pathway. This is mainly because a green energy transition can then be achieved by directing the focus on exploration of renewable energy sources.

#### **1.1.2.4. Manufacturing sector**

Manufacturing is one of the key sectors within the economic pillar of *Vision 2030* and the *Big Four Agenda* with a marked contribution of 15 percent of GDP by 2030. The sector has identified the establishment of Industrial Parks (IPs) and Special Economic Zones (SEZs) as flagship projects to support economic growth. The private sector has recognized the potential that Industrial Zones (IPs, SEZs and Export Processing Zones (EPZs)) offer an enabling environment for manufacturing through well managed infrastructure that is very much lacking in the country. However, if Industrial Zones are not operated in line with strict environment standards, it will result to increased and concentrated levels of pollution from ambient air pollution, greenhouse gas emissions, and solid and liquid waste (*Saleman & Jordan, 2014*). Currently, Kenya is experiencing an explosion of un-regulated Industrial Zones across the country. If left unregulated and operate in loose environmental standards, the Industrial Zones can easily override their proven socio-economic advantages. The sector has had several policy strategies implemented to aid in its growth and expansion - *Vision 2030, Big Four Agenda, Kenya Industrial Transformation Programme (KITP), National Trade Policy, Investment Policy and Buy Kenya Build Kenya (BKBK)*. However, greening the sector is still a challenge due to high energy use, large particulate and hazardous air emissions, and the sector's slow adoption of new technologies an innovation.

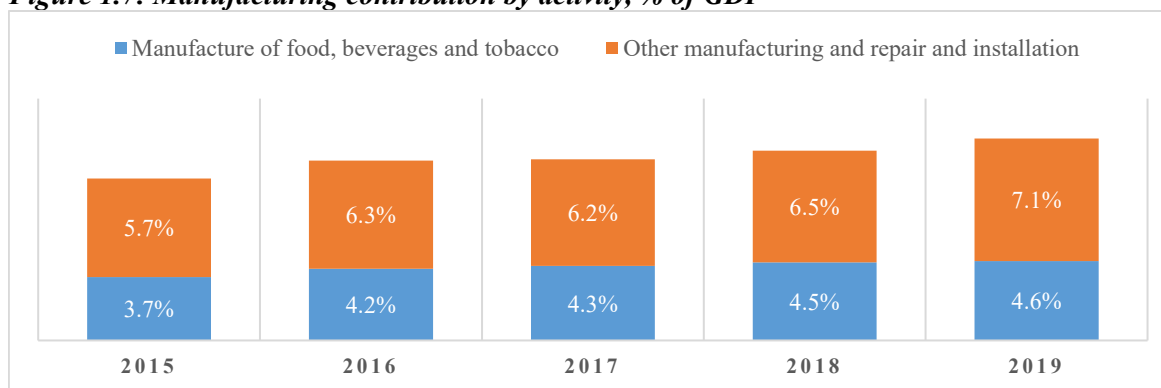
However, some business in the sector have embraced cleaner production technologies through technical assistance offered by the Kenya National Cleaner production Centre (KNPCPC). Various clean production technologies embraced include improving efficiency of production systems, reduced wastage of raw materials and energy and building technical capacities for the industries. The manufacturing sector is also a significant source of jobs especially having the highest employment multiplier over other economic sectors. If a green pathway can be adopted by the sector, coupling it with sustained growth, the county's competitiveness will increase, jobs will be created and resource use would be more efficient.

##### **1.1.2.4.1. Contribution to economic growth**

The manufacturing sector's contribution to GDP has over the years been on a declining trend from 11 percent in 2012 to 7.5 percent in 2019. It is clear that Kenya is instead deindustrializing. This is a worrying trend considering the sector is expected to contribute to 15 percent of GDP by 2022 under the *Big 4 Agenda* and *Vision 2030*. Using 2019 as a base year, Kenya has to close a gap of 7.5 percent by 2022 if the target is to be achieved (*KNBS, 2020*). The number of manufacturers in the country has grown over the years with manufacturing output expanding by 25 percent since 2015. An estimated five percent of Kenyan manufactured goods are exported (*KNBS, 2020*).



**Figure 1.7: Manufacturing contribution by activity, % of GDP**



Source: Author based on Economic Survey 2020, KNBS

#### 1.1.2.4.2. Employment status and social well being

The wage employment of the sector stands at 11 percent of the total economy, a drop from 2014 period's figure of 12 percent with employment in the private sector steadily at 91 percent of total manufacturing labor. As at 2017, informal employment in manufacturing was 2.8 million, this is about 8.2 times more than total manufacturing wage employment for the same period. This clearly outlines the reliance of the sector on the informal economy to drive its growth (KNSB, 2020).

Informal employment in the sector has been growing at 3X the rate of formal employment. However, there is an overall drop in labor productivity from an overall two percent annually to three percent since 2013 (UNIDO, 2010). This can be attributed to the sector's skill mismatch from poor linkages between training institutions and the sector.

#### 1.1.2.4.3. Investment requirements

The manufacturing sector, according to assessment of green investment opportunities in Kenya research project (Strategic Business Advisors, n.d.), requires approximately KES 10.8 billion (USD 107 million with the 2019 exchange rate of 101.3) in the long run to finance sustainability and climate change issues in the manufacturing sector. This is planned to be implemented through four key intervention areas – (i) energy efficiency and production process improvements to a tune of KES 1 billion, (ii) renewable energy with KES 1.2 billion, (iii) waste management with KES 1.5 billion (iv) agro-processing with KES 6.1 billion, and (v) product innovation with KES 1 billion.

Private financing to the manufacturing sector currently stands at 17 percent of total commercial lending. Value of credit advanced to the sector from industrial financial institutions stood at KES 1.7 billion in 2019, a 31 percent increased from 2018. This was driven largely by an increase in the number of enterprises financed by Kenya Industrial Estates Limited (KIE). KIE plays a critical role in promoting MSMEs through financing and facilitating development of enterprises (KNBS, 2020).

#### 1.1.2.4.4. COVID-19 and its implications

Interestingly, the COVID-19 pandemic has had an albeit positive effect with the local manufacturing sector, specifically the textile sub sector. This was mainly driven by adaptation following a shortage of imported protective personal equipment (PPE) for medical personnel such as masks. An example is the shift of the Kitui County Textile Center from garment

production to surgical mask production. Kenya has a limited experience in manufacturing medical supplies and has mainly relied on imports from China and foreign aid to cater for this gap. Kitui County Textile Center factory's shift to production of basic protective equipment reflects a dire need for manufactured medical supplies in the face of COVID-19 pandemic. This has also been reflected in small businesses who have shifted from garment making to mask production to cater for cloth masks demands. The center has led the country in production of surgical masks to match the standards of N95 respirators<sup>10</sup>.

In the face of respiratory challenges that the COVID-19 patients may succumb to, Kenya has a shortage of hospitals with the necessary ventilation machines for breathing support. Currently, the number stands at 259 functional ventilators across Kenya's health network, according to Dr Idris Nzao Chikophe, Secretary-General of the Kenya Critical Care Society. Despite this shortage, innovation and technology has led in development of locally made ventilators. A group of fifteen medical and engineering students at Kenyatta University have made Kenya's first homegrown ventilator to aid in respiratory challenges for patients severely affected by COVID-19. The students were provided guidance under the university's the Chandaria Business Incubation and Innovation Centre making it easier for the students' invention to meet international standards. This is a key mechanism in aiding innovation in the manufacturing sector – support from academia, research, and the private sector. As at April 25, 2020, the prototype had been tested and proved to meet all the parameters required in providing respiratory support<sup>11</sup>.

From the private sector, Toyota Kenya, an automobile assembling firm, developed a Bridge Mechanical Ventilator to be used as an emergency use resuscitator system to support patients with COVID-19 respiratory failure. The Bridge Mechanical Ventilator was made from locally sourced components that can be easily replicated to develop up to 20 ventilators per day. So far, the automobile assembler is still waiting for the necessary approvals to be able to upscale production (*Ibid*).

#### **1.1.2.5. Waste management sector**

Past inventories indicate that national average waste estimate 22,000 tons per day. Assuming an average of per capita waste generation of 0.5 kilograms for the current national population of 45 million, both rural and urban, this translates to eight million tons of waste generated annually. Past records show that out of the total waste generated, 60 to 70 percent is organic waste, 20 percent is plastic, 10 percent is paper, two percent is metal, and one percent is medical waste. There is currently no distinction between these waste categories. All the waste generated, whether from households, industries or health care institutions is referred to as municipal waste. This municipal waste is often left unsorted and contaminated in landfills. Electronic waste (e-waste) alone in Kenya averages at over 44,000 tons each year from items such as old laptops and phones (*GoK, 2019a*).

E-waste in Kenya ballooned in major cities and towns in the past decade due to the increased use of mobile phones and an expanding middle class. The majority of e-waste is recycled informally in Kenya. E-waste collector's separate plastic, motherboards, batteries and copper wire for sale and then burn the excess, which is detrimental to their health. A new bill, the draft *National E-waste Management Strategy, 2019* has recently been introduced to parliament, to aid in

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<sup>10</sup> The Kenyan factory that transformed into a surgical mask assembly line overnight, [Washington Post](#)

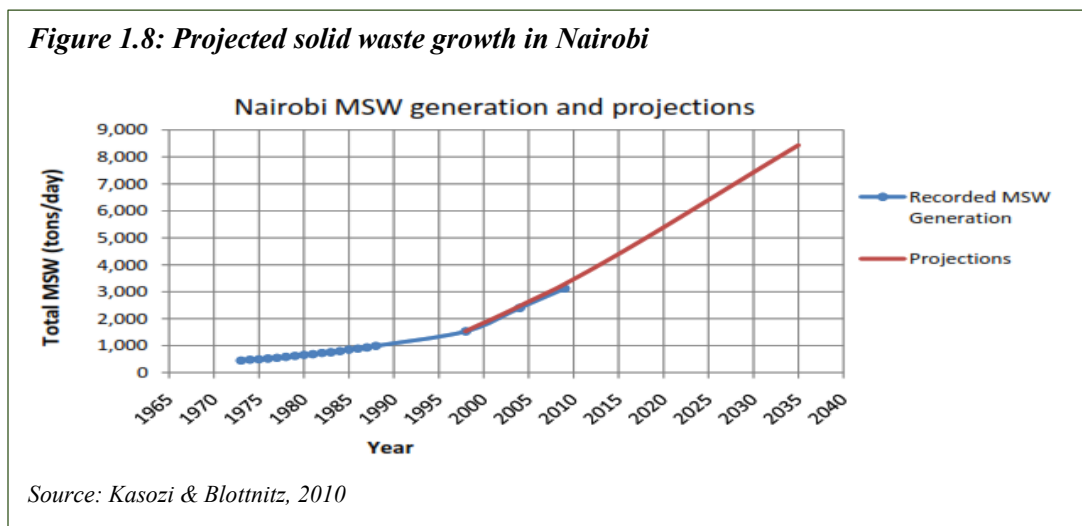
<sup>11</sup> <http://www.gearbox.co.ke/covid-19innovations>

developing new solutions through mainly having at least 10 collection centers for e-waste in each county.

The waste management sector is generally divided into two sub sectors - recycling and upcycling. With upcycling, it involves transformation of disposable or unwanted material, in this case waste, into a high value and/or quality product. The end product from upcycling is one with a higher aesthetic value and which more usage can be drawn from. It is considered an innovative way using less energy-intensive methods to achieve the cradle-to-cradle approach with a circular economy. Under recycling, waste is recovered from scrap or waste and reprocessed into useful products. Commonly, glass, paper, plastic, and metals such as aluminum and steel are usually recycled. With fruit and vegetable scraps, they are usually recycled through composting.

#### 1.1.2.5.1. Contribution to economic growth

The waste management sector’s contribution to GDP currently stands at 0.7 percent as at 2019 and has not seen much growth since 2013 where it stood at 0.9 percent. (KNBS, 2020a). Waste has historically been viewed from an urban area perspective with Nairobi, Mombasa, Kisumu and Nakuru as some of the cities where data has been attempted to be collected. Waste growth is a factor of population and economic growth hence its perception from urban centers that see a high population growth. In Nairobi, the municipal solid waste (MSW) has been on an upward growth with latest data placing MSW at 3,462 tons per day in 2010 with a projected increase to 7,427 tons per day in 2030 (Kasozi & Blottnitz, 2010).



#### 1.1.2.5.2. Employment status and social well being

The wage employment of the sector is relatively steady at one percent of the total economy with a peak from 0.4 percent in 2014. The employment in the private sector is approximately 13 percent of total waste management labor. This is because of the informal nature of the sector’s private businesses and the majority of the waste pickers, where the bulk of employment features. More so, these informal waste pickers are grossly underpaid and work under dangerous conditions without much, if any, legal protection, health or safety equipment. The lack of training and learning opportunities make innovations and improvement difficult.

#### 1.1.2.5.3. Investment requirements

The waste management sector, based on the National Solid Waste Management Strategy 2014 requires approximately KES 1.85 billion to transition the country to Zero Waste Principles. This

is planned to be implemented through five objectives – (i) KES 60 million to formulate policies, legislations and economic instruments to reduce waste quantities, (ii) KES 205 million to inculcate responsible public behavior on waste management, (iii) KES 180 million to promote waste segregation at source depending on the county’s waste levels, (iv) KES 5 million to promote resource recovery for materials and energy generation (*local and foreign investor contribution not recorded*), and (v) KES 1.4 billion to establish environmentally sound infrastructure and systems for waste management.

#### 1.1.2.5.4. COVID-19 and its implications

Proper waste management facilities and treatment at household, medical and commercial levels have never been more important. This is due to the secondary virus effects that may evolve with improper waste disposal. Nearly all the population is using masks on a daily basis which are disposed by households in their waste bins. With little segregation of waste at source in Kenya, this implies that these masks are being disposed with all other waste – organic, glass, plastic, etc. This can expose waste collectors to health problems if they come across an infected person’s mask and also lead to unscrupulous behavior such as re-use of disposed masks. This is even dire in the case of health facilities disposal of PPEs.

Both the National Environment Management Authority (NEMA) and Ministry of Health have called for proper disposal of masks and PPEs to avoid secondary spread of COVID-19. The Ministry of Health published an Infection Prevention and Control Recommendations for Coronavirus Disease 2019 (COVID-19) in Health Care Settings (*GoK, 2020a*) with a section on guidance for medical waste management. The recommendation calls for waste segregation, labelling and treatment methods such as autoclaving, incineration, chemical disinfection, grinding/ shredding/disinfection methods.

Unfortunately, there have been no such directives for households and commercial areas on segregation and disposal of PPEs such as masks and gloves. This can be an area of intervention that NEMA can take advantage of to implement good waste management practices such as segregation at source, guidelines for waste collection centers such as labelling of waste, and disposal methods for various waste categories.

### 1.1.3. Green growth and job creation as a response to the development challenges

#### 1.1.3.1. Concept of green growth

A green economy as defined by UNEP is one that results in “*improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities*”. Basically, a green economy is one that is low carbon, resource efficient and socially inclusive. This further expounds the concept of green growth as development that *fosters economic growth and development by ensuring natural resources endure to provide the resources and environmental services from which our well-being relies*. The focus of green growth strategies is ensuring that natural resources are able to deliver their full economic potential on a sustainable basis. Thus, the concept of green growth amounts to environmentally-sound and resource-efficient growth.

The study used a green growth concept of **environmentally-sound and resource-efficient growth**.

#### 1.1.3.2. Concept of green jobs

Green jobs are usually defined from both an environmental and social aspect. The environmental aspect defines green jobs as jobs that reduce the consumption of energy and raw materials, limit

greenhouse gas emissions, reduce waste and pollution, protect and restore ecosystems and enable businesses and communities to adapt to climate change (UNEP, 2008). The social aspect defines green jobs as jobs that are decent as defined by ILO - “opportunities for work that is productive and delivers a fair income, security in the workplace and social protection for families, better prospects for personal development and social integration, freedom for people to express their concerns, organize and participate in the decisions that affect their lives and equality of opportunity and treatment for all women and men”.

Green jobs can also be defined from a **process** and **output** approach. In an **output approach**, jobs are green if they exist in businesses that produce green products and services that benefit the environment and/or conserve natural resources. This definition then clusters green jobs in six areas; (a) jobs from the energy sector that focuses on renewable sources, (b) jobs that manufacture energy-efficiency equipment, appliances, buildings and vehicles, (c) jobs that produce goods and services that improve energy efficiency of buildings and efficiency of energy storage and distribution, (d) jobs that promote pollution reduction and removal, greenhouse gas reduction, and recycling and reuse, (e) jobs that contribute to organic agriculture, sustainable forestry and soil, water, and wildlife conservation, and (f) jobs that develop green technology and practices whether through government and regulatory administration, education, training, and advocacy. In a **process approach**, jobs are green if they research, develop, maintain, or use technologies and practices that impact their establishment’s ability to make progress in one or more of the first five categories (a) to (e). Hence these green jobs are jobs where the workers’ duties involve making their establishment’s production processes more environmentally friendly and/or ensuring that they use fewer natural resources.

The study used the green jobs concept from **ILO’s environmental aspect and output approach**.

### **1.1.3.3. Concept of green investment**

Transitioning to green growth pathways requires significant finance and investment and more importantly, a major shift and scale up in the way both the public and private sectors invest. A study by the National Climate Change Action Plan in 2013 estimated that KES 1.8 trillion (USD 19 billion) is required to support climate change mitigation actions in Kenya leading up to the realization of *Vision 2030 (GoK, 2018a)*. The top three-climate change mitigation actions investment allocation is in restoration of forests on degraded lands followed by geothermal energy generation and reforestation of degraded forests. The least allocation is in mainstreaming of low-carbon development options into planning. Other climate change mitigation actions prioritized for the investment are improved cook stoves and LPG cook stoves, agroforestry, bus rapid transit and light rail corridors, development of greenhouse gas inventory and improvement of emissions data, and measuring, reporting and monitoring forestry emissions and sinks.

Under the third medium-term plan (MTPIII), a total of KES 4.5 trillion is required to finance the term’s indicative budget with KES 430 million being allocated for climate financing through the Green Climate Fund (GCF) and KES 4.1 billion dedicated to transition to a green economy with green technologies and projects. Sixty percent of the required funds is expected to finance both public and private entities through the GCF by 2022. An investment volume of KES 15 billion is expected to be realized through at least 40 percent of all financial service providers (FSPs). From this, GoK expects to have realized 1,200 green jobs by the end of MTPIII (*GoK, 2018d*).

The study used a green investment concept of **finance and/or investment needed to advance green growth and job creation**.

#### **1.1.4. The private sector context in the country**

The private sector in Kenya is well established and sizable by sub-Saharan region standards. It plays a key part in the economy and one can draw a parallel line between the private sector and the health of the Kenyan economy. Despite its continuous growth over the years, the private sector is limited by infrastructure, security, regulatory and political challenges. Its structure is largely split between informal and formal sector. The formal sector is sizeable and benefits from its size to be a healthy and productive private sector. However, the informal private sector<sup>12</sup> is not discernable hence does not gather much support. Despite the formal private producing the larger part of economic output, the informal sector employs most of the population - 83.6 percent of the labor force in the country but its contribution to GDP is difficult to capture (*KNBS, 2017*).

The formal private sector is diversified across all three economic activities<sup>13</sup>. However, exports are largely dominated under the primary economic activity, agriculture, by a few international companies with little value addition to the agricultural products. Eighty percent of the formal private sector contributes to GDP via agriculture, manufacturing, trade, tourism - hotels and restaurants, transport and communication, and financial services sectors. Trade, ICT, transport and financial services, drive the growth in the private sector (*AfDB, 2013*).

Domestic companies own most of the private sector. It does not benefit from much FDI unlike its neighboring countries. However, from recent discoveries of oil under the mining sector, there is expectation that it may benefit from FDI in the future. The sector faces stability changes from its politically charged environment. Political instability has caused the private sector uncertainty in its operations and inconsistent growth. It is also exposed to shocks from agriculture supply, tourism demand, and import fluctuations driven by fuel imports.

The private sector is a significant contributor to economic growth particularly in the four focus sectors of the study. However, internal infrastructure challenges impede the sector from reaching its full potential.

##### **1.1.4.1. Focus on Micro, Small and Medium Enterprises (MSMEs)**

There is no substantial record of Small and Medium Enterprises (SMEs) in Kenya. According to an economic survey report by KNBS in 2017, there exists 1.56 million licensed MSMEs<sup>14</sup> in the country and about 5.85 million unlicensed businesses. A common consensus is that the sector plays a key role in economic development and job creation with most jobs created in the economy attribute to SMEs. SMEs are largely informal with estimates placing the MSMEs at about 7.5 million enterprises that contribute about 34 percent of the GDP in the economy and employing 15 million Kenyans. The informal sector in Kenya comprises of 98 percent of business in Kenya that contribute 80 percent of jobs and three percent of the GDP in the Kenyan economy (*KNBS, 2017*). MSMEs operate under the Micro and Small Enterprise Act of 2012 that provides new rules and institutions to support micro and small businesses in Kenya through

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<sup>12</sup> This covers non-primary activities as per the ILO definition of an informal sector - *a group of production units comprised of unincorporated enterprises owned by households, including informal own-account enterprises and enterprises of informal employers (typically small and non-registered enterprises)*.

<sup>13</sup> Refers to primary, secondary and tertiary economic activities

<sup>14</sup> MSMEs refer to businesses in Kenya that have a maximum annual turnover of KES 500,000 and employ less than 10 people.

promotion, development and regulation of MSMEs. An example of such institutions is the Micro and Small Enterprise Authority within the Ministry of Industrialization and Trade.

Looking at the jobs they create, MSMEs can play a key role in green growth. This can be achieved by employing their innovative approaches to operations and value chains, stimulating economic diversification, transformation and growth. By adopting green business practices, and providing products and services through sustainable value chains, MSMEs can help in driving green growth and job creation. However, greening measures may affect MSMEs' performance both positively and negatively. From a positive aspect, MSME's can tap into the niche green market by going green and increase their market share and profits. By being eco-friendly, they can reduce their costs of operation through use of recycled materials and enhanced operation efficiency. On the negative side, greening MSME's creates an extra burden over their existing challenges in accessing to finance, accessing markets and product development and innovation. More so, their businesses will attract additional costs associated with investment in technology, compliance with regulation, and innovation. Despite these costs, which vary by sector and could end up being insignificant as compared to potential benefits, there is still a challenge of accessing green investments and absorbing green costs of which most of them are associated with sunken businesses costs. More so, adapting green measures will require skills and technological understanding of green operations and value chains that MSMEs often lack due to their traditional approach to businesses and limited technological understanding.

#### ***1.1.4.2. Green development challenges for the private sector***

The private sector faces several challenges, depending on its size and the industry it operates in, from transforming their businesses to sustaining the environment from which they derive much of their needed resources for production. These challenges, which are largely driven by climate change, pollution and environmental degradation, will affect how private sector conduct their operations and develop their value chains. There is a need to shift to green operations and value chains that sustain the environment especially given the compounding nature of business - operations, employees, suppliers, and current or future customers. More so, if businesses want to sustain their profits, they must adapt to the changing environment by adopting the six principles of a green economy under GESIP. These challenges can be summarized as:

##### Developing a new way to do business

Most businesses are making a conscious effort to protect their resource base and have positive relations with the community the business operates in. To address the environmental challenges that businesses are increasingly facing in protecting their resource base, most businesses are reviewing their value chains to be more efficient and integrating a reverse supply chain. This implies dissecting their value chains and seeking out activities that can be greened which in turn may lead to a change in their business models. By employing such measures, private enterprises can manage business and investment risks ensuring sustainable growth of their business. The stability of the private sector also depends on the physical risks it can bear from property damages and trade disruption caused by climate change, liability risks it can reduce from following a low carbon development pathway and transition risks expected from policy and regulation as a result to a shift to a green economy (*Carney, 2015*).

##### Reducing resource use

As stated earlier, the current norm of doing business cannot sustain the private sector in the future. There is a need to adopt the six principles outlined under GESIP into their operations. A major challenge, and an opportunity, is in reducing the resources used in their production

activities. This will require streamlined production centers operating at increased efficiency and competitiveness. The need for innovation and new inclusive green business models has never been as important as it is today. The private sector aims to be profitable for many years and decades to come but if they do not develop new or improve existing products and services or diversify their business streams by incorporating green activities and principles, then they will not achieve their targets. It has been proven that green sectors have higher-than-average growth rates with a good example from green (renewable) energy sector that has the highest global compounded annual growth rates (CAGR) in revenues (*NYU Stern, 2017*).

### Restructuring finance

According to a survey carried out on enterprises by the World Bank between 2010 and 2017 in developing countries, access to finance was the primary barrier for business development (*World Bank, 2017*). This even worsens the financial constraints expected if a business follows a green development pathway. The private sector is still hesitant to invest in green business mainly due to failure to understand a green business case, the rigid risk assessment criteria followed by local financing institutions and a lack of proven green business models. This is where development partners (DPs) can come in by stimulating the demand for green technologies and increase the capital available for the private sector to invest in green businesses. This can either be through direct financing such as grants, risk sharing instruments like guarantees or providing medium to long-term finance to cover the long payback periods of most green ventures.

### Raising awareness

Despite being a source of innovation and new technologies, the private sector, for the most part being SMEs, do not have the knowledge or lack the capacity to address environmental challenges in their business. The private sector can harness this challenge as an opportunity to create a knowledge hub that SMEs can access to understand the benefits, they can gain from adopting green activities. This will help to hedge against risks from environmental impacts that ensures sustained growth to the private sector.

### Linking the informal economy to the formal economy

The formal-informal duality of the country's private sector can dampen green growth and job creation if not resolved. On the one hand, the formal economy produces the bulk of the GDP but the informal economy is the one that employs the larger share of the population. This duality presents a unique case where the formal economy can be used to drive green growth while the informal economy to drive creation of green jobs. However, this dualistic nature needs to be resolved to further catapult the private sector potential. To generate the needed green productivity in the private sector, the informal economy needs to be transformed from low to high value-added activities through capital and technology linkages and access to new market opportunities.

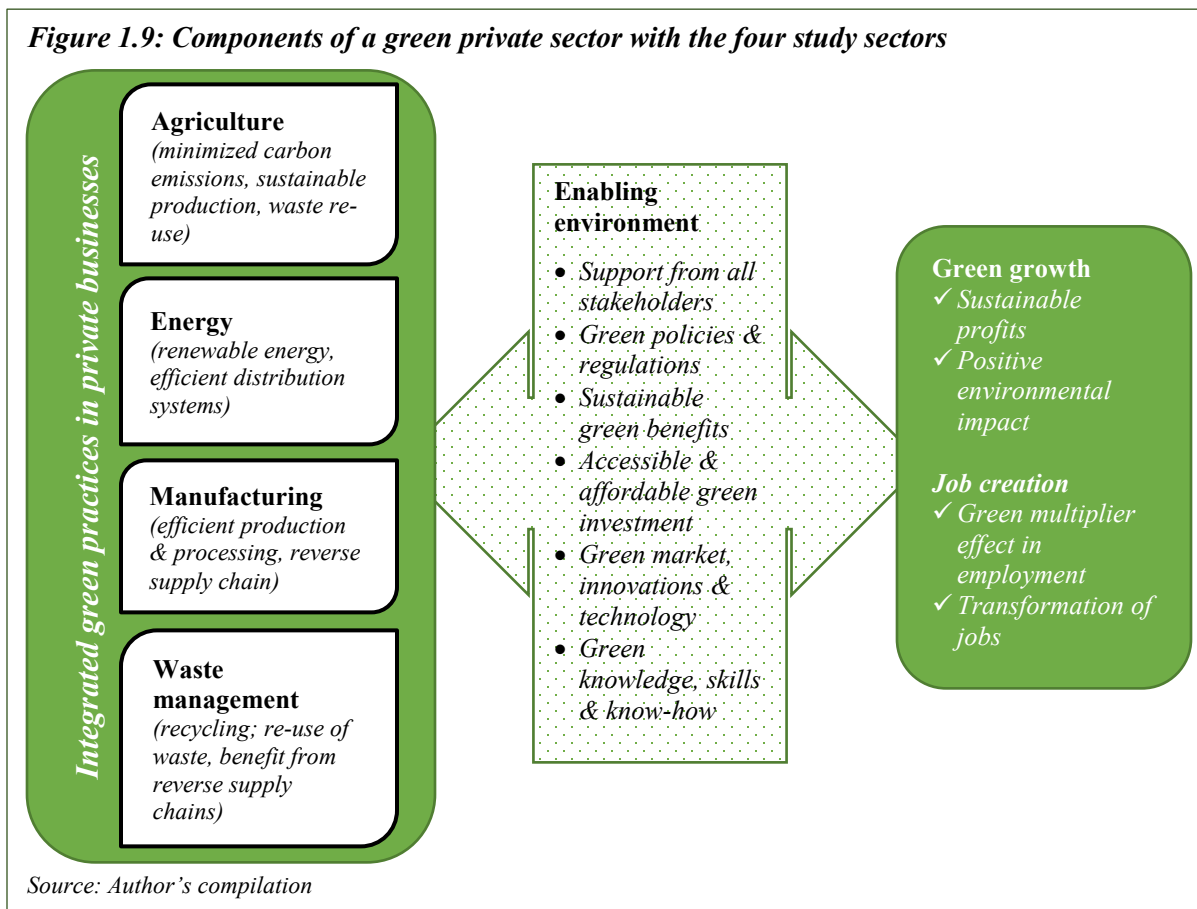
## **1.2. Conceptual framework**

The premise of the study is that in order to achieve green growth and job creation, the private sector is fundamental in this goal. The concept of a 'greened' private sector is catalytic and will have multiple benefits to the economy, environment and society. Accordingly, greening the private sector implies harnessing and scaling up green value chains. This can be achieved by improving and/or developing a green value chain by integrating environmental standards along the entire chain by optimizing links between actors. Development of green value chains requires promotion of green investment and opportunities in areas where the economic benefits from the use of limited and renewable resources are maximized and environmental harm is minimized.



Focusing on the select sectors for this study, agribusiness need to adjust their entire chain to green aspects; energy need to focus on upscaling renewable energy sources; manufacturing business need to adopt a circular approach in their production processes and drive reverse supply chains; and waste management need to be assimilated to all sectors of the economy via recycling instruments. A mix of policy instruments, including eco-labelling, green public procurement, green cluster networks, environmental taxes, tradable permits, subsidy reform, green regulations, and standards will create an enabling environment for this.

As shown in figure 1.9, there are multiple opportunities to green the private sector throughout the value chain in the four focus sectors.



### 1.3. Purpose and objectives of the study

The study is intended to generate and provide an evidence and knowledge base to inform and orient private sector decision making and investments and influence the design, and implementation of public policies, programmes and other interventions to upscale private green investments that can generate green growth while creating decent employment.

The overall objective of the study is to strengthen measures and conditions to expand private sector investment that will increase green growth while creating jobs.

The specific objectives of the study are to:

- i. Strengthen national strategies to expand private sector investment that will increase green growth while creating jobs,

- ii. Increase knowledge and appreciation of the benefits and opportunities for private sector to invest in green business and increased ability of the private sector to seize business opportunities offered by green growth pathways in selected sectors,
- iii. Strengthen knowledge, skills and overall capacity of the private sector to identify design and expand investment in green business thereby contributing to green growth and job creation,
- iv. Strengthen knowledge and capacity of the policy makers to design and implement policies and incentives for private green business to drive growth and employment. In this regard the study will contribute to strengthening the capacity of member States to develop, reform and implement their green economy frameworks and nationally determined contributions (NDCs), and
- v. Strengthen platforms or networks to increase peer learning and collaboration among the private sector and between the private sector and governments.

The study will build on the work of partners and other organisation in the related fields. It will build on and complement ECA's work particularly on greening industrialization, greening value chains and private sector development. The study will generate, and package action-oriented knowledge products thus contributing to ECA's strategic direction of fostering local responses and adapting global solutions to the continent's problems. Moreover, the study is premised on the importance of and need for innovative solutions and approaches to increasing growth and job creation thus aligning with the ECA's strategic focus on articulating policy options to accelerate economic diversification and job creation in the region.

The study will make substantial contributions to the achievement of many continental and global development goals and targets including those set out in Africa's Agenda 2063, the 2030 Agenda for Sustainable Development and the Paris Agreement on Climate Change. The study will contribute particularly to the achievement of SDGs 2, 7, 8, 9, 12, 13, 14 and 15 and the corresponding goals of Agenda 2063 and nationally determined contributions under the Paris Agreement.

### **1.3.1. Scope of the study**

The study will focus on the potential to upscale green business investment in the four focus sectors including agriculture, energy, manufacturing and waste management. These sectors underpin growth in Kenya and also offer huge opportunities for private sector investment. Yet investments in these sectors has always come with a high environment foot print. Therefore, steering investments to green business will have substantial green growth and employment outcomes.

## **1.4. Methodology**

The study was conducted under the overall responsibility of the ECA Addis Ababa Office. It presents an in-depth study using a mixed method approach where both qualitative and quantitative information was collected and analysed throughout the process. The study was also participatory with the Ministry of Environment and Forestry being kept abreast of the developments of the study. Interviews were conducted over two and a half months using a set of evaluation questions presented in the inception report to triangulate the responses with the interview findings.

The study was an independent exercise with one consultant based in Kenya with support from the study team from ECA Addis Ababa office who contributed on any logistic and/or

methodological issues to properly conduct the assessment in as independent way as possible, given the circumstances and resources provided.

In this study, the consultant focused on the following key actors in the four sectors being examined: financiers, government coordinating agencies, NGOs, private sector representatives and business associations, research institutions, financial institutions, and other stakeholders. A group of stakeholders identified from the inception report were approached with a request for interviews. A total of 104 stakeholders were contacted via email and telephone. The sampling used was convenience sampling that was based on convenient accessibility and proximity to the consultant was used (*Robinson, 2011*). No criteria other than a quota for gender, a balance between females and male, was used for sampling. Thirty-five stakeholders agreed to be interviewed for this study, see Annex 2 for the socio-demographic characteristics of interview participants. The interviews were conducted and none of the interviewees reported any conflict of interest. No compensation was provided for the interviewees.

The study used four study methods to understand and assess the objectives, including – desk-based review of related documents; context analysis of study findings and interviews; descriptive analysis of green growth and jobs methodologies, and case study analysis on the four focus sectors of the study. An overview of the study methods is provided in Table 1.4 below.

**Table 1.4: Study Methods**

Activity	Description
<b>Desk based review</b>	Reading of related green economy, growth, investments and jobs documents to situate the country and sectoral contexts.  See Annex 1 for the list of green-growth oriented national frameworks.
<b>Individual Interviews (context analysis)</b>	Exploration and analysis of the factors and measures needed to strengthen private sector role in agriculture, energy, manufacturing and waste management to unlock green growth and job creation.  A guiding questionnaire and semi-structural interview guide were developed and tailored for the target sectors.
<b>Descriptive analysis</b>	Use of green growth and green jobs methodology to estimate sectorial green contribution and multiplier effect.  See Annex 4 for the results.
<b>Case Study analysis</b>	Used to show a multi-dimensional perspective of various approaches private sector have undertaken to implement green practices.
<i>Source: Author's compilation</i>	

Study findings and conclusions are based on sound evidence and analysis documented in this report. Information collected is triangulated, verified from different sources, to the greatest extent possible. Analysis leading to evaluative judgments is clearly spelled out.

### 1.4.1. Sampling

There were two stages of sample selection in the study. At the first stage, primary sampling unit clusters were selected based on the four sectors reviewed in the study. The primary sampling unit clusters were categorized according to six stakeholder groups – financiers, financial institution, government agencies, private sector, research institutions and academia, and NGO's and DPs. At the second stage, the stakeholders were selected for the interviews, using a systematic sampling

method. Wherever possible, the senior most personnel were the respondent. In the absence of the senior most personnel, the next senior personnel were interviewed.

### **1.5. Limitations of the Study**

The study faced a number of limitations. Firstly, the timing of the study, at the beginning of the year, was not an ideal time to set up interviews with various stakeholders. This can be attributed to the fact that the sample of stakeholders required to be senior people at their organizations whose annual leave usually falls in the beginning of the year. More so, for the private sector, most businesses annual plans were under final review which made it difficult to slot time for the interviews. Also, due to their seniority level, most respondents had busy schedules that could not allow one to lock them in for an interview.

Secondly, the study, for the most part, depended on primary data from questionnaires and interviews. It was not possible to get in depth information on some issues that could have been followed up with another interview. The responses are therefore right to the extent of the information provided by the respondents.

Thirdly, the study had expected to carry out focus group meetings which were not possible due to low response rate from the sector businesses associations. The business associations would be the ideal stakeholder to facilitate a focus group meeting to be conducted from their members list.

Fourthly, following the emergent COVID-19 pandemic, interviews with five respondents were not able to be conducted due to logistic reasons.

### **1.6. Structure of report**

The structure of the report is as follows:

- Chapter 1 provides background information and context of the study, presents the analytical framework of the study, describes the purpose and objectives of the study, and methodology and study limitations. The section also outlines the development context of the four focus sectors by exploring their contribution to GDP, employment and social well-being, investment needs and their links to other sectors in the economy.
- Chapter 2 presents the findings of the study based on primary and secondary data. This was done by identifying, presenting and analysing private sector green investments/businesses in four ways - existing and potential private sector green investments/businesses, job creation, green growth and environmental outcomes, scalability and good practices. A nexus across the four focus sectors was also presented in this chapter.
- Chapter 3 concludes with conclusions and recommendations based on the study findings.

## **2.0. CHAPTER 2: Analysis of the status and potential of private sector-led green business that creates jobs in selected sectors**

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### **2.1. Introduction**

The findings consist of collected data from desk reviews, interview notes, and questionnaire responses. The main recurring themes and concepts in the data were guided by the study's purpose and objectives. All respondents articulated their views using a variety of discussions and narratives, drawing upon their experience, beliefs, views, and observations. Drawing from the questionnaire and interview findings, it is evident that respondents possessed some degree of awareness of green growth and its application in their sectors. Most acknowledged the role of the private sector as a driver in achieving a green economy in Kenya. Despite their concern on the lack of a clear green direction, most respondents believed that the potential can mainly be achieved through increased awareness of what a green economy is and its translation across sectors, an enabling green environment with a bias towards policy processes and investments, and a shift from the traditional understanding of job creation.

### **2.2. General status and trends in private sector green investments and businesses**

The green landscape of the private sector in Kenya is generally not widely adopted. This is attributed to the lack of know-how of what a green enterprise is. A green enterprise or business is defined in this study as a *“profitable business activity that is low carbon, climate resilient, and contributes to efficient use of natural resources, reduces or eliminates waste and pollution or contributes increased availability, quality, or productivity of water, forests, land and other natural assets”*. Unfortunately, it is rare to find a company that completely encompasses this definition. During the interviews, it was found that most businesses integrate several green principles in their business but do not wholly adopt what it entails to be a green business. 82 percent of the respondents acknowledged practice of green activities while 80 percent agreed that green business activities are better than ‘non-green’ business activities. This is because they equally find green activities to increase their productivity through cost reductions and conserve the environment the business is in. This in turn bolsters their reputation in the community and are aligned to environmental compliance guidelines. Other reasons the respondents found green activities to be better is because of quick wins from applying a green business model and price premium a business attracts from offering green products and/or services. However, the respondents cautioned on that generally, there is as much as there is a correlation between green economic activities and sustainability, some green activities can be ecologically harmful to the eco-system.

Most business are quite nascent to adoption of green activities quite with the earliest start date for integrating green activities being late 2000s. An interesting finding was that most businesses use the term sustainable business<sup>15</sup> over a green business and equate these two terms to mean the same thing. The lack of the use of the green business terminology could also be due to the lack of knowledge of the country's GESIP framework for a green economy and green growth plans in the businesses. However, a couple of the businesses do have environmental and social

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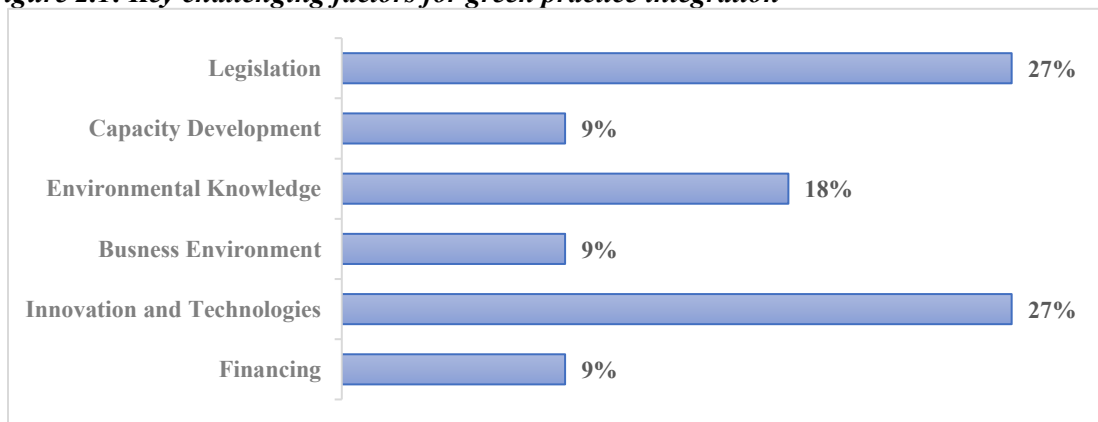
<sup>15</sup> Sustainable business is defined by *an enterprise that has minimal negative impact, or potentially a positive effect, on the global or local environment, community, society, or economy—a business that strives to meet the triple bottom line.*

governance principles in place that are updated when need be with others, especially from manufacturing, which have regular annual environmental impact assessments (EIAs).

From an operations perspective, 80 percent of the respondents noted that their business model is still viable in a green economy which matches their understanding of what green growth is “*economic growth that entails increased and efficient production and competitiveness while at the same time ensuring climate resilience and maintenance or increase in the quality, quantity and productivity of natural assets*” – 80 percent. More so, 89 percent of the respondents noted that their value chains had improved from integration of green practices.

Generally, green practices have not been widely adopted by the private sector. Overall, there was an average of 42 percent adoption of green practices financed by a marginal investment of less than five percent of the total financing for private businesses. Most business had less than 5 green activities in their value chain. The few green activities witnessed in private businesses is driven by challenges from legislation due to changing political leadership and capabilities and innovation and technologies that are expensive to procure and largely unavailable from the local market. This was followed closely by environmental knowledge from a lack of access of technical support around green practice integration. The fourth key challenge tied between financing from the high sunk costs associated with green practice integration with limited financial resources available, capacity development, and business environment from a lack of local green tools, business case measurements and verification procedures. The respondents did not find supply in obtaining green technological information and inputs as a key challenge in integration of green practices – figure 2.1 shows this.

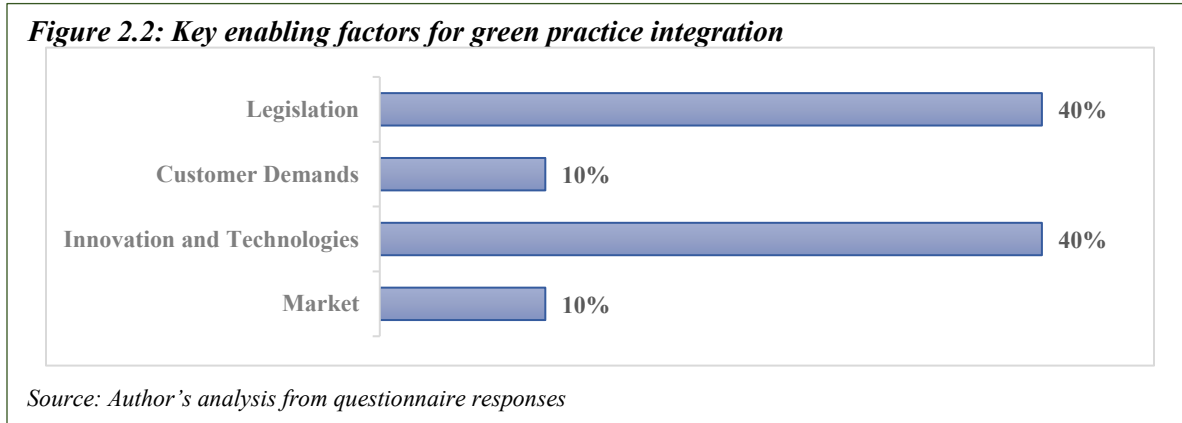
**Figure 2.1: Key challenging factors for green practice integration**



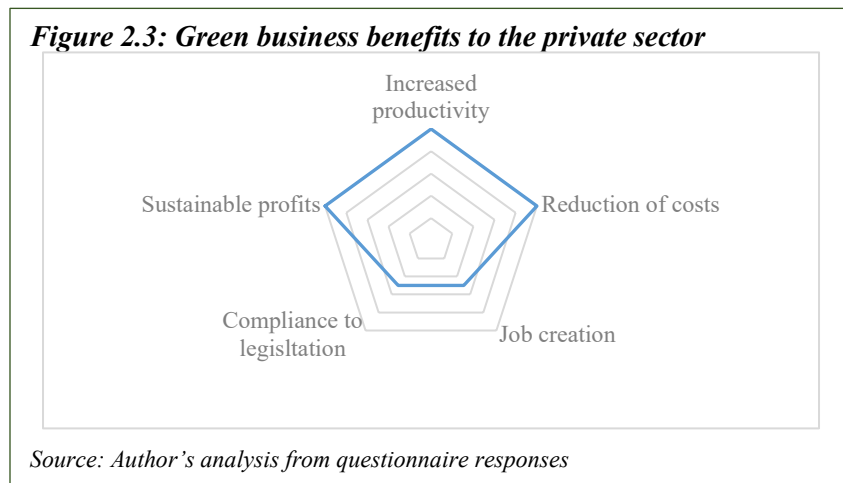
Source: Author's analysis from questionnaire responses

Interestingly, the key challenges stated above were also stated as key enablers for green practice integration - legislation that supports green practice integration and innovation and technologies such as heat recovery systems and use of green energy to power production processes. This is followed closely by customer demands of green products and/or services and a market that offers a premium price for green products and/or services. A notable non-enabling factor for green practices integration was financing which is not readily accessible and is expensive from the local credit facilities, business environment from having a non-level playing field for the business with other businesses having a higher competitive advantage over others from economies of scale, capacity development due to a lack of availability of comprehensive training

and education on green practices, and environmental knowledge that is not readily available – figure 2.2. illustrates this.

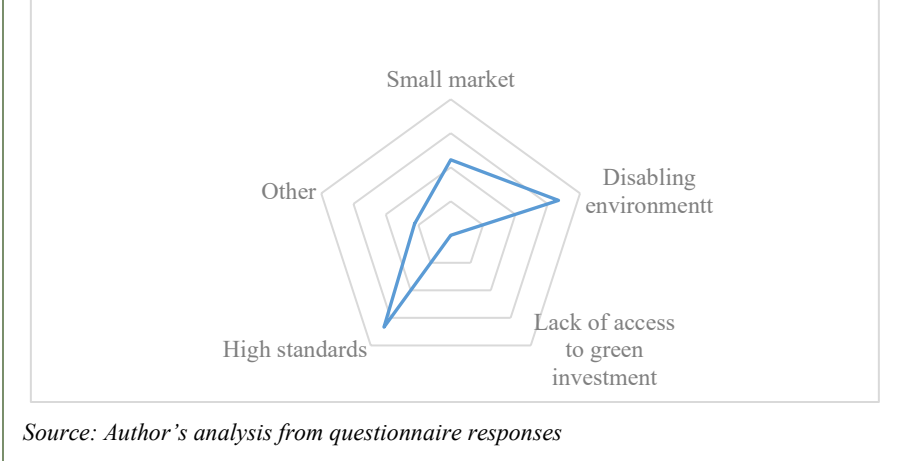


Awareness of green business benefits were mostly accessed, by all four focus sector respondents, from a self-interest perspective with business owners researching on the benefits of integrating green practices in their value chains – 57 percent. This is followed closely by business associations – 22 percent and other avenues such as workshops or training programs – 22 percent, as a source of green benefit awareness. Three business benefits from integration of green practices were identified – increased productivity, reduction of costs and sustainable profits.



Comparing to disadvantages, the key business disadvantage was identified – high market and compliance standards associated from integrating green practices and a disabling environment born from a lack of supportive policies in driving private sector adoption of green practices. – figure 2.4. illustrates this.

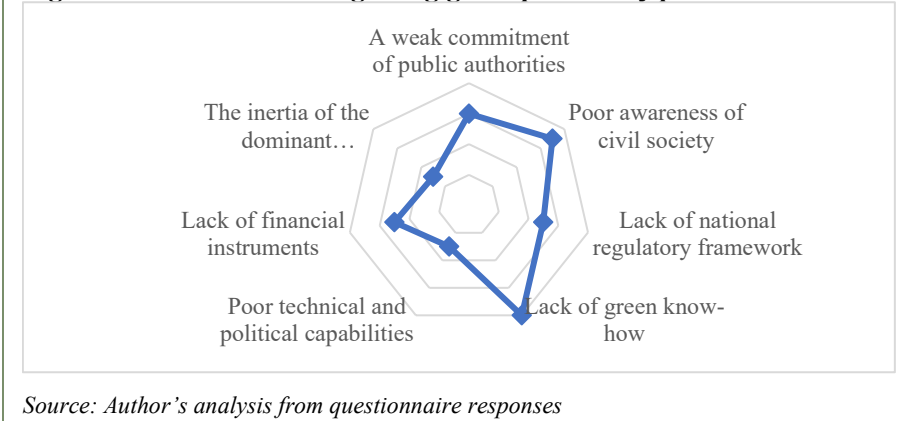
**Figure 2.4: Green business disadvantages to the private sector**



### 2.2.1. Barriers and enablers for private investments/businesses

The top three main barriers for the private sector in advancement of green practice integration were mainly seen as lack of green know-how at 22 percent, poor awareness by the civil society at 19 percent and a weak commitment by public authorities at 16 percent – figure 2.5. The lack of green know-how is driven largely by the lack of both green knowledge and its application in the various sectors. The respondents stated that they are few green practitioners, especially in the agriculture and manufacturing sectors, who have been trained and have knowledge on how to integrate green practices in a business. Poor awareness by both producers and consumers, and the civil society as a whole, on what green practices are in their respective sectors hinders private green business from flourishing in their production of green products and services. Without an understanding of what a green product and service is and why it is being sold at a premium price, makes it difficult for a private green business to operate. The weak commitment by public authorities is seen majorly as government is not a regular consumer of green products and services which in turn make private green business face challenges when selling their services. This is tied into the lack of a national regulatory framework that respondents found establishing a green procurement framework as the solution to the barrier. More so, a lack of financial instruments, both fiscal and from financial institutions, have made it difficult in operating a private green business. Without a financial support, especially one that is green related, then the business operation is hindered from succeeding.

**Figure 2.5: Barriers in integrating green practice by private sector**

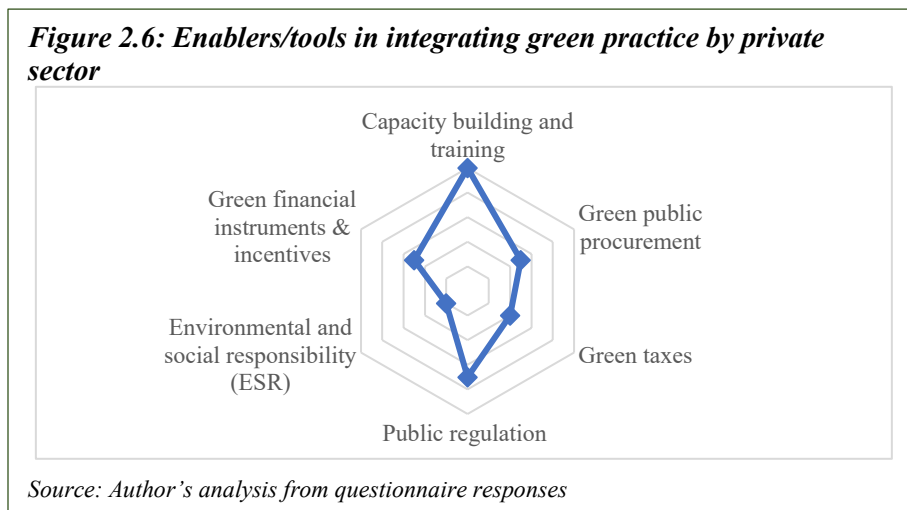




The top three main tools and/or enablers for the private sector in their advancement of green practice integration were mainly seen as capacity building at 30 percent, public regulation at 21 percent and green public procurement and green financial instruments and incentives each at 15 percent. In capacity building, by having education institutions and training facilities offering green related curriculum can go a long way in having a ready labor force that has the necessary green-related expertise. One notable green related capacity building enabler is seen with the manufacturing sector with the Kenya National Cleaner Production Centre (KNCPC) that offers courses and training on clean development mechanisms and with the energy sector with the Strathmore Energy Research Centre (SERC) and Institute of Energy Studies & Research (IESR) offering renewable energy courses and training.

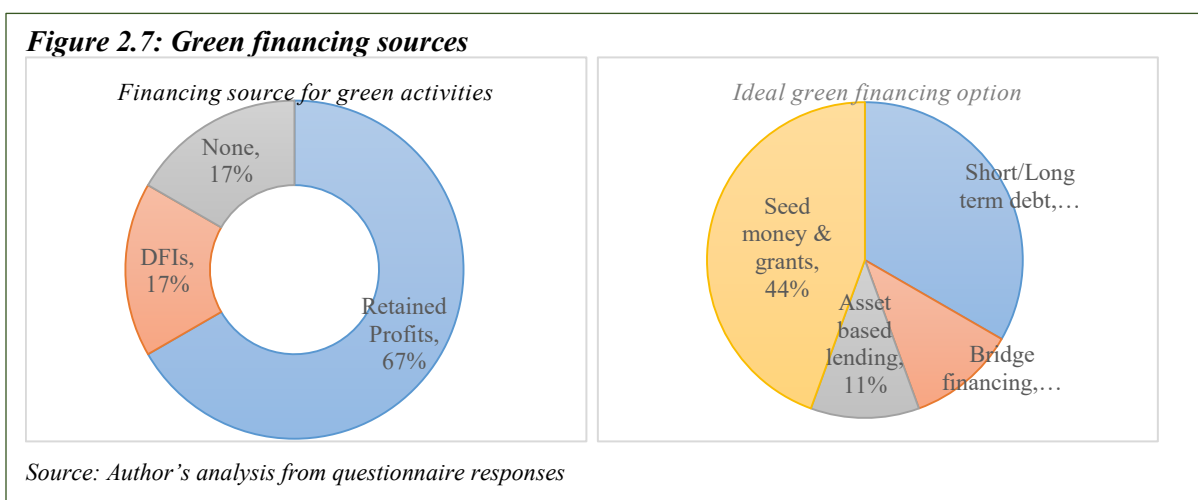
Under public regulation, the respondents called for an alignment of existing frameworks to green related principles, in this case, GESIP, to ensure that the sectorial public frameworks have integrated green aspects in their goals and milestones. This will ensure any public-private partnerships (PPPs) and funds set aside for the sector can be tapped into by private green businesses. One such public regulation that can enable an increase in green investments is the pending bill on exempting tax on green bonds that will crowd in more than KES 500 billion worth of private sector investment and create more than 500,000 jobs (*Daily Nation, n.d.*)

Green taxes, financial instruments and incentives can be used as tools to promote and hasten adoption of green practices with the private sector. Currently, Kenya offers a limited number of these tools such as an environmental tax - excise duty payable on polythene bags and VAT exemption of sealed tanks made of plastic used to produce biogas to promote green energy. More so, a green public procurement framework can also go a long way in setting up government as a buyer of green products and services thus promoting private green businesses. Unfortunately, Kenya does not have such a framework in place.



Focusing on financing, most of the respondents agreed that green financing sources are not known and they have rarely, if not, accessed green financing options. Most of the respondents noted that financing for their green activities was sourced from retained profits – 67 percent while others had accessed financing from development financial institutions (DFIs) – 17 percent. A notable missing green financing source for most businesses were local credit institutions, shareholders, and government loans. However, when asked what their ideal green financing option would be, most of the respondents pointed out seed money and grants as the ideal option –

44 percent, followed closely by short and/or long-term debt from local credit institutions – 33 percent. Other options were bridge financing and asset-based lending, both at 11 percent – figure 2.7. showcases this.



Finally, most of the respondents agreed that a green economy is a key to unlock their sector's growth.

## 2.2.2. Cross-cutting enabling environment

For the private sector to drive green growth and job creation, and thus promote a green economy, there is a need to have an enabling environment for them to do so. The enabling environment will mainly be driven by regulations and standards, institutional arrangements, policy processes, financing and fiscal policy instruments. This section provides an overview of cross-cutting issues to be considered to promote an enabling environment for the private sector to drive green growth and job creation.

### 2.2.2.1. Regulations and standards

This represents direct ways that government can enhance private sector participation in green development pathways. However, if not designed properly, they can in turn become barriers that can impede private green businesses from flourishing. Some of the existing regulations and standards include FiT, VAT exemption on renewable energy technologies and SWHs, ban on single-use plastic materials,

A potential regulation and standard that can enable market transformation for green products and services is ecolabeling. Ecolabelling can provide a necessary tool in international markets by showcasing support for high environmental management which in turn raises environmental standards, if public awareness exists, through consumer choice. More so, it is a strategic element to gain access to new and/or existing premium green markets. If it can be placed as a norm for private green investments/businesses, then ecolabeling offers an opportunity to add value to existing products, expand a business' reach in existing markets or maintain market share in a competitive environment through product differentiation.

**Box 2.1: Ecolabeling as a way to promote green products and services**

REWE International in Austria developed an ecolabel named, *Pro Planet*, that reviews sustainability of a selected food products. The label marks products that cause the least harm to the environment along their entire supply chain. Also, reviewed are the internationally recognized social standards. The label was developed through a collaborative process with an environmental NGO, Friends of the Earth Austria, a social and human rights organization, Caritas, and a scientific research institute, Sustainable Europe Research Institute. The label is based on a review using a set of resource use indicators, specific indicators for measuring the sustainable agricultural products like pesticide use intensity, and strict controls of social standards at the producer level.

In Kenya, there exists some ecolabeling that private agribusiness can take advantage of such as the '*Grown Under the Sun*' label informs European consumers that the business produce is less energy intensive and results in less CO<sub>2</sub> emissions than the equivalent European products. This is because the product is grown naturally without the use of artificial heat and light. The '*Kenya-GAP*' label that covers horticultural products is the only African certification scheme that is equivalent to the EUREPGAP/GLOBALG.A.P. The label allows a business to be recognized and aid in gaining a competitive edge against other businesses.

Source: Author's compilation; <http://www.proplanet-label.at/>

Formal certification schemes can also be used to identify goods and services that have been produced in an environment that reduces negative environmental and social impacts. By having such a differentiation, green products can increase market share and value across economic sectors. More so it ensures growth contribution from production maintains long term resource sustainability and environmental practices. They also act as a source of information for consumers to discern which products and services have been produced with the environment in mind.

**Box 2.2: Identifying certification schemes to market local products in international markets**

Sustaining environmental standards has increasingly recognized by formal certification schemes such as ISO 14001 for environmental management systems in manufacturing and waste management, Global Good Agricultural Practice (GAP) for agricultural products or energy audits in energy use. Such independent recognition helps business to gain access to markets or gain premium prices for their products and/or services. For example, the Kenyan **horticultural sub sector** has been favored by premium prices and market access through increased production efficiency and diversifying to non-traditional export markets such as the Middle East, China, Japan, Australia and New Zealand. The sub-sector has managed to maintain competitive advantage by focusing on producing high standard products, increasing variety and product differentiation and new markets such as direct export sales to major supermarket chains. This was achieved by adding value addition in integrated food processing.

**2.2.2.2. Institutional arrangements**

The overarching green framework for the country is *Vision 2030*, as presented in section 1.1. The *Big Four Agenda* that is set to be achieved under Medium Term Plan III is also another green growth-related national framework. The *Big Four Agenda* is anchored under four pillars - food security, affordable housing, manufacturing, and affordable healthcare for all. Related to the study are food security through the agriculture sector and manufacturing. Under manufacturing, eight sub-sectors have been targeted to increase manufacturing sector's contribution to GDP to 20 percent and is expected to be enabled by increasing the ease of doing business, development of industrial parks (IPs) and zones, enhancing SME business performance, increasing market access and implementing tightened import and export standards. Under agriculture, the drive is to achieve 100 percent food security by enhancing large scale production, driving small holder productivity and reducing the cost of food. This is expected to be enabled mainly by policy in developing new standards, implementing a private-public partnership (PPP) framework,

gazetting various crop bills, adopting duty waiver on farm equipment and feeds, investment in renewable energy and curbing multiple levies (*GoK, 2020d*).

A notable green oriented framework is the Green Economy Strategy and Implementation Plan 2016 – 2030 (GESIP). GESIP focus is to enhance low-carbon, resource efficient, equitable and inclusive socio-economic transformation of the Kenyan economy. More so, it binds the social and economic constraints the country faces in achieving the *Vision 2030* goal and is aligned with the outcomes of the United Nations Conference on Sustainable Development (Rio+20). A notable factor addressed in GESIP is the role that the private sector can play in implementing the plan through adoption of green economy technologies and practices in a self – sustaining manner.

***Box 2.3: KAM promoting environmental performance for companies***

Much can be learned from private sector business associations that have been successful in influencing their industry’s behavior. KAM, through their CEEC, have carried out various energy, water and wastewater audits since its inception in 2006. Some of the benefits reaped from this venture include:

- KES 12 billion worth of energy savings from 1,000 energy audits in 850 companies over the past 12 years.
- Trained over 400 energy managers to help enhance knowledge in energy management.
- Consolidated savings worth KES 287.2 million from water and wastewater audits from four facilities - Kenyatta National Hospital, Thika Water Company, Sarova Whitesands Hotel and Kenyatta University - Ruiru Campus.
- Carrying out annual energy management awards to recognize businesses that have achieved significant reduction in their energy consumption from implementation of energy efficient measures and technologies.

*Sources: KAM (2017)*

A key gap that arose following interviews with various respondents was the lack of government initiative in procuring and using green products and services. This not only highlights the lack of government commitment in following a green development pathway, but also allows political interests to stifle progress gained by the private sector in driving green growth. One key area that respondents acknowledged was in the adoption of sustainable consumption and production (SCP) principles, one of the six GESIP principles, by the government. This can be implemented through a green public procurement (GPP) framework for the country at national level that can be mandated to be translated into the devolved units in the country, Box 2.4 presents the benefits of a GPP framework under SCP principles.

**Box 2.4: Promoting SCP principles under a GPP framework in South Korea**

Early 1990s, the South Korean government introduced comprehensive policies for GPP. The policy package included various initiatives such as ecolabelling, GPP, green store certification, and a green credit card scheme. The legal framework for GPP consists of two Acts: The **Environmental Technology and Industry Support Act** and the **2005 Act on Promoting the Purchase of Green Products**. The policy package, the above two Acts, were predated by the **1994 Act on Development and Support of Environmental Technology** that was later replaced by the Environmental Technology and Industry Support Act which established GPP and eco-label in Korea.

Under the 2005 Act on Promoting the Purchase of Green Products, all state organizations were mandated to submit an annual implementation plan on green purchases to the Ministry of Environment at the beginning of each year with performance records for the previous year. The act also required all government offices to buy eco-labeled green products and services. Under the Environmental Technology and Industry Support Act, that has undergone various amendments and additions over the years since 2011 with the latest review in January 2016, calls for promotion of development, support, and distribution of environmental technologies. It also calls for fostering of the environmental industry, thus contributing to environmental conservation, the promotion of green growth and the sustainable development of the national economy. The GPP policy has been implemented through various agencies but most importantly through the Public Procurement Service, the central government procurement agency.

Overall, the South Korean government has dedicated USD 3 billion for GPP implementation that accounts for 20% of total goods purchased via the Public Procurement Service. Ten years after the implementation of the green purchasing law, the annual growth rate of licensed products averaged at 29 percent with an average of 84 percent over the first three years.

Despite gaining significant progress in implementation of GPP through legal framework, environmental criteria, political and institutional support, monitoring tools, capacity building and training, and dissemination and communication of GPP benefits, South Korea still faces some challenges. Some of these challenges include reviewing their monitoring and tracking GPP system to improve communication on environmental and financial benefits from GPP policies, inclusion of a social criteria in green public purchasing and market challenges in the adaptability to new environmental requirements.

*Source: Author drawn from 2013 Green Public Procurement in the Asia Pacific Region, APEC (2013) and Didham & Hishashi, 2020*

**2.2.2.3. Policy instruments**

Policy instruments such as taxes, pollution charges, public expenditure on resilient infrastructure, green subsidies and market mechanisms can encourage private investments/businesses to follow a green development pathway. From the interviews, it was clear that a right policy mix needs to be established that will optimize synergies and minimize trade-offs between different areas and policies. A summary of suggested policy instruments is summarized in table 2.1.

**Table 2.1: Proposed policy instruments for green business advancement**

Policy Instrument	Examples	Description
<b>Market based instruments</b>	<ul style="list-style-type: none"><li>• environmental taxes and charges</li><li>• material input taxes</li><li>• tradable permits</li><li>• environmental subsidies</li><li>• environmental incentives</li></ul>	<p>These instruments internalize external costs by making the polluter pay. These instruments exist in GESIP as one of the six principles of the plan.</p> <p>In the short run, these instruments offer incentives for behavior change of polluters and resource users while in the longer run, they encourage innovation and improvement of new and more efficient production methods.</p>
<b>Regulatory policies</b>	<ul style="list-style-type: none"><li>• standard setting</li><li>• verification methods</li><li>• green public procurement</li></ul>	<p>These instruments are useful in pinpointing sources of pollution if easily identified, monitored and enforced. They also provide certainty and clarity for administrators and businesses.</p>

Policy Instrument	Examples	Description
		A well-designed standard and regulation can stimulate short term innovation and technology dissemination by creating a demand for green products and services. But if poorly designed, they can limit technological innovation in the long-run.
<b>Non-economic measures</b>	<ul style="list-style-type: none"> <li>• voluntary approaches</li> <li>• information provision</li> <li>• green jobs training programmes by sector</li> </ul>	These instruments work better when they are implemented together with other policy instruments. They encourage sectors to improve their own performance related to resource efficiency and environmental protection.
<b>Fiscal and pricing instruments</b>	<ul style="list-style-type: none"> <li>• recycling tax</li> <li>• emission trading systems</li> <li>• tax credits by sector</li> <li>• fossil fuel subsidy reform</li> </ul>	<p>These instruments shift the tax burden from labor to environmentally damaging activities. This is done by creating a double dividend – reduced resource use on one side and job creation on the other side.</p> <p>The instruments help in improving the ecosystem, job creation, stimulates eco-innovation and promotes an efficient tax system.</p>
<b>Information based instruments</b>	<ul style="list-style-type: none"> <li>• environmental data collection</li> <li>• environmental valuation</li> <li>• energy audits and awards</li> <li>• eco-labelling or certification schemes</li> </ul>	These instruments also require a correct design to complement and strengthen the other policy instruments. For example, eco product labels inform consumers of environmentally friendly goods and in turn create awareness in the general public.

*Source: Author's analysis*

Examples of some non-economic measures – green jobs training, and information-based instruments, energy awards are highlighted in Box 2.5 and 2.6.

***Box 2.5: Enabling a greened employment sector at macro level***

In the Republic of Korea, green growth is a government driven agenda that has translated to centrally coordinated efforts. To achieve their estimated green job potential, the government invested in greening education policies, vocational training, youth education and public awareness raising initiatives. This was implemented due to the many green technologies and innovations scaling up from early stages that faced shortages of experts. More so, the government implemented various tax reforms such as changes in investment tax credit system (*up to 7 percent tax credit for corporate investment in facilities*), tax credits to offset the social security premiums bound to increase following employment growth in SMEs, income tax credits for young workers employed by SMEs, and revision of the Earned Income Tax Credit system. The government also focused development of green industries to drive economic growth and as a means of job creation. Between 2009 to 2012, the country invested in approximately KRW 50 trillion to create approximately 900,000 jobs in green industries ranging from green energy, recycling of waste resources and ensuing conversion to energy, and building of energy saving homes and offices.

*Source: [https://www.ilo.org/wcmsp5/groups/public/---ed\\_emp/---emp\\_policy/---cepol/documents/publication/wcms\\_201104.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_policy/---cepol/documents/publication/wcms_201104.pdf)*

**Box 2.6: Energy management awards to recognize companies with efficient energy practices**

The Energy Management Awards under CEEC to promote excellence in energy management by recognizing businesses that have achieved significant reduction in their energy consumption through implementation of energy efficient measures and technologies. In 2019, Kenya Breweries Ltd took the Overall Energy Management Award and Overall Water Efficiency Award, Strathmore University take the Overall Renewable Energy Award, BAT Nairobi take the Sustained High-Performance Award and Njoro Canning Factory Ltd taking the Best Most Improved. These awards have since become a benchmark for the industrial sector best practice in energy efficiency.

*Source: Author's compilation based on CEEC report, KAM (2017)*

#### 2.2.2.4. Financing/investment

The government has facilitated this environment in various ways – investment in Special Economic Zones (SEZs) and in industrial and SME parks. The MSME sector still does not have an enabling financing/investment environment in place yet. A plan has been underway to implement a National Credit Guarantee Scheme to facilitate access to affordable credit. This was recently realized, June 2020, under the COVID-19 pandemic stimulus package with KES 6 billion being set aside for the credit scheme (*GoK [@StateHouseKenya], 2020, May 25*). Other expected financing/investment environment improvements include - establishment of an Ex-Im Bank and an Industrial and Commercial Development Bank to offer long-term credit funded by long-term bonds, expand the current credit reporting framework to include credit providers from outside the financial sector, and ratification of the Securities Investment and Derivatives Bill to deepen the capital markets and the Financial Services Authority (FSA) Bill to consolidate the existing non-bank financial sector regulators.

At the private sector level, green financing is currently at its nascent stage with the capital markets championing the way for adoption of various green financial instruments. Other financial systems such as banks, insurance, and institutional investors offer piecemeal green financing. The most notable and recent green private financing offering was from the capital markets, the Green Bond, launched in December 2019 through a joint initiative with Kenya Bankers Association (KBA), Nairobi Securities Exchange (NSE) and the Climate Bond Initiatives under the Green Bond Programme Kenya. The launch saw KES 4.3 billion raised against a KES 5 billion target to finance the green building sector under Acorn Developers Limited, a real estate developer and Helios, a private equity fund (*Business Daily, 2020*).

However, with banks, categorization of green financing to either brown, green or blue has not yet been adopted. Most banks do categorize some financing as sustainable following adoption of the Sustainable Finance Initiative (SFI) Guiding Principles<sup>16</sup> steered by KBA. For example, KCB bank has adopted SFP and championed for integration of six principles in banking systems - alignment, impact, customers and clients, stakeholders, governance and culture, transparency and accountability. The bank was able to review their portfolio through a joint programme with IFC where they found that a maximum of 15 percent (approximately KES 30 billion) of their corporate book is green. This provides an entry point for local banking to participate in financing green businesses. From a policy aspect, banks have also received support from its regulator, the Central Bank of Kenya (CBK) in the release of the SFI Guiding Principles, and with the National

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<sup>16</sup> aim to raise awareness on sustainable practices and environmental and social governance (ESG) risks within the banking sector through an e-learning training platform.

Treasury via sponsorship of a 2017 Cabinet Paper on Green Finance in the country. Overall, banks have not offered financing to green businesses because they are not fully aware of the financial returns that green investments offer; base their credit decisions on credit rating of the business rather than on the potential returns from the particular green investment; and have not had much experience in supporting green investments making them hesitant to provide credit on this basis.

For the insurance sector, despite being the most mature one in sub-Saharan Africa (SSA), is largely under-developed with motor insurance having majority share of its market. However, in recent years, green insurance options such as the national weather and crop insurance for smallholder farmers has started scaling up. The country's investment requirements for crop insurance is estimated at KES 0.5 billion for five years as per the NAIP (*GoK, 2019b*). The adoption of insurance services to enhance climate informed agriculture has also spurred existing crop insurance products from private insurers to scale up and increase their crop insurance value offerings for farmers – see box 2.7.

***Box 2.7: Green insurance option - index based insurance, in the agriculture sector***

As of 2017, a local agriculture insurance product designer, ACRE Africa, had cumulatively insured over USD 75 million for more than 1 million farmers in Kenya, Tanzania, and Rwanda. ACRE Africa is an early innovator of agricultural solutions for smallholder farmers that has evolved with current technologies such as mobile payments system, M-Pesa. The business started off as a retail weather index insurance product in 2009 under the former Kilimo Salama that was reoriented to be offered through aggregator partners, such as One Acre Fund.

Another innovative index-based insurance is the ILRI-designed satellite-index livelihood insurance solution offered in Ethiopia and Kenya. The product was first piloted in Kenya in 2010 and developed their payout criteria based on a satellite-based index (NDVI) that compares available vegetation during the season. Its success led to a partnership with the World Bank and the government of Kenya to launch the Kenya Livestock Insurance Program (KLIP) in 2015. KLIP offers livestock insurance contracts to targeted individuals in Northern Kenya.

*Source: ISF, 2018*

Despite having a substantial asset base, institutional investors such as pension funds with an asset base of 14 percent of GDP (*KNBS, 2020*), they rarely finance green business opportunities. Some examples of how the private sector is mobilizing green investment is seen in box 2.8.



**Box 2.8: Examples of the private sector supporting a green investment environment**

- The Green Bonds Programme in Kenya initiated by KBA, NSE and the Climate Bond Initiatives launched a KES 4.3 billion green bond in December 2019. The bond targeted investors under the green building sector under Acorn Developers Limited, a real estate developer and Helios, a private equity fund.
- In 2019, CMA developed a green bond market framework to issue listed and unlisted green bonds. The framework is embedded in a legal framework through a Policy Guidance Note on Issuance of Green Bonds and the approval of amendments to the NSE Listing Rules by CMA.
- KBA launched the Sustainable Finance Initiative in 2014 to guide balancing of the banking sector business goals with Kenya’s development priorities and socio-environmental concerns.
- Two local banks, CFC Stanbic and Cooperative Bank, with funding from AfDB, have provided green credit lines worth KES 3.3 billion for energy and resource efficiency projects and green mortgage products.
- A local bank, NCBA in partnership with a local telecom service provider, Safaricom, funded M-KOPA a total of KES 860 million for their renewable energy start-up. M-KOPA provides solar home systems on credit to customers with little formal credit history or collateral.
- In 2013, NSE launched the Growth Enterprise Market Segment (GEMS) to enable SME companies to raise funds from the capital markets.

Source: Weblinks from Green Bonds Programme Kenya, KBA, NSE, CMA

From the descriptive analysis, the common financing option for green activities by the various sectors was long term debt and grants. However, other financing options such as bridge financing were suggested to cover cashflow needs especially for the sectors that rely on cash payments on a day to day basis. This is in line with the country’s reliance on ODA loans and grants as critical sources of finance (*Development Initiatives, 2015*). In Kenya, public DFIs and multinational development banks are key actors who support green investment and development of green financial products. However, most of this green financing is government-to-government with DFIs preference to leverage on private investment by working with local and international banks and private equity investors.

However, various respondents were not aware of the expected investment needs for their sectors as shown in section 1.2.3. This highlights a need for the government sector agencies to increase private sector awareness of the sector’s investment needs to facilitate categorization of investments and to spur local financial institutions to adopt green financing modes.

### **2.2.3. Scalability of private green businesses**

The key interest of the private sector in being involved in green development is from an economic perspective and always features the question – *how can my business sustain profits in the long run*. The private sector can scale up their green businesses to promote green growth and job creation by adopting one or all of the below approaches:

- i. Direct economic savings linked with either reduced resource use or generated waste that requires treatment and use of efficient energy technologies,
- ii. Indirect economic development by investing in low-carbon technologies that would eventually stimulate growth from innovation,
- iii. Mobilize environment-friendly investments and green projects,
- iv. Advancement from diversified green value chain activities thus generating new green jobs, and
- v. Product and market advancements.

Additionally, to these transitions in ways of doing business, a shift by the private sector is needed to new development paradigms that encourage environmental and social governance (ESG) responsibilities. Annex 1 illustrates the various green-related frameworks that guide private sector participation in green development pathways. Thus, the private sector needs to grab this opportunity to pull ahead of enforcement laws to attract green economic savings as opposed to paying for not acting.

#### **2.2.3.1. Use of national platforms for peer learning and green business advancement**

At the national level, to promote green growth and job creation, there exists a National P4G platform established in partnership with the Royal Embassy of Denmark and Kenya Private Sector Alliance (KEPSA). The platform is led by its co-chairs the National Treasury of Kenya and KEPSA as well as the Ministry of Environment and Forestry and the Vision 2030 Delivery Secretariat. The platform was established in 2018 and aims to nurture and scale up PPPs to deliver Kenya's *Vision 2030* and *The Big 4 Agenda* (2018 – 2022). The platform has established three scale up opportunities– Sustainable Special Economic Zones (SEZs), Building Efficiency Accelerator, and the Africa Innovation Lab for Climate Finance, and three startups - Partnership for a New Plastics Economy in Kenya, Global Distributors Collective, and Energize Africa. The platform offers a databank of green practitioners one can reach out to for training needs that is linked to the Kenya School of Government (KSG) and various sectorial ministries. A gap that was highlighted was in the lack of researchers, to facilitate flow of knowledge from research to practice, and CSOs, to present the social sphere of green businesses, in the platform.

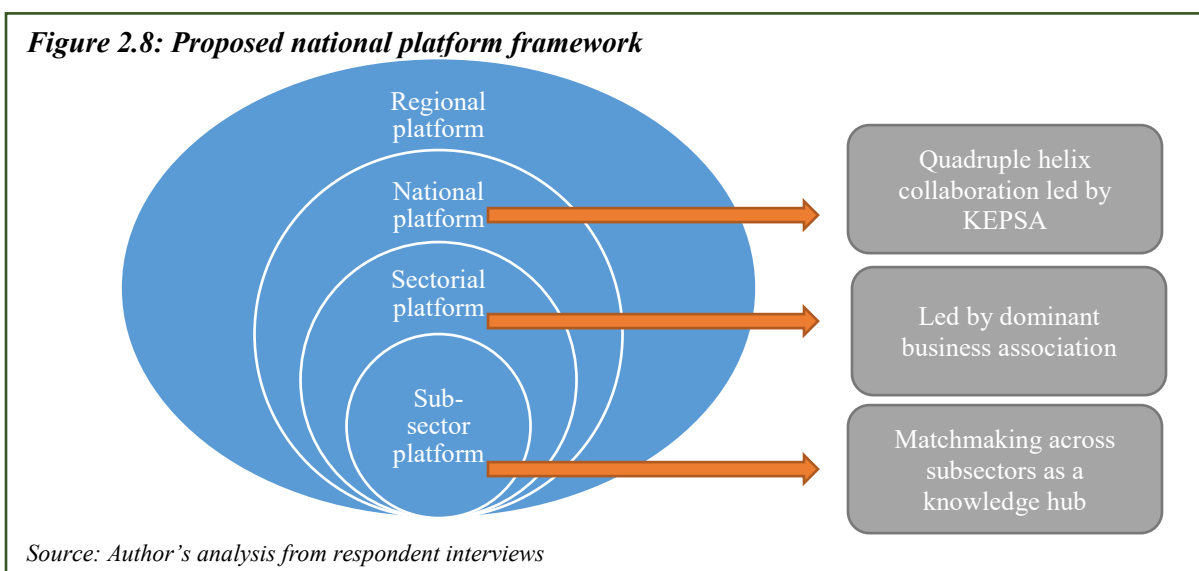
A key platform that has promoted several green startups is the Kenya Climate Innovation Center (KCIC). The center provides incubation, capacity building services and financing to entrepreneurs and new ventures developing innovative solutions in energy, water and agribusiness to address climate change challenges. KCIC is supported by the World Bank's infoDev Climate Technology Program (CTP) and funded by the UKAid and the Danish Ministry of Foreign Affairs. So far, KCIC has managed to finance over 70 climate technology ventures, achieve a business survivability rate of 50 percent at proof of concept phase and 75 percent at the seed phase, achieved a 100 percent leverage ratio for 30 percent of investments, and an overall 50 percent leverage on entire cost of the center via local cash and in-kind contributions. The center has also managed to generate over 930 direct jobs and 3,700 indirect jobs where over 1,400 of these jobs are for women. On the environmental front, the Center has managed to mitigate 1.5 million tons of CO<sub>2</sub>, install 90MW of off-grid energy, provide energy access to 1 million people, and improve the efficiency of 22,500 small-scale farms from its incubated businesses<sup>17</sup>.

A common consensus amongst respondents was the need to have sector and sub sector champions who are members of the business community leading the national platform agenda. This will then be supplemented by the various ministerial heads from sectors of the economy to ensure that a public official is present for any lobbying that the business community may require. This can further be complemented by a quadruple helix collaboration between academia, researchers, private and CSO actors. There was a suggestion of having a sectorial platform that feeds into national and regional platforms – this proposed framework is illustrated in figure 2.8 To facilitate a proper peer learning environment, there needs to be matchmaking between sub-

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<sup>17</sup> <https://www.greengrowthknowledge.org/sites/default/files/KCIC%20presentation.pdf>

sectors to facilitate discussions from a “grass root” level in order to transfer knowledge and research that can feed into sectorial platforms. These sectorial platforms can then be led by KEPSA at the national level, representing the business community as a whole at regional levels.



Many of the respondents agreed that the various platforms for peer learning and green business advancement has been from business associations. These business associations have facilitated them with training, knowledge and financing for both ‘non-green’ and green business ventures. More so, the associations play a critical role in lobbying for the interest at micro and macro levels. The various business associations related to the four focus sectors are presented in Annex 5, the list is not exhaustive but a representation of the business associations.

**2.2.3.2. Mapping of environmental performance indicators**

By identifying economic activities that support core environment-related growth and employment across the four focus sectors– table 2.2, the private sector can then target the environment-related activity across their respective value chains that can be scaled up in pursuit of green development pathways.

**Table 2.2: Mapping environmental performance indicators**

Sector	Environment related activity	Indicator of environmental performance			
		Resource efficiency	Energy efficiency	Mitigation	Adaptation resilience
Indicator		resource use per unit of output	energy consumption per unit of output	efficacy in reducing waste and emissions released into the environment	disease prevention, improved ecosystem
Agriculture	Organic farming	No pesticides	Low energy use	Carbon dioxide removal	
	Sustainable agriculture				New production methods
Energy	Bioenergy	Renewable source	High efficiency	Reduces GHGs	
	Solar				
	Hydropower				
	Wind				

Sector	Environment related activity	Indicator of environmental performance			
		Resource efficiency	Energy efficiency	Mitigation	Adaptation resilience
<b>Manufacturing</b>	Clean production	Reduced water usage Recycling materials Reuse of waste	Use of energy efficient technologies and products	Reduces CO <sub>2</sub> and GHG emissions	Use of modern equipment
<b>Waste Management</b>	Recycling Upcycling	Recycling materials Reuse of waste		Reduces CO <sub>2</sub> emissions from having less landfills and incineration	

*Source: Author's analysis based on ILO, 2011 template*

Mapping of these environmental indicators is the first step in creating a Material Flow Analysis (MFA) for the four focus sectors. MFA is an essential tool to provide the needed data and insights for decision making for green development pathways. MFA outlines the ‘stock’ the economy has for economic activities to be conducted, both raw and recyclable. This will aid in implementing a robust reverse supply chain system in the economy.

### 2.2.3.3. Stimulating green financing/investments

The key constraint with green financing/investments is the lack of financial institutions risk criterion for green business opportunities. This leads to green business opportunities being assessed as other ‘non-green’ opportunities due to a general lack of understanding in green business models. To counter this, financial institutions need to be stimulated to offer green financing/investments by adopting new technologies which will offer the right mechanism for green business models, often created by technologists and innovators, to be adopted. By doing this, coupled with increase access in information surrounding green business practices, then the leverage needed for advancing credit will be established. Hence, active “selling” of the green component of private businesses will be accepted by financial institutions. Public resources can aid in increasing leverage for private sector green financing/investments through policy effectiveness. By the private sector aligning their interests to GESIP goals, the result will be viable projects being undertaken and thus achieve public policy outcomes.

However, green finance/investments cannot be stimulated if the right conditions are not in place. The conditions necessary to scale up private businesses are largely dependent on the business size. Examples of conditions required to scale up private businesses are shown in table 2.3.

**Table 2.3: Conditions for scaling up private businesses**

Conditions	Type of business	Description
<b>Partnerships</b>	SMEs	Relationships, from international marketing partners, international NGOs with skills and technology, local partners who assist with social components such as youth training support, and community level partnerships for running cooperative ventures with local small and medium scale producers.
<b>Monitoring and reporting</b>	SMEs LEs	Despite having bookkeeping as a hurdle for many SMEs, monitoring and reporting environmental performance is an issue for both SMEs and large enterprises (LEs). This can be achieved by being open and transparent on how they are advancing the positive impacts and identifying and mitigating potential negative impacts of their work

Conditions	Type of business	Description
<b>Financial viability and sustainability</b>	SMEs	There exists a gap in how small and medium scale businesses adopt more business-oriented approaches to managing and financing their business. This brings questionable remarks on how the business is able to report on social and environmental benefits it delivers. Most of these businesses lack of access to funds for business management training and to lines of credit and investors
<b>Digitization</b>	SMEs LEs	A digital economy opens several new opportunities for scaling up, reducing costs, and enabling the creation of new business models that can challenge existing ones. SMEs can draw various potential benefits from digital technologies like better access to skills, talent or markets, better collaboration and communication, or greater access to novel technologies and applications.
<b>Targeted policies</b>	SMEs LEs	These policies foster a dynamic enabling environment that eases access to and effective use of strategic resources. However, these policies must be implemented against the backdrop of sound framework conditions, to incentivize risk-taking and ensure that business growth potential is realized.
<b>Enabling environment</b>	LEs	More often, LEs are exposed to a hindered business environment to operate in. This can be seen in duplication of licensing operators at government and county levels, lack of financial incentives to shift to green businesses and poor standardization of products being sold in the market
<b>Access to finance</b>	SMEs LEs	Difficulties in accessing finance are widely recognized as one of the major obstacles for sustaining a business as confirmed under component 1. Lack of finance prevents businesses from investing in innovative projects, improving their productivity, and seizing opportunities in expanding or new markets.
<b>Competitiveness</b>	SMEs LEs	Innovation spurs competitiveness which in turn drives growth. For SMEs, this comes into play in driving local supply chains of specialized small producers. This aids them to focus on market niches. For LEs, by adopting new technologies and innovations, they can better place themselves in the market by offering low prices from increased productivity and cost savings.
<b>Foreign Direct Investments (FDIs)</b>	SMEs LEs	FDI presents an avenue for knowledge and innovation that can benefit business growth. Policies should foster a conducive business environment for FDI inflows and promote linkages between foreign subsidiaries and domestic firms via supplier-buyer relationships, joint ventures and joint technology development and training.
<b>Intellectual Property (IP) protection</b>	SMEs	SMEs typically lag behind LEs in management of intangible assets that are critical for innovation potential into market value, competitiveness and growth. To better enable SMEs to leverage their intangibles, policies should target internal obstacles - lack of knowledge and strategic perspective, and low accessibility of IP system - administrative burdens and complex and costly litigation and enforcement mechanisms.
<b>Research partnerships</b>	SMEs LEs	To facilitate knowledge flows, partnerships among SMEs and LEs, and between SMEs, LEs, investors, academia and research centers can enhance growth prospects. This can be in the form of soft innovation infrastructures such as science parks and business incubators like the Kenya Climate Innovation Center (KCIC) that create opportunities for innovation partnerships and collaborative research.

*Source: Author's analysis based on desk reviews*

### 2.3. Agriculture sector

From the interviews, it was clear that green agriculture is not well understood. However, climate smart agriculture (CSA) and sustainable agriculture are common terms used in the sector. However, on comparing various literature on the definitions, it was found that the essence of green agriculture and sustainable agriculture are generally the same while CSA is seen from more of mitigation and adaptation approach to agriculture given climate change.

“Green agriculture” is defined as “*increasing food security in terms of availability, access, stability and utilization while using fewer natural resources, through improved efficiencies throughout the food value chain (FAO, 2011).*”

“Sustainable agriculture” is defined as the *management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such development... conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable (FAO, 2011).*

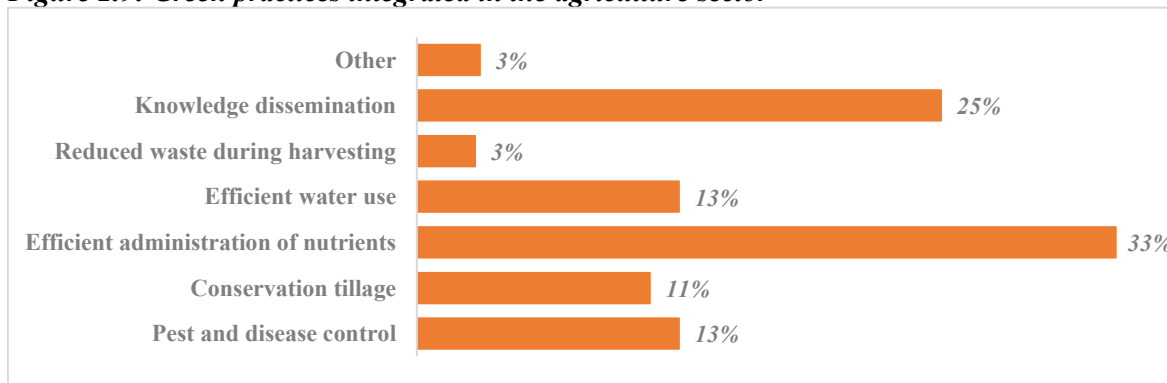
“CSA” is defined as *agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes GHGs (mitigation), and enhances achievement of national food security and development goals (FAO, 2010).*

Hence, CSA is viewed as an approach that aims to solve the challenges arising from climate change in the agriculture sector while sustainable agriculture focuses on the balance between economic, social and environmental needs in agriculture and green agriculture targets the reduced use of natural resources while at the same time intensifying production.

Greening of agriculture translates to the increase in the use of farming practices and technologies that will (a) concurrently maintain or improve farm productivity, (b) ensure sustainable food provision, and (c) lessen any negative externalities that may arise that by ensuring any ecological resources – water, soil, air and biodiversity, exploited are rebuilt. This calls for resilient agricultural practices and technologies based on agro-ecological knowledge to facilitate sustainable agricultural growth. The key challenge is that agro-ecological knowledge is already practiced in the sector, but its adoption is minimal.

The descriptive analysis found that private businesses in the agriculture sector, the key green practices integrated by businesses were efficient administration of nutrients through use of manure and organic waste and assessment of soil nutrient needs by 33 percent. This was followed closely by knowledge dissemination of good farming practices and climate information at 25 percent, pests and disease control through use of natural pesticides and biological control at 13 percent, efficient water use using efficient water technologies such as wind powered pumps and irrigation scheduling at 13 percent, conservation tillage at 11 percent, reduced waste during harvesting using food to market systems at five percent, and other green practices at three percent – this is depicted by figure 2.9

**Figure 2.9: Green practices integrated in the agriculture sector**



Source: Author’s analysis from questionnaire responses

## 2.3.1. Existing and potential of private sector green investments/businesses

### 2.3.1.1. Existing private sector green investments/businesses

Looking at a typical agricultural value chain that flows from production, harvesting & transport, processing & storage, distribution & packaging, and finally markets, there are several areas along the entire chain that can be greened. The use of renewable energy solutions can also be found along a green value chain showcasing the agriculture-energy nexus portrayed in section 2.7. These examples of a greened value chain are what will guide the business case presented in this section.

**Table 2.4: Greened activities across an agricultural value chain**

	<b>Production</b> (input and on-farm activities)	<b>Harvesting &amp; transport</b>	<b>Processing &amp; storage</b>	<b>Distribution, packaging &amp; handling</b>	<b>Markets</b>
<b>Actors</b>	<ul style="list-style-type: none"> <li>• Farmers</li> <li>• Farmer association</li> <li>• Input suppliers</li> </ul>	<ul style="list-style-type: none"> <li>• Farmers</li> <li>• Logistic businesses</li> </ul>	<ul style="list-style-type: none"> <li>• Processors – primary &amp; secondary</li> <li>• Machine suppliers</li> </ul>	<ul style="list-style-type: none"> <li>• Packaging businesses</li> <li>• Logistic businesses</li> </ul>	<ul style="list-style-type: none"> <li>• Local market – retailers, groceries</li> <li>• Export market</li> </ul>
<b>Greened activities</b>	<ul style="list-style-type: none"> <li>• Reduced number &amp; use of agri-chemicals</li> <li>• Heat recovery systems (greenhouses)</li> <li>• Use of organic manure &amp; fertilizer</li> <li>• Efficient use of water on need be basis</li> </ul>	<ul style="list-style-type: none"> <li>• Fuel efficient machinery &amp; vehicles</li> </ul>	<ul style="list-style-type: none"> <li>• Heat &amp; water recovery</li> <li>• Reduce water pumping times</li> <li>• Evaporative cooling</li> <li>• Pre cooling methods</li> <li>• Variable speed drive motors</li> <li>• Heat recovery &amp; exchange systems</li> <li>• Recirculation of air in dryer equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Use bio-based resources for alternative packaging</li> <li>• Eco-design packaging</li> <li>• Route optimization</li> </ul>	<ul style="list-style-type: none"> <li>• Sale to green niche markets</li> </ul>
<b>Green energy integration &amp; solutions</b>	<ul style="list-style-type: none"> <li>• Bioenergy &amp; geothermal for heating systems</li> <li>• Solar/wind powered water pumps</li> <li>• Use of waste for anaerobic digestion to produce heat</li> </ul>	Biofuel powered machinery & vehicles	<ul style="list-style-type: none"> <li>• Process waste to generate biogas</li> <li>• Solar PV powered coolers, chillers, heaters &amp; dryers</li> <li>• Water recycling &amp; reuse</li> <li>• On-demand hot water systems</li> </ul>	Biofuel powered machinery & vehicles	

Source: Author's compilation based on desk reviews and interviews

### 2.3.1.1.1. Select business cases for the agricultural sector

#### Business Case 1: Use of agricultural waste for energy production

DuduTech, an affiliate of Finlays Kenya, produces and sells biological control organisms for Integrated Pest Management (IPM) and vermicompost. The business model is to process the agricultural waste of its parent company, Finlays Kenya, into a valuable resource. The business success factors of DuduTech's business model are partnership with parent company that mitigated capital start-up risk and ensure continuous supply of their material supply - vegetative waste; a diversified portfolio - sale of biological control organisms and vermicompost; and segmented markets for its compost product. The use of labor-intensive technology generates employment especially for low-income persons.

**Table 2.5: DuduTech business case**

	<b>Green Practice</b>	<b>Stimuli used</b>	<b>Costs</b>	<b>Benefits/Returns</b>
<b>Production</b> <i>(input and on-farm activities)</i>	<ul style="list-style-type: none"> <li>• Use of waste inputs, vegetative waste &amp; animal manure to produce final product</li> <li>• Use of agricultural waste to produce biological control pest management products</li> </ul>	<ul style="list-style-type: none"> <li>• Consistent supply of vegetative waste from parent company</li> </ul>	<ul style="list-style-type: none"> <li>• Capital investment of USD 46,460</li> <li>• Operation &amp; maintenance cost of USD 103/ton of vermicompost</li> </ul>	<ul style="list-style-type: none"> <li>• 40 tons of vermicompost per month</li> <li>• Annual profit of USD 7,000–8,500 is made from sales of vermicompost</li> <li>• Reduced nitrates release into the soil and water bodies from use of vermicompost</li> </ul>
<b>Market</b>		<ul style="list-style-type: none"> <li>• Parent company purchases 80% of produce</li> </ul>		<ul style="list-style-type: none"> <li>• Finlay's attainment of a Fair-Trade Certification attests the Good Agricultural Practice (GAP) in the use of vermicompost</li> </ul>

*Source: Author's compilation based on Otoo et al., 2018*



**Box 2.9: Use of solar energy in food processing plants**

Tapi Food, an Indian based confectionary producing company installed automatic tracking parabolic mirrors of 10 m<sup>2</sup> each that generate around 350 kg of steam per day at a pressure of around 6 kg/cm<sup>2</sup> to heat a special type of steam jacketed kettle. The total investment cost of the installation was approximately USD 23,015 of which 25 percent was covered by Tapi Food and the remaining 75 percent was subsidized by the government. Tapi Food was able to pay back the amount in around 3 years through adoption of solar energy. The processing facility uses solar energy to produce steam that is then used to steam jacketed kettle to heat and concentrate juice. The heat is also used to boil fruits, additives and water to transform them into jams and jellies. The solar panels enable Tapi food to produce around 1,000 kg of products per day while consuming around 500 liters of water per day to produce steam. This translates to a saving of around 1,000 tons of firewood per annum that was initially used to produce heat. The facility also uses bio waste and other agricultural waste to power the boilers at night and on the days when solar energy is low. Following the success of solar steam production units, the company aims to use renewable energy for all of its processing processes.

Source: Solar Thermal World, 2013

**Business Case 2: Integrating sustainable practices in agricultural farming and production**

Olivado is a large foreign-owned business that supplies avocado and other edible oils to the export market. Olivado’s business model is based on an out-grower scheme of 1,500 farmers, with over half of them being women, across Embu, Kiambu, Kirinyaga and Meru counties. The firm has established an agreement where it buys at least 95 percent of their yearly avocado crop from the farmers.

**Table 2.6: Olivado Kenya business case**

	<b>Green Practice</b>	<b>Stimuli used</b>	<b>Costs</b>	<b>Benefits/Returns</b>
<b>Production</b> <i>(input and on-farm activities)</i>	<ul style="list-style-type: none"> <li>• Providing education in farm management, organic fertilizing and water sustainability to out-grower farmers</li> </ul>			<ul style="list-style-type: none"> <li>• Farmers are organic certified by Swiss organic certifier IMO</li> </ul>
<b>Processing &amp; storage</b>	<ul style="list-style-type: none"> <li>• Use of agriculture waste to power factory’s generators</li> <li>• Use of vehicles powered with natural gas</li> <li>• Use of heat exchange systems for piped water</li> <li>• Installation of a solid-liquid separator to produce bio-fertilizer</li> </ul>	<ul style="list-style-type: none"> <li>• Consistent supply of agriculture waste from processing avocado oil</li> </ul>		<ul style="list-style-type: none"> <li>• 5,000 m<sup>3</sup> of biogas produced per day</li> <li>• 94% purified methane gas with carbon dioxide, hydrogen sulphide, water and contaminants removed</li> </ul>

	Green Practice	Stimuli used	Costs	Benefits/Returns
<b>Production</b> <i>(input and on-farm activities)</i>	<ul style="list-style-type: none"> <li>• Providing education in farm management, organic fertilizing and water sustainability to out-grower farmers</li> </ul>			<ul style="list-style-type: none"> <li>• Farmers are organic certified by Swiss organic certifier IMO</li> </ul>
<b>Market - export</b>				<ul style="list-style-type: none"> <li>• Organic certified produce</li> </ul>

*Source: Author's compilation based on <https://www.olivado.com/the-story/kenya>*

### Business Case 3: Use of agricultural extension and advisory service (AEAS) to transform agriculture sector

Private AEAS was born out of rapid urbanization, shift in dietary standards, emerging concerns over sustainable agriculture production and a peak in the demand for nutritious and safe food. The business model features a knowledge-intensive and technologically driven solution in order to remain competitive. However, there are gaps such as developing clear costing, financing and revenue-generation structures to demonstrate a sustainable business case.

#### ***Box 2.10: An example of a market led AEAS***

**InstaVeg**, a medium sized social business that uses an out-grower farming business model embedded with extension and other services. The business sources multiple fresh vegetables for both local and market from 300 small- and medium-scale out growers in Kirinyaga and Nyeri counties. InstaVeg has enabled these farmers to gain access to export markets with stringent quality and food safety requirements. InstaVeg uses two indicators to measure its performance (i) matching production with end-market demand – currently set at 720 tons of produce as the annual break-even capacity, and (ii) compliance with Good Agricultural Practices (GAPs); both of which they have not managed to meet. The main services gaps identified relate to broadening the range of inputs that can be accessed on credit (e.g. fertilizer), facilitating advance payments and performing grading at the collection center for enhanced transparency

*Source: Kilelu, 2020)*

### Business Case 4: Use of quality-based systems to improve milk quality from dairy farmers

Happy Cow, a local dairy agribusiness, works with milk collection and bulking enterprises that collect milk from 2,000 small scale dairy farmers in Nakuru and Nyandarua counties. The business uses a quality-based milk payment system (QBMPS) for payment of milk to smallholder dairy farmers based on volume and quality standards they meet. These food safety measures give the smallholder farmers an opportunity to earn bonuses over the normal milk prices that meets QBMPS standards. The payment module used is based on the grade of milk scored from 0 – 100 points on the quality of milk delivered to Happy Cow. The premium grade dubbed Grade A offers an additional KES 2 if a quality score of 70-100 is achieved, standard grade dubbed Grade B offers an additional KES 1 if a quality score of 40-69 is achieved, and penalty grade dubbed Grade C offers no bonus for a quality score of less than 39 is achieved. Mixed milk represents quality of milk supplied by farmers who venture into but never fully commit to implementing the changes required for the QBMPS. Happy Cow implemented the Milk Quality Tracking and Tracing (MQTT) and QBMPS quality standards in November 2017. (Ndambi, 2018).

**Table 2.7: Happy Cow business case**

	<b>Green Practice</b>	<b>Stimuli used</b>	<b>Costs</b>	<b>Benefits/Returns</b>
<b>Production</b> <i>(input and on-farm activities)</i>	<u>Farmers</u> <ul style="list-style-type: none"> <li>• Use of hygienic milk containers to transport milk from farm to collection centers</li> <li>• Reduction in rejected Grade A milk</li> <li>•</li> </ul>	SNV’s Kenya Market-led Dairy Programme <ul style="list-style-type: none"> <li>• Training in milk hygiene, good feeding, fodder management and conservation</li> </ul>	<ul style="list-style-type: none"> <li>• KES 1.55/kg of Grade A milk</li> <li>• KES 1.17/kg of Grade B milk</li> <li>• KES 0.20/kg of Grade B milk</li> <li>• KES 0.83/kg of mixed grade milk</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced milk rejection rates of 0.5% for Grade A milk against a milk rejection rates of 5.8% for mixed milk</li> <li>• Additional income of KES 19.87 per day, applied on dairy sales of 10.71kgs, for milk sold rather than rejected</li> <li>• Profit of KES 2.31/kg of Grade A milk</li> <li>• Enhanced business inclusion through connection to higher value and thus more profitable dairy supply chains</li> </ul>
<b>Processing &amp; storage</b>	<u>Processors</u> <ul style="list-style-type: none"> <li>• Reduced production failures</li> </ul> <u>Collection centers</u> <ul style="list-style-type: none"> <li>• Construction of a mini-lab and MCPs</li> <li>• Clocking system to monitor milk transportation systems and collect milk within a set time frame</li> </ul>	SNV’s Kenya Market-led Dairy Programme	<u>Processors</u> <ul style="list-style-type: none"> <li>• KES 3.05/kg of Grade A milk</li> </ul> <u>Collection centers</u> <ul style="list-style-type: none"> <li>• KES 0.56/kg of Grade A milk</li> </ul>	<u>Processors</u> <ul style="list-style-type: none"> <li>• Net loss of KES 2.12/kg of Grade A milk</li> <li>• KES 0.93/kg of Grade A milk</li> <li>• Increased cheese yield – from use of 13-14kg of milk to 9–10 kg of milk for 1kg of cheese</li> </ul> <u>Collection centers</u> <ul style="list-style-type: none"> <li>• Net loss of KES 0.24/kg of Grade A milk.</li> <li>• KES 0.56/kg of Grade A milk</li> </ul>
<b>Market</b>				<ul style="list-style-type: none"> <li>• Accreditation under the Kenya Accreditation Service (KENAS) in December 2018</li> </ul>

*Source: Author’s compilation based on Ndambi et al, 2019*

### Business Case 5: Use of innovative financial measures to finance agriculture businesses

Juhudi Kilimo, a microfinance institution, was founded in 2009 from a spin-off of K-Rep Development Agency, a Kenyan microfinance incubator. Juhudi offers tailored asset financing to smallholder farmers using an innovative financing approach based on group-lending where farmer groups self-monitor the repayment of the loans. So far, the financier has issued over 40,000 loans worth over USD 23 million to smallholder farmers. Juhudi has used debt financing to grow its lending operations. Its field support and training are done via partnerships with the Department of Livestock, Ministry of Agriculture, Livestock and Fisheries; Swiss Contact and Techno Serve. Juhudi’s loans target productive assets such as dairy cows, chickens and irrigation equipment, which generate immediate and sustainable income for farmers. The productive assets are often insured and can act as a form of collateral in case of default. The group-lending requirement is a 15% refundable deposit, 2-month training, and a group commitment to guarantee each other’s loans. The average annual interest rate on loans is 33% against a market average of 36% of similar microfinanciers. The microfinancier achieves an average repayment rate of 96% for all loans. Group lending is based on farmer groups based in the same geographic area and engaging in similar farming activities. The group membership fee covers training costs, an incentive for group members to work together. The microfinancier’s success is based on extensive partnerships, both local and international; use of technology - a cloud-based loan tracking system; and understanding clients’ needs – financing for productive assets (*Business Call to Action, n.d.*).

#### **Box 2.11: Innovative finance mechanisms to attract agri-investments**

**DigiFarm**, an integrated mobile platform, developed in partnership between Safaricom and Mercycorps. provides loans to farmers to purchase farm inputs (fertilizer, phytosanitary products, and seeds). The loan is accompanied by training modules about their use. The farm inputs are sourced from an agro-dealer, Inprocure, and the training modules from Arifu. The loan is in the form of e-vouchers that can be exchanged for inputs at Inprocure. The solution was piloted in 2017 and has so far registered 167,000 farmers.

**Agri-Wallet** is an innovative mobile business account that can be used to save, borrow and pay for income-generating activities. The Agri-Wallet is a specific-purpose account used by farmers, buyers/traders and agro-dealers. It enables them to pay each other on time, even when their buyers pay them later. Agri-Wallet enables farmers to save money specifically for buying inputs. It gives buyers and agro-dealers short-term working capital credit to bridge the period between paying their suppliers and getting paid by their buyers. Agri-Wallet is fully integrated with MPESA.

*Source: Wattel & Savelkouls (2018)*

### **2.3.2. Job creation through private sector green investments/businesses**

The actual number of green jobs created in the agriculture sector was difficult to obtain and identify due to data limitations. Hence context analysis summarized green investment opportunities and the resulting job creation areas, using the green jobs concept presented in section 1.1.3.2 – this is outlined in table 2.7.

**Table 2.8: Summary of green agriculture opportunities and job creation areas**

	Opportunities	Job creation areas
Crop	<ul style="list-style-type: none"> <li>• Ecological farming               <ul style="list-style-type: none"> <li>○ Mixed and inter cropping</li> <li>○ Recycling soil nutrients</li> <li>○ Green manuring</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Farmers at all levels – small, medium and large scale</li> </ul>

	Opportunities	Job creation areas
	<ul style="list-style-type: none"> <li>• Conservation farming               <ul style="list-style-type: none"> <li>○ Minimum tillage</li> <li>○ Ridge tillage</li> <li>○ No-tillage</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Technical expertise in using biological organisms to enrich soil</li> </ul>
	<ul style="list-style-type: none"> <li>• Micro use of fertilizers and herbicides</li> <li>• IPM using biological controls</li> </ul>	<ul style="list-style-type: none"> <li>• Production of green agricultural inputs</li> <li>• Scientists and researchers</li> </ul>
	<ul style="list-style-type: none"> <li>• Small-scale irrigation systems powered by renewable energy</li> </ul>	<ul style="list-style-type: none"> <li>• Technologists and innovators</li> <li>• Sales and technical services</li> </ul>
	<ul style="list-style-type: none"> <li>• Farm mechanization and equipment powered by renewable energy</li> </ul>	
	<ul style="list-style-type: none"> <li>• Integrated post-harvest systems               <ul style="list-style-type: none"> <li>○ Recycled metal silos</li> <li>○ On farm agro-processing facilities</li> <li>○ Cold-chain processing systems</li> </ul> </li> <li>• Food to market systems</li> </ul>	<ul style="list-style-type: none"> <li>• Post-harvest supply and distribution chains</li> </ul>
<b>Livestock</b>	<ul style="list-style-type: none"> <li>• Integrated livestock systems and production</li> </ul>	<ul style="list-style-type: none"> <li>• Livestock farmers at all levels – small, medium and large scale</li> <li>• Production of green agricultural inputs</li> <li>• Sales and technical services</li> </ul>
	<ul style="list-style-type: none"> <li>• Use of livestock by-products such as hides</li> </ul>	<ul style="list-style-type: none"> <li>• On-farm processing facilities</li> </ul>

*Source: Author's analysis*

### 2.3.3. Green growth/environmental outcomes of private sector green investments/businesses

Using selected business cases presented in section 2.3.1.1.1, table 2. 8 presents the various green growth, using the definition outlined in section 1.1.3.1. and/or environmental benefits from pursuing green agricultural practices.

**Table 2.9: Environmental benefits for selected business cases**

Business	Green growth/environmental benefits
<b>DuduTech</b>	<ul style="list-style-type: none"> <li>• Reduction in water and soil pollution from reduced nitrates release into the soil and water bodies from use of vermicompost</li> </ul>
<b>Olivado</b>	<ul style="list-style-type: none"> <li>• Reduced GHG emissions from purifying methane gas up to 94% purified by removing carbon dioxide, hydrogen sulphide, water and contaminants</li> </ul>
<b>Happy Cow</b>	<ul style="list-style-type: none"> <li>• Reduced incidence of milk-related illnesses and other hazards</li> </ul>

*Source: Author's compilation*

Using the green agriculture opportunities presented in table 2.7, the potential green growth/environmental outcomes from these opportunities are presented in table 2.9.

**Table 2.10: Potential green growth/environmental benefits from select green agriculture opportunities**

	Opportunities	Green growth/environmental benefits
<b>Crop</b>	<ul style="list-style-type: none"> <li>• Ecological farming               <ul style="list-style-type: none"> <li>○ Mixed and inter cropping</li> <li>○ Recycling soil nutrients</li> <li>○ Green manuring</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Mitigating greenhouse effect and global warming by appropriating carbon in soil</li> <li>• Low energy requirements reducing energy intensity per unit of land cultivated</li> <li>• Enhances and protects biodiversity</li> </ul>
	<ul style="list-style-type: none"> <li>• Conservation farming               <ul style="list-style-type: none"> <li>○ Minimum tillage</li> <li>○ Ridge tillage</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Reduced soil erosion thus maintaining soil quality</li> </ul>

	Opportunities	Green growth/environmental benefits
	<ul style="list-style-type: none"> <li>○ No-tillage</li> </ul>	<ul style="list-style-type: none"> <li>● Improved water quality and efficient water use</li> <li>● Improved air quality</li> </ul>
	<ul style="list-style-type: none"> <li>● Micro use of fertilizers and herbicides</li> <li>● IPM using biological controls</li> </ul>	<ul style="list-style-type: none"> <li>● Maintenance and increase of biodiversity</li> <li>● Reduced pesticide pollution of land and water</li> <li>● Functioning ecosystems</li> <li>● Reduced health hazards to farmers and animals</li> </ul>
	<ul style="list-style-type: none"> <li>● Small-scale irrigation systems powered by renewable energy</li> </ul>	<ul style="list-style-type: none"> <li>● Improved air quality</li> <li>● Reduced pollution and mitigated greenhouse effects</li> </ul>
	<ul style="list-style-type: none"> <li>● Farm mechanization and equipment powered by renewable energy</li> </ul>	
	<ul style="list-style-type: none"> <li>● Integrated post-harvest systems <ul style="list-style-type: none"> <li>○ Recycled metal silos</li> <li>○ On farm agro-processing facilities</li> <li>○ Cold-chain processing systems</li> </ul> </li> <li>● Food to market systems</li> </ul>	<ul style="list-style-type: none"> <li>● Increased food availability</li> <li>● Reduced environmental and human health toxins in crop storage and contaminants of biotic origin such as aflatoxin</li> </ul>
Livestock	<ul style="list-style-type: none"> <li>● Integrated livestock systems and production</li> </ul>	<ul style="list-style-type: none"> <li>● Sustainable farming practices</li> <li>● Clean energy from biogas production from manure and dairy wastewater</li> <li>● Reduced human health toxins and contaminants</li> <li>● Counteracted greenhouse effect from biomass and perennial fodders</li> </ul>
	<ul style="list-style-type: none"> <li>● Use of livestock by-products such as hides, offal</li> </ul>	

Source: Author's analysis

**2.3.4. Scalability of private sector green enterprises or investments/business**

**2.3.4.1. Existing enabling factors for green investments/business**

**2.3.4.1.1. Institutional arrangements**

The key enabling factor in agriculture is existing green frameworks that promote agriculture transformation from subsistence to modern agriculture. This is supported at macro level in the country's development plan, *Vision 2030*, that places agriculture as a key sector in achieving the intended annual economic growth rate. This is expected to be achieved through a transformation of smallholder agriculture from subsistence to an “*innovative, commercially oriented and modern agricultural sector*”. Following adoption of *Vision 2030*, the Strategy for Revitalizing Agriculture (SRA) 2004-2014 was revised leading to the development of the Agriculture Sector Development Strategy 2010-2020 (ASDS) that aims for a paradigm shift from subsistence agriculture to agri-business. ASDS is implemented through a strategic document – Agricultural Sector Transformation and Growth Strategy 2019-2029 (ASTGS) that focuses on agricultural transformation through nine flagship programmes.

Following further inspection of the ASDS and ASTGS policy documents, there was a gap in adequately covering and mainstreaming climate change adaptation (CCA) in agriculture. This was especially important considering that 98 percent of agricultural activities are rain-fed and highly susceptible to climate change and climate variability (*GoK, 2018b*). This led to the development of the Kenya Climate Smart Agriculture Implementation Framework 2018-2027 (KCSAIF) to guide on innovative and transformative initiatives, and best practices that will address climate change challenges. KCSAIF aims at increasing agricultural productivity while

sustainably building resilience of agricultural systems in the country (GoK, 2018c). Through KCSAIF, there are various implementing options for the Kenya Climate Smart Agriculture Strategy 2017-2026 (KCSAS).

#### 2.3.4.1.2. Financing/Investment

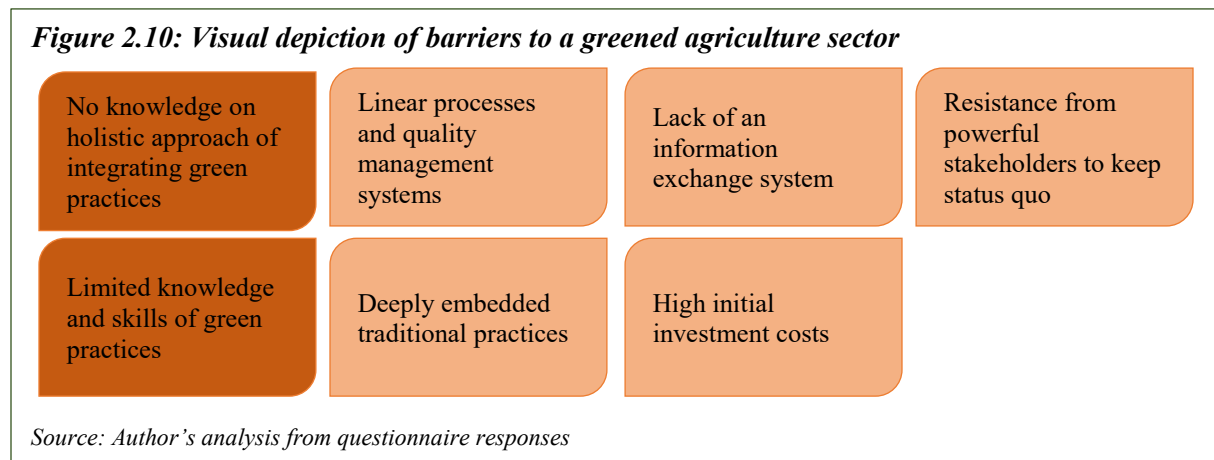
Agricultural credit is low in the country and is further highlighted by the few financial institutions offering the service. The largest private agricultural financing comes from the Co-Operative Bank of Kenya that provides agricultural financial services to around seven million clients, either directly or indirectly through cooperatives. Under the public sector, the Agricultural Finance Corporation (AFC) has been at the forefront in offering agricultural credit to farmers in Kenya.

A key gap is the lack of agricultural development banks to service small-scale farmers who are mostly unserved by both private and institutional credit as opposed to largescale farmers, millers and traders who are able to mobilize commercial lending. In spite of this gaps, many microfinanciers, such as Juhudi Kilimo, are filling this gap by offering credit based on group lending as previously mentioned.

#### 2.3.4.2. Gaps and challenges hindering flourishing green investment/ business

From the questionnaires, challenging factors for the agriculture sector were business environment from stiff competition in the market especially for export-oriented businesses and supply where oversupply can lead to low prices when selling produce each by 50 percent. This is further exacerbated by barriers such as lack of green know-how and a lack of understanding on how to holistically integrate green practices in the sector. This was followed closely by integrated linear processes and systems, high initial costs related to transition and lack of an information exchange system than businesses can draw from to increase green agriculture practices. These barriers are what hinder the agriculture sector from harnessing their full potential to realizing a greened agriculture sector.

**Figure 2.10: Visual depiction of barriers to a greened agriculture sector**



Source: Author's analysis from questionnaire responses

#### 2.3.4.3. Opportunities to enhance the enabling environment

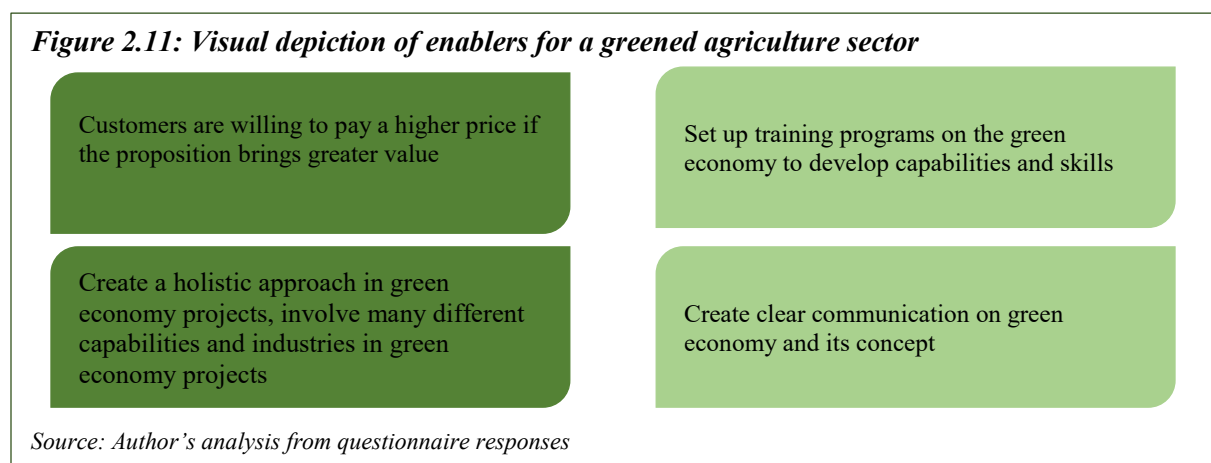
From the questionnaires, key enabling factors for the agriculture sector were market and environmental knowledge each by 40 percent through linkages to export market and creation of awareness, and capacity development by 20 percent such as providing green agriculture extension services. Environmental knowledge can be observed from the integrated green practices of efficient administration of nutrients and knowledge use of good farming practices

and climate information. This further informs the market enabling factor for agricultural produce farmed using good farming practices.

These enablers can enhance the green agriculture sector by:

- i. Creating a holistic approach to a green agriculture sector with different capabilities and industries that promote a circular economy, the sector can benefit from an all-inclusive approach to greened agriculture.
- ii. Matching the right inputs such as seeds with early maturity to the right production area for optimal yields, integrating good farming practices that re-use agricultural waste and by-products for fertilization and energy production.
- iii. Reducing post-harvest losses by having on-farm agricultural processing facilities, direct food to market systems and implementing triple bagging recycled packaging and integrated cold chain systems to deliver fresh produce with high nutrient content.
- iv. Setting up training programs to develop capabilities and skills to enhance the available green knowledge and create a space for new technologies and innovations to be discovered. This will in turn feed into the research pool that the agriculture sector has and further promote the right green technologies for the sector.
- v. By ensuring there is a clear communication on the direction of a greened agriculture sector will allow for an understanding on how climate smart agriculture feeds into the broad direction of a green economy.

**Figure 2.11: Visual depiction of enablers for a greened agriculture sector**



### Proposed policy mix for a green agriculture sector

In agriculture, the way forward is sustainably intensifying agriculture production while creating employment multiplier opportunities across the value chain. In order to do this, agricultural laws need to have environmental legislation embedded into them on nature conservation, water protection, and pollution control – table 2.10 shows examples of such policies.

**Table 2.11: Example of policies to encourage use of green agriculture**

Policy option	Examples	Description
<b>Unconditional incentives</b>	<ul style="list-style-type: none"> <li>• direct subsidies</li> <li>• tax exemptions</li> <li>• subsidized credit</li> </ul>	These instruments are mostly used to promote technology adoption and enhance land productivity.
<b>Payment for environmental services</b>	<ul style="list-style-type: none"> <li>• area based</li> <li>• product based</li> </ul>	Generally, participation is usually voluntary and payment is conditional. Compliance is monitored by buyers who can opt to stop paying for environmental services if outcomes are substandard.



Policy option	Examples	Description
<b>Participatory resource management</b>		This instrument uses communities as key people responsible for managing natural resources.
<b>Training and extension services</b>	<ul style="list-style-type: none"> <li>• training programmes</li> <li>• targeted extension services</li> </ul>	This instrument educates farmers on sustainable farming practices, how to make better-informed choices on fertilizer and pesticide uses and reduces the impact of agriculture on the environment
<b>Research and development</b>	<ul style="list-style-type: none"> <li>• grants and tax credits</li> <li>• partnerships</li> <li>• green agricultural technologies</li> </ul>	Research promotes technological innovation which can improve environmental performance of farming systems. This can be realized from innovations in engineering, information technology and biotechnology.

*Source: Author's analysis*

#### 2.3.4.4. Learning from the COVID-19 pandemic

The COVID-19 pandemic has presented a unique opportunity for a robust and resilient agriculture value chain that feeds into an improved food system. More so, it has reinforced the importance of the agriculture sector not only for offering essential service – food provisions, but its employment multiplier effect as a commercial enterprise. It has highlighted not only the need for a continuous food production system but also the logistics and supply chain that handles and transports the produce. The private sector can respond to this by:

- i. Investment in food-tech and agri-tech – leveraging on e-commerce to shorten logistics and supply chains will not only reduce the cost of business but also reduce greenhouse effect from having several vehicles transporting produce. Another way is to create a platform network to promote food to market systems linking farmers directly with consumers. The shortened value chain not only brings the consumer closer to the farmer and create traceability but will also provide a peer-to-peer platform for farmers and agribusinesses to learn from each other.
- ii. Exploit current technologies such e-commerce and commodity trading systems to create digital data opportunities to collect data on food availability, pricing, and accessibility. To ensure that data captured can be used in various forms, data collected should feature the standard food stocks and yield data and go further to capture trade flows, food prices at the retail level, and food availability in urban and rural areas.

## 2.4. Energy sector

The energy sector is characterized by energy production and energy demand. Because electricity is a major source of energy for industry and households, emphasis will be placed on electricity power supply hence green energy sources. The respondents generally agreed that green energy and renewable energy can be used interchangeably. On further inspection of their definitions there is generally no difference between the two.

“Green energy” is defined as *energy that is naturally replenished and sourced such as sunlight, wind, rain, tides, plants, algae and geothermal heat.*

“Renewable energy” is defined as *energy that is collected from renewable resources, which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat (Omar et al., 2014).*

Respondents agreed that green (renewable) energy is mainly categorized by the source of energy – solar, wind, hydro, bioenergy and geothermal. However, due to high investment costs, geothermal was not seen as a viable investment option for the private sector. A key challenge with green energy was identified in the storage and transmission. The equipment used for this are not considered ‘green’ which have a negative effect to the environment. More so, Kenya recently started using solar energy solutions but a roadmap for the recycling of the waste expected once the lifecycle of the equipment is expired poses a challenge for the sector.

## 2.4.1. Existing and potential of private sector green investments/businesses

### 2.4.1.1. Existing private sector green investments/businesses

As mentioned earlier, because energy is seen from an electricity supply perspective, the business case presented herein will follow the same. A typical electricity value chain flowing from power generation, transmission and distribution, and to various service locations will be presented with possible greened activities across the value chain. These greened value chain activities will premise the business case presented in this section.

**Table 2.12: Greened activities across an energy value chain**

	Energy sources (renewable)	Electricity generation	Transmission	Distribution	Service location
<b>Actors</b>	<ul style="list-style-type: none"> <li>• Solar</li> <li>• Wind</li> <li>• Hydro</li> <li>• Bioenergy</li> <li>• Geothermal</li> </ul>	<ul style="list-style-type: none"> <li>• KENGEN</li> <li>• IPPs</li> </ul>	<ul style="list-style-type: none"> <li>• KENTRACO</li> </ul>	<ul style="list-style-type: none"> <li>• KPLC – central grid</li> <li>• Off grid systems</li> </ul>	<ul style="list-style-type: none"> <li>• Residential areas</li> <li>• Commercial enterprises</li> <li>• Industries</li> </ul>
<b>Greened activities</b>	<ul style="list-style-type: none"> <li>• Power electricity with renewable energy</li> </ul>	<ul style="list-style-type: none"> <li>• Green energy storage solutions</li> </ul>	<ul style="list-style-type: none"> <li>• Power wheeling</li> <li>• Green grid code</li> </ul>	<ul style="list-style-type: none"> <li>• Mini grid systems</li> <li>• Smart metering</li> <li>• Net metering</li> </ul>	<ul style="list-style-type: none"> <li>• Energy efficiency</li> </ul>
<b>Green energy integration &amp; solutions</b>					Use of waste from service locations to generate biogas

*Source: Author's compilation based on desk reviews and interviews*

#### 2.4.1.1.1. Select business cases for the energy sector

##### Business Case 1: Attracting private investments to deliver wind power in Kenya

The Lake Turkana Wind Power Project (LTWP) is a large-scale wind farm that generates 300MW for the national grid. The project was financed by a complex consortium of power companies, investors and development finance institutions (DFIs). The wind farm covers 40,000 acres making it the largest wind farm in Sub Saharan Africa and the biggest single private investment in Kenya.

**Table 2.13: Lake Turkana Wind Power business case**

	<b>Green Practice</b>	<b>Stimuli used</b>	<b>Costs</b>	<b>Benefits/Returns</b>
<b>Electricity generation</b>	<ul style="list-style-type: none"> <li>• Supply of green energy</li> </ul>	<ul style="list-style-type: none"> <li>• Clean Development Mechanism that mitigated economic risk sufficiently to attract private investors</li> <li>• Planning and engaging with local communities before project kick-off</li> </ul>	USD 790 million	<ul style="list-style-type: none"> <li>• Mitigate greenhouse gas emissions equal to 740,000 metric tons of carbon dioxide equivalent/year</li> <li>• Enhance resilience to climate change</li> <li>• Creation of 2,500 green jobs from the local community</li> <li>• Tax contribution of USD 590 million</li> <li>• Revenue from carbon credits, approximately USD 6.6 million/year</li> </ul>
<b>Transmission</b>		<ul style="list-style-type: none"> <li>• Public funding through a concessional loan to construct a 436 km transmission line and substations</li> </ul>		<ul style="list-style-type: none"> <li>• Mitigate human health impacts from harmful air pollutants</li> </ul>
<b>Distribution</b>				<ul style="list-style-type: none"> <li>• Enhance reliability of energy supply</li> </ul>
<b>Service location</b>				<ul style="list-style-type: none"> <li>• Reduced consumer price of electricity</li> <li>• Creation of 150 jobs from the local community</li> </ul>
<i>Source: Author's compilation based on Cookson et al, 2017</i>				

**Box 2.12: Catalyzing private sector investments in renewable energy**

In the case of LTWP, the four private investors were industry investors who also took other roles in the project - project managers (KP&P, Aldwych), turbine producer and maintenance services (Vestas), and GIS services (Sandpiper). Apart from Sandpiper, the rest of the private investors were foreign firms. For debt financing, the only private credit provider was a foreign firm, Dutch Triodos Bank, that contributed a small part of the debt capital. With private investment largely being contributed by private investors make the assets neither tradable nor owned by institutional investors or financialized companies. This presents a good practice of not only offering financing/investments, but for a private business being a part of the development of a green energy project. However, there was a heavy reliance on DFIs to finance the debt portion of the project.

Source: Cookson et al (2017)

**Business Case 2: Using agricultural waste as a source of energy**

Mumias Sugar Company is a local, large-scale, publicly listed company that generates electricity from its bagasse-based co-generation plant, a recent addition to its product offering of sugar for local and export consumption. The plant generates about 34 MW of electricity which it sells to KPLC – 76 percent of generated electricity, and uses the latter for factory needs and domestic use for on-site staff. The business model is cost-driven and based on its strategic access to bagasse from its nucleus estates and out-growers.

**Table 2.14: Mumias Sugar Company business case**

	<b>Green Practice</b>	<b>Stimuli used</b>	<b>Costs</b>	<b>Benefits/Returns</b>
<b>Electricity generation</b>	<ul style="list-style-type: none"> <li>Bioenergy supply</li> <li>Use of ash, by product of cogeneration, as soil enrichment in cane sugar plantation</li> </ul>	<ul style="list-style-type: none"> <li>Long-term power purchase agreement (PPA) with KPLC</li> </ul>	<ul style="list-style-type: none"> <li>Capital investment of USD 63 million</li> <li>Annual operations and maintenance cost of USD 1 million</li> </ul>	<ul style="list-style-type: none"> <li>Revenue from sale of carbon credits - USD 270,000 in 2010</li> <li>Steady annual profit of USD 3.68 million</li> <li>Stable electricity supply</li> <li>Mitigate environmental pollution by reducing GHG emissions</li> <li>Employment generation</li> <li>Improved soil productivity and yield</li> <li>Carbon Emissions Reduction (CER) certificate</li> </ul>
<b>Transmission</b>		<ul style="list-style-type: none"> <li>Use of KPLC to transmit and distribute electricity</li> </ul>		

	Green Practice	Stimuli used	Costs	Benefits/Returns
<b>Distribution</b>				<ul style="list-style-type: none"> <li>Expanded electricity supply to the community</li> </ul>
<b>Service location</b>				<ul style="list-style-type: none"> <li>Ability to be energy self-sufficient</li> </ul>

*Source: Author's compilation based on Gebrezgabher et al., 2018*

**Box 2.13: Use of Pay-As-You-Go (PAYG) model to make off-grid solar solutions affordable**

Until 2011, off-grid solar solutions were small and affordability was a significant challenge for scale up of the business. The PAYG model was a significant success factor for off-grid solar lighting products for solar home systems and solar lanterns. With this model, it is estimated that 700,000 solar home systems and 2–3 million solar lanterns have been sold so far.

The PAYG business models use both mobile payment and machine-to-machine connectivity technologies to deliver solar power to customers. In a PAYG model, the consumer makes an initial payment to unlock the system, and then makes periodic payments, usually daily, through mobile money banking. If the customer fails to make payments, the system is locked remotely and will no longer work. In some instances, part of the customer's payment goes toward the cost of the system, and after a certain duration of time, the customer owns the system. In others, lighting is provided "as a service"—the customer never actually owns the solar product, and only pre-pays remotely through their cell phone for a certain number of hours of light. Despite the success of the PAYG model, product **quality** remains a challenge for both solar home systems and solar lanterns. This is because the solar components are imported from China where generic components can be purchased despite having quality standards for solar products.

*Source: Carr-Wilson & Pai (2018)*

**Business Case 3: Generating power from slaughterhouse waste**

The Nyongara Slaughter House is located in Dagoretti, at the outskirts of the city, in an area abundant of slaughter houses that supply meat to different parts of Nairobi. The biogas operations began in 2011 with biogas used for heating and electricity generation for refrigeration and lighting purpose, and use of slurry output to cultivate tomatoes. The business model is based on three value propositions - treating waste from slaughterhouse units to aid them to meet environmental regulations, generating electricity from the waste and producing bio-fertilizer.

**Table 2.15: Nyongara Slaughter House business case**

	Green Practice	Stimuli used	Costs	Benefits/Returns
<b>Electricity generation</b>	<ul style="list-style-type: none"> <li>Use of biogas factory slurry output to cultivate tomatoes</li> <li>Generation of biogas from 60 tons of solid waste &amp; 60,000 liters of wastewater</li> <li>Use of reliable technology to</li> </ul>	<ul style="list-style-type: none"> <li>Possible closure of slaughter houses around the area following pollution of Nairobi river</li> <li>Partnership between Nyongara Slaughter House and UNEP, UNIDO and</li> </ul>	<ul style="list-style-type: none"> <li>Capital investment of up to KES 1.4 million</li> </ul>	<ul style="list-style-type: none"> <li>Cost savings of KES 418,160/year</li> <li>Reduced cost of energy from KES 16/kW to KES 7/kW</li> <li>Reduced water pollution in Nairobi river</li> <li>Reduction of CO<sub>2</sub> emissions &amp; GHG emissions</li> </ul>

	Green Practice	Stimuli used	Costs	Benefits/Returns
	treat waste to required local environmental standards	KIRDI through the Ministry of Environment and Forestry		<ul style="list-style-type: none"> <li>Reduction of human health problems from reduced water pollution</li> </ul>
Service location	<ul style="list-style-type: none"> <li>Use of solar heating for temperature-controlled digester</li> <li>Recovering waste heat to replace wood and charcoal for hot water to clean the slaughterhouse</li> </ul>			<ul style="list-style-type: none"> <li>Electricity generated is consumed by the business and surplus sold to adjacent slaughter-house units and neighboring households</li> <li>Re-opening of closed slaughterhouses re-instates jobs</li> </ul>

*Source: Author's compilation based on Odero et al., 2018*

**Box 2.14: Harnessing local skills to manufacture solar panels**

Solinc is a medium-sized local business in Naivasha that manufactures solar panels of 20W to 250W and assembles solar home kits that consist of a battery, phone charger and LED lights, and solar lighting solutions. Its manufacturing capacity is at 200,000 solar panels per year. The company's staff are mostly from the local community who have received extensive training in manufacture of solar panels in Netherlands. The company sources its components from China, India and Europe but manufactures the panels locally unlike other business who import readymade panels.

**Business Case 4: Self-sustaining mini-grid system for remote areas**

KUDURA is a clean energy and water solution that provides renewable electricity, biogas, potable water and organic fertilizer in areas lacking these services. Electricity is provided via micro- or mini-grid while water and biogas are collected from the central location where the unit is installed. The business model is social based and self-sustaining – a completely stand-alone renewable energy solution that is community-run. Capital investment is used to set up KUDURA that is deployed and run by the local community to provide water and energy services. The service is payable on a PAYG model which in turn generates returns for its investors. The key business success factor is linking renewable energy provision with other rural development needs such as agriculture and/or water provision.

**Table 2.16: KUDURA business case**

	Green Practice	Costs	Benefits/Returns
Electricity generation	<ul style="list-style-type: none"> <li>Hybrid biomass/solar PV plant</li> <li>Biogas and organic fertilizer plant from animal or food waste</li> <li>Water purification plant using UV filtration</li> </ul>		<ul style="list-style-type: none"> <li>15% internal rate of return (IRR) for investors</li> <li>75% more savings/house/month from using electrical bulbs instead of kerosene lanterns</li> </ul>

	Green Practice	Costs	Benefits/Returns
<b>Distribution</b>	<ul style="list-style-type: none"> <li>• Distribution of electricity powered by solar &amp; biomass</li> <li>• Smart metering system provides easy payment options</li> </ul>		<ul style="list-style-type: none"> <li>• 60% reduced operations expenditure from 25% uptime increase</li> </ul>
<b>Service location</b>			<ul style="list-style-type: none"> <li>• 72% reduction of kerosene use by the community</li> <li>• 74% monthly savings from energy use by the community</li> <li>• 50% monthly savings on electricity &amp; diesel by schools</li> <li>• Zero cases of waterborne illness through consistent use of potable water</li> </ul>

*Source: Author's compilation based on <https://www.rvesol.com/kudura-2/>*

**Box 2.15: Developing a market for the private sector using mini grids**

Mini-Grids Results Based Financing (RBF) project by GiZ aims to facilitate implementation of 20 solar PV mini-grids in rural Kenya through private sector participation. This is expected to be done using RBF incentives that will trigger private sector investment and support the development of Solar Hybrid Village Mini-Grids (SHMGs). The incentives are result based and feature grants on verified delivery of pre-agreed, clearly defined and measurable results. Results vary from successful construction, commissioning and operation of the mini-grid to connection of new customers as well as amount of clean energy generated and supplied to customers. The private businesses take up 100% of investment risk and pre-finance their projects using private equity, bank loans or other sources of funds. The incentives are payable upon verification of results. The key challenge is in the use of diesel-powered generators to distribute the electricity.

*Source: [https://energypedia.info/images/5/51/Mini-Grids\\_RBF\\_Brochure.pdf](https://energypedia.info/images/5/51/Mini-Grids_RBF_Brochure.pdf)*

**2.4.2. Job creation through private sector green investments/businesses**

The actual number of green jobs created in the energy sector was difficult to obtain and identify due to data limitations. However, the scope of most green jobs in the energy sector are found with renewable energy sources, data from decentralized renewable energy (DRE) will be used to showcase existing green jobs in the energy sector. Using data from Power4All 2019 report, the census shows that DRE accounted for 9,669 direct formal jobs and 15,141 direct informal jobs in the period 2017/18 with an expectation of 17,000 direct formal jobs and 23,000 direct informal jobs in the 2022/23 period. Out of these jobs, pico-solar and solar heating system (SHS) businesses had the larger share of the green jobs, 78 percent for direct formal jobs and 97 percent for direct informal jobs over the 2017/18 period. The level of these green jobs is skilled, more than two-thirds, with sales and distribution as the larger job category. Women take up a quarter of the DRE jobs with the youth accounting for more than 40 percent of total DRE jobs (Power4All, 2019).

Context analysis summarized green investment opportunities and the resulting job creation areas, using the green jobs concept presented in section 1.1.3.2 – this is outlined in table 2.16.

**Table 2.17: Summary of green energy opportunities and job creation areas**

Sub sector	Opportunities	Job creation areas
Solar & Wind	<ul style="list-style-type: none"> <li>• Micro, mini and off grid systems                             <ul style="list-style-type: none"> <li>○ Power generation</li> <li>○ Parts and turbine model production</li> <li>○ Mounting structures and permitting</li> <li>○ Technology switching</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Module and cells manufacturing</li> <li>• Niche Technologies</li> <li>• Medium to large-scale turbine manufacturing</li> <li>• Installation, retailing, sales and delivery</li> <li>• Routine inspection and maintenance</li> </ul>
	<ul style="list-style-type: none"> <li>• Smart and net metering</li> <li>• Power wheeling</li> </ul>	<ul style="list-style-type: none"> <li>• System integration</li> </ul>
	<ul style="list-style-type: none"> <li>• Pumping and portable systems</li> </ul>	<ul style="list-style-type: none"> <li>• Routine inspection and maintenance</li> </ul>
	<ul style="list-style-type: none"> <li>• Heating and cooling systems</li> </ul>	<ul style="list-style-type: none"> <li>• Routine inspection and maintenance</li> </ul>
Hydro	<ul style="list-style-type: none"> <li>• Small hydro                             <ul style="list-style-type: none"> <li>○ Integration to rural electricity plans</li> <li>○ Local &amp; imported technologies</li> <li>○ Off grid connection</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Medium to large-scale turbine manufacturing</li> <li>• Manufacturing of equipment components</li> <li>• Technical servicing</li> </ul>
	<ul style="list-style-type: none"> <li>• Power wheeling</li> </ul>	<ul style="list-style-type: none"> <li>• System integration</li> </ul>
Bioenergy	<ul style="list-style-type: none"> <li>• Biomass production                             <ul style="list-style-type: none"> <li>○ Manufacture of improved cooking stoves and boilers</li> <li>○ Clean biomass systems</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Ash disposal</li> <li>• Maintenance and servicing of equipment</li> </ul>
	<ul style="list-style-type: none"> <li>• Biogas                             <ul style="list-style-type: none"> <li>○ Manufacture of industry-scale biodigesters</li> </ul> </li> <li>• Biofuels                             <ul style="list-style-type: none"> <li>○ Production of crop biofuel – small and large scale</li> <li>○ Collection systems</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Research and capacity building</li> <li>• Biogas and biofuel technology</li> <li>• Installation, retailing, sales and delivery</li> <li>• Farming crops for biofuel</li> </ul>
	<ul style="list-style-type: none"> <li>• Cogeneration                             <ul style="list-style-type: none"> <li>○ Manufacture of industry-scale biodigesters</li> <li>○ Power generation technology</li> <li>○ Off grid systems</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• System integration</li> </ul>

Source: Author's analysis

### 2.4.3. Green growth/environmental outcomes of private sector green investments/businesses

Using selected business cases presented in section 2.4.1.1.1, table 2.17 presents the various green growth, using the definition outlined in section 1.1.3.1. and/or environmental benefits from pursuing green energy.

**Table 2.18: Environmental benefits for selected energy business cases**

Business	Green growth/environmental benefits
Lake Turkana Wind Power	<ul style="list-style-type: none"> <li>• Mitigated greenhouse gas emissions</li> <li>• Enhanced resilience to climate change</li> <li>• Creation of 2,500 green jobs from the local community</li> <li>• Mitigated human health impacts from harmful air pollutants</li> </ul>
Mumias Sugar Company	<ul style="list-style-type: none"> <li>• Mitigated environmental pollution by reducing GHG emissions</li> <li>• Employment generation</li> <li>• Self-sufficient energy generation and use</li> </ul>
Nyongara Slaughter House	<ul style="list-style-type: none"> <li>• Reduced water pollution in Nairobi river</li> <li>• Reduction of CO<sub>2</sub> emissions and GHG emissions</li> </ul>



Business	Green growth/environmental benefits
	<ul style="list-style-type: none"> <li>• Reduction of human health problems from reduced water pollution</li> </ul>
<b>KUDURA</b>	<ul style="list-style-type: none"> <li>• Improved health from reduced use of kerosene</li> <li>• Savings from energy use by the community and savings on electricity and diesel by schools</li> <li>• Zero case of water borne related diseases</li> </ul>
<i>Source: Author's compilation</i>	

Using the green energy opportunities presented in table 2.7, the potential green growth/environmental outcomes from these opportunities are presented in table 2.18.

**Table 2.19: Potential green growth/environmental benefits from select green energy opportunities**

Business Opportunity	Green growth/environmental benefits
<b>Micro, mini and off grid systems (green energy based)</b>	<ul style="list-style-type: none"> <li>• Reliable electricity and extended daylight hours for communities</li> <li>• Increased energy efficiency and reduction in carbon emissions when combined with efficient and environmentally sustainable battery storage</li> </ul>
<b>Smart and net metering</b>	<ul style="list-style-type: none"> <li>• Reduced electricity consumption</li> <li>• Increased transmission and distribution efficiency</li> <li>• Reduced need for vehicles for meter reading thus reducing carbon emissions</li> <li>• Opportunity for distributed generation that reduces reliance on fossil-fuel</li> </ul>
<b>Solar heating and cooling</b>	<ul style="list-style-type: none"> <li>• Reduces respiratory and cardio health issues resulting from improved air quality</li> <li>• Reduced energy consumption</li> <li>• Eliminates the pollution that may have resulted from burning fossil fuels for heating and cooling purposes</li> </ul>
<b>Small hydro power</b>	<ul style="list-style-type: none"> <li>• Provision of electricity to remote communities</li> <li>• Contribute to decentralized mini-grids serving remote areas</li> </ul>
<b>Power Wheeling</b>	<ul style="list-style-type: none"> <li>• Promotes energy efficiency by transmitting excess power to other areas with too much demand</li> </ul>
<b>Bioenergy production</b>	<ul style="list-style-type: none"> <li>• Diversified agricultural output by stimulating rural economic development</li> <li>• Contributes to poverty reduction by increasing food prices and incomes for farmers</li> <li>• Lower GHG emissions</li> <li>• New revenues from the use of agricultural residues and carbon credits</li> <li>• Reduction in energy dependence on central grid</li> <li>• Diversified domestic energy supply</li> <li>• Access to affordable and clean energy for rural SMEs</li> </ul>
<i>Source: Author's analysis</i>	

## 2.4.4. Scalability of private sector green enterprises or investments/business

### 2.4.4.1. Existing enabling factors for green investments/business

#### 2.4.4.1.1. Institutional arrangements

Sessional Paper No.4 of 2004 is considered the nascent and integral policy that set about the development of renewable energy in Kenya. It stipulated the challenges in Kenya that can be resolved with implementation of renewable energy and the necessary adjustments needed in various energy institutions. It led key energy sector reforms and strategies such as the Energy Act 2019, Universal Access of Electricity by 2020, Feed-in-Tariff policy (FiT 2012 and 2008)

that introduced private sector investments to renewable energy, Solar PV and Solar Thermal Regulations (2012), and Energy Efficiency and Conservation Policy (Energy Management Regulations 2012). More so, Sessional Paper No.4 of 2004 aided in restructuring of the Ministry of Energy (MoE) to introduce the Geothermal Development Company (GDC) to advance geothermal power generation and Rural Electrification and Renewable Energy Corporation (REREC), a dedicated arm of the government to advance rural power electrification.

**Table 2.20: Energy sector policy targets and outcomes**

Targets by renewable energy source	Outcomes
<b>Solar</b>	<ul style="list-style-type: none"> <li>Realize at least 100MW from solar by 2017, 200MW by 2022 and 500MW by 2030</li> </ul>
<b>Solar - PV</b>	<ul style="list-style-type: none"> <li>Install solar PV systems in 50% of the remaining public facilities in off grid areas.</li> <li>Install at least 100,000 units of solar PV home solar systems by 2017</li> <li>Install at least 200,000 units of solar PV home solar systems by 2022</li> </ul>
<b>Solar – thermal (solar water heating systems)</b>	<ul style="list-style-type: none"> <li>Raise awareness by ensuring installation of at least 350,000 SWH units by 2017, 450,000 SWH units by 2022 and at least 700,000 SWH units by 2030</li> </ul>
<b>Hydro</b>	<ul style="list-style-type: none"> <li>Achieve 700MW power generation by 2023 from large hydropower</li> <li>Achieve a total of 50MW from small, mini, micro and pico hydropower by 2018</li> <li>Achieve a total of 100MW from small, mini, micro and pico hydropower by 2023</li> <li>Achieve a total of 300MW from small, mini, micro and pico hydropower by 2030</li> </ul>
<b>Bioenergy - biomass</b>	<ul style="list-style-type: none"> <li>By 2023, provide incentives for private sector participation in generation, exploitation, production, distribution, supply and use</li> <li>Sustain 10% and above tree cover while exploiting biomass activities</li> </ul>
<b>Bioenergy - biogas</b>	<ul style="list-style-type: none"> <li>Construct 5,000 biogas digesters by 2018, 6,500 by 2022 and 10,000 by 2030</li> </ul>
<b>Bioenergy - biofuel</b>	<p>Accelerate bio-fuel development through PPPs with the private sector through:</p> <ul style="list-style-type: none"> <li>Pilot a 10% ethanol-gasoline (E-10 Mandate) blend in Government vehicles and in public transport vehicles by 2018</li> <li>Pilot 1% biodiesel blend in Government vehicles and in different blending ratios for use as hybrid fuel at isolated power generation plants by 2018</li> <li>All gasoline vehicles in Kenya to use at least 10% ethanol-gasoline (E-10 Mandate) blend by 2030</li> <li>Government vehicles to use at least 5% biodiesel blend and all isolated power generation plants to use 100% biodiesel by 2030</li> </ul>
<b>Bioenergy - cogeneration</b>	<ul style="list-style-type: none"> <li>Undertake pilot programmes to generate at least 50MW of electricity using municipal/industrial solid waste by 2017, 100MW by 2022 and 300MW by 2030 under PPP arrangements</li> <li>Facilitate 800MW of co-generation capacity from bagasse and agro-residues by 2022 and 1,200MW by 2030</li> </ul>
<b>Geothermal</b>	<ul style="list-style-type: none"> <li>Increase geothermal generation to 1,887MW by 2017 through both the public sector and the private sector to invest via PPPs and joint venture arrangements</li> <li>Increase geothermal generation to 5,500MW by 2030</li> </ul>
<b>Wind</b>	<ul style="list-style-type: none"> <li>Provide fiscal incentives on wind energy equipment and systems</li> <li>Development of wind power generation of at least 500MW by 2017 and 1,000MW by 2022 and 3,000MW by 2030</li> </ul>

*Source: Author based on data from selected National Energy Policy 2014 targets, GoK (2014)*

#### 2.4.4.1.2. Financing/Investment

Due to the capital intensity of green energy projects, their success lies on the access to startup and expansion capital. Due to this barrier, institutional finance is essential for these projects. In Kenya, the government uses two tools – public private partnerships (PPPs) to combine public and private financing, and Power Purchase Agreements (PPA) to mobilize project financing by private investors. The PPA approach is an important tool to aid private sector investments in

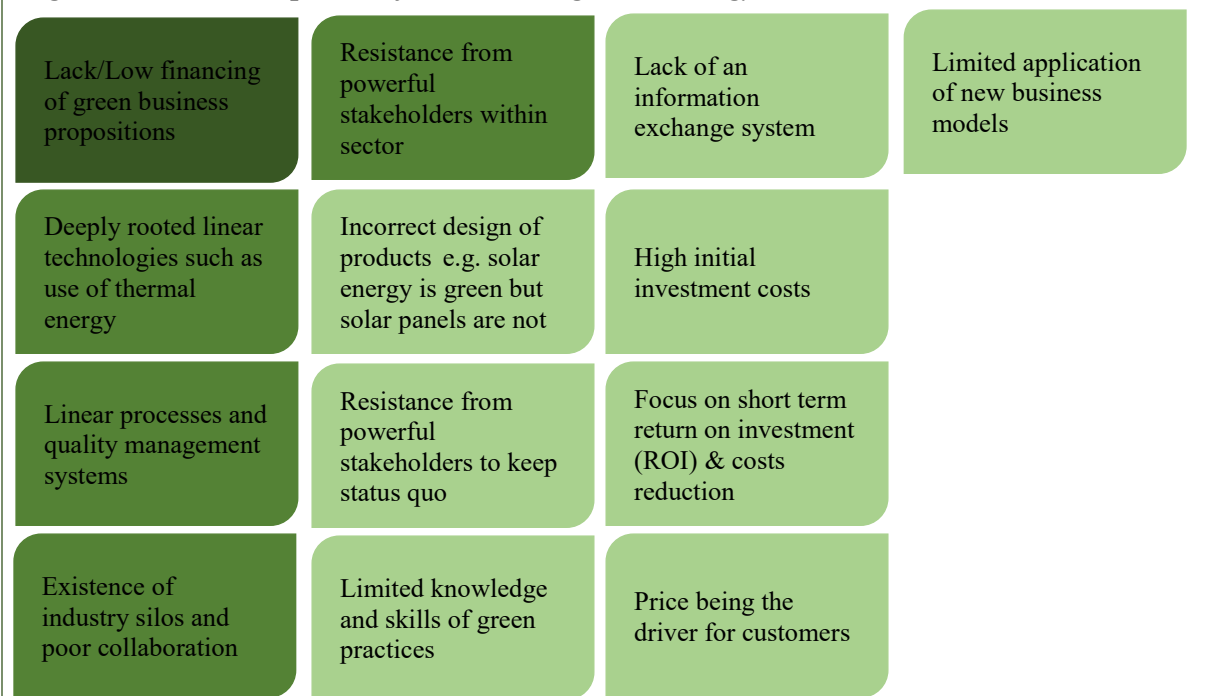
renewable energy. Through a PPA, power producers have guaranteed revenue from renewable energy investment thus giving confidence to lenders on repayment of debt.

**2.4.4.2. Gaps and challenges hindering flourishing green investment/ business**

From the questionnaires, challenging factors for the energy sector was business environment by 21 percent, followed by customer demands, environmental knowledge, financing and legislation by 14 percent, and capacity development and innovation and technologies at seven percent as shown in figure 2.12. The business environment is challenging due to lack of promotion of local technologies such as wind turbines locally made and the lack of verification procedures on the standards of imported green technologies especially with solar panels. Also, the misconception that green energy solutions are cheap has been a hinderance in the adoption of green energy solutions. This is reaffirmed by poor understanding of the costs and benefits on implementing green energy solutions. Most consumers shy away from the high initial investment costs without looking at the long run benefit of green energy solutions. This ties into the financing challenge associated with the high sunk costs. It is further exacerbated by the changing political capabilities around legislation – the biggest blow for the solar sub sector was the withdrawal of the mandatory SWH guidelines for all buildings in late 2019.

These gaps were exacerbated by barriers lack and/or low financing of green energy business propositions given the high initial investment costs associated with green energy solutions. This is followed closely by deeply rooted linear technologies such as use of thermal energy, linear processes and quality management systems from historical use of the main grid system, existence of industry silos and poor collaboration as seen from competing small scale solar and wind equipment outfitting, and resistance from powerful stakeholders within sector such as the nascent contracted IPP who mostly use fossil fuel based thermal energy. These barriers are what hinder the energy sector from harnessing their full potential to realizing a renewable powered economy.

**Figure 2.12: Visual depiction of barriers to a greened energy sector**



Source: Author’s analysis from questionnaire responses

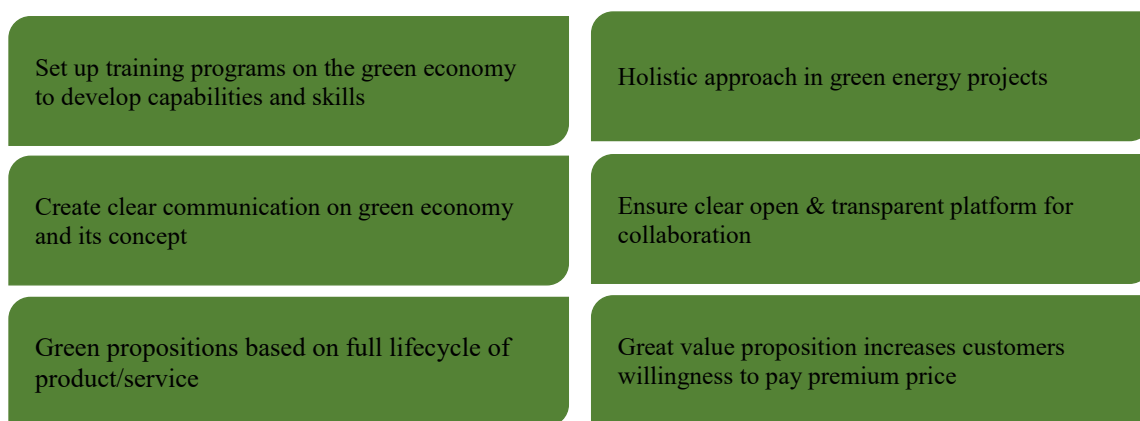
#### *2.4.4.3. Opportunities to enhance the enabling environment*

Descriptive analysis found that enabling factors were customer demands, environmental knowledge and legislation each by 33 percent. With increased consumption of green energy, specifically solar, has seen an increased demand by customers for the solutions. This was further promoted by legislation, especially the guidelines on SWH and zero-rated import duty on imported solar panels that saw a perception shift to the benefits that green energy can offer. Environmental knowledge is also a key enabling factor since most consumers find that they can reduce their carbon footprint through use of green energy, which is especially the case for processing facilities. More so, the use of bioenergy solutions such as biogas has steadily increased due to the understanding that the produce methane gas is clean and good for the environment.

These enablers can enhance the green energy sector by:

- i. Setting up training programs to develop capabilities and skills to enhance the available green knowledge in the sector but will be able to create a space for new technologies and innovations to be discovered and implemented. This has been especially true in solar energy technologies that have seen it power street lights, houses and off grid systems to remote areas of the country.
- ii. By ensuring there is a clear communication on the direction of the green energy sector for an understanding on how the sector's growth can be planned out. So far, Kenya has been able to do this with the Energy Policy 2019, Scaling up Renewable Energy Programme (SREP), Least Cost Power Development Plan (LCPDP), Rural Electrification Master Plan, Sessional Paper No. 4 of 2004 and the Feed-in Tariff (FiT) Policy.
- iii. Green propositions based on full lifecycle of product to understand the lifecycle of green energy equipment. This will enable planning for recycle and reuse of the equipment components by auditing of installed green energy equipment and developing a material recovery plan for recycling and reuse. This also ties into having a holistic approach in green energy projects.
- iv. By ensuring item (ii), then a clear, open and transparent platform for collaboration can be established in the sector where stakeholders can share knowledge and best practices to advance renewable energy in the country.
- v. Matching the advantages to the disadvantages of various green energy solutions, a greater value proposition can be offered to customers which increases their willingness to pay premium price. An example of this is trading off the downside of solar – no energy is harnessed at night, with the benefits of wind energy – greater speeds at night.

**Figure 2.13: Visual depiction of enablers for a green energy sector**



Source: Author's analysis from questionnaire responses

**Proposed policy mix for a green energy sector**

The renewable energy sector in Kenya has come a long way to be integrated into policies and its adoption, especially solar energy. However, there are some gaps in policies that need to be supplemented or complemented by other policies as shown in table 2.20.

**Table 2.21: Example of policies to encourage use of renewable energy**

Policy option	Examples
<b>Leading by example</b>	<ul style="list-style-type: none"> <li>• Support for early adopters and innovators</li> <li>• Government procurement</li> </ul>
<b>Guidelines</b>	<ul style="list-style-type: none"> <li>• Technology transfer</li> <li>• Specialized renewable energy trainings</li> </ul>
<b>Demand stimulation</b>	<ul style="list-style-type: none"> <li>• Renewable purchase obligation &amp; energy certificates</li> </ul>
<b>Financial incentives</b>	<ul style="list-style-type: none"> <li>• Tax reduction/exemption &amp; tax credits</li> <li>• Standards and verification tools</li> <li>• Carbon pricing</li> <li>• Soft loans and guarantees, &amp; capital grants and rebates</li> </ul>
<b>Price based options</b>	<ul style="list-style-type: none"> <li>• Feed-in-premiums &amp; feed-in-tariffs</li> </ul>
<b>Market based options</b>	<ul style="list-style-type: none"> <li>• Renewable portfolio standards</li> <li>• Quota obligations, technology banding, &amp; green certificates</li> </ul>

Source: Author's analysis

**2.4.4.4. Learning from the COVID-19 pandemic**

A key takeaway following the COVID-19 pandemic is that investments in renewable energy have remained profitable while those for fossil fuels have fallen. This has highlighted that the proposed Lamu coal plant will not be a profitable venture for Kenya. This shows the need to increase private sector participation in the renewable energy space and setting aside funds, which were missing in the COVID-19 stimulus package, to fast track renewable energy projects. If the country can invest in grid expansion to favor decentralized grid systems, then the private sector can respond to this by:

- i. Accepting the shift to results-based financing models to accelerate private investments in green energy solutions with verified end-user energy connections to ensure an efficient grid connection.
- ii. Pursuing decentralized grid systems that are community centered ensuring the provision of electricity under a PAYG model is demand driven.

- iii. Target energy efficiency investment opportunities to reflect green growth outcomes of sustainable consumption and production principles.

## 2.5. Manufacturing sector

The respondents generally agreed that green manufacturing and sustainable manufacturing can be used interchangeably. On further inspection of their definitions there is generally no difference between the two.

“Green manufacturing” is defined as *development and use of manufacturing processes that minimize or eliminate waste streams and the use of toxic materials (Silberglitt, et al., 2009).*

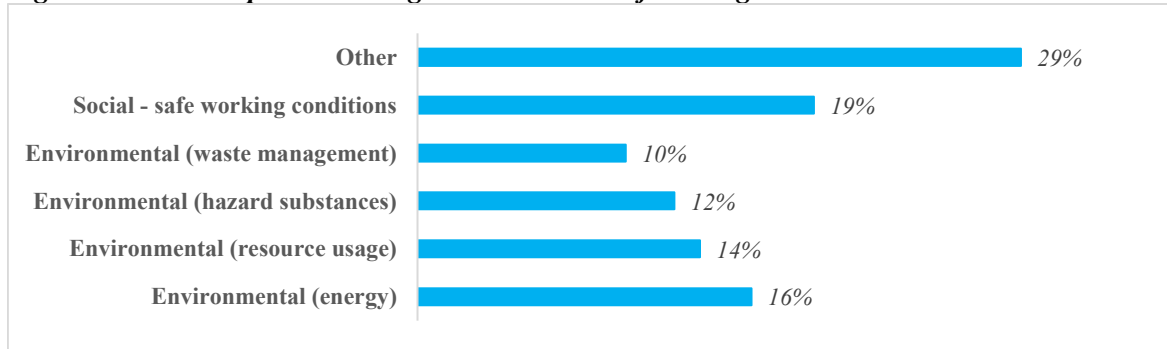
“Sustainable manufacturing” is defined as *creation of manufactured products that use processes that minimize negative environmental impacts, conserve energy and natural resources, are safe for employees, communities, and consumers and are economically sound<sup>18</sup>.*

Respondents noted that green manufacturing is more about the various practices a manufacturer has integrated to minimize and eliminate waste streams and reducing or replacing the use of toxic materials. These practices are characterized by the environment – energy use, resource usage, hazardous substances, waste management, and safe working conditions. The descriptive analysis found that in the manufacturing sector, the key green practices integrated were safe working conditions through use of internal safety inspections, external work environment audits, mechanical lifting aids, process modifications to reduce noise and vibrations, employee training on hazardous risks and key operations performance indicators by 19 percent. This was followed closely by environmental energy use mainly via employee training on energy savings, mapping energy consumption to identify energy savings and leakages, heat recovery and recycle using heat exchangers and equipment upgrades and maintenance for improving efficiency at 16 percent. Other integrated green manufacturing practices were environmental resource usage through material recycle and reuse, material substitution for better efficiency and material usage and process optimization by 14 percent. At 12 percent, environmental monitoring in use of hazard substances was practiced through biologically-based wastewater treatment and oil leakage prevention. The least practiced green manufacturing practices at 10 percent was on waste management mainly through donation of waste and by-products to other industries or institutions– this is depicted by figure 2.14.

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<sup>18</sup> <https://www.oecd.org/innovation/green/toolkit/aboutsustainablemanufacturingandthetoolkit.htm>

**Figure 2.14: Green practices integrated in the manufacturing sector**



Source: Author’s analysis from questionnaire responses

## 2.5.1. Existing and potential of private sector green investments/businesses

### 2.5.1.1. Existing private sector green investments/businesses

Looking at a typical manufacturing value chain that flows from material supply, production and processing, distribution, packaging and handling, markets, and a final and key value chain activity for green advancement, reverse material supply. The use of renewable energy solutions can also be found along a green value chain showcasing the manufacturing-energy nexus portrayed in section 2.7. These examples of a greened value chain are what will guide the business case presented in this section.

**Table 2.22: Greened activities across a manufacturing value chain**

	Material supply	Production & processing	Distribution, packaging & handling	Markets	Reverse supply chain
<b>Actors</b>	<ul style="list-style-type: none"> <li>Local supply</li> <li>Imported supply</li> </ul>	<ul style="list-style-type: none"> <li>Design &amp; engineering</li> <li>Manufacturers</li> </ul>	<ul style="list-style-type: none"> <li>Logistic companies</li> <li>Packaging companies</li> </ul>	<ul style="list-style-type: none"> <li>Local market – final point of sale</li> <li>Export market</li> </ul>	<ul style="list-style-type: none"> <li>Industry actors</li> <li>Recyclers</li> <li>Upcyclers</li> </ul>
<b>Greened activities</b>	<ul style="list-style-type: none"> <li>Minimal use of virgin raw materials</li> <li>Material recycle and reuse</li> <li>Material substitution for better efficiency</li> </ul>	<ul style="list-style-type: none"> <li>Clean production technologies</li> <li>Energy efficient equipment and machinery</li> <li>Process waste to generate biogas</li> <li>Component and product design optimization</li> <li>Redesigning of components for solid waste reduction</li> </ul>	<ul style="list-style-type: none"> <li>Ecofriendly packaging materials</li> <li>Clear product information relayed</li> <li>Fuel efficient vehicles</li> <li>Route optimization</li> </ul>	<ul style="list-style-type: none"> <li>Green niche markets</li> <li>Certifications for green practices</li> <li>Environmental audits and standards</li> </ul>	<ul style="list-style-type: none"> <li>Integration of waste streams across the value chain</li> <li>Re-use of salvageable waste for manufacturing – wastewater, production waste</li> <li>Extended producer responsibility on packaging materials</li> <li>Disposal of non-reusable waste</li> </ul>

	Material supply	Production & processing	Distribution, packaging & handling	Markets	Reverse supply chain
<b>Green energy integration &amp; solutions</b>		<ul style="list-style-type: none"> <li>• Biogas use from process waste</li> <li>• Use of renewable energy in production &amp; processing</li> </ul>	<ul style="list-style-type: none"> <li>• Biofuel powered vehicles</li> </ul>		<ul style="list-style-type: none"> <li>• Use of waste to generate heat and power</li> </ul>

*Source: Author's compilation based on desk reviews and interviews*

### 2.5.1.1.1. Select business cases for the manufacturing sector

#### Business Case 1(a): Use of resource efficient and clean production (RECP) measures to boost productivity

Chandaria Industries Ltd is a local, large scale private business that manufactures and convert paper. The business model centers on recycling waste paper and blending virgin pulp to create various tissue products. By adopting RECP measures and recommendations, the company has improved its operations through cost reduction, efficient resource use and improved environmental performance. Previous to this, the company relied on intensive thermal energy use from running the boiler for paper milling and high-water consumption intensity in the paper and cotton mill plants.

**Table 2.23: Chandaria Industries business case**

	Green Practice	Stimuli/change integrated	Costs	Benefits>Returns
<b>Material supply</b>	<ul style="list-style-type: none"> <li>• Procurement of high quality waste paper thus reduced washing cycles</li> <li>• Improved stock dewatering leading to improved first pass retention.</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction of new process for improved flocculation</li> <li>• Installation of inclined screens to avoid overflow losses.</li> </ul>	<ul style="list-style-type: none"> <li>• Part of USD 4,802 investment for material efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Material efficiency from reduced materials use of 3,200 tons – KES 26 million savings</li> </ul>
<b>Production &amp; processing</b>	<ul style="list-style-type: none"> <li>• Effluent treatment and wastewater recovery and recycling</li> <li>• Monitoring water consumption &amp; wastewater generation via metering and sub-metering of usage and discharge points</li> <li>• Monitoring productivity levels</li> <li>• Improving operation of</li> </ul>	<p>Assistance of the Kenya National Cleaner Production Centre (KNCPC), part of part of the global RECP Network via</p> <ul style="list-style-type: none"> <li>• Comprehensive training and awareness</li> <li>• Operational improvements</li> <li>• Improved technologies</li> </ul> <p>Compliance with national legislative</p>	<ul style="list-style-type: none"> <li>• Part of USD 4,802 investment for energy and water efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Energy efficiency from reduced energy of 5,367,429 kWh/year - KES 19.24 million savings</li> <li>• Water efficiency – reduced by 150,000 m<sup>3</sup>/year with a KES 1.6 million savings</li> <li>• Reduced pollution load to sewer - BOD from 750mg/l to 380mg/l</li> </ul>



	<b>Green Practice</b>	<b>Stimuli/change integrated</b>	<b>Costs</b>	<b>Benefits/Returns</b>
	dissolved air flotation system <ul style="list-style-type: none"> <li>• Use of poly-electrolytes for wastewater treatment.</li> <li>• Boiler efficiency monitoring and infrared heat analysis</li> </ul>	framework for environmental management		
<b>Distribution, packaging &amp; handling</b>				<ul style="list-style-type: none"> <li>• Sole supplier status for a range of products to several multinationals</li> </ul>
<b>Markets - local</b>	<ul style="list-style-type: none"> <li>• Cleaner Production (CP) certification – used as proof of environmental best practices and eco-friendly products</li> </ul>	Assistance of the Kenya National Cleaner Production Centre (KNCPC), part of part of the global RECP Network via		<ul style="list-style-type: none"> <li>• Attainment of ISO 9000:2001 certification in Quality Management Systems</li> <li>• Award winner of Cleaner Production Awards from 2007 to 2009</li> </ul>
<b>Reverse supply chain</b>	<ul style="list-style-type: none"> <li>• Recycled waste water used in production dilutions and improved shop floor cleaning</li> <li>• Waste segregation at source</li> <li>• Quantification of generation levels</li> <li>• Recycling of sludge for production of egg trays</li> </ul>	<ul style="list-style-type: none"> <li>• Application of green procurement measures</li> <li>• Promotion of 3R (reduce, reuse and recycle) approaches</li> </ul>		
<i>Source: Author's compilation based on UNIDO (2011).</i>				

**Business Case 1(b): Use of resource efficient and clean production (RECP) measures to boost productivity**

Pwani Oil Products is a local, large scale private business that manufactures edible oils, fats and laundry bar soaps. By adopting RECP recommendations, the company commissioned a new refinery plant to replace the previously inefficient refinery as part of its technology change. They were able to expand production capacity from 150 to 300 tons/day of refined oil and maximized production efficiency. The new refinery doubled the number of jobs, from 150 to 300, generating new employment.

**Table 2.24: Pwani Oil business case**

	<b>Green Practice</b>	<b>Stimuli/change integrated</b>	<b>Costs</b>	<b>Benefits/Returns</b>
<b>Material supply</b>	<ul style="list-style-type: none"> <li>• Installation of a more efficient refinery of capacity 350-400 tons/day.</li> <li>• Process unit synchronization to avoid material overflows.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction of reworks of non-conforming soap.</li> <li>• Reduced spillages and leakages through repairs of pumps.</li> </ul>		<ul style="list-style-type: none"> <li>• Material efficiency from reduced materials by more than 5,500 tons (5% reduction) – over USD 20,000 savings</li> </ul>
<b>Production &amp; processing</b>	<ul style="list-style-type: none"> <li>• Condensate trapping for boiler feed water</li> <li>• Use of biofuel pitch to run boilers</li> <li>• Switch from furnace oil to biomass – use of 4 biomass boilers</li> <li>• Investment in capacitor banks for maintained power supply</li> <li>• Replacement of old air compressors with efficient ones with variable speed drives</li> <li>• Use of steam powered machines</li> </ul>	<p>Assistance of the Kenya National Cleaner Production Centre (KNCPC), part of part of the global RECP Network via</p> <ul style="list-style-type: none"> <li>• Comprehensive training and awareness</li> <li>• Operational improvements</li> <li>• Improved technologies</li> </ul> <p>Compliance with national legislative framework for environmental management</p>		<ul style="list-style-type: none"> <li>• 15,000 liters per day of condensate recovered</li> <li>• Cable &amp; transformer losses reduction to 2.8% from 1.6%</li> <li>• Drop from 146.25 kWh/hr to 110 kWh/hr of average motor power consumption</li> <li>• Energy efficiency with reduced energy use of 2,774,400 kWh/year – USD 422,372 savings</li> <li>• Water efficiency – reduced by 3,070 m<sup>3</sup>/year with a USD 653 savings</li> <li>• 98% reduction in carbon dioxide emissions - 22,550 tons reduced with USD 180,396 savings</li> </ul>
<b>Markets – local &amp; export</b>	<ul style="list-style-type: none"> <li>• Expanded market from use of clean production practices</li> </ul>	<p>Assistance of the Kenya National Cleaner Production Centre (KNCPC), part of part of the global RECP Network</p>		<ul style="list-style-type: none"> <li>• Awarded overall winner of Cleaner Production Awards in 2009</li> </ul>
<b>Reverse supply chain</b>	<ul style="list-style-type: none"> <li>• Reuse of reject water to flush toilets &amp; general cleaning</li> </ul>			

*Source: Author's compilation based on UNIDO (2011).*

**Box 2.16: Collaborating with associations to foster a circular economy**

The Framework of Cooperation (FOC) signed between the government through the Ministry of Environment and Forestry, the National Environment Management Authority (NEMA) and the private sector through the Kenya Association of Manufacturers (KAM) shows a good example of government and the private sector working together to promote a circular economy. The partnership seeks to reduce plastic waste in the environment through collection and recycling. It is from this partnership that led to the wide acceptance of Kenya’s Plastic Action Plan which if enforced fully will result in a comprehensive funding, compliance and monitoring mechanism, which creates awareness, education and commitment from every stakeholder in the value chain, to redesign their role and contribute real resources towards making our circular economy ambition a reality for our future generations.

Source: Circular economy key for sustainable growth, [Business Daily](#)

**Business Case 2: Addressing pollution and inefficient use of resources**

Nyanza Bottling Company were among the manufacturers who have implemented the cleaner production project under the Lake Victoria Environmental Management Program phase II (LVEMP II). The program was designed to address pollution and inefficient utilization of resources. The adoption of clean production has boosted the workplace environment, reduced waste generation and emissions benefiting the communities living around factories.

**Table 2.25: Nyanza Bottling Company business case**

	<b>Green Practice</b>	<b>Stimuli/change integrated</b>	<b>Costs</b>	<b>Benefits&gt;Returns</b>
<b>Material supply</b>	<ul style="list-style-type: none"> <li>Monitoring of water usage at each operation level.</li> <li>Controlled leakages from damaged pipes and spillages</li> </ul>	Assistance from Lake Victoria Environmental Management Program		<ul style="list-style-type: none"> <li>Material efficiency from reduced water use from 5 liters to 2.4 liters</li> </ul>
<b>Production &amp; processing</b>	<ul style="list-style-type: none"> <li>Construction of an effluent treatment plant to use treated water for other beneficial use such as vehicle washing, gardening and construction</li> <li>Shift from using a furnace oil boiler to an agro waste type boiler</li> <li>Switching off lights after working hours</li> <li>Installing translucent roofing sheets and glass blocks to utilize natural light</li> </ul>			<ul style="list-style-type: none"> <li>Clean production practices saved the company KES 166 million/year</li> <li>Saving of 1,100 m<sup>3</sup>/day from effluent treatment plant</li> <li>Saving of 3,000 liters of diesel/day</li> <li>Reduced energy consumption by 25%</li> </ul>

	Green Practice	Stimuli/change integrated	Costs	Benefits/Returns
	<ul style="list-style-type: none"> <li>Better insulation of cold rooms and chilled rooms</li> <li>Channeling the final rinse water for cleaning plastic crates instead of discharge</li> </ul>			
<b>Reverse supply chain</b>	<ul style="list-style-type: none"> <li>Recycling backwash water from the water treatment plant</li> <li>Recycling of crate chips, glass &amp; worn out pallets</li> </ul>			<ul style="list-style-type: none"> <li>Saving of 45 m<sup>3</sup>/day of water from recycling backwash water</li> </ul>

*Source: Author's compilation based on <https://www.cpkkenya.org/media-centre/articles/tanzania/how-mwanza-industries-benefit-from-adoption-of-cleaner-production>*

### Business Case 3: Sustainable circular economy approach for waste management

Thika Cloth Mills is a local, medium business that produces over 1 million meter of fabric cloth in different blends, colors and print. The textile business aim was to reduce energy water and chemicals consumption by cutting costs and waste. This, in turn, reduced their environmental impact and increase the quality of its products.

**Table 2.26: Thika Cloth Mills business case**

	Green Practice	Stimuli/change integrated	Costs	Benefits/Returns
<b>Production &amp; processing</b>	<ul style="list-style-type: none"> <li>Biomass briquettes production</li> <li>Operation of efficient boiler</li> <li>Steam sold to another textile company</li> <li>Pre-treatment of wastewater streams</li> </ul>	<ul style="list-style-type: none"> <li>Installation of a 5.3 MW boiler using financing and technical assistance from Sustainable Use of Natural Resources and Energy Financing programme (SUNREF)</li> </ul>	<ul style="list-style-type: none"> <li>USD 1.3 million investment</li> </ul>	<ul style="list-style-type: none"> <li>Energy savings of 270MWh/y</li> <li>Emissions savings of 167t eq CO<sub>2</sub>/y</li> <li>Increased quality of yarns</li> <li>Reduced water and chemical consumption</li> </ul>

*Source: Author's compilation based on <https://www.sunref.org/en/projet/banking-on-new-technology-to-modernize-textile-firm-and-expand-capacity/>*

### **Box 2.17: Towards a circular economy with recycled packaging materials**

Unilever has started packaging in containers made from recycled plastics to reduce environmental damage. This effort is part of the company's plans to ensure that all its plastic packs are made from re-used or recycled plastic by 2025. The re-usable plastic packs have been made out of waste collected and manufactured by local recycling firm Mr. Green Africa. By using recycled packaging materials, Unilever has indirectly created 1,700 jobs for collection and delivery of plastics in Nairobi. The partnership, between Unilever and Mr. Green Africa, has also enlisted 140 primary schools to collect plastic waste.

*Source: Unilever adopts recycled plastics packaging, [Business Daily](#)*

#### Business Case 4: Attracting private investment for green manufacturing principles

Kenya Association of Manufacturers (KAM), a manufacturing business association, developed a partnership with the Agence Française de Développement (AFD) to offer project developers and banks with technical assistance with credit financing for energy efficiency and renewable energy projects. This was offered through a financing facility - Sustainable Use of Natural Resources and Energy Financing programme (SUNREF). Technical assistance is offered via capacity building, institutional support, and training while financial support is offered via loans, grants, and guarantees. The facility targets SMEs to aid them in overcoming the barriers in accessing green investment. The financial component of the facility is led by the private sector via local commercial banks that act as lending agencies. AFD provides the local commercial banks with low-rate, long-term finance for refinancing purposes. Hence, the facility offers local financial institutions with special partnership conditions giving them an opportunity to capture climate-change mitigation financing and scale up lending to SME developers and climate-related projects. The selection of financial institutions depends on a fixed criterion –credit risk policy, size, climate finance strategy, risk appetite for green projects, staff availability, client portfolio mix, and credit risk appraisal of financial institutions. Currently, the facility partner banks are the Cooperative Bank, Chase Bank NCBA Bank and Diamond Trust Bank.

#### **2.5.2. Job creation through private sector green investments/businesses**

The actual number of green jobs created in the manufacturing sector was difficult to obtain and identify due to data limitations. Hence context analysis summarized green investment opportunities and the resulting job creation areas, using the green jobs concept presented in section 1.1.3.2 – this is outlined in table 2.26.

**Table 2.27: Summary of green manufacturing opportunities and job creation areas**

	Opportunities	Job creation areas
<b>Manufacturing</b>	<ul style="list-style-type: none"> <li>• Expansion and upgrading of existing processing lines to enhance efficiency                             <ul style="list-style-type: none"> <li>○ Green efficiency principles</li> <li>○ Clean production instruments</li> <li>○ Waste energy recovery</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• In all sectors leading to greened and transformed jobs</li> <li>• Technical capacity building</li> <li>• Alternative technologies</li> </ul>
	<ul style="list-style-type: none"> <li>• Innovation                             <ul style="list-style-type: none"> <li>○ Use of eco-friendly materials</li> <li>○ Solutions for non-recyclables</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Partnership with academia and research institutions</li> </ul>
	<ul style="list-style-type: none"> <li>• Reverse supply chains                             <ul style="list-style-type: none"> <li>○ Integrating waste materials in processing lines</li> <li>○ Reduction, recycling and re-use of waste</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Sector symbiosis with waste management</li> <li>• Life Cycle Assessment</li> <li>• Materials specification and use</li> <li>• Impact Quantification</li> </ul>
<i>Source: Author's analysis</i>		

#### **2.5.3. Green growth/environmental outcomes of private sector green investments/businesses**

Using selected business cases presented in section 2.5.1.1.1, table 2.27 presents the various green growth, using the definition outlined in section 1.1.3.1. and/or environmental benefits from pursuing green energy.

**Table 2.28: Environmental benefits for selected manufacturing business cases**

Business	Green growth/environmental benefits
Chandaria Industries Ltd	<ul style="list-style-type: none"> <li>• Material, water and energy efficiency</li> <li>• Reduced pollution load to sewer</li> </ul>

Business	Green growth/environmental benefits
	<ul style="list-style-type: none"> <li>• Improved air quality from reduced air contamination</li> </ul>
Pwani Oil Products	<ul style="list-style-type: none"> <li>• Material, water and energy efficiency</li> <li>• Reduced cable and transformer losses</li> <li>• Reduced carbon dioxide emissions</li> </ul>
Nyanza Bottling Company	<ul style="list-style-type: none"> <li>• Material efficiency</li> <li>• Recycling backwash water</li> <li>• Reduced energy consumption</li> </ul>
Thika Cloth Mills	<ul style="list-style-type: none"> <li>• Energy savings</li> <li>• Emissions savings</li> <li>• Reduced water and chemical consumption</li> </ul>

*Source: Author's compilation*

Using the green manufacturing opportunities presented in table 2.26, the potential green growth/environmental outcomes from these opportunities are presented in table 2.28.

**Table 2.29: Potential green growth/environmental benefits from select green manufacturing opportunities**

Business Opportunity	Green growth/environmental benefits
Expansion and upgrading of existing processing lines to enhance efficiency	<ul style="list-style-type: none"> <li>• Increased material, water and energy efficiency</li> <li>• Identification of waste streams that heat and power can be drawn from</li> </ul>
Use of eco-friendly and recyclable materials	<ul style="list-style-type: none"> <li>• Reduced/complete clearance of landfill and waste pile up</li> <li>• Promotes a circular economy with economic gains – cost savings</li> </ul>
Reverse supply chains	<ul style="list-style-type: none"> <li>• Decrease raw material footprint</li> <li>• Carbon footprint gains from reverse logistics, reducing fuel costs</li> </ul>

*Source: Author's compilation*

## 2.5.4. Scalability of private sector green enterprises or investments/business

### 2.5.4.1. Existing enabling factors for green investments/business

#### 2.5.4.1.1. Institutional arrangements

Sessional Paper No. 9 of 2012 on the National Industrialization Policy Framework for Kenya is the key policy framework for the sector. The policy is guided by the overarching policy objective of sustaining 15 percent GDP contribution, making Kenya competitive and preferred geography for industrial investments which will in turn result in increased wealth and job creation in the country.

**Table 2.30: Manufacturing sector policy targets**

Objectives based on National Industrialization Policy Framework	Link to KAM Priority Agenda 2019
Strengthen the capacity and local content of domestically manufactured goods by 20%	<ul style="list-style-type: none"> <li>▪ Promoting access to quality, affordable and reliable energy for manufacturing, reducing transport and logistic costs, and incentivizing prompt payment culture</li> <li>▪ Enhance local market access</li> <li>▪ Supporting pro-industry skill development, green growth, a fit for purpose public service and enhanced digitization</li> </ul>
Raise the share of products in the regional market from 7% to 15 %	<ul style="list-style-type: none"> <li>▪ Enhance regional market access</li> </ul>
Develop niche products for existing and new markets	<ul style="list-style-type: none"> <li>▪ Enhance local and regional market access and diversifying international market access</li> </ul>

Objectives based on National Industrialization Policy Framework	Link to KAM Priority Agenda 2019
Increase share of FDI in the industrial sector by 10%	<ul style="list-style-type: none"> <li>Ensuring a stable macroeconomic environment</li> </ul>
Increase share of locally produced industrial components, spare parts and machine tools by 25%	<ul style="list-style-type: none"> <li>Competitiveness and level playing field by lowering the cost of imported industrial inputs and fighting against illicit trade, contraband, substandard goods and dumping</li> </ul>
Develop at least 2 Special Economic Zones (SEZs) and 5 SME Industrial Parks (IPs)	<ul style="list-style-type: none"> <li>Supporting pro-industry skill development, green growth, a fit for purpose public service and enhanced digitization</li> </ul>
Establish an Industrial Development Fund at a minimum of KES 10 billion for long term financing of manufacturing enterprises	<ul style="list-style-type: none"> <li>Enhancing cashflow to manufacturers</li> <li>Avail long term financing to manufacturers</li> <li>Increase government financing for SME</li> </ul>
Increase share of MSME manufacturing output by 20%	<ul style="list-style-type: none"> <li>Promoting access to quality, affordable and reliable energy for manufacturing, reducing transport and logistic costs, and incentivizing prompt payment culture</li> <li>Increase government financing, market access and governance for SMEs</li> </ul>
Increase local content of locally manufactured goods for export to at least 60%	<ul style="list-style-type: none"> <li>Diversifying international market access</li> </ul>
Increase share of industries located outside major urban centers - Nairobi, Mombasa, Kisumu, Nakuru, Eldoret) to at least 50%	<ul style="list-style-type: none"> <li>Ensure predictable and stable industrial policies development, certainty and predictability of tax policies and national policy and institutional coherence for the manufacturing sector</li> </ul>
<p><i>Source: Author based on data from National Industrialization Policy Framework for Kenya, GoK (2012) and KAM Priority Agenda 2019 from KAM (2018)</i></p>	

#### 2.5.4.1.2. Finance/Investment

The manufacturing sector benefits from many avenues for public financing. For medium to large enterprises, public finance can be accessed from Industrial Development Bank (IDB), Development Bank of Kenya (DBK), and Industrial and Commercial Development Corporation (ICDC). In 2019, IDB advanced KES 330 million worth of credit for three start-up businesses in energy briquetting, leather and paper processing, and expansion of five textile, tea and food processing businesses; DBK advanced KES 94 million worth of credit in 2019 for manufacture and installation of heavy steel components and structural steelwork for power generation plants, cement production plants and steel production plants; and ICDC advanced KES 640 million for four start-ups and two existing businesses in food and pharmaceutical processing activities (KNBS, 2020). For small and micro businesses, Kenya Industrial Estates (KIE) offers financing and facilitation development of enterprises. The amount of loans advanced by KIE was KES 602.7 million in 2019 for 380 projects with the main beneficiary being businesses from the food sub sector.

More so, the sector is able to access green financing from SUNREF with credit ranging from USD 40,000 to USD 200,000. However, this range can exclude micro and small businesses who may need less than USD 10,000 financial assistance.

#### 2.5.4.2. Gaps and challenges hindering flourishing green investment/ business

From the questionnaires, the most challenging factor for the manufacturing sector was legislation, business environment, capacity development, financing and environmental knowledge by 17 percent, followed by customer demands and innovation and technologies at

eight percent. The business environment is challenging because implementation of most of the green practices is not mandatory making it challenging for green business to compete on price, given green advantage is factored in, with ‘non-green’ businesses. In turn, integration of green manufacturing practices usually translates to high initial investment costs of which financing is an issue. Despite integrating green practices, one needs the right people trained in their implementation which is difficulty to maintain. Also, despite having a business association that shares environmental knowledge, not all of its members benefit from access to the knowledge. More so, despite production of green products and services, there is no defined ecolabeling to distinguish green products from non-green products. This coupled by some barriers such as high initial investment costs associated with green practice integration, and lack of an information exchange system for green know how. This is followed closely by limited application of new business models which can be explained by the lack of knowledge of a holistic approach in integrating green practices in the manufacturing lifecycle, price being the major driver for customers who may not be willing to pay premium for green products, a focus on short term ROI without looking at the costs savings that come from green practices and limited knowledge and skillset on green practices. The lack of know-how on a holistic approach to green manufacturing also explains the focus on the end product lifecycle recycling instead of waste streams at each value chain activity, deeply rooted linear technologies and the limited availability and quality of recycling material. Lack of financing for green business propositions is also explained by the high initial investment costs that green practice integration attracts. These barriers are what hinder the manufacturing sector from harnessing their full potential to realizing a green industrial process.

**Figure 2.15: Visual depiction of barriers to a green manufacturing sector**



Source: Author's analysis from questionnaire responses



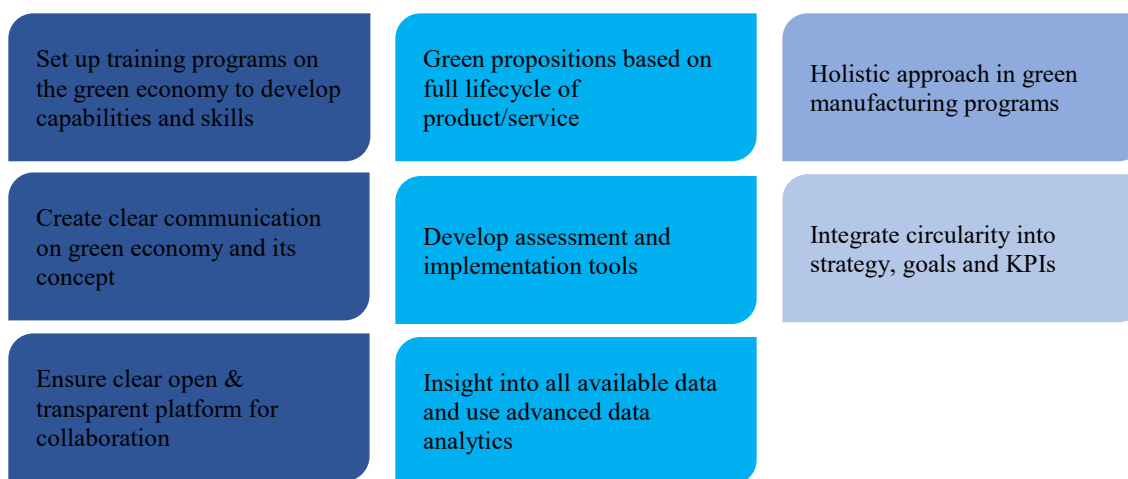
#### *2.5.4.3. Opportunities to enhance the enabling environment*

Descriptive analysis found that enabling factors were business environment and innovation and technologies each by 29 percent. The business environment has stiff competition which make manufacturers turn to green practices to increase their productivity levels. This in turn has led to new innovation and technologies used in the sector such as heat recovery and anti-pollution systems. Environmental knowledge is also a key enabling factor since manufacturers has a strong business association that educates its members on green business benefits. This in turn build customers' demands as they are more inclined to relate and purchase products and services that conserve the environment. More so, the adoption of the EPR guidelines and Kenya Plastics Action Plan initiated by the manufacturer's business association has aided in the integration of green practices in the sector.

These enablers can enhance the green manufacturing sector by:

- i. Setting up training programs to develop capabilities and skills to enhance the available green knowledge in the sector and create a space for new technologies and innovations to be discovered and implemented. This has been especially true in heat recovery and exchange systems and boiler upgrades.
- ii. By ensuring there is a clear communication on the direction that the green manufacturing sector will allow for an understanding on how the sector's growth can be planned out. So far, Kenya has been able to do this with the National Industrialization Policy 2012 – 2030 and the Kenya's Industrial Transformation Programme (KITP).
- iii. By ensuring item (ii), then a clear, open and transparent platform for collaboration can be established in the sector where stakeholders can share knowledge and best practices to advance green manufacturing processes in the country.
- iv. Green propositions based on full lifecycle of product with an understanding of the lifecycle of manufacturing products can aid in the mapping of waste streams to shift focus to end of product lifecycle recycling.
- v. Having assessment and implementation tools to track CO<sub>2</sub> and GHG emissions will aid manufacturers in pinpointing the areas in their value chain that need to have more environmental focus. This also ties into having the needed insight through data that is integrated in their systems to monitor environmental non-compliance.

**Figure 2.16: Visual depiction of enablers for a green manufacturing sector**



Source: Author’s analysis from questionnaire responses

**Proposed policy mix for a green manufacturing sector**

Production processes that rely less on fossil fuel use and efficient use of natural resources are required in driving a green agenda. Green manufacturing policies will lead this structural change.

**Table 2.31: Example of green manufacturing policies**

Policy option	Examples	Description
<b>Revenue-Neutral Green Taxes</b>	<ul style="list-style-type: none"> <li>revenue recycling</li> <li>environmental taxes</li> </ul>	These instruments function by increasing economic efficiency by internalizing environmental costs.
<b>Fiscal policy reforms</b>	<ul style="list-style-type: none"> <li>green value added tax reform</li> <li>fossil fuel subsidy reform</li> </ul>	These reforms will guide a shift away from production processes that damage the environment to environmentally responsible production processes.
<b>Efficiency policies</b>	<ul style="list-style-type: none"> <li>energy efficiency</li> <li>resource efficiency</li> </ul>	This instrument can be used to promote efficient use of production inputs to minimize wastage and promote recycling.
<b>Carbon adjustments</b>	<ul style="list-style-type: none"> <li>carbon pricing</li> </ul>	These instruments offer a trade to counterbalance higher costs due to environmental taxation.

Source: Author’s analysis

Other policy options include command and control policies like standards, licenses or permits, compliance monitoring and enforcement; voluntary actions such as cleaner production programs, environmental management systems, product labelling, and corporate social responsibility; and transparency and disclosure through toxic release inventory, public disclosure and environmental performance awards

**2.5.4.4. Learning from the COVID-19 pandemic**

In spite of the innovations that the COVID-19 pandemic as aforementioned in section 1.1.2.4.5., there are areas of improvement especially in packaging of manufacturing products. Following the ban of single-use plastics in the country, many manufacturers have seen the benefits of recyclable packaging – see Box 2.17. However, with the pandemic, there has been an increased use of plastic packaging especially for sanitizers, PPEs and disinfectant products. Since consumer demand for these products have increased, then it follows that these plastic packaging disposals will increase. The guidelines around Extended Producer Responsibility (EPR) may

prompt manufacturers to establish a reverse supply chain, the success is hinged upon voluntary commitment. The private sector can respond to the pandemic by

- i. Harnessing local innovations, such as the local ventilator production, from academia and research to be scaled up over importation of technologies.
- ii. Boosting academia/research and private sector collaboration to fill the gap between idea generation and creation of technologies from the ideas.
- iii. Re-using of existing components from manufacturing to develop new machinery and equipment that is eco-friendly. This requires a complete catalogue of all components used in manufacturing to implement deconstruction of components for re-use.

## **2.6. Waste management sector**

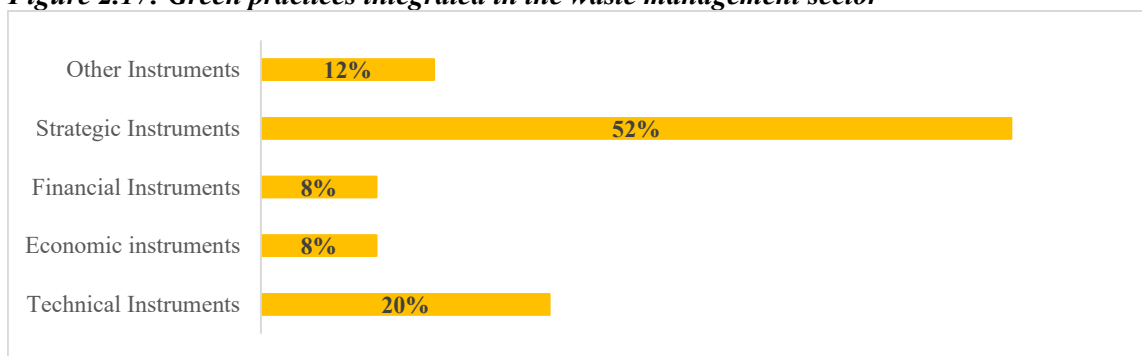
Respondents agreed that the best terminology to use for waste management is “recycling” and “upcycling”. The consensus was common on the definitions provided during consultations.

“Recycling” is defined as *the process of converting waste materials into new materials and objects.*

“Upcycling” is defined as *process in which products and materials that are no longer in use, or are about to be disposed, are instead repurposed, repaired, upgraded and remanufactured in a way that increases their value.*

The main difference noted was that in recycling value is often partially lost as opposed to upcycling where value is retained. Respondents noted that waste management is mostly done from an environment conservation perspective and most businesses will implement waste management as a way to reduce costs. This is done by mapping various waste streams at both household and commercial levels to find ways to integrate waste in production processes. More so, the long-term benefits and general well-being from recycling waste is also a motivator for most waste businesses. Generally, the recycling subsector is an easier entry point for the private sector because the costs are low – need to match your recycling needs with various waste collection centers, as opposed to upcycling subsector that requires investment in both equipment and skill. The descriptive analysis found that in the waste sector, the key green practices integrated were strategic instruments such as Extended Producer Responsibility (EPR) that has greatly enabled their businesses to tap into to get waste materials at 13 percent. Other integrated green waste management practices This was followed by use of technical instruments such as waste collection services, combination of waste collection systems, treatment methods, provision of curbside services to households and commercial areas, existence of source separation activity in packaging waste and organics, and convenient location of collection facilities at five percent. Other integrated practices were financial instruments at four percent through bans on products with low or no recyclability such as plastic bags through the Kenya Plastics Action Plan and economic instruments at two percent by corresponding between volume or weight and charges and payments to waste collectors – this is depicted by figure 2.17.

**Figure 2.17: Green practices integrated in the waste management sector**



Source: Author's analysis from questionnaire responses

## 2.6.1. Existing and potential of private sector green investments/businesses

### 2.6.1.1. Existing private sector green investments/businesses

The business case presented in this section will use an example of a recycling value chain that collects waste, sorts waste at two levels – primary and secondary, processes the waste into a saleable product. The generation of renewable energy can also be found along a green value chain showcasing the waste-energy nexus portrayed in section 2.7. These examples of a greened value chain are what will guide the business case presented in this section.

**Table 2.32: Greened activities across a waste management value chain**

	Collection of waste	Primary sorting of waste	Secondary sorting of waste	Processing of waste	Sale of recycled/upcycled product
<b>Actors</b>	<ul style="list-style-type: none"> <li>Waste pickers – formal &amp; informal</li> <li>Collection centers</li> <li>Industries</li> </ul>		<ul style="list-style-type: none"> <li>Recyclers – formal &amp; informal</li> <li>Upcyclers – formal &amp; informal</li> </ul>		<ul style="list-style-type: none"> <li>Industries</li> <li>Farmers</li> </ul>
<b>Greened activities</b>	<ul style="list-style-type: none"> <li>Improved livelihoods of informal waste pickers</li> <li>Reverse supply chain from industries</li> </ul>	<ul style="list-style-type: none"> <li>Fuel efficient machinery</li> <li>Use of short processing equipment</li> </ul>			<ul style="list-style-type: none"> <li>Use of organic materials for farming</li> <li>Use of recycled materials for materials and</li> </ul>
<b>Green energy integration &amp; solutions</b>				<ul style="list-style-type: none"> <li>Use of waste to produce bio-energy</li> </ul>	<ul style="list-style-type: none"> <li>Green energy production</li> </ul>

Source: Author's compilation based on desk reviews and interviews

#### 2.6.1.1.1. Select business cases for the waste management sector

##### Business case 1: An integrated waste management system for organic waste

TakaTaka Solutions, a local, medium and foreign owned business has adopted a different approach than other waste disposal enterprises in Nairobi and has developed an integrated system for waste management. The company's 200 or so staff – most of them women – sort all incoming waste into roughly 50 different categories that are then passed on to recyclers. Organic waste accounts for around two thirds and is used directly as animal feed or composted for use as

fertilizer. TakaTaka Solutions has three revenue streams – waste collection fees from customers (USD 1/month for informal settlements, USD 2/month - USD 3/month and USD 5/month - USD 6/month for mid-sized and large-sized households, and USD 100/month to USD 1000/month for commercial enterprises dependent on waste volume) that make up 60 percent of revenue, and sale of recyclables and compost that make up the latter revenue stream.

**Table 2.33: TakaTaka business case**

	<b>Green Practice</b>	<b>Stimuli/change integrated</b>	<b>Costs</b>	<b>Benefits/Returns</b>
<b>Collection of waste</b>	<ul style="list-style-type: none"> <li>• Collection of organic waste</li> <li>• Recycling of 95% of waste collected</li> <li>• Curbside &amp; collection center points</li> <li>• Efficient waste collection by employing 3X more staff - sorters and composting staff</li> </ul>	<ul style="list-style-type: none"> <li>• Grant funds and advisory from experts in waste management within the company</li> </ul>	<ul style="list-style-type: none"> <li>• Capital cost of USD 40,000/ facility with 20 tons daily input</li> <li>• Operational cost of USD 10,000/month</li> <li>• Capital cost of USD 350,000 to maintain compost plant with 25 tons daily input</li> <li>• Premium truck collecting vehicles costing about USD 50,000</li> </ul>	<ul style="list-style-type: none"> <li>• Creation of jobs</li> <li>• USD 50,000 from sales in 2013</li> <li>• Collects 470 tons of waste/month</li> </ul>
<b>Primary and secondary sorting of waste</b>	<ul style="list-style-type: none"> <li>• Sorting of all incoming waste into roughly 50 different categories</li> </ul>			
<b>Processing of waste</b>	<ul style="list-style-type: none"> <li>• Compaction of Styrofoam, a difficult waste to recycle.</li> </ul>			<ul style="list-style-type: none"> <li>• Recycling of 446 tons of waste/month</li> <li>• Produces 50 tons of compost/month</li> <li>• Saves 1,100 CO<sub>2</sub> emissions/year based on composting calculations only</li> <li>• Reduction of around 84,000 tons of greenhouse gases/year</li> </ul>
<b>Sale of recycled/upcycled product</b>	<ul style="list-style-type: none"> <li>• Sale of compost &amp; recyclables</li> <li>• Improving soil productivity from compost sold</li> <li>• Door-to-door awareness campaigns on waste disposal practices</li> </ul>			
<p><i>Source: Author's compilation based on <a href="https://www.innovationpolicyplatform.org/www.innovationpolicyplatform.org/system/files/1%20Waste%20Collection_Apr6/index.pdf">https://www.innovationpolicyplatform.org/www.innovationpolicyplatform.org/system/files/1%20Waste%20Collection_Apr6/index.pdf</a></i></p>				

**Box 2.18: Reducing food waste at national levels**

To solve the food waste problem in South Korea, the Ministry for Food, Agriculture, Forestry and Fisheries and the Ministry for Health, Welfare and Family Affairs, and other government ministries set up a comprehensive policy mix to change the food culture, reduce waste and increase recycling. The policy mix included (a) National Masterplan on Food Waste Reduction that was the overarching framework for implementation, (b) recycling programme that demanded collection of food waste in residential catering businesses, and (c) landfill ban for food waste and voluntary agreements with catering businesses to encourage reduced food waste and loss. An innovative approach to reduce food waste was using a volume-based food waste fee system. The system required households to pay a fee based on the amount of food waste they generate that is measured on a scale at the bottom of the waste bin. In order to promote recycling, the government financed development of public recycling facilities.

Source: Kim et al. (2013)

**Business case 2: Waste is value approach**

Havillah is a local, medium sized business that adds value to post consumer and industrial solid trash. The business does this by adopting an on-site model to collect, sort and process the waste into organic and inorganic products.

**Table 2.34: Havillah business case**

	<b>Green Practice</b>	<b>Stimuli/change integrated</b>	<b>Costs</b>	<b>Benefits&gt;Returns</b>
<b>Collection of waste</b>	<ul style="list-style-type: none"><li>• Purchase waste depending on the value up to KES 22 per kilo</li><li>• Use of digital technologies to weigh and pay for waste</li></ul>			<ul style="list-style-type: none"><li>• Reduced pollution with over 600 tons of solid waste recovered and recycled so far</li><li>• Inclusion of waste collectors into the recycling value chain</li></ul>
<b>Primary and secondary sorting of waste</b>	<ul style="list-style-type: none"><li>• Bought and shredded more than 3000 tons of waste since 2014</li></ul>			<ul style="list-style-type: none"><li>• Creation of 1,500 indirect jobs and 40 direct jobs</li></ul>
<b>Processing of waste</b>	<ul style="list-style-type: none"><li>• 95% of all solid waste is recycled</li></ul>			<ul style="list-style-type: none"><li>• Gross income of KES 10 million/year</li></ul>
<b>Sale of recycled/upcycled product</b>	<ul style="list-style-type: none"><li>• Provision of recyclable materials to industries</li></ul>			<ul style="list-style-type: none"><li>• Recycling a fraction of 55% of the waste</li></ul>

Source: Author's compilation based on interview with Samuel Maina

**Business case 3: Demonstrating green growth practices through eco-entrepreneurship**

EcoPost Limited that produces eco-friendly fencing posts over the traditional wood fencing posts. EcoPost secures its supplies of plastic from a number of waste-sorting businesses that in turn have purchased waste from (informal) collectors or collected the waste themselves. About 80 percent of the revenues come from direct sales with its product's main use being for landscaping and fencing.

**Table 2.35: EcoPost business case**

	Green Practice	Stimuli/change integrated	Costs	Benefits/Returns
Collection of waste		<ul style="list-style-type: none"> <li>Partnership approach with African Nazarene School of Business for research &amp; knowledge; Wamulembe Self Help Group &amp; TakaTaka Solutions for waste collection, and Giraffe Center &amp; Smart Signs as buyers of the recycled product</li> <li>Skills training in sorting of plastic and production of posts</li> </ul>		<ul style="list-style-type: none"> <li>Recycled 2 million kgs of waste/year</li> <li>Provided direct jobs to 220 people and income opportunities to an additional 2,177 people - 80% under the age of 25 and 56% women</li> <li>Replaced 60,000 wooden posts, which corresponds to saving approximately 2,400 trees</li> <li>Contribute to a healthier environment.</li> <li>USD 1.5 million from sales in 2013</li> </ul>
Primary and secondary sorting of waste	<ul style="list-style-type: none"> <li>Sorting of waste to be shredded into small strips to be heated</li> <li>Compaction of strips to cast into moulds of various shapes and sizes.</li> </ul>			
Processing of waste	<ul style="list-style-type: none"> <li>Recycles 30 tons of waste/month</li> <li>Reduces costs of deforestation</li> <li>Use of sawdust waste from timber companies</li> </ul>			
Sale of recycled/upcycled product	<ul style="list-style-type: none"> <li>Recycled posts for fencing &amp; landscaping</li> </ul>			

Source: Author's compilation based on <http://www.ecopost.co.ke/>

### Box 2.19: Tackling e-waste in East Africa

WEEE Centre offers recycling services for e-waste to the general public, business, learning institutions, government and NGOs in East Africa by working closely with social enterprise Close the Gap project. The increasing amount of e-waste has created a need to recycle them in an environment-friendly way. This presents an opportunity to reuse ICT products to bridge technological gaps in low-income countries. Thus, WEEE Centre works on the treatment of collected e-waste by creating possibilities of reusing, dismantling and sourcing of downstream management in environmental compliance. So far, the centre has safely handled more than 10,000 tons of e-waste, 200 tons/month, since inception. Some of the challenges faced in business are missing regulations makes it challenging to collect the waste. However, with the recent adoption of Extended Producer Responsibility (EPR) guidelines, the centre will receive regulatory support to strengthen the business. The centre makes a good business case as the demand for usable ICT devices is high in low-income countries as local manufacturers are not there and new products are expensive in local markets. The technology of management is easy to adapt, however ICT collection and financing the operations must be explored locally if such operations are to be scaled.

Source: <https://www.wtert.net/bestpractice/268/The-WEEE-Centre-in-Nairobi-Kenya.html>

### Business Case 4: Franchise model approach for sanitation and waste management

Sanergy is a social foreign owned business offering affordable, accessible, and hygienic sanitation solution. The business does this by creating a network of low-cost sanitation centers for the underprivileged population living in areas without sewage or electricity. To scale up its business model, Sanergy utilized public and private partnerships such as the government Unilever, Kiva, and Oxfam. Over 600 Sanergy toilets have been installed in six informal settlements in Nairobi.

Table 2.36: Sanergy business case

	Green Practice	Stimuli/change integrated	Costs	Benefits/Returns
<b>Collection of waste</b>	<ul style="list-style-type: none"> <li>• Safe collection of 7,878 metric tons of waste</li> <li>• 8,095 tons of waste safely removed from the community/year</li> <li>• Lower costs of waste transportation</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• 4X less to provide sanitation per person/year</li> <li>• Cost of USD 13 per person/year with the government bearing only USD 6 per person/year of that cost</li> </ul>	<ul style="list-style-type: none"> <li>• Improved environmental quality - daily collection of 4.5 metric tons of faeces and 2.5 tons of urine</li> <li>• Over 3,560 fresh life toilets serving 142,400 residents per day</li> </ul>
<b>Primary and secondary sorting of waste</b>	<ul style="list-style-type: none"> <li>• Treatment of waste</li> </ul>			
<b>Processing of waste</b>	<ul style="list-style-type: none"> <li>• Co-digestion of faeces with other organic waste.</li> <li>• Convert waste into organic fertilizer and insect-based animal feed</li> </ul>			<ul style="list-style-type: none"> <li>• Organic fertilizer has yielded 30% increased yield in crop yield and animal weight</li> </ul>
<b>Sale of recycled/upcycled product</b>	<ul style="list-style-type: none"> <li>• Certification for the sale of organic fertilizer by KEBS</li> </ul>			

Source: Author's compilation based on <http://www.sanergy.com/approach/>

### 2.6.2. Job creation through private sector green investments/businesses

The actual number of green jobs created in the manufacturing sector was difficult to obtain and identify due to data limitations. Hence context analysis summarized green investment opportunities and the resulting job creation areas, using the green jobs concept presented in section 1.1.3.2 – this is outlined in table 2.36.

**Table 2.37: Summary of green waste management opportunities and job creation areas**

Sub sector	Opportunities	Job creation areas
<b>Recycling</b>	<ul style="list-style-type: none"> <li>• Source waste separation <ul style="list-style-type: none"> <li>○ Collection, separation and processing</li> <li>○ Curbside collection</li> <li>○ Diversion of waste from landfill</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Formalized waste collectors</li> </ul>
	<ul style="list-style-type: none"> <li>• Waste material tracking systems and waste storage solutions</li> </ul>	<ul style="list-style-type: none"> <li>• System integration</li> <li>• Waste quantification and processing</li> </ul>
	<ul style="list-style-type: none"> <li>• Waste energy recovery <ul style="list-style-type: none"> <li>○ Conversion of large quantities of waste into biomass.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Energy management systems</li> </ul>
<b>Upcycling</b>	<ul style="list-style-type: none"> <li>• Repurposing waste <ul style="list-style-type: none"> <li>○ Creating new waste streams across sectors</li> <li>○ Monitoring waste generated</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Waste quantification and processing</li> <li>• Waste technologies</li> </ul>

Source: Author's analysis



### 2.6.3. Green growth/environmental outcomes of private sector green investments/businesses

Using selected business cases presented in section 2.6.1.1.1, table 2.27 presents the various green growth, using the definition outlined in section 1.1.3.1. and/or environmental benefits from pursuing green energy.

**Table 2.38: Environmental benefits for selected waste management business cases**

Business	Green growth/environmental benefits
<b>TakaTaka Solutions</b>	<ul style="list-style-type: none"> <li>• Promote direct collection of waste hence highest employment potential</li> <li>• Reuse and recycling of disposable goods</li> <li>• Extended lifecycle of materials</li> </ul>
<b>Havillah</b>	<ul style="list-style-type: none"> <li>• Reduced pollution with over 600 tons of solid waste recovered and recycled so far</li> <li>• Inclusion of waste collectors into the recycling value chain</li> <li>• Indirectly created 1,500 jobs from waste collectors</li> </ul>
<b>EcoPost Limited</b>	<ul style="list-style-type: none"> <li>• Mitigate climate change by saving acres of forest land that sequest CO<sub>2</sub> emissions</li> <li>• Provided direct jobs to 220 people and income opportunities to an additional 2,177 people - 80% under the age of 25 and 56% women</li> </ul>
<b>Sanergy</b>	<ul style="list-style-type: none"> <li>• Improved environmental quality - daily collection of 4.5 metric tons of faeces and 2.5 tons of urine</li> </ul>

*Source: Author's compilation*

Using the green manufacturing opportunities presented in table 2.36, the potential green growth/environmental outcomes from these opportunities are presented in table 2.38.

**Table 2.39: Potential green growth/environmental benefits from select green waste management opportunities**

Business Opportunity	Green growth/environmental benefits
<b>Source waste separation</b>	<ul style="list-style-type: none"> <li>• Awareness of the benefits of recycling</li> <li>• Reduced contamination of waste materials easing sorting of waste</li> </ul>
<b>Waste material tracking systems and waste storage solutions</b>	<ul style="list-style-type: none"> <li>• Improving waste traceability and control</li> <li>• Increased reuse from waste materials – enhances waste sorting and processing</li> </ul>
<b>Waste energy recovery</b>	<ul style="list-style-type: none"> <li>• Clean energy solutions</li> <li>• Increased energy supply to power industries and households</li> </ul>
<b>Repurposing waste</b>	<ul style="list-style-type: none"> <li>• Reduced waste in landfills</li> </ul>

*Source: Author's compilation*

### 2.6.4. Scalability of private sector green enterprises or investments/business

#### 2.6.4.1. Existing enabling factors for green investments/business

##### 2.6.4.1.1. Institutional arrangements

There have been efforts to encourage 3Rs – Reuse, Recycle and Recovery especially from a commercial perspective, but the total waste generated in the country remains high. This overburden and pollutes land, air and water resources. *Vision 2030* seeks to relocate the current waste dumpsite in Dandora as well as develop flagship functional compliant and sustainable waste management systems in major towns by the year 2030. However, a major impediment to this has been the lack of regulation and policies to promote efficient and sustainable management of waste in the framework of a green economy. A bill on the issue was introduced to parliament in 2013 and has recently been signed into law as the *National Sustainable Waste Management*

*Bill, 2019*. Following the introduction of this draft bill, some aspects of the waste management sector has been mainstreamed in Kenya. If passed, the bill will act as the guiding policy framework for waste management in Kenya. The policy is expected to increase the value extraction from waste thus making waste a resource. More so, the policy will create an environment with harnessed and incentivized large-scale investment in waste recovery and recycling industry. Hence, it will create the required regulatory environment to enable an effective handling of the waste challenge by adopting a waste hierarchy and circular economy (*GoK, 2019*).

Currently, the waste management sector is guided by the National Solid Waste Management Strategy 2015 (*GoK, 2015*) as the new bill awaits adoption by the senate. Table 2.39 summarizes the policy targets for the sector.

**Table 2.40: Waste management sector policy targets and outcomes**

Policy Objectives	Link to National Solid Waste Management Strategy
<b>Promote waste management through implementation of the waste hierarchy and circular economy concepts</b>	<ul style="list-style-type: none"> <li>▪ Promote waste as an income generating venture</li> <li>▪ Promote resource recovery for materials and energy generation               <ul style="list-style-type: none"> <li>○ Recycling facilities</li> <li>○ Energy generation plants</li> <li>○ Recovered materials</li> <li>○ Collaboration on recycling and energy recovery</li> </ul> </li> </ul>
<b>Enhance mapping, planning, segregation, collection, transportation and service provision of waste management</b>	<ul style="list-style-type: none"> <li>▪ Promote waste segregation at source               <ul style="list-style-type: none"> <li>○ Segregated waste services</li> </ul> </li> </ul>
<b>Strengthen the institutional framework that enables and enforces integrated planning, budgeting, decision-making and implementation, at both the national and county level</b>	<ul style="list-style-type: none"> <li>▪ Formulate policies, legislations and economic instruments on solid waste management               <ul style="list-style-type: none"> <li>○ Policies and economic instruments on waste reduction</li> <li>○ Uptake of efficient technologies</li> <li>○ Compliance and enforcement of waste management legislations</li> </ul> </li> </ul>
<b>Set up transparently managed financial mechanisms on national and county level to invest in waste management infrastructure</b>	<ul style="list-style-type: none"> <li>▪ Formulate policies, legislations and economic instruments on solid waste management               <ul style="list-style-type: none"> <li>○ Policies and economic instruments on waste reduction</li> </ul> </li> </ul> <p><i>The sources of funding for the implementation will be from GoK, PPPs, waste generators and DPs</i></p>
<b>Engage, strengthen and build partnerships with all stakeholders, including private and informal sector, as well as the general public, including education for responsible waste management behavior</b>	<ul style="list-style-type: none"> <li>▪ Inculcate responsible public behavior on waste management               <ul style="list-style-type: none"> <li>○ Capacity building in waste management</li> <li>○ Informed public on waste management</li> </ul> </li> <li>▪ Establish environmentally sound infrastructure and systems for waste management               <ul style="list-style-type: none"> <li>○ Improvement of existing waste management facilities</li> <li>○ Waste collection and transportation systems</li> <li>○ Waste transfer stations</li> <li>○ Waste treatment facilities</li> <li>○ Waste disposal facilities</li> </ul> </li> </ul>

Policy Objectives	Link to National Solid Waste Management Strategy
<i>Source: Author based on data from National Sustainable Waste Management Policy, GoK (2019a) and National Solid Waste Management Strategy, GoK (2015)</i>	

#### 2.6.4.1.2. Finance/Investment

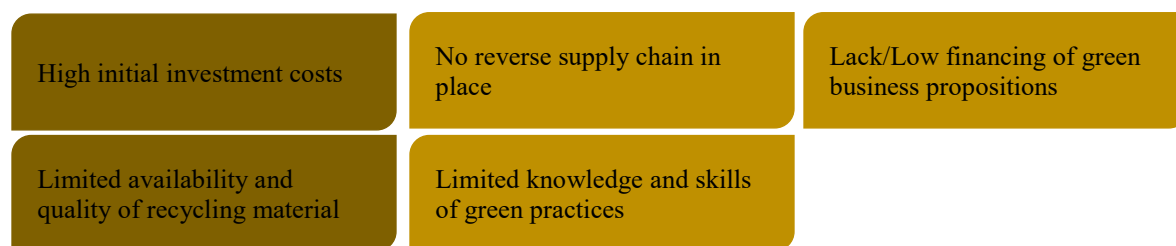
Currently, there is no targeted financing for waste management companies. Most of these businesses rely on equity and grants to kickstart their operations. This can be linked to the practice of private businesses participating in solid waste management for corporate social responsibility (CSR) activities.

#### 2.6.4.2. Gaps and challenges hindering flourishing green investment/ business

The most challenging factor from descriptive analysis for the waste management sector was customer demands at 40 percent. This is due to the low awareness levels and campaign for recycling and upcycling by government. This is followed closely by environmental knowledge, financing and innovation and technologies at each at 20 percent as shown in figure 2.18. Financing is issue especially on the costs of running an upcycling business. More so, technologies that promote energy efficiency are expensive such as compaction machines. Environmental knowledge is still a challenge since there is no source separation of waste which can greatly reduce the manual work that waste management businesses undertake to separate waste to various categories – organic, plastic, paper, glass, metal, etc.

These challenges are rooted in barriers such as high initial investment costs associated with green practice integration such as machinery and equipment and compliance and licensing fees, and limited availability and quality of recycling material. This tallies with the lack and low financing options and having no reverse supply chain to purchase waste and byproducts for waste management respectively. More so, historically, waste management was under the mandate of local authorities hence there was limited knowledge and skills to green the sector further from waste collection and disposal only.

**Figure 2.18: Visual depiction of barriers to a green waste management sector**



*Source: Author's analysis based on questionnaire responses*

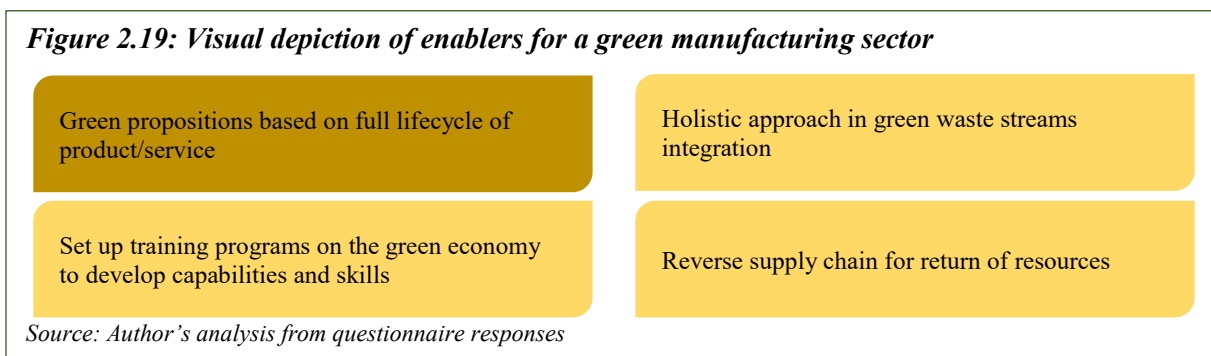
#### 2.6.4.3. Opportunities to enhance the enabling environment

From the questionnaires, enabling factors were business environment, customer demands, innovation and technologies, legislation and market each by 20 percent as shown in figure 2.19. The key factor has been the EPR guidelines and the Kenya Plastics Action Plan that has aided from a legislation perspective but also opened up new markets for sourcing raw materials for recyclers. More so, if a business is associated with waste management practices that promote a green economy, their reputation increases and customers are more inclined to be associated with the business – a good example is TakaTaka solutions that provides waste collection services for recycling to various shopping complexes.

These enablers can enhance the green manufacturing sector by:

- i. Green propositions based on full lifecycle of product with an understanding of the lifecycle of products can aid in the mapping of waste streams to shift focus away from end of product lifecycle recycling. This also ties into having a holistic approach in integrating waste streams.
- ii. Setting up training programs to develop capabilities and skills will increase the skill set needed especially for upcycling activities. This can also create a space for new technologies and innovations to be discovered and implemented from local industries.
- iii. Implementing a reverse supply chain for return resources by integrating waste stream identification and mapping at household and commercial levels. This will ensure that there is available recycling material for use for the waste management sector.

**Figure 2.19: Visual depiction of enablers for a green manufacturing sector**



Source: Author's analysis from questionnaire responses

#### Proposed policy mix for a green waste management sector

Waste management policies are quite new in Kenya. However, the policies have not restructured the matching policy instruments to be up to date. Examples of such instruments that can be used are shown in table 2.40.

**Table 2.41: Example of policies to encourage use of renewable energy**

Policy instrument	Examples
<b>Legal</b>	<ul style="list-style-type: none"> <li>• Solid waste recovery and disposal laws</li> <li>• Enforcement of reuse and recycling for industrial sector</li> <li>• Increased government support of regulatory and supervisory statutes</li> </ul>
<b>Financial</b>	<ul style="list-style-type: none"> <li>• Disincentives such as landfilling tax</li> <li>• Financial incentives for waste recyclers and industries that use recovered materials over virgin materials</li> <li>• Waiver on capital repayment for waste MSMEs</li> </ul>
<b>Communication</b>	<ul style="list-style-type: none"> <li>• Advocacy for behavioral change through media campaigns, communication and technology</li> <li>• Dissemination of waste management information at ward levels to increase awareness</li> </ul>
<b>Institutional</b>	<ul style="list-style-type: none"> <li>• Decentralized solid waste management</li> <li>• Public-private partnerships such as voluntary agreements</li> <li>• Strengthened entrepreneurial activities especially for SMEs</li> <li>• Training</li> <li>• Promotion of research and development</li> </ul>

Source: Author's analysis

#### **2.6.4.4. Learning from the COVID-19 pandemic**

Proper waste management has never been more important as it is today in a post COVID-19 world. Use of protective materials has been on the increase and their disposal, considering the

fears surrounding the COVID-19 virus, and the case of recycling has come center stage in waste management discussions. This offers a unique position for private business in the waste management sector to come up with innovative and environmentally friendly ways in their disposal, especially for medical waste. The private sector can do this by:

- i. Creating public awareness on specific guidance on waste collection for both infected and uninfected households and commercial enterprises. This will reduce contamination of waste offering quick sorting and processing of waste thus saving labor costs on primary sorting.
- ii. Integrate occupational health and safety training for their waste workers, especially those who collect waste, increasing the know-how on handling waste. This ensures that processing of waste is quicker and hence reduce the time for sorting and processing waste
- iii. Lobby for waste management to be an essential service and value chain actor in industries to minimize public health problems.

## **2.7. Linkage and nexus among the four focus sectors**

A key takeaway from the study was the nexus relationship between the four focus sectors. There exists a loop system on how these sectors can interact with each other in a green economy. This loop system can be used to harness cross sectoral relationships to forward the green development agenda. By understanding the loop system, avenues for green opportunities can be identified and taken advantage of in promoting green development. This is reviewed in sections 2.7.1 to 2.7.4.

### **2.7.1. Agriculture-energy nexus**

*The agriculture sector plays a dual role with the energy sector – as an energy user and an energy supplier through biomass and bioenergy forms.*

As an energy supplier, the agriculture sector in Kenya has not heavily exploited this avenue as a green energy solution, specifically under bioenergy. However, biomass has in the past been used by both households and commercial enterprises but in charcoal form. Charcoal is not considered a green solution and has recently been attempted to be phased out with biomass such as charcoal briquettes made from agricultural waste being offered as an alternative. In recent years, bioenergy solutions are being adopted in the country with use of agriculture waste as the source of power generation with ERPA the country's energy regulator providing guidelines and measurements for exploitation of agricultural waste - 1m<sup>3</sup> of solid waste generates approximately 0.95kWh of energy. Currently, Kenya produces 4 million tons of waste annually from its urban centers which if harnessed can generate energy of approximately 3,760kWh per annum (*assuming all the waste can be used*).

As an energy user, the agriculture sector uses energy for crop production activities such as mechanized tilling, irrigation and post-harvest processing, livestock production activities and agro processing centers. contributes the highest to total GHG emissions in the country at approximately 40 percent. This contribution largely comes from conventional tillage, burning of the savannah and crop residues, and rice cultivation. It is estimated that the agricultural emissions will increase by 30 percent by 2030 driven by livestock production and soil cultivation (GoK, 2018a).

There have been recent innovations that have switched to green energy solutions to power various agricultural productions and using sustainable agricultural practices to reduce GHG emissions. These two approaches coupled with improved energy efficiency techniques can

further strengthen the agriculture and energy nexus for a green economy, box 2.19 showcases several examples of this nexus.

**Box 2.20: Examples of agriculture-energy nexus**

[Solar Freeze](#) offers post-harvest management solutions via cold storage facilities to rural small holder farmers. The cold storage units are powered by solar energy. The solar powered cold storage solutions are offered as mobile units on a pay-as-you-go (PAYG) model, cold chain distribution model promoting a sharing economy amongst smallholder farmers, and as an IT solution through a cold storage management system.

[Kenya Tea Development Agency \(KTDA\)](#) have implemented energy efficiency measures to reduce the energy used to process one kilo of tea by an average 15 per cent over a four-year period. This was a programme conducted by KTDA, Ethical Tea Partnership (ETP) and German Development Agency (GIZ). This was achieved through adopting a mix of energy audits, replacement of machine parts, installation of LED lights and training production staff on energy efficiency.

*Source: Author based on Solar Freeze company profile and KTDA energy efficiency programme*

### 2.7.2. Manufacturing-energy nexus

*The manufacturing sector has a dual role with the energy sector – as an energy user and an energy supplier through bioenergy from industrial waste.*

There is a heavy reliance of energy to power manufacturing processes given the equipment and machinery used in industrial production. This only portrays the manufacturing sector as a user of energy. Often times, industrial waste is either disposed or incinerated. There is no reverse supply chain of industrial waste to supply energy needs.

As an energy supplier, the manufacturing sector have yet to embrace the use of industrial waste to generate energy for their day to day use. This is mainly due to the high energy requirements needed to run various plants of which industrial waste could only power a fraction of it.

As an energy user, the manufacturing sector is the third highest emitter of GHG emissions in the country at 5.4 percent of total national GHG emissions that is expected to rise to 9.9 percent by 2030, this is inclusive of direct fuel combustion emissions. This contribution is attributed to process-related emissions from chemical and/or physical change of inputs and production and use of hydrofluorocarbons.

With development of renewable energies, there is a consensus that manufacturing will adopt green technologies and practices in their processes. This is confirmed from the primary data collected. However, the uptake is slow and can become a missed opportunity for Kenya if not pursued to its fullest potential.

**Box 2.21: Examples of manufacturing-energy nexus**

[Nampak Kenya](#) is offers metal packaging solutions to the East African market that has adopted various energy efficiency measures such as shift from C11 to C12 tariff that had costed the business KES 16 million, power factor correction, installation of solar tubes, variable speed drives on pumps/fans and use of LED bulbs.

[Tropical Power](#) have an installed 2.2 MW anaerobic digester that produces 18,000MWh of electricity per annum. This is powered by 50,000 tons of organic waste per annum to produce the clean energy. Production of this clean energy has contributed to about 7,000 tons of CO<sub>2</sub> reduction per year that is equivalent to 5 million liters of diesel burnt using thermal plants.

*Source: Author based on CEEC report, KAM*

### 2.7.3. Manufacturing-waste management nexus

*Given current waste management regulations, manufacturing plays a key role in waste management as a waste supplier and user if proper reverse supply chain were established.*

Following the adoption of Extended Producer Responsibility (EPR) guidelines in 2019, the waste management sector is able to leverage on this guideline to create a recycling supply chain from manufacturers. More so, the Kenya Plastics Action Plan calls for all manufacturers that use plastic packaging materials have a recycling company who recycles their plastic waste. The manufacturers also need to indicate their recycler on labels placed on the plastic packaging. These regulations have provided the base for this nexus.

Most of the respondents agreed that if these regulations were enforced fully, it would create the much-needed reverse supply chain in the manufacturing sector and provide readily available recycling material for the waste management sector. This can be expanded further if the industrial zones and parks can be greened to stimulate investments in the face of resource scarcity.

As much as solid waste and plastic has been campaigned for recycling, metal recycling is still a challenge for the sector. Another competing factor for this nexus is the setting up of recycling companies by the manufacturers. This has led to few of the waste recyclers taking advantage of the Kenya Plastics Action Plan guideline. It has also created constrained partnerships between the manufacturers and waste recyclers since the waste recyclers efforts become duplicated from two fronts – the manufacturer and from the local authorities who have historically taken the lead in waste management.

#### **Box 2.22: Examples of manufacturing and waste management nexus**

[Unilever](#) recently launched its first fully recyclable plastic packaging for one of its products, Sunlight Scouring powder in January 2020. This was done in partnership with a local waste management company, Green Africa Trading Limited. The switch is expected to mitigate the use of thousands of tons of virgin plastic per annum. This showcased the first step in joining a fully circular plastic economy for Kenyan manufacturers.

*Source: Author based on Business Daily Article, 29.01.2020*

### 2.7.4. Waste management-agriculture nexus

*Waste management offers the agriculture sector an opportunity to implement eco-friendly waste management practices.*

Historically, there has been evidence of agricultural waste being recycled in the agriculture sector. This has mostly been done as green manure for crop production. However, there has been improper practices of waste management such as open burning and dumping. This not only creates pollution but makes eco-friendly waste management a challenge. Hence, there is a need for an integrated waste management that promotes agricultural recycling of organic wastes in a more sustainable approach.

Agricultural wastes can be categorized from the source such as:

- coffee waste from processing plants - *for every 1 ton of coffee exported, 0.46 percent of this is pulp waste and about 17 percent of waste water is generated,*
- sisal waste from exploitable fibers that represents five percent of total leaf weight,
- sugar processing plants that produce waste in the form of bagasse, filter cake and wastewater, and

- beef cattle slaughter houses where 20 percent of the cattle weight constitutes waste from dung, stomach and intestinal contents, blood, condemned organs and others.

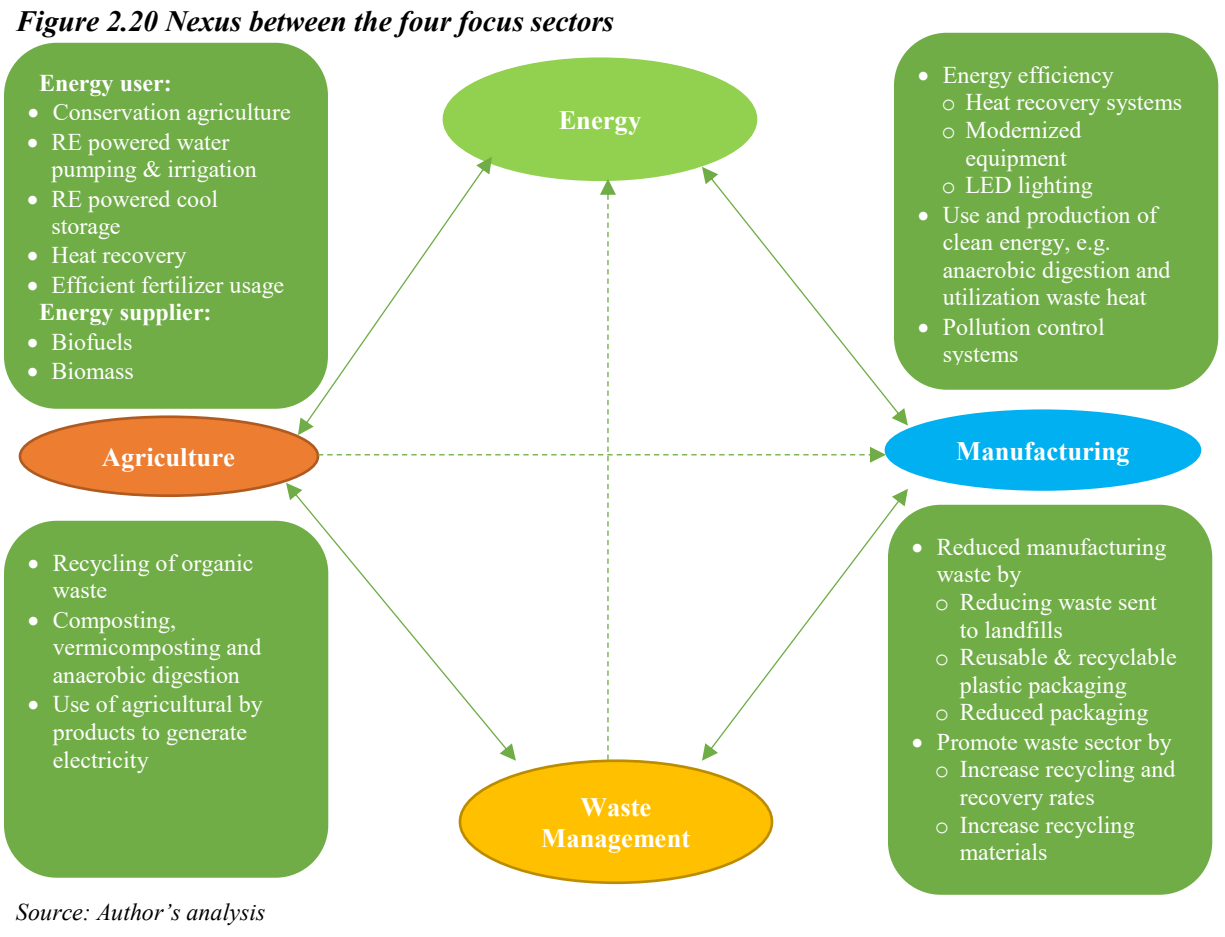
Various practices of reducing agricultural waste have not been widely adopted and is largely dependent on the knowledge the farmer or business has on waste management. This creates a limited amount of recycled materials for waste recyclers.

**Box 2.23: Examples of waste management and agriculture nexus**

Olivado has taken a lead in recycling their agricultural by-products by turning them into useable methane to power the factory and provide fuel for their vehicles, and to produce 3,000 MT of fertilizer. The company started a research project in 2011 on how to use avocado waste as feedstock for biogas. Eight years later, the company had a fully functioning biogas plant that exceeded the initial potential of methane production by 20%. With this clean natural gas, the company powers two of their generators to run the factory, cool stores and packhouse.

Source: Based on “How our factory in Kenya thrives on sustainable practices”, Olivado

Figure 2.20 illustrates the summarized nexus relationship between the four focus sectors.





## **3.0. CHAPTER 3: Conclusion and recommendations**

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### **3.1. Conclusion**

One important gap in the current state of knowledge on private sector driving green growth and job creation is the lack of systemic understanding about what a green economy is. This study aimed to address this gap by examining different sets of opportunities, challenges, barriers and enablers for the agriculture, energy, manufacturing, and waste management sectors as perceived by various stakeholders in the value chain of private businesses. The study employed a broad range of methods for reaching its goal, including literature review, stakeholder analysis and semi-structured interviews.

The analysis of stakeholder interviews revealed potential factors that could help green private businesses to succeed, such as central government, counties, consumers, development partners and researchers. Key challenges identified were lack of consistent and capable legislation through policies and guidelines, and low innovation and technologies in the green space. At sectorial levels, for agriculture, key challenges were oversupply issues and stiff competition in the business environment; for energy, key challenges was the business environment that lacks verification of standards of equipment for green energy installation; for manufacturing, key challenges were financing issues due to high sunk costs of green technologies, low skill level of green practitioners, lack of a readily available green knowledge, and lack of an eco-labeling policy that would enable green products have a distinctive mark to capture niche markets ; and for waste management, key challenge was lack of customer awareness of recycling and upcycling benefits. Key enabling factors identified was capacity building through setting up of training programs to increase the wealth and breadth of green knowledge and skill. At sectorial levels, for agriculture, key enabling factors identified were having a green public procurement framework for the country to make government purchase and promote green agricultural produce; for energy, key enabling factors identified was capacity building and training to build the skill of self-educated green energy technicians; for manufacturing, key enabling factors identified capacity building and training, green financial instruments and incentives, and strong green public regulation for the sector; and for waste management, key enabling factors identified was capacity building and training to breed new innovations and technologies and green taxes.

Desk review of various business cases highlighted that often, an external stimulus is needed to propel private business to integrate green business practices. An interesting note is that for the waste management sector, the stimuli was from within the businesses and often spearheaded by experts in the waste management space. For the other sectors, the external stimuli were driven by either financial mechanisms such as grants and/or technical assistance in the form of training and capacity building. Despite having limited data on the costs of integrating businesses practices, the benefits and returns from energy and material efficiency, mitigation of negative environmental effects from reduced carbon emissions, and creation of jobs cannot be underestimated. The key business success factor for these business cases was a shift in the view of green practices as expensive to the long-term view of sustainable profits, cost savings, product advancement by unlocking new markets, and increased reputation and brand value from certifications.

The study outlined various conditions for MSMEs and large enterprises to enable them to be scaled up from increase green private financing/investment. Overall, a change in business models, adoption of new technologies and alignment to the country's green framework, GESIP,

are the key challenges for the private sector to overcome for green development pathways. This coupled with partnerships, monitoring and reporting frameworks, financial viability and sustainability, digitization measures, targeted green policies, increased access to finance, competitiveness, foreign direct investments (FDIs), intellectual property (IP) protection, and research partnerships, will unlock green financing/investments in the private sector. A notable disadvantage is the lack of mechanism to link the informal private sector with formal private sector. The waste management sector and agriculture sector, specifically dairy sub sector, have found ways in enhancing this linkage via informal waste pickers and informal milk suppliers respectively.

The study also uncovered key mechanisms to upscale investment opportunities for private business for green advancement. For example, in order to provide critical resources such as skills and materials, researchers and academia could improve educational capacities and technical expertise while governments could provide a platform for knowledge exchange. Effective and efficient planning and implementation of such multiple interventions for scaling up would require collaboration between various stakeholders – a quadruple helix model for entrepreneurship and innovation to drive green growth and thus job creation. A special consortium was proposed that could be placed as a special vehicle under the presidency’s office to driver the agenda countrywide.

This study presents a systemic approach to understanding private businesses perspectives on challenges and success factors for pursuing a green growth development path. It describes key mechanisms through which relevant interventions and potential actions were identified. The study extends our understanding about the landscape that private green businesses work, challenges they face, support they need, how different factors influence each other in the value chain, and potential actions for upscaling.

## **3.2. Recommendations**

Based on the above findings and conclusions of the study, the following formulates several country crosscutting/general recommendations and sector-specific recommendations are made.

### **3.2.1. General recommendations**

#### Private sector as promoters of green supply chains, source of green investments and leaders in the innovation space

There is a clear recognition of the key position that private sector actors can play in supporting the implementation of Nationally Determined Contributions (NDCs). The private sector can do this by promoting green supply chains, being a source of investment, and leaders in innovation in clean technologies and resource efficiency. Having a national strategy that can strengthen measures and conditions and expand private sector investment for green growth while creating jobs is vital for transition and adoption of a green growth agenda. This can be achieved by engaging the private sector in three areas:

#### *As a promoter of green supply chains*

In order to promote green supply chains, the establishment of a green procurement framework driven by the public sector is a key enabling factor. Once implemented, the private sector will recognize the demand and will be able to align themselves to the country’s position on green procurement. This can be supported by establishing a national green supply chain network through environmental preferred purchasing (EPP) programs across the sectors guided under one overall national network. The network can be based on a coalition of sectorial stakeholders

committed to working together towards green supply chains. The national green supply chain network will have private businesses in the various sectors who abide by a supplier codes of conduct pledging to help build a collaborative network of green supply chains to promote and contribute to the SCP principles under GESIP framework.

#### *As a source of green investment*

In order to effectively mobilize green private investment, there is a need to understand what will work and what will not from an environmental perspective. Hence, the national strategy should not only focus on the amounts garnered or required from the private sector for green investments, but on the impact that these opportunities will have in the environment. This, coupled with a robust monitoring framework will establish the baseline for environmental impact of green investments and thus provide necessary evidence base to support further mobilization of private green investments.

#### *As an innovation leader*

A key factor is having a consistent pipeline of business opportunities that promote clean technologies and resource efficiency. Unfortunately, most of these opportunities are small scale and lack the necessary financing to support their development. Another factor that needs to be considered is the negative relation between innovation and scaling up of the innovations. Hence, despite development of an innovation pipeline, there is a need to create the demand for its financing too. This can be achieved by harnessing green investments instruments such as grants, seed money and concessional financing.

#### Mapping of investment flows to define, track and report on green financing opportunities

Mapping of investment flows is important to track, define and report on green financing from financial institutions. The mapping, both cross sectoral or sectoral based, will accelerate attainment of GESIP goals by having a ready pipeline of funds for private sector to draw from for energy, water and material efficiency; clean production; climate resilience; reduce resource degradation; and waste integration economic activities. The result will be targeted green investment for the private sector to propel environmentally-sound and resource-efficient growth. In order to enhance the mapped investment flows, a standardized format should be used that is publicly available with common definitions and methods to quantify green finance. More so, the mapping should utilize a common approach across sectors to strengthen the assessment and comparability of green finance. Reporting of the mapped investment flows should be conducted annually as a requirement for financial institutions with a flexible reporting system to allow for practical, adaptable and coordinated tracking. The mapping should be done by financing instrument type, sector the financing has been advanced to, and the GESIP principles the financing is responding to.

#### Use of public and private mechanisms to scale up green investments

Depending on the type of investor, various mechanisms will be needed to nudge the private sector to invest in green business opportunities. Often, green business opportunities have a social component attached to them, whether it is job creation or improved livelihoods, which may be too expensive for private businesses. Hence, there are certain mechanisms that can be offered to private investors to increase their participation in green investments such as blended finance by combining grants or subsidized loans with commercial finance as seen in Lake Turkana Wind Farm, equity based financing with strategic partnerships, cash and back leveraged financing, structured funds, guarantee schemes such as that offered by the government to mobilize local

capital for financial institutions to fund MSMEs, green energy credit lines, green bonds, and technical assistance.

#### Adopting Material Flow Analysis (MFA) to track and monitor raw and recyclable materials across value chains

Natural resources are essential as they provide raw materials, energy, food, water and land. They also offer environmental and social services to the economy. By making sure that they are managed well and used efficiently is one of the six guiding principles of GESIP. However, there is no Material Flow Analysis (MFA) in their use across the sectors in the economy. Hence, there is a need to have a good understanding of the natural resource baseline with supported high-quality data on material flows. There is a need to (a) monitor physical trade flows by origin and destination, (b) monitor flows of secondary raw materials and recyclable materials, (c) develop methods to assess the environmental impacts of materials use, (d) measure indirect flows and develop common conversion factors and coefficients, (e) provide sector level and material specific data to identify opportunities for improved performance and efficiency gains, (f) and identify a set of indicators for use in measuring MFA.

#### Setting up a balanced portfolio that promotes green economy components

A balanced portfolio of market, regulatory and information-based policy measures (see table 2.1.) is necessary to drive private sector participation in a green economy. The balanced portfolio needs to be informed by the private sector, which can be done via peer learning platforms, to ensure the right policy mix that fosters innovation, particularly eco innovation and investments in green technologies, are proposed and accepted. A modelling tool that ensures synergies are maximized and tradeoffs are minimized by promoting resource efficient development pathways. This will then lead to development of new products, new business models, new behavior of consumers and new policy instruments and frameworks for green business advancement.

#### Improving innovation and knowledge transfer using peer learning platforms

Innovation is a major driver to transition to a greener economy. Innovation is needed across all four sectors to improve resource use efficiency. However, the institutional frameworks required to boost innovation may be a burden to the government which makes the case for the private sector to improve transfer of knowledge through peer learning platforms with sector and sub-sector champions leading the agenda. This is not only a cheaper and simpler alternative, but it can help in the penetration of the needed to transfer new technologies to all businesses, whether small, medium or large. A multi-stakeholder approach is needed in setting up these peer learning platforms are needed. A good and balanced mix of private sector, public sector, academia and research institutions, CSOs and financial institutions is required for effective lobbying activities. Another approach would be to create a special consortium for green business advancement to act as a special vehicle under the presidency's office to driver the agenda countrywide.

### **3.2.2. Sector specific recommendations**

#### **3.2.2.1. *Agriculture sector***

##### Increased use of data on water and energy use across value chains as part of MFA

There is a need to understand the usage, amounts and types of energy and water inputs at various stages in an agricultural value chain. This will depict the entry points for various energy and water technologies. The data on energy and water use and the volumes used on food processing is not collected for the sector making it difficult to measure the benefits and costs of green

interventions. More so, regulations and licenses can ensure sustainable management of water and energy resources.

#### Increase access to technologies to broaden scale of agribusinesses

Access to new and improved technologies can only be realized if it is backed by agricultural research that places emphasis on environmental requirements in enhanced productivity. The government should increase agricultural research and development funding to boost agricultural productivity. An example of green technologies that can be researched and developed is in the use of biotechnology in plant and animal breeding. This will result in having improved varieties with higher yield, pest resistance and stress tolerance, and open up business and job creation opportunities with the agriculture-waste nexus. The private sector can stimulate increased access to technologies if offered research and development tax credits relating to costs of undertaking specific innovation activities.

#### Adopt alternative farming systems such as on-farm processing to increase green benefit returns

Farming systems should move away from conventional farming only and adopt a mix of mix of conventional, organic and integrated techniques. This calls for farming systems that not only respond to food security issues but also to environmental concerns and consumer preferences. Food and feed production should balance conservation of natural resources with reduced environmental pressures. At the same time, consumers are demanding food produced through organic methods with more variety, consistency and year-round availability. Due to this, conventional farming needs to be supplemented by other farming systems such as organic production, nutrient balancing and precision farming.

#### Structural adjustment measures in green transition to boost bioenergy production and intensify agriculture for job multiplier effects

A major component of structural adjustment measures is reforming and decoupling agricultural supports from output and input levels to mitigate negative environmental effects. To implement this, there needs to be a shift to agriculture production via environmental services and products such as converting land and resources to produce organic and green products or land conversion for bioenergy production such as crop bio-fuels or intensified agricultural systems. A holistic approach is needed to ensure that the growth from the adjustment promotes green growth and creates an employment multiplier effect across the value chain.

### **3.2.2.2. Energy sector**

#### Policy consistency to facilitate adoption and awareness of green energy solutions

One of the challenges raised around policies was the changing ways of political capabilities. A notable effect of this was the withdrawal of the mandatory SWH regulation that would have continued to benefit the solar sub sector. This makes the future uncertain and creating huge risk margins that need to be considered. This in turn raises the investments costs of renewable energy. Inconsistencies in policies make government credibility low making it difficult to attract and mobilize private investors. Policy change is inevitable, however, the manner in which policy changes is what needs to be reviewed by government.

#### Use of robust fiscal instruments to promote adoption of green energy solutions

A significant way to enable the green energy sector is to develop fiscal instruments to encourage transition into a green powered economy. This is done by incentivizing actions that support transition and providing disincentives for 'non-green' energy sources. Recommended types of

instruments include environmental taxation, subsidized green energy credit lines, green levies and levies, and green market mechanisms such as carbon trading in the local NSE.

#### Well-designed FiT policies by linking price to market volume

A poorly constructed FiT policy in the face of a boom of use of renewable energy can do more harm than good. A good FiT policy for renewable energy can be adopted by the Germany's solar PV FiT case. The country's policy breakthrough was linking price paid for a solar PV per unit to the solar PV market volume. This evolved to strategies for market growth by regulating FiT price levels. This was coupled by a downward pressure on solar PV prices. The result was an increase in the scale of the solar PV industry and lower transaction costs inclusive of grid connection and installation fees. Thus, the use of price to control volume rather than putting hard caps on volume was a strategy that enabled the success of FiT for solar PV in Germany. The strategy can be adjusted for the Kenya context but its significance cannot be discounted to catalyze private investments in green energy solutions.

#### Use of patent development as a proxy for new and improved green energy technologies

Patent activity is a proxy measure of country's level of specialization in specific technologies and the future potential for market share growth. Patent development can be promoted in renewable energy technologies by placing it at the heart of industrial and economic development. This includes providing necessary intellectual property protection to renewable energy technologies that have high knowledge intensity and learning potential. By offering this protection, idea creation can be catalyzed which can be linked to innovative private financial mechanisms for their generation and scale up.

### **3.2.2.3. *Manufacturing sector***

#### Establish a green government procurement framework to catalyze demand for green products

The framework established should not only focus on purchasing green goods but also services such as research and technologies that promote green practices. The green procurement framework offers the government an avenue to procure environmentally superior goods and services and in turn creates the demand for the private sector to venture into green production practices.

#### Support creation of knowledge and skills through training and capacity building programmes

To create a thriving green manufacturing sector, there is a need to establish necessary support functions that help the sector build up the knowledge and skills to adopt new, green procedures, processes and products. These support functions also create and disseminate relevant technical information via energy efficiency assessment, self-auditing tools, guidelines and benchmarking tools. By supporting green skill and knowledge, there will be a ready pool of labor to match to the green jobs needed in the sector.

#### Promote green supply chains, both reverse supply and logistic chains

The scope of green supply chains ranges from reactive monitoring of environmental implications of production processes to proactive practices implemented through the Rs principles - Reduce, Re-use, Rework, Refurbish, Reclaim, Recycle, Remanufacture, and Reverse logistics. This will aid in development of a reverse supply chain that ensures a circular economy is promoted. Out of this, private businesses can have avenues where they can invest in the promotion of these practices leading to a transformed sector, Industry 4.0. Industry 4.0 coupled with the high multiplier effect of job creation in the manufacturing sector will result in advancement of a green growth agenda.

#### Establish data collection and information exchange on material usage

Inventory of material usage in the manufacturing sector is key to establish a baseline to which environmental effects can be measured against. This data includes, but not limited to, data on CO<sub>2</sub> emission, water withdrawal, energy use intensity, material consumption and hazardous waste generation. The data allows for a holistic understanding of the environmental effects that various industries may be contributing to the environment. Hence, there are entry points for manufacturers to take green efficiency measures to counteract this.

#### Complement greened industries with green services by matching clean production with eco-services

By integrating green production processes such as resource efficiency, energy efficiency, pollution control and chemical and waste management is only one side of the coin in promoting green manufacturing practices. There is a need to complement this with green services such as eco-design of machinery and equipment, eco industrial parks, integrating the recycling across waste streams in the value chain.

#### **3.2.2.4. Waste management sector**

##### Developing supply and demand policies for waste recycling

It is necessary to create both supply and demand side policies that promote a positive change in the recycling rates of waste. This can be done by implementing tight enforcement measures that level the playing field of waste management businesses with a clear set of guidelines. This will ensure that the targets outlined in section 2.6.4.1. are achieved. A key driver in this is NEMA who are mandated to formulate policies around waste management.

##### Use of financial incentives to increase adoption of recyclable materials

There has been a challenge in promoting use of recycled materials by various industries. This is owing to the fact that there are no financial incentives from government and a general lack of knowledge of the exact material properties of recycled plastics. The private sector can be a leader in this by promoting the guidelines outlined in the Plastics Action Plan, reviewing their business' waste streams and implementing reverse supply chains. A step in this direction will highlight the demand for financial incentives by government.

##### Promoting recycling industries by adopting the 3Rs principles

A key step in promoting a green economy in Kenya is strengthening the greened recycling businesses. This is because they are linked to all other sectors in the economy and are the key driver of a circular economy through the 3Rs principles. If these principles can be implemented at the county level via environmental departments and other contracted solid waste handlers, then a strong link can be forged to link relevant private sector businesses responsible for recycling with necessary investment and technologies. More so, there must be willingness by plastic manufacturers to use recycled plastic. This will promote investment and green jobs. Further, for the model to be a success, these investors must be willing to use recycled plastic.

##### Change in consumer behavior in waste handling

Post-consumer behavior of using packaged materials must be encouraged. This calls for education and guidance in handling the waste. This creates a space for private training and capacity building businesses to offer the knowledge on waste handling at household levels. More so, local infrastructure and access to convenient disposal systems by both public and private businesses should be provided to ensure the behavior is widespread and adoption is easy.

### Strategic public and private partnerships to enhance technology transfer on e-waste management

Partnerships for action on technology transfer will aid Kenya develop e-waste management systems and strategies based on the whole recycling value chains and life-cycle analysis. The government, particularly NEMA, is a key agent in instrumenting partnerships by formulating supporting policies and guidelines. These policies should be aimed at encouraging employment and investment in the private sector such as tax subsidies for recycling companies and easing the process of acquiring the necessary technology.



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## ANNEXES

### *Annex 1: National frameworks that are green growth oriented in Kenya*

Policy/Legal Document	Provision	Implementation Body
<b>NATIONAL LEVEL</b>		
<b>Constitution of Kenya</b>	Article 42 recognizes a clean and healthy environment as a right. Article 60 (c) calls for sustainable and productive management of land resources Article 69 [(a)-(h)] declares that the State shall ensure sustainable exploitation, utilization, and protection of genetic and biological diversity; establish a system for environmental impact assessment; and achieve and maintain a tree cover of at least 10 per cent of the land area of Kenya.	<b>Government of Kenya</b>
<b>Vision 2030</b>	Overall vision and policy framework for sustainable development	<b>Ministry of Devolution and Planning</b>
<b>Green Economy Strategy and Implementation Plan (GESIP) 2016 – 2030</b>	A macro policy framework that identifies enabling conditions for an accelerated transition to a green economy.	<b>Ministry of Environment and Natural Resources</b>
<b>Climate Act 2016</b>	Development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya.	<b>State Department of Environment</b>
<b>National Climate Change Action Plan (NCCAP, 2013-2017)</b>	Encourage low carbon climate resilient development through implementation of the NCCRS.	<b>State Department of Environment</b>
<b>Environmental Management and Coordination Act 2012</b>	Establishment of an appropriate legal and institutional framework for the management of the environment and related matters.	<b>State Department of Environment</b>
<b>National Climate Change Response Strategy (NCCRS)</b>	Kenya's first national planning document dedicated to addressing the threats posed by climate change and taking advantage of potential climate change related opportunities.	<b>State Department of Environment</b>
<b>National Climate Change Framework Policy</b>	Facilitate a coordinated, coherent and effective response to the local, national and global challenges and opportunities presented by climate change. Its main goal is to enhance adaptive capacity and resilience to climate change, and promote low carbon development.	<b>State Department of Environment</b>
<b>National Wetlands Conservation and Management Policy</b>	Ensure wise use and sustainable management of wetlands in order to enhance sustenance of their ecological and socio-economic functions for the present and future generations	<b>State Department of Natural Resources</b>
<b>Agriculture</b>		
<b>Kenya Climate Smart Agriculture Implementation Framework 2018 – 2027 (KCSAIF)</b>	A framework that provides guidance to various innovative and transformative initiatives and best practices that will strive to address challenges brought about by climate change. It is expected to ensure increased agricultural productivity and sustainably build resilience of the national agricultural systems.	<b>Ministry of Agriculture, Livestock and Fisheries</b>
<b>Kenya Climate Smart Agriculture Strategy 2017-2026 (KCSAS)</b>	The broad objective of the strategy is to adapt to climate change, build resilience of agricultural systems while minimizing emissions for enhanced food and nutritional security and improved livelihoods.	<b>Ministry of Agriculture, Livestock and Fisheries</b>
<b>Energy</b>		

Policy/Legal Document	Provision	Implementation Body
<b>Energy Act 2019</b>	Aims to facilitate provision of clean, sustainable, affordable, reliable and secure energy services at least cost, while protecting the environment.	<b>Ministry of Energy</b>
<b>The Energy (Solar Water Heating) Regulations, 2012</b>	Requirement for all domestic dwellings or residential houses, commercial buildings, health institutions and educational institutions with hot water (60 °C) requirements of a capacity exceeding one hundred liters per day shall install and use solar water heating systems.	<b>Ministry of Energy</b>
<b>The Energy (Solar Photovoltaic Systems) Regulations, 2012</b>	Provide rules and standards for the installation of solar photovoltaic (PV) systems.	<b>Ministry of Energy</b>
<b>Feed-in Tariffs for Renewable Energy Resource Generated Electricity- Guide for Investors</b>	Accelerates the development of green energy, including wind, solar and renewable biomass; and to promote generation of electricity from renewable energy sources	<b>Ministry of Energy</b>
<b>Scaling up Renewable Energy Programme (SREP) Investment Plan for Kenya</b>	The government and various actors in the Kenyan society seek to use the benefits of SREP in low-income countries to achieve their goals in energy, in a way that improves environmental, economic, social and productive development.	<b>Ministry of Energy</b>
<b>Manufacturing</b>		
<b>Extended Producer Responsibility (EPR) Guidelines 2019</b>	Enables a circular economy for environmentally sustainable use and recycling of plastics in Kenya.	<b>Ministry of Environment and Forestry</b>
<b>Kenya Industry and Entrepreneurship Project (KIEP)</b>	Strengthen the existing start up ecosystem in Kenya and leverage it to help address the pervasive challenges of low productivity and innovation at the firm level, particularly in lagging sectors with high potential for employment generation.	<b>State Department of Investment and Industry</b>
<b>Occupational, Safety and Health Act, 2007</b>	Health, safety and welfare of persons employed in factories.	<b>Ministry of Labour, Social Security and Services</b>
<b>Environmental and Social Management Framework (ESMF)</b>	Set out principles, rules, guidelines and procedure to assess the environmental and social impacts, and monitoring to ensure that environment and social aspects are considered	<b>State Department of Investment and Industry</b>
<b>Waste Management</b>		
<b>National Sustainable Waste Management Policy, 2019 (draft)</b>	Increase the value of waste over time to the Kenyan economy through industrial processing activities aimed at producing useful products or sources of energy through reusing, recycling, or composting waste.	<b>State Department of Environment</b>
<b>Scrap Metal Act, 2015</b>	The Act prohibits exportation of any scrap metal unless a written notice of the intention to export the scrap metal is provided by a public officer from a police station specifying the premises and time at which the scrap metal may be inspected.	<b>State Department of Industrialization</b>
<b>Environmental Management and Coordination (Waste Management) Regulations, 2006</b>	Outlines the responsibility of waste generators and activities needed to segregation of waste by a waste generator.	<b>State Department of Environment</b>

Policy/Legal Document	Provision	Implementation Body
<b>The Environmental (Impact Assessment and Audit) Regulations, 2003</b>	Defines "waste" as any matter prescribed to waste and any matter whether liquid, solid, gaseous or radioactive, which is discharged, emitted or deposited in the environment in such volume composition or manner likely to cause an alteration of the environment.	<b>State Department of Environment</b>
<b>The Environmental Management and Coordination Act (EMCA), 1999</b>	Provides for the stipulation of a right to a clean and healthy environment and the duties to safeguard and enhance the environment.	<b>State Department of Environment</b>
<b>GLOBAL LEVEL</b>		
<b>Nationally Determined Contributions (NDCs)</b>	A commitment to reduce the national GHG emissions by 30 percent compared to the ‘business as usual’ scenario by 2030.	<b>Ministry of Environment and Forestry</b>

***Annex 2: Socio-demographic characteristics of interview participants***

<b>Interview Characteristics</b>		<b>Frequency</b>
		<b>n=35</b>
<b>Gender</b>	Male	29 (83%)
	Female	6 (17%)
<b>Age group</b>	Under 35	1 (3%)
	36 – 54	32 (91%)
	55 and over	2 (6%)
<b>Nationality</b>	Kenyan	33 (94%)
	Non-Kenyan	2 (6%)
<b>Education</b>	Secondary	0 (0%)
	Further	11 (31%)
	Higher	24 (69%)
<b>Stakeholder group</b>	Financiers	5 (14%)
	Financial Institution	2 (6%)
	Government agencies	3 (9%)
	Private sector	16 (46%)
	Research Institutions & Academia	4 (12%)
	NGO's & DPs	5 (14%)
<i>Source: Author's analysis</i>		



**Annex 3: Results of primary data analysis**

**A3.1. Sectorial green agricultural practices**

**A3.1.1. Agriculture**

**Table A 1: Green agricultural practices**

<b>Practices</b>	<b>% adoption</b>	<b>Practices</b>	<b>% adoption</b>
<b>Pest and disease control</b>	<b>13%</b>	<b>Reduced waste during harvesting</b>	<b>3%</b>
natural pesticides	25%	Food to market food systems	17%
integrated pest management	25%	use of metal silos	0%
integrated pest management	0%	integrated cold chain processing	0%
biotechnology	0%	triple bagging systems	0%
<b>Conservation tillage</b>	<b>11%</b>	preservation infrastructure facilities	0%
no-tillage	13%	food banks in strategic areas	0%
mulch-tillage	0%	<b>Knowledge dissemination</b>	<b>25%</b>
ridge-tillage	0%	good farming practices	50%
<b>Efficient administration of nutrients</b>	<b>33%</b>	climate information services	50%
use of manure and organic waste	67%	climate insurance services	0%
assessment of soil nutrient needs	33%	climate smart practice	0%
changing crop and irrigation patterns	0%		
<b>Efficient water use</b>	<b>13%</b>		
efficient water technologies	25%		
irrigation scheduling	25%		
improved watershed management	0%		
minimized water runoff	0%		

**A3.1.2. Manufacturing**

**Table A 2: Green manufacturing practices**

<b>Practices</b>	<b>% adoption</b>	<b>Practices</b>	<b>% adoption</b>
<b>Environmental (energy)</b>	<b>16%</b>	<b>Environmental (waste management)</b>	<b>3%</b>
Employee training on energy savings	33%	Donation of waste and by-products to other industries or institutions	22%
Mapping energy consumption to identify energy savings and leakages	22%	Component and product design optimization	11%
Use of renewable energy	11%	Redesigning of components for solid waste reduction	11%
Heat recovery and recycle using heat exchangers	22%	Non-conforming products reduction	11%
Equipment upgrades and maintenance for improving efficiency	22%	Reuse and recycle of direct and indirect waste	11%
Energy-efficient building automation systems	11%	Employee training on sorting and waste reduction	11%
Energy audits	11%	Minimization of unnecessary packaging	11%
Design for the environment and energy efficient production	11%	External and on-site recycling	11%

<b>Practices</b>	<b>% adoption</b>	<b>Practices</b>	<b>% adoption</b>
ISO 14001	0%	Process water and emulsions closed-loop systems	0%
<b>Environmental (resource usage)</b>	<b>14%</b>	Substitution of hazardous materials	0%
Material recycle and reuse	22%	<b>Social – safe working conditions</b>	<b>19%</b>
Material substitution for better efficiency	22%	Internal safety inspections	33%
Material usage and process optimization	22%	Mechanical lifting aids	33%
Operational performance indicators	22%	Process modifications to reduce noise and vibrations	22%
Monitoring of fresh water use	11%	Key performance indicators	22%
Recirculating water for cooling	11%	External work environment audits	11%
Minimization of unnecessary packaging	11%	Employee training on hazardous risks	11%
Closed-loop water systems	0%	Employees rotation between work stations	0%
Rain water usage for cooling processes	0%		
<b>Environmental (hazard substances)</b>	<b>12%</b>		
Hazardous substances substitution or elimination	22%		
Standard safety procedures	22%		
Tracking chemicals in processes and products	11%		
Training on hazardous substances	11%		
Solvents substitution	11%		
Heavy metals filtration	11%		
Biologically-based wastewater treatment	11%		
Oil leakage prevention	11%		
Air filtration and cleaning systems	0%		

### A3.1.3. Waste Management

**Table A 3: Green waste management practices**

<b>Practices</b>	<b>% adoption</b>	<b>Practices</b>	<b>% adoption</b>
<b>Technical instruments</b>	<b>5%</b>	<b>Financial instruments</b>	<b>4%</b>
Collection services	10%	Bans on products with low or no recyclability e.g. plastic bags	29%
Provision of curbside services to households and commercial areas	10%	Landfill bans on untreated/unsorted or separately collected waste	0%
Existence of source separation activity in packaging waste	10%	Existence of incineration bans	0%
Existence of source separation activity of organics	10%	Mandatory separation of non-packaging waste	0%
Waste separation at source	0%	Mandatory separation of packaging waste	0%
Combination of collection systems	0%	Existence of legal requirements for the separation of packaging waste	0%
Convenient location of collection facilities	0%	Existence of legal requirements for the separation of non-packaging waste	0%
Treatment methods	0%	<b>Strategic instruments</b>	<b>19%</b>
Number of waste streams separated	0%	Extended producer responsibility (EPR)	50%

<b>Practices</b>	<b>% adoption</b>	<b>Practices</b>	<b>% adoption</b>
Incineration rates	0%	Zero waste policies	0%
<b><i>Economic instruments</i></b>	<b>2%</b>	Quantified targets for waste diversion rates incl. zero waste targets	0%
Correspondence between volume or weight and charges	17%	Waste prevention and re-use activities	0%
Producer responsibility (PR) implemented prior to packaging and packaging waste (PPW) directive	0%		
Communication and co-ordination between local authorities (LA) and industry	0%		
Low overall cost compliance achieved	0%		
Deposit refund for capture rate of packaging containers	0%		
Subsidies from local authorities	0%		
Collection efficiency from collection facilities	0%		

***Annex 4: Select business associations for the four focus sectors***

Sector	Business Association
<b>Private Sector</b>	<ul style="list-style-type: none"> <li>• Association of Small and Medium Enterprises in Kenya (ASMEK)</li> <li>• Federation of Women Entrepreneur Association (FEWA)</li> <li>• Jua Kali Association</li> <li>• Kaskazi Jua Kali Association</li> <li>• Kenya Private Sector Alliance (KEPSA)</li> <li>• Kenya National Alliance of Street Vendors &amp; Informal Traders</li> <li>• Micro &amp; Small Enterprises Federation (MSEF)</li> </ul>
<b>Agriculture</b>	<ul style="list-style-type: none"> <li>• Agriculture Industry Network</li> <li>• Fresh Produce Exporters Association of Kenya (FPEAK)</li> <li>• Kenya Agri-business and Agro Industry Alliance (KAAA)</li> <li>• Kenya Flower Council</li> <li>• Kenya Livestock Producers Association (KLPA)</li> <li>• Kenya National Farmers Federation (KENAFF)</li> <li>• Kenya Organic Agriculture Network (KOAN)</li> </ul>
<b>Energy</b>	<ul style="list-style-type: none"> <li>• Improved Stoves Association of Kenya</li> <li>• Kenya Renewable Energy Association (KEREAA)</li> </ul>
<b>Manufacturing</b>	<ul style="list-style-type: none"> <li>• Kenya Association of Manufacturers (KAM)</li> <li>• Kenya Motorist Industry Association</li> <li>• Kenya Motor Repairers Association (KEMRA)</li> </ul>
<b>Waste Management</b>	<ul style="list-style-type: none"> <li>• Kenya Association of Waste Recyclers</li> </ul>
<i>Source: Author's analysis</i>	