



Technical Report

# GREEN GROWTH INDEX 2023 KENYA

DECEMBER 2023

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# Foreword

Kenya is transitioning into a green model of economic growth and development. In pursuit of this transition, it has adopted a development pathway that seeks to deliver economic growth that is both environmentally sustainable and socially inclusive. Kenya's Vision 2030 aims to transform the country into an industrialized middle-income country, offering our citizens a high quality of life in a clean and secure environment. As part of the transition to the green economy, the Kenya government, through implementing the Green Economy Strategy and Implementation Plan (GESIP), is transitioning the country's socio-economic landscape into one characterized by low carbon emissions, resource efficiency, equity, and inclusivity. The GESIP guides Kenya's economic growth towards a resource efficient, low-carbon, climate-resilient, and socially inclusive trajectory.

The green economy has also been mainstreamed in the Fourth Medium Term Plan (MTP IV) 2023 – 2027, which transitions the Country to the next long-term development plan. Therefore, I am delighted to present the Kenya Green Growth Index, which will act as an evidence-based tool for assessing the impacts of green growth policy implementation and investments in Kenya and comparing green growth performance against other countries in Africa and other global regions. The Green Growth Index has four (4) dimensions, namely: efficient and sustainable resource use; natural capital protection; green economic opportunities; and social inclusion. Each dimension is guided by four sustainability pillars supporting the green growth transition. Additionally, to ensure ease of comparison of performance, the Green Growth Index has been developed using global sustainability indicators that are policy-relevant and contextualized to Kenya and which are

drawn from the Sustainable Development Goals (SDGs), the Paris Agreement, and the Aichi biodiversity targets. The Green Growth Index will be periodically improved as data on indicators is developed and becomes available in Kenya and as Kenya's Green Economy Strategy implementation unfolds. Kenya's overall GGI score was 47.95 in 2023, implying that the green growth performance was only moderate and about halfway to achieving the sustainability targets. There is, therefore, the window of opportunity to improve green growth performance by pursuing the development priorities, including economic transformation and environmental sustainability, which offer considerable opportunities in greening Kenya's economy.

# Preface

Climate change and environmental degradation significantly and urgently threaten economic growth and livelihoods globally. In Kenya, the threat is pressing. While Kenya is responsible for less than 0.1% of global greenhouse gas (GHG) emissions annually, its economy is highly vulnerable to the effects of climate change due to its reliance on sectors susceptible to climate shocks, such as agriculture, tourism, and ecosystem services.

The 2015 Paris Agreement calls for a strengthened global response to the threat of climate crisis and deteriorating environmental conditions, seeking to keep a global temperature rise this century to well below 2°C above pre-industrial levels. Additionally, the Paris Agreement aims to strengthen the ability of countries to deal with the impacts of climate change combined with their obligations under the 2030 Development Agenda's Sustainable Development Goals (SDGs) to promote sustainable and inclusive development.

The Kenya Green Growth Index has been developed as an evidence-based tool for assessing the impacts of green growth policy implementation and investments in Kenya and for comparing green growth performance against top-performing developing countries. It is framed on a green growth economic development model, which aims to deliver equal opportunities from economic prosperity while protecting the environment; it integrates SDG indicators and targets related to green growth dimensions that support the quality of life (i.e., efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion). To measure national-level green growth performance, it benchmarks indicators against sustainability targets, including the SDGs, the Paris Climate Agreement, and the Aichi Biodiversity Targets.

The Kenya Green Growth Index was developed by a multi-disciplinary national team of national stakeholders with guidance from the Global Green Growth Institute (GGGI) team. The preliminary scores and website of the Green Growth Index were presented to various stakeholders for consultation, and their valuable inputs were incorporated into this Index formulation.

The government will ensure that the Kenya Green Growth Index remains relevant to and supports the country's green growth goals of transitioning to a low-carbon economy, protecting ecosystem health, building a resilient society, and promoting inclusive growth. The National Treasury and Economic Planning will further guide the process of periodically updating the indicators and replacing the proxy variables while making them available as the implementation of Kenya's Green Economy Strategy unfolds.

It is my sincere hope that the Green Growth Index will be useful not only in the assessment but also in monitoring and evaluation of green growth policy implementation and investments in Kenya.



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The Kenya GGI required vast expertise, research, consultation, and effort to complete. The finalization of the document would not have been possible without the dedication of all the individuals and organizations who worked together throughout the development process. We would like to express our most profound appreciation to those who have worked on shaping and guiding this process over the last eight months.

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# Acronyms and Abbreviations

AB	Access to Basic Services and Resource	CH4	Methane	GEO	Green Economic Opportunities	ILO	The International Labour Organization
ACA	Academic institution	CO2	Carbon Dioxide	GER	Gross Enrollment Ratio	IMF	The International Labour Organization
ADB	Asian Development Bank	CO2eq	Carbon Dioxide equivalent	GESIP	Green Economy Strategy and Implementation Plan	INFR	sustainable infrastructure
AFOLU	Agriculture, Forestry, and Other Land Use	DALY	Disability-Adjusted Life Year	GEU	Green Economy Unit	IP	Investment Prospectus
AIDS	Acquired Immunodeficiency Syndrome	DMC	Domestic Material Consumption	GG	Green Growth	IPU	Inter-Parliamentary Union
ASAL	Arid and Semi-Arid Lands	EE	Efficient and Sustainable Energy	GGGI	Global Green Growth Institute	IQR	Interquartile Range
BAU	Business-As-Usual	EFFI	Resource Efficiency	GGI	Green Growth Index	IRENA	International Renewable Energy Agency
BE	Biodiversity and Ecosystem Protection	EIA	U.S. Energy Information Administration	GGPM	Green Growth Performance Measurement	ISO	International Organization for Standardization
BP	The British Petroleum Company plc	EQ	Environmental Quality	GHG	Greenhouse Gas	IUCN	International Union for Conservation of Nature
BRT	Bus Rapid Transport	ESRU	Efficient and Sustainable Resource Use	GJ	Green Employment	KALRO	Kenya Agricultural and Livestock Research Organization
CAID	Climate Action and Inclusive Development	EV	Electric Vehicle	GN	Green Innovation	KAM	Kenya Association of Manufacturers
CAIT	Climate Analysis Indicators Tool	EW	Efficient and Sustainable Water Use	GOVT	Government	KCSAS	Kenya Climate Smart Agriculture Strategy
CBD	Convention on Biological Diversity	FAO	Food and Agriculture Organization of the United Nations	GT	Green Trade	KEPSA	Kenya Private Sector Alliance
CBS	Cabinet Secretary	FAOSTAT	Food and Agriculture Organization Statistics	GV	Green Investment	KIPPRA	The Kenya Institute for Public Policy Research and Analysis
CETRAD	Centre for Training and Integrated Research in ASAL Development	FSC	Forest Certification Organizations	GVC	Global Value Chains	KFS	Kenya Forest Service
COP 28	28TH Conference of the Parties	KALRO	Kenya Agricultural and Livestock Research Organization	HDI	Human Development Index	KIRDI	Kenya Industrial Research and Development Institute
COVID-19	Coronavirus disease	GB	Gender Balance	HIV	Human Immunodeficiency Virus	MoALD	Ministry of Agriculture and Livestock Development
CPF	Country Programme Framework	GCP	Global Carbon Project	ICT	Information Communications Technology	KNBS	Kenya National Bureau of Statistics
CV	Cultural and Social Value	GDP	Gross Domestic Product	IEA	International Energy Agency	ME	Material Use Efficiency
CW	ClimateWatch	GE	GHG Emissions Reduction	IHME	Institute for Health Metrics and Evaluation	MEA	Multilateral Environmental Agreements

# Acronyms and Abbreviations

METSI	Ministry of Environment, Science, Technology, and Innovation	NDCP	National Council For Population and Development	SDIDE	State Department for ICT & Digital Economy	UNEP-WCMC	UN Environment Programme World Conservation Monitoring Centre
MENR	Ministry of Environment, Water and Natural Resource	NEMA	National Environment Management Authority	SDT	State Department for Transport	UNESCO	United Nations Educational, Scientific and Cultural Organization
MF	Material Footprint	NGO	Non-government institution	SE	Social Equity	UNFCCC	United Nations Framework Convention on Climate Change
MJ	Megajoule	SDEP	State Department for Economic Planning	SE4ALL	Sustainable Energy for All	UNICEF	United Nations International Children's Emergency Fund
MITI	Climate Mitigation	N2O	Nitrous Oxide	SI	Social Inclusion	UNIDO	United Nations Industrial Development Organization
MoALD	Ministry of Agriculture and Livestock Development	ODA	Official development assistance	SL	Sustainable Land Use	UNISDR	United Nations Office for Disaster Risk Reduction
MOFA	Ministry of Foreign & Diaspora Affairs	OECD	Organisation for Economic Co-operation and Development	SOCI	Social Inclusion and Sustainable Livelihoods	UNODC	United Nations Office on Drugs and Crime
MSW	Municipal Solid Waste	PAP	Policy Action Plan	SP	Social Protection	UNSD	United Nations Statistics Division
MT	Metric ton	PEFC	Programme for the Endorsement of Forest Certification	STI	Science, Technology, and Innovation	UNSTATS	United Nations Statistics Division
MTP IV	Fourth Medium Term Plan	PM2.5	Particulate matter with a diameter of less than 2.5 micrometers	TB	Tuberculosis	USAID	United States Agency for International Development
MoEP	Ministry of Energy and Petroleum	REDD	Reducing Emissions from Deforestation and forest Degradation	TGE	Total Government Expenditure	USD	United States Dollar
MOFA	Ministry of Foreign & Diaspora Affairs	RESI	Resilience building	TNT&EP	The National Treasury and Economic Planning	USDA	United States Department of Agriculture
MoGEE	Ministry of Economy and Environment	RESO	Resource efficiency	UHC	Universal Health Coverage	WB	World Bank
MoWSI	Ministry of Water, Sanitation and Irrigation	RVC	Regional Value Chains	UN	United Nations	WDPA	World Database on Protected Areas
National Treasury	Ministry of Water, Sanitation and Irrigation	R&D	Research and Development	UN-Habitat	United Nations Human Settlements Programme	WHO	World Health Organization
NBSAP	National Biodiversity Strategy and Action Plan	SDBE	State Department for Blue Economy and Fisheries	UNCTAD	United Nations Conference on Trade and	WIPO	World Intellectual Property Organization
NCCAP	National Climate Change Action Plan	SDEP	State Department for Economic Planning	UNDP	United Nations Development Programme	WTTC	World Travel and Tourism Council
NCP	Natural Capital Protection	SDG	Sustainable Development Goals	UNEP	United Nations Environment Programme	UoN	University of Nairobi
NDC	Nationally Determined Contributions	SDHUD	State Department of Housing and Urban Development				





# 1

## Introduction

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### 1.1 About the Green Growth Index

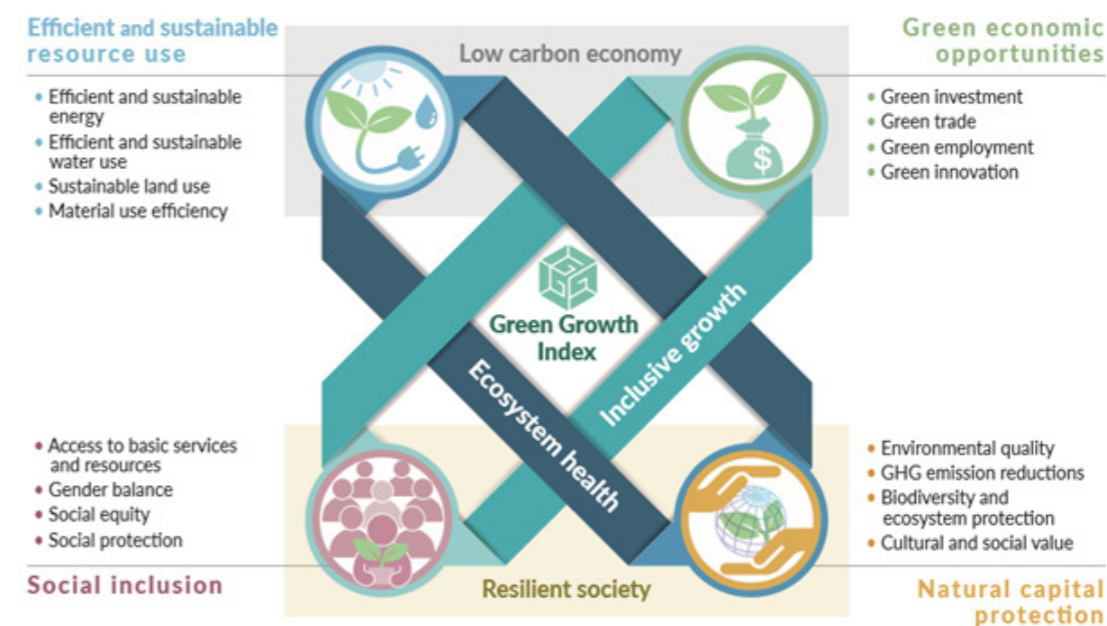
In 2019, the Global Green Growth Institute (GGGI) developed the Green Growth Index to provide its Members and Partners with a practical and explicit policy tool to measure their green growth performance and track their green growth transition. The framework for the Green Growth Index was developed in collaboration with over 300 national stakeholders worldwide, ensuring its applicability across countries. <sup>1</sup> Thus, in addition to the Global Green Growth Index, which allows comparing status in achieving sustainability targets of the Sustainable Development Goals (SDGs) in more than 147 countries <sup>2</sup>, the framework is applied to develop the National Green Growth Index, which facilitates the use of green growth indicators that are most relevant to a country's environmental, economic, and social contexts. The indicators are aligned with the four dimensions in the Green Growth Index framework, including efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion (Figure 1). The framework builds on GGGI's definition of green growth:

*"...a development approach that seeks to deliver economic growth that is both environmentally sustainable and socially inclusive. It seeks opportunities for economic growth that are low-carbon and climate resilient, prevent or remediate pollution, maintain healthy and productive ecosystems, and create green jobs, reduce poverty and enhance social inclusion." (GGGI Refreshed Strategic Plan 2015-2020, (GGGI, 2017:p.12) <sup>3</sup>*

The interlinkages among the green growth dimensions are underpinned by four sustainability concepts – low carbon economy, ecosystem health, inclusive growth, and resilient society <sup>4</sup>. The framework emphasizes that efficient and sustainable use of natural resources will produce more goods and services with less resources. This will in turn protect natural capital including water, energy, land, and materials as well as the ecosystem services they provide. A healthy ecosystem characterized by, for example, fertile soil, multifunctional forests, productive land and seas, good quality freshwater and clean air, and pollination increases economic productivity and creates new economic opportunities. The green growth framework also highlights the importance of protecting natural capital, which provides sources of economic growth such as green jobs, trade, and investment. Finally, social inclusion is considered a key mechanism to both the achievement and distribution of gains from green growth, where people are not only beneficiaries of economic growth but also contributors to creating economic opportunities.

The selection of green growth indicators in each dimension is guided by four sustainability pillars, ensuring alignment with the SDGs, Paris Climate Agreement, and Aichi Biodiversity Targets. Applying the multidimensional green growth framework to identify indicators requires understanding the social, economic, and environmental contexts as well as challenges and opportunities for green growth transition. The framework's multidimensionality requires practices that not only integrate policy-relevant indicators but also generate robust scores from the Green Growth Index. In the case of Kenya, the policy relevance of the green growth indicators is ensured through the participatory design process led by the National Treasury and Economic Planning, and the robustness of the scores is validated through the stepwise analytical approach through GGGI's technical support. This technical report presents the design process and discusses the scores for the Kenya Green Growth Index, developed through close collaboration between the National Treasury and Economic Planning and GGGI in 2023.

Figure 1 Framework for the Green Growth Index



## 1.2 Purpose for Developing the Index

Kenya is East Africa's largest economy, as such, the country's orientation towards sustainable development and the transition towards a low-carbon economy has profound, positive and far-reaching implications both at the national and international levels. In this light, that the country has acknowledged that national and regional environmental, economic, and social challenges impeding the country's progress towards economic prosperity are best answered with sustainable solutions, by developing its national green economy strategy. With the implementation period of 2016-2030, the objective of the Kenya Green Economy Strategy and Implementation Plan (GESIP) is to transition the country's socioeconomic landscape into one characterized by low carbon emissions, resource efficiency, equity, and inclusivity in five thematic areas: sustainable infrastructure, building resilience, sustainable natural resources management, social inclusion, and sustainable livelihood.

The government of Kenya has understood that successful sustainable development relies on decisive action, hence its Vision 2030, which is the country's blueprint that aims to transform Kenya into a newly industrializing, globally competitive, and middle-income country that provides a high quality of life to all its citizens by 2030, embraces three key pillars: Economic, Social and Political.<sup>5</sup> The Economic Pillar aims to achieve an average economic growth rate of 10% per annum that can be sustained until 2030 and beyond while, the Social Pillar strives to secure a just, cohesive, and equitable social development in a clean and secure environment and finally, the Political Pillar aims to realize a people-centered, result-oriented, and accountable democratic system.<sup>6</sup> These three pillars are anchored in the foundations of Macroeconomic Stability; Infrastructure Development; Science, Technology, and Innovation; Land Reforms; Human Resource Development; Security, Public Sector Reforms, and a National Value System.

Prior to the development and implementation of the GESIP, the country had in the past initiated interventions to orient itself towards a greener development pathway. These included targeted projects aimed at increasing the adoption of green technologies

and other forms of green investments, employment in the environmental rehabilitation and conservation ventures, green energy generation, cleaner industrial production strategies and sustainable agricultural practices sectors.<sup>7</sup> Kenya's green agenda also exists in various policies and legislations such as 2018-2022 Medium Term Plan of Kenya Vision 2030, Climate Change Act of 2016, National Climate Change Action Plan 2018 – 2022, National Energy Policy of 2018, the Non-motorized Transport Policy of 2015 and aligned with the Country's Big Four Agenda 2018-2022 which had set policies and measures that focused on by the government in the following areas: (i) Expansion of manufacturing, (ii) Affordable housing, (iii) Universal healthcare, and (iv) Food security and nutrition.

Kenya has made significant strides towards a green economic model and is a leading country in Africa in the space of climate policy implementation and spurring climate action.<sup>8</sup> It is in this regard that the country in 2022 requested to join GGGI and is one of the few countries in Africa with a rating of 22°C compatibility projecting that the country is on track to meet or exceed its Paris Agreement Commitments. But the Medium-Term Review of the GESIP notes that more efforts are yet needed to actualize the various strategic objectives of GESIP. Strengthening collaboration and institutional coordination in the delivery of GESIP objectives and strategies, as well as building capacity of the Green Growth Unit at the Ministry of Environment, Climate Change and Forestry to enable it to monitor and coordinate the implementation of GESIP, is highly recommended to support the country's transition to a low carbon economy.

Through membership to GGGI, Kenya aims to benefit from technical expertise and know-how that will scale up its green growth interventions and maximize good practices and approaches to leapfrog to a green economic model as per its Visions 2030 and the Green Growth Index is a useful tool to support the country's trajectory. The objective of the National Green Growth Index Assessment for Kenya was twofold. Firstly, the Green Growth Performance Measurement (GGPM) would be used to identify the country's green growth priorities and guide GGGI and the Government of Kenya by measuring the country's performance in achieving sustainability targets including Sustainable Development Goals, Paris Climate Agreement, and Aichi Biodiversity Targets for four green growth dimensions: efficient and sustainable resource

use, natural capital protection, green economic opportunities, and social inclusion. This will provide an evidence-based support in the development of the GGGI Kenya Country Programme Framework (CPF). Secondly, the National Green Growth Index Assessment for Kenya is aimed at supporting the Government of Kenya to unlock access to climate finance through the development of pipelines of projects.

## 1.3 Structure of the Report

**Chapter 1** introduces the Green Growth Index, briefly explains the purpose of developing the Index for Kenya, and presents the structure of this technical report.

**Chapter 2** describes the detailed process for designing the Kenya Green Growth Index. First, it describes the national stakeholders participating in the design process. Second, it discusses the participatory activities to capacitate the participants in identifying green growth indicators most relevant to Kenya's economic, social, and economic contexts and interpreting the challenges and opportunities for green growth transition based on the Index scores. Moreover, the participants' role and the purpose of the various activities are explained. Finally, the chapter presents the stepwise analytical approach complementing the participatory process.

**Chapter 3** discusses Kenya's contexts, policies, and priorities for green growth. The contexts include social, economic, and environmental issues that pose policy challenges and create economic and societal opportunities during the green growth transition. The chapter introduces the national policies and sectoral programs that support green growth in Kenya. Finally, the four development priorities emphasized in Kenya's Green Economy Strategy and Implementation Plan (GESIP) are briefly discussed in this chapter. These priorities include promoting sustainable infrastructure, building resilience, enhancing resource efficiency, and ensuring social inclusion and sustainable livelihoods. The chapter corresponds to Step 1 of the analytical approach presented in Chapter 2.

**Chapter 4** presents the 80 green growth indicators selected by the participants from the participatory process for designing the Kenya Green Growth Index. Using checklist tables, the chapter identifies the links of the indicators to the issues being addressed in national policies and sectoral programs and their relevance to the development priorities. The significance of the indicators to the SDGs and Global Green Growth Index is also discussed in this chapter. The computation of the Green Growth Index involves benchmarking against sustainability targets. This chapter introduces the sustainability targets used for each green growth indicator. Finally, proxy variables, which temporarily replaced indicators with insufficient data, are presented in this chapter. The chapter corresponds to Step 2 of the analytical approach presented in Chapter 2.

**Chapter 5** presents the scores for the Kenya Green Growth Index. First, it discusses the overall green growth performance at the pillar and dimension levels of the Index by looking at the distance to sustainability targets and performance dashboards. The trend in green growth performance at these levels of score aggregation is also presented for the period 2010-2022. Second, the chapter presents the scores for the 80 green growth indicators and discusses the challenges and opportunities identified by the participants in improving performance in these indicators. It also discusses how different national and sectoral policies could further enhance the performance of the green growth indicators. The chapter corresponds to Step 3 of the analytical approach presented in Chapter 2.

**Chapter 6** provides the summary and conclusions of the report for the following topics: (i) challenges and opportunities for green growth transition based on the discussion in Chapter 5, (ii) policy gaps based on the links between green growth performance and issues being addressed in national and sectoral policies, (iii) next steps to improve and update the green growth indicators in the Kenya Green Growth Index in the following years.

**Chapter 7** presents the normalized scores for the 80 green growth indicators and aggregated scores for pillars, dimensions, and the Green Growth Index from 2011 to 2022. The former scores were computed from the normalization and benchmarking methods, and the latter from aggregating the normalized and benchmarked scores of the green growth indicators.



# 2

## Design process

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### 2.1 The National Stakeholders

During the Kick-off meeting for the Kenya Green Growth Index project on the 22<sup>nd</sup> of May 2023, GGGI explained the critical role of the National Treasury and Economic Planning in the design process, particularly in selecting and mobilizing the national stakeholders participating in various activities over several months. More than 50 national stakeholders from 20 institutions in Kenya actively participated in webinars, online surveys, participatory

workshops, and targeted consultations, leading to the selection of the 80 most policy-relevant green growth indicators. The participatory activities ensured that national stakeholders capacities were built, and their expertise contributed to developing the Kenya Green Growth Index. Table 1 lists the national stakeholders from twenty government agencies, three non-governmental organizations, and one academic institution. They represent interdisciplinary expertise covering the four green growth dimensions – efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion.

**Table 1** Participants in the design process of the Kenya Green Growth Index

Ministries/Institutions	Sector
The National Treasury - Financing locally-led climate action program (National Treasury - FLLoCA)	GOVT
The National Treasury and Economic Planning (National Treasury)	GOVT
Ministry of Agriculture and Livestock Development (MoALD)	GOVT
Ministry of Agriculture and Livestock Development, Climate Change Unit (MOALDCCU)	GOVT
Ministry of Energy and Petroleum (MoEP)	GOVT
Ministry of Environment, Climate Change and Forestry (MECCF)	GOVT
Ministry of Foreign & Diaspora Affairs (MoFA)	GOVT
Ministry of Mining, Blue Economy and Maritime Affairs (MoMBEMA)	GOVT
Ministry of Water, Sanitation and Irrigation (MoWSI)	GOVT
State Department for Economic Planning (SDEP)	GOVT
State Department for ICT & Digital Economy (SDIDE)	GOVT
State Department for Transport (SDT)	GOVT
State Department of Housing and Urban Development (SDHUD)	GOVT
The Kenya Institute for Public Policy Research and Analysis (KIPPR)	GOVT
National Environment Management Authority NEMA	GOVT
Centre for Training and Integrated Research in ASAL Development (CETRAD)	GOVT
Kenya Agricultural and Livestock Research Organization (KALRO)	GOVT
Kenya Electricity Generating Company PLC (KenGen)	GOVT
Kenya Forest Service (KFS)	GOVT
Kenya Industrial Research and Development Institute (KIRDI)	GOVT
Kenya Association of Manufacturers (KAM)	NGO
Kenya Private Sector Alliance (KEPSA)	NGO
Sustainable Energy for All (SE4ALL)	NGO
University of Nairobi (UoN)	ACA
<b>Total</b>	<b>24</b>

Note: GOVT – government, NGO – non-government, and ACA – academic institutions. The activities are described in section 2.2 Participatory Activities.

### 2.2 Participatory Activities

The process for developing the Kenya Green Growth Index followed systematic and participatory approaches, facilitating the capacity building of the national stakeholders (Figure 2). It is systematic because the output from each activity feeds in as

input into the following activity. It is participatory because the national stakeholders were not only recipients but also sources of knowledge for developing the Index. The design process is, at the same time, a learning process. Throughout the design process, the national stakeholders discussed, suggested, and selected the indicators that are policy relevant – with GGGI providing the needed technical support and expertise (see Annex 1). The participatory activities combined different forms and mediums

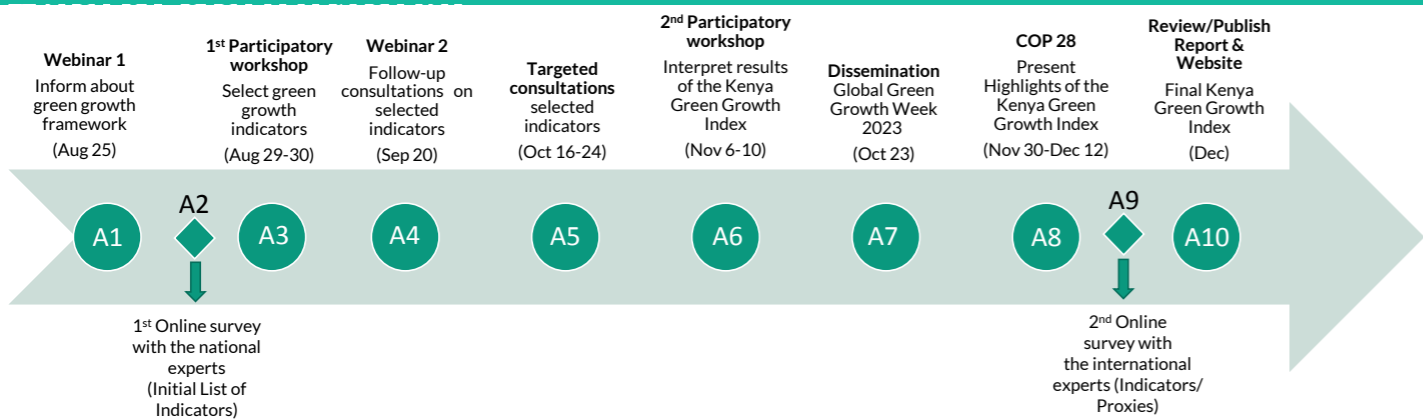
to allow interactive participation with and among the national stakeholders, including webinars, workshops, online surveys, targeted consultations, and dissemination (e.g., global conference). Figure 3 shows the chronology of the ten participatory activities to develop the Kenya Green Growth Index from August to

December 2023. The participatory activities were complemented by the technical support of GGGI's Green Growth Performance Measurement (GGPM) team, which is described in section 2.3 Stepwise Analytical Approach. Details on each participatory activity are discussed below.

Figure 2 Selected photos of the participants during the first (top) and second (bottom) participatory workshops



Figure 3 Design process for the Kenya Green Growth Index



**Activity 1 (A1) – Webinar 1 on green growth framework**

**Objective:** Inform the participants about the concepts and applications of the Green Growth Index.

**Output:** Created knowledge among participants on the different green growth indicators for the dimensions and pillars of the Green Growth Index, enabling them to respond to the questions in the 1st online survey.

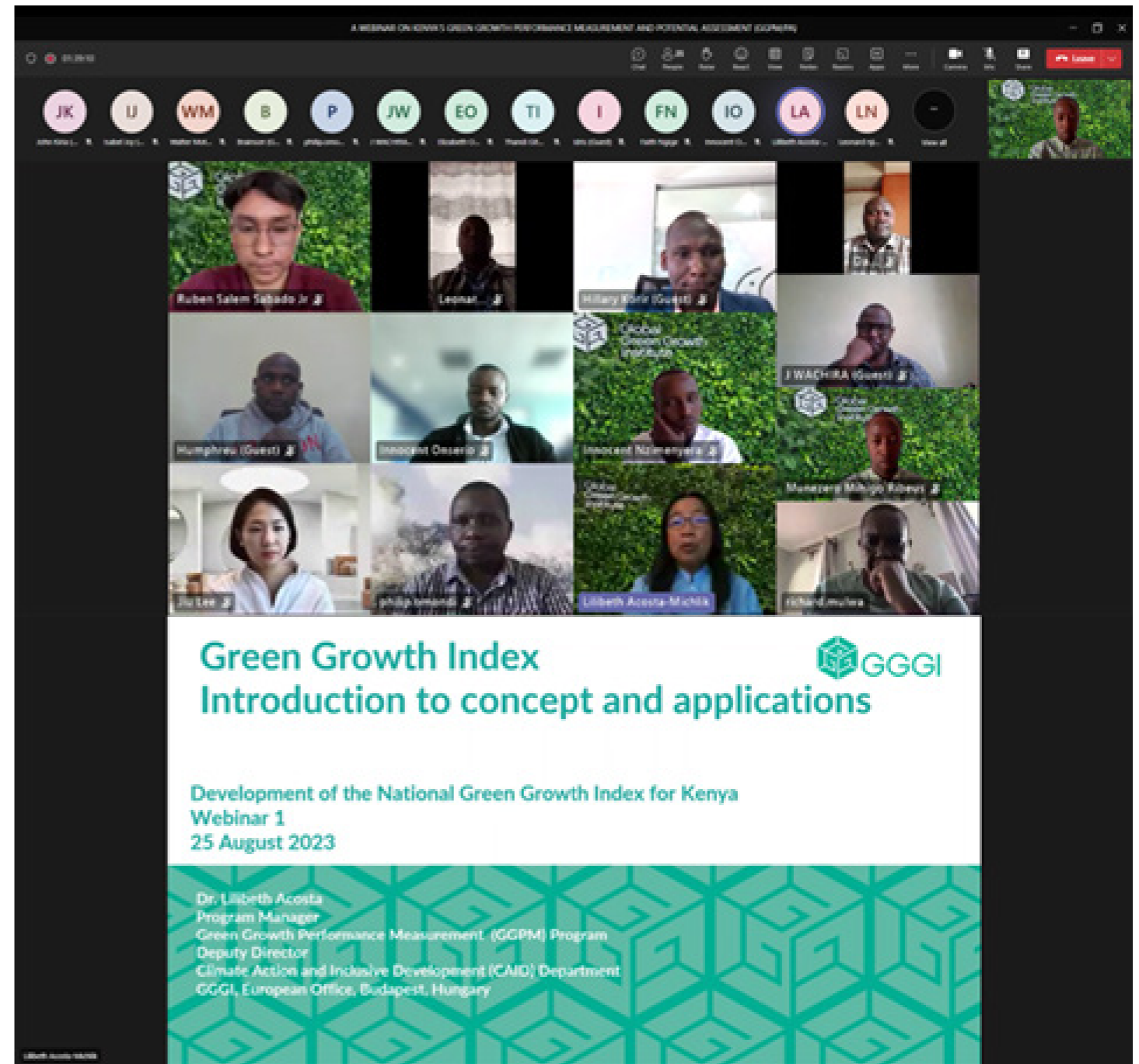
**Highlights:** GGGI's partner from the National Treasury and Economic Planning explained that Kenya's green growth strategy was adopted in 2016 but priorities have since changed. The Green Growth Index will thus assist in assessing the existing gaps and provide recommendations.

The webinar on the green growth framework was held in Nairobi on August 25, 2023 (Figure 3). The GGPM team presented the framework for the Green Growth Index (Figure 4). The framework emphasizes that efficient and sustainable use of natural resources

will produce more goods and services with fewer resources. This will, in turn, protect natural capital, including water, energy, land, and materials, as well as the ecosystem services they provide. A healthy ecosystem characterized by, for example, fertile soil, multifunctional forests, productive land and seas, good quality freshwater and clean air, and pollination increases economic productivity and creates new economic opportunities.

The green growth framework also highlights the importance of protecting natural capital, which provides sources of economic growth such as green jobs, trade, and investment. Finally, social inclusion is considered a pivotal mechanism for achieving and distributing the gains from green growth, where people are not only beneficiaries of economic growth but also contributors to creating economic opportunities.

Figure 4 Activity 1 (A1) – Webinar 1 on green growth framework



Dr. Lilibeth Acosta, Program Manager for GGGI's Green Growth Performance Measurement presenting the concept and applications of the Green Growth Index to the national stakeholders during Webinar 1 on 25th August 2023.

**Activity 2 (A2) – First online survey on the green growth indicators**

**Objectives:** (i) Familiarize the national stakeholders with the potential indicators for the different green growth dimensions; (ii) Build their capacity to assess the policy relevance of the green growth indicators to Kenya's economic, social, and environmental contexts; and (iii) Train them on how to use the online survey form which will be used during 1st participatory workshop.

**Output:** Created knowledge among participants on the policy relevance of the green growth indicators, which was necessary for the discussion during the 1st participatory workshop and selection of indicators for the Kenya Green Growth Index.

**Highlights:** Out of more than 200 potential green growth indicators, the national stakeholders selected the 80 most policy-relevant indicators for the Kenya Green Growth Index. Twenty-nine (29) stakeholders participated in the online survey, and the results of their ratings are presented in Annex 3.

The first online survey was conducted on August 25-29, 2023. The survey consisted of a semi-structured questionnaire suggesting five

potential green growth indicators and other alternative indicators for each pillar, which the participants rated according to the policy relevance to Kenya's economic, social, and environmental contexts (Figure 5). The ratings are very high, high, moderate, low, very low, and not relevant. The participants provided ratings based on their fields of expertise and/or expert judgments. They were asked to explain the ratings they gave to the green growth indicators in each pillar. If the participants gave a very low or not relevant rating, they were asked to suggest alternative indicators and provide information on the data sources. The alternative indicators can come from the list suggested in the survey or from the participants' knowledge.

The GGPM team identified the green growth indicators presented in the first online survey by assessing Kenya's policy frameworks and development priorities discussed in Chapter 3. Based on this assessment, the team created checklist criteria to determine the policy relevance of the suggested green growth indicators. The criteria are described in section 2.3.2 Data preparation. The GGPM team also checked the suggested indicators' online sources and data availability. When the data were unavailable online, the participants were requested to propose possible data sources from national databases or statistics.

**Figure 5 Activity 2 (A2) – Example of questions in the 1st Online survey on the green growth indicators**

**Activity 3 (A3) – First participatory workshop**

**Objectives:** (i) Allow national stakeholders to discuss with each other the policy relevance of the green growth indicators and (ii) Allow them to rate and vote on the green growth indicators with the highest policy relevance to Kenya's economic, social, and environmental contexts.

**Output:** Selected 80 green growth indicators to be included in the Kenya Green Growth Index.

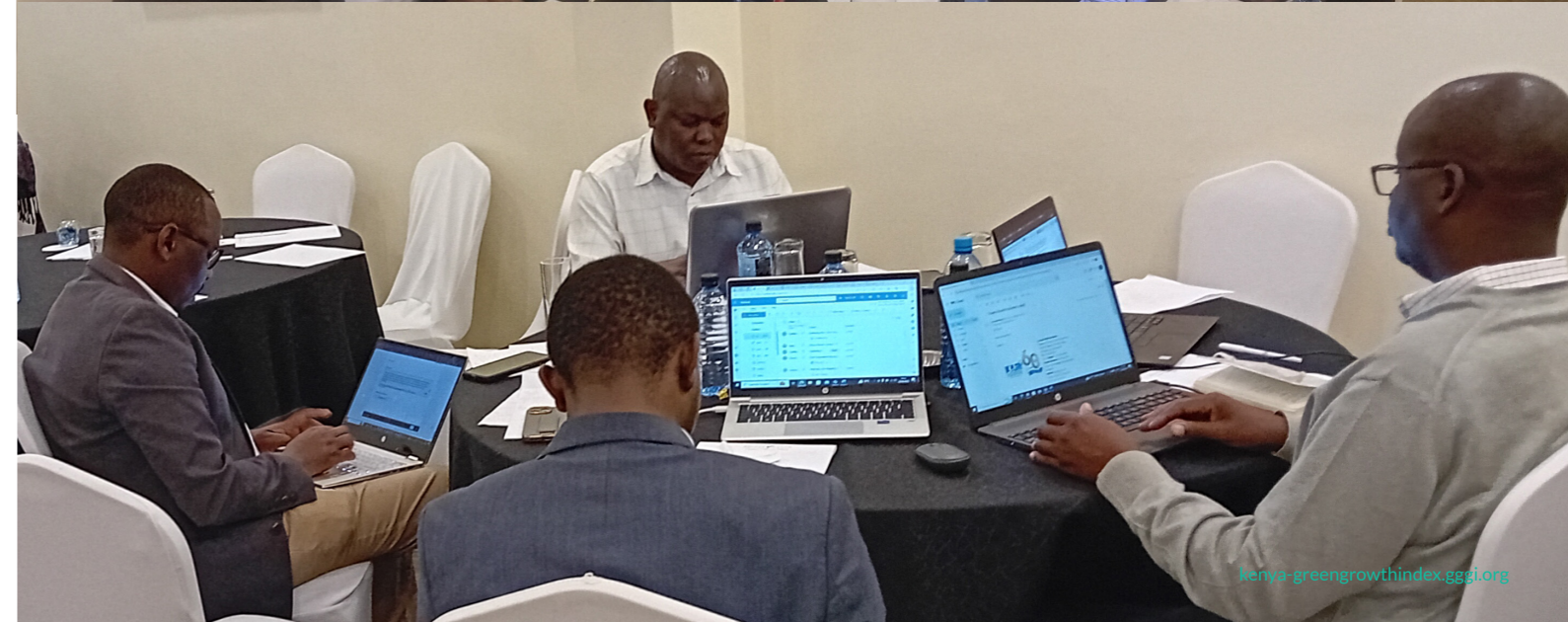
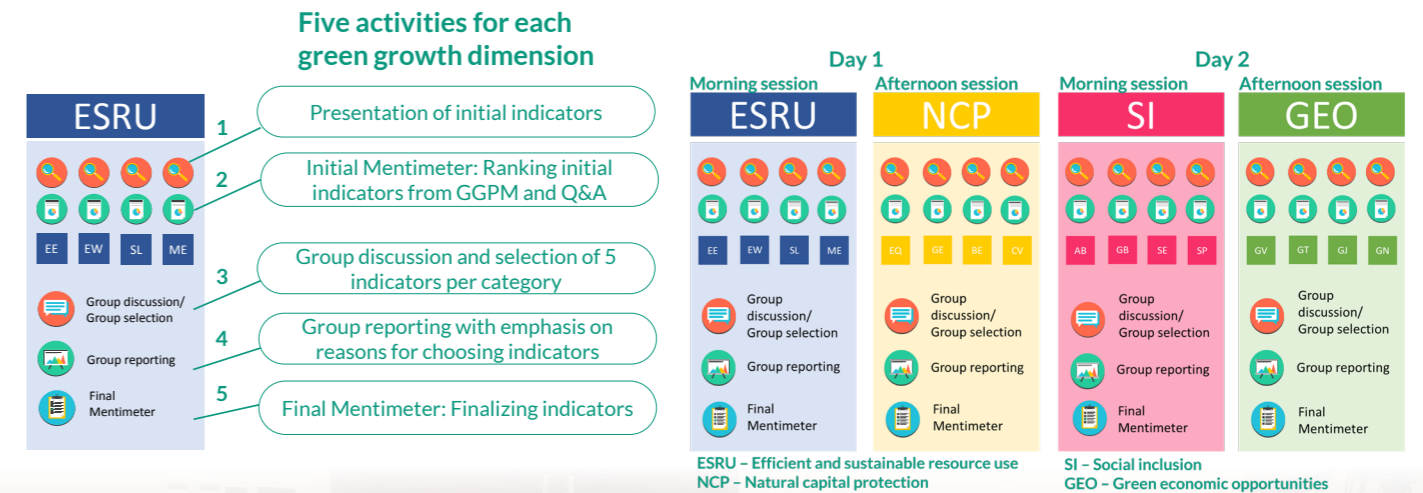
**Highlights:** The list of 80 green growth indicators was finalized based on the group ratings during the breakout sessions (results are in Annex 3) and the Mentimeter votings during the plenary sessions (results are in Annex 4).

The first participatory workshop was conducted in Nairobi on August 29-30, 2023. The workshop allowed national stakeholders to discuss together the green growth indicators, which they individually rated in the 1st online survey. It provided well-structured activities to enable them to rate and vote on the green growth indicators before and after the breakout sessions, during

which they discussed with each other the policy relevance of the indicators in each dimension (Figure 6). For example, for the efficient and sustainable resource use (ESRU) dimension, the first activity was the GGPM team's presentation of the five indicators for each pillar; the second activity was the initial individual voting on the indicators for each pillar using Mentimeter software; the third activity allowed the participants to join one of the three

breakout groups to discuss the relevance of the indicators and provide agreed ratings using the online survey form; the fourth activity was a reporting from each breakout group on the reasons for the votes given to the indicators; and the fifth activity was final voting on the indicators for each pillar using Mentimeter software. The same structure was followed for all other green growth dimensions.

**Figure 6 Activity 3 (A3) – Structure of activities during the 1st Participatory workshop survey**



**Activity 4 (A4) – Webinar 2 follow-up consultations**

**Objectives:** (i) Present the 80 green growth indicators with national stakeholders who did not attend the first participatory workshop and (ii) Allow them to provide ratings and suggestions on the indicators selected during the first participatory workshop.

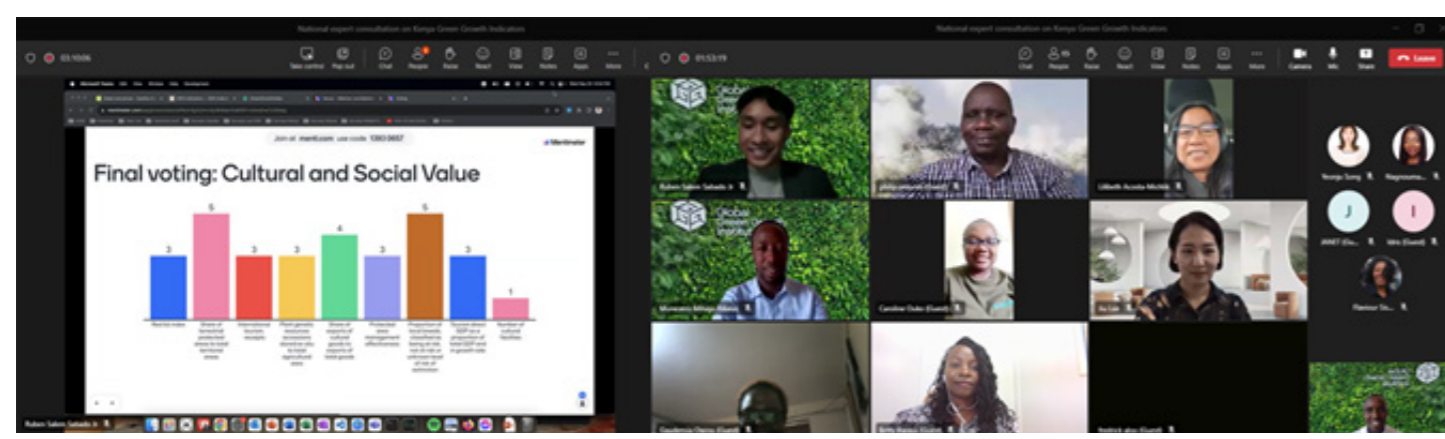
**Output:** Validated 80 green growth indicators to be included in the Kenya Green Growth Index.

**Highlights:** The list of 80 green growth indicators was validated and finalized based on the additional Mentimeter votings, and the votes were combined with the final ratings collected during the

first participatory workshop (results are in Annex 5).

Webinar 2 was conducted in Nairobi on September 20, 2023, allowing more national stakeholders to provide final ratings on the 80 Kenya Green Growth Index indicators. The green growth indicators included new indicators suggested by the national stakeholders during the first participatory workshop on August 29-30, 2023. For cultural and social values, for example, these include protected areas management effective, proportion of local breeds classified as at risk, tourism direct GDP as a proportion of GDP, and number of cultural facilities (Figure 7). The national stakeholders were thus allowed to vote on all green growth indicators, which the other stakeholders discussed during the first participatory workshop.

**Figure 7 Activity 4 (A4) – Webinar 2 follow-up consultations**



Mr. Ruben Sabado Jr. conducting the final Mentimeter voting during the Webinar 2 on September 20, 2023.

**Activity 5 (A5) – Targeted consultations**

**Objectives:** (i) Present the 80 green growth indicators selected by the national stakeholders during the first participatory workshop and Webinar 2 and (ii) Create awareness of the Kenya Green Growth Index among non-government institutions.

**Output:** Dissemination of the Kenya Green Growth Index to facilitate alignment of relevant activities in other institutions and identify appropriate data sources for green growth indicators.

**Highlights:** Consultations were conducted with the Sustainable Energy for All (SEforALL), Kenya Private Sector Alliance (KEPSA), Centre for Training and Integrated Research in ASAL Development (CETRAD), Sewerage of County Government / Municipal (Nairobi) and Kenya Wildlife Services.

- KEPSA on October 18, 2023, to examine pertinent policy issues and programs that foster social and economic development in Kenya that are of value to the Green Growth Index.
- CETRAD on October 20, 2023, to consult on CETRAD’s role in bolstering the Green Growth Index through their core focus areas, including enhanced access to water services, sanitation initiatives, and efficient water resources management. Data availability for these areas was also discussed.
- Sewerage of County Government / Municipal (Nairobi) and Kenya Wildlife Services on October 24, 2023, to discuss the data availability for developing the Green Growth Index

**Activity 6 (A6) – Second participatory workshop**

**Objectives:** (i) Share with the national stakeholders the link to the website of the Kenya Green Growth Index; (ii) Allow them to discuss with each other the challenges and opportunities for green growth transition based on the Index scores; (iii) Build their capacity to interpret the scores of the Kenya Green Growth Index; and (iv)

Share experience on lessons learnt in developing National Green Growth Index in another country. (sharing experience)

**Output:** (i) Access to the website on the final scores of the Kenya Green Growth Index and (ii) national stakeholders’ assessments of the challenges and opportunities in the country’s green growth transition.

**Highlights:** The discussions during the breakout sessions allowed the national stakeholders to contribute to this report’s analysis of the Green Growth Index scores. An expert from the Zambia Ministry of Economy and Environment (MoGEE) shared experience on the design process of the Zambia Green Growth Index in 2022.

The second participatory workshop was conducted in Naivasha on November 6-10, 2023. The one-week workshop allowed the participants to discuss and interpret the final scores in the Kenya Green Growth Index. It followed a similar structure as in the first participatory workshop (Figure 6) wherein (1) the GGPM team

presented the Index scores for each pillar in each dimension; (2) participants provided initial votes on green growth pillars that could enhance Kenya’s green growth performance; (3) breakout groups discussed the challenges and opportunities to enhance green growth performance based on the Index scores; (4) breakout groups reported on the results of their discussions; and (5) participants provided final votes on green growth pillars. Figure 8 shows examples of questions the participants had to answer during the breakout sessions. The participants discussed and responded to the same questions for all pillars in the three breakout groups. Moreover, during the second participatory workshop on November 9, 2023, Mr. Hedges Tembo, Chief Green Economy from the Zambia Ministry of Economy and Environment (MoGEE), gave an online presentation on the Zambia Green Growth Index, sharing experiences with the national stakeholders on the design process in Zambia in 2022 (Figure 9). He led the 43 national stakeholders from 28 institutions who participated in developing the Green Growth Index, which informed the development of the National Green Growth Strategy in Zambia.

**Figure 8 Activity 6 (A6) – Examples of questions to interpret the scores during the second participatory workshop**

Analysis of indicator scores for efficient and sustainable energy (EE)

Based on the Index scores, how will you rate the opportunities for improving Kenya's green growth performance in efficient and sustainable energy? \*

Very High  
 High  
 Moderate  
 Low  
 Very Low

Indicator	20	40	60	80	100
EE1				●	
EE2				●	
EE3	●				
EE4					●
EE5					●

Please explain the rating you have given to the indicator category. \*

Your answer \_\_\_\_\_

[Back](#) [Next](#) [Clear form](#)

Analysis of the indicator scores for efficient and sustainable energy (EE)

Based on the Index scores, which of the five indicators for EE provides the best opportunity to improve Kenya's green growth performance? \*

Note: Please choose only 1-2 indicators

EE1 - Ratio of total primary energy supply to GDP (Energy intensity)  
 EE2 - Share of renewable to total final energy consumption  
 EE3 - Logistics performance index: Quality of trade and transport-related infrastructure  
 EE4 - Electricity generation from renewables  
 EE5 - Per capita electricity consumption

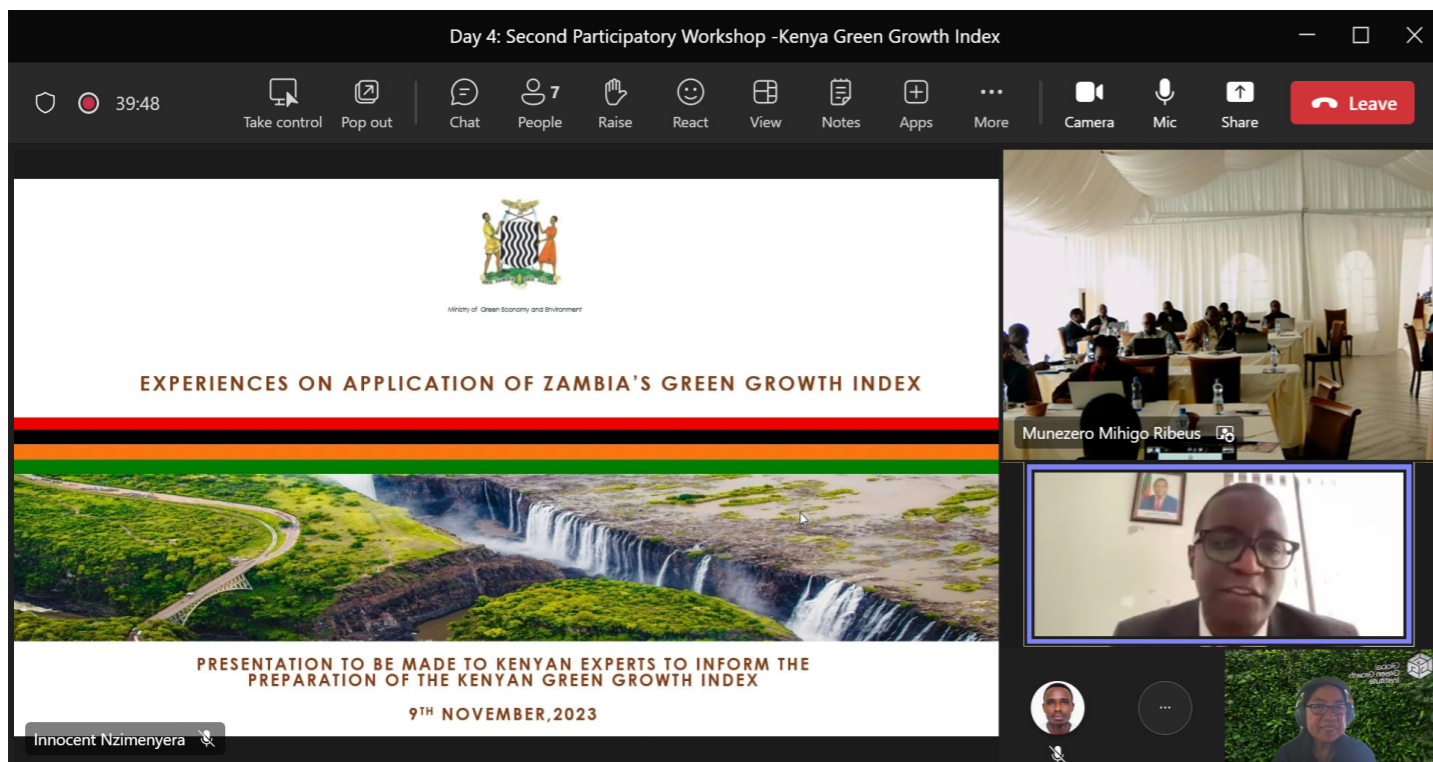
Please explain the reason for choosing the indicator(s). \*

Your answer \_\_\_\_\_

What are the challenges to further improving the Index scores for the chosen indicator(s)? Challenges can include policy priorities, implementation and management, financing, public acceptability, resource constraints, cultural values, etc. You can also provide specific examples on these challenges. \*

Your answer \_\_\_\_\_

**Figure 9 Activity 6 (A6) – Sharing experience from Zambia Green Growth Index during the second participatory workshop**



Mr. Hedges Tembo, Chief Green Economy from the Zambia Ministry of Economy and Environment (MoGEE) presenting the Zambia Green Growth Index and sharing experience on its design process to the Kenyan stakeholders.

**Activity 7 (A7) – Dissemination during the Global Green Growth Week 2023**

**Objectives:** (i) Create awareness of the collaborative project between the National Treasury and Economic Planning and GGGI to develop the Kenya Green Growth Index; (ii) Train government officers who are participating in the development of the Index to disseminate it to the national stakeholders globally; and (iii) Inform international organizations on the application of the Global Green Growth Index at the national level.

**Output:** Dissemination of the Kenya Green Growth Index during the Global Green Growth Week 2023.

**Highlights:** The session garnered one of the highest numbers of attendees (106) and livestreamed views (175) in this global conference.

The Kenya Green Growth Index was presented in the session on Green Growth Index - A Policy Tool to Mainstream Green Growth Indicators in Planning Process and Capacity-Building during the Global Green Growth Week, held virtually on October 23-27, 2023 (Figure 9). Dr. Malle Fofana, GGGI's Director and Head of Programs

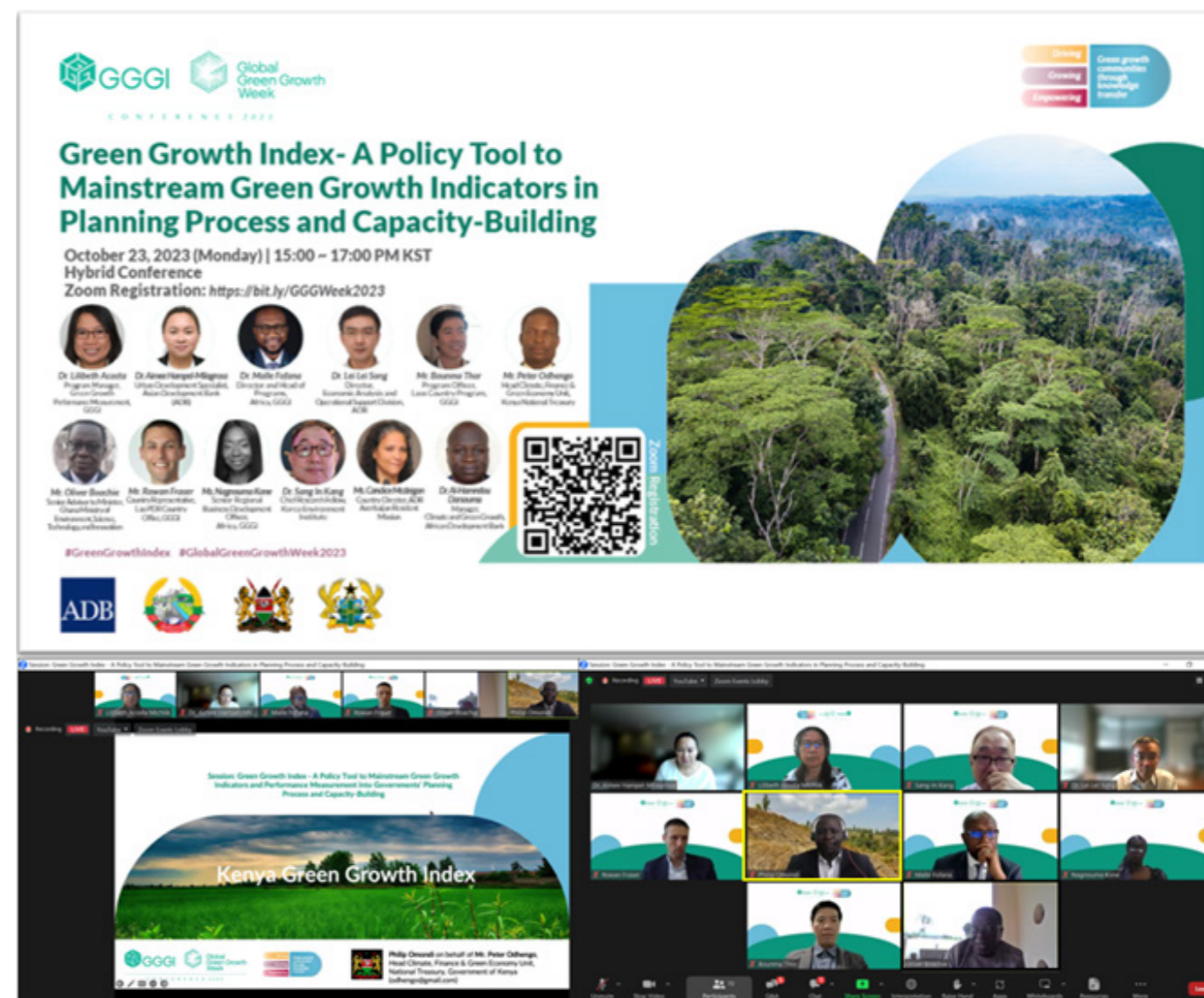
in Africa, gave the welcome remarks, and Dr. Lei Lei Song, Director of Economic Analysis and Operational Support Division at the Asian Development Bank (ADB), gave the opening remarks for this session on October 23, 2023. Dr. Lilibeth Acosta, Deputy Director and GGPM Program Manager at GGGI presented an overview of concepts and applications in Asia and Africa and a comparison of the green growth performance in Azerbaijan and Central Asian countries. Mr. Philip Omondi presented the Kenya Green Growth Index on behalf of Mr. Peter Odhengo, Head of Climate, Finance and Green Economy Unit at the National Treasury and Economic Planning. Other National Green Growth Index presentations were given for Ghana and Lao PDR. Mr. Oliver Boachie, Senior Advisor to the Minister at the Ministry of Environment, Science, Technology, and Innovation (METS), presented the Ghana Green Growth Index. Mr. Bounma Thor, Program Officer in GGGI Lao PDR Country Office, presented the Lao PDR Green Growth Index on behalf of Ms. Sisavanh Didaravong, Deputy Director General, DRI, Ministry of Planning and Investment. Dr. Aimee Hampel-Milagrosa, Urban Development Specialist in the ADB's Water Supply and Urban Development Sector Group, moderated the presentations during the session. The presentations create awareness among global audiences about the value of the Green Growth Index in tracking performance in the green growth transition.

**Other speakers and panelists in the session included the following:**

- Dr. Lei Lei Song, Director, Economic Analysis and Operational Support Division, ADB Philippines
- Mr. Rowan Fraser, Program Officer, Laos Country Program, Lao PDR

- Ms. Nagnouma Kone, Senior Regional Business Development Officer, Africa, Côte D'Ivoire
- Dr. Sang In Kang, Chief Research Fellow, Korea Environment Institute, Republic of Korea
- Dr. Al-Hamndou Dorsouma, Manager, Climate and Green Growth, African Development Bank (AfDB), Côte d'Ivoire

**Figure 10 Activity 7 (A7) – Dissemination of the Kenya Green Growth Index during the Global Green Growth Week 2023**



Mr. Philip Omondi presenting the Kenya Green Growth Index on behalf of Mr. Peter Odhengo, Head of the Climate Finance and Green Economy Unit, National Treasury and Economic Planning

**Activity 8 (A8) – Creating awareness during the COP28**

**Objectives:** (i) Create awareness of the collaborative project between the National Treasury and Economic Planning and GGGI on the Kenya Green Growth Index and

**Output:** Creating awareness dissemination of the Kenya Green Growth Index during the COP28

**Highlights:** The Summary Report was published in the Kenya Green Growth Index website: <http://kenya-greengrowthindex.gggi.org/>.

The National Treasury and Economic Planning created awareness of the Kenya Green Growth Index during the 28th UN Climate Change Conference of the Parties (COP28) in Dubai, United Arab

Emirates, from November 30 to December 12, 2023. During a panel discussion on the “NDC delivery lab: an innovative approach towards unlocking finance for climate action in the most gender and climate vulnerable hotspots of Kenya”, in Kenya Pavilion during COP28, Mr. Odhengo lauded GGGI initiative in supporting the country develop the Kenya Green Growth Index (Figure 11). He further clarified that the GGGI is a treaty-based international inter-governmental organization is dedicated in supporting and promoting strong, inclusive and sustainable economic growth in developing countries and emerging economies. The GGGI achieves this through supporting a global transition toward a model of green growth, based on country specific models, with policies and strategies that orients to achieve poverty reduction, social inclusion, environmental sustainability and economic growth.

**Figure 11 Activity 7 (A7) – Creating awareness of the Kenya Green Growth Index during COP28**



**Activity 9 (A9) – Second online survey**

**Objectives:** (i) Inform the international experts on the first application of the Green Growth Index at the national level and (ii) Collect feedback on the policy relevance of the indicators selected by the national stakeholders for the Kenya Green Growth Index.

**Output:** International experts’ ratings on the relevance of the indicators to policy decision-making and development contexts in Kenya or, in general, African countries.

The second online survey was conducted in December 2023. It consisted of a semi-structured questionnaire for the international experts to review the relevance of the green growth indicators to policy decision-making and development contexts in Kenya or, in general, African countries. Since 2019, at least 100 national

stakeholders have been participating worldwide in the annual review of the green growth indicators in the Global Green Growth Index reports. The GGPM team continues to review the indicators and update the index to replace proxy variables with SDG indicators when their data availability improves. Because the Kenya Green Growth Index was featured in the 2023 Global Green Growth Index report, international experts were also requested to review the indicators in the former. The GGPM team designed the survey with an “adaptive” questionnaire so that the international experts could only provide feedback on the indicators in their field(s) of expertise (Figure 12). The feedback from the international experts would help update the Kenya Green Growth Index next year and assess green growth indicators to be considered in the national Green Growth Strategy. Overall, the online survey results show that the international experts agree with the green growth indicators selected for the Kenya Green Growth Index (Annex 6).

**Figure 12 Activity 9 (A9) – Example of questions for the international experts in the second online survey**

**PART 2 Efficient and sustainable resource use (ESRU) - energy**

The first category in the ESRU dimension is efficient and sustainable energy, which refers to delivering more services or products per unit of energy used and meeting present needs by using renewable sources to ensure sustainability of energy for future use (IRENA & C2E2, 2015; Kutscher, Milford, & Keith, 2018).

Is energy your field of expertise? Or, do you have knowledge on energy efficiency? \*

Yes  
 No

**Efficient and sustainable energy (EE)**

Below are the five indicators selected by the government experts for this category. In addition to the units of measurement, information is provided whether it is an SDG indicator. You will find at the bottom of the page the ratings provided by the Kenya government experts on these indicators.

**EE1** - Energy intensity level of primary energy (MJ per constant 2017 PPP GDP), SDG indicator  
**EE2** - Renewable energy share in the total final energy consumption (Percent), SDG indicator  
**EE3** - Logistics Performance Index: Quality of trade and transport-related infrastructure (Score)  
**EE4** - Electricity generation from renewables (Terawatt-hours)  
**EE5** - Per capita electricity consumption (kWh per capita)

Please rate the indicators described above based on their relevance to policy decision-making and development contexts in Kenya or, in general, African countries. \*

	Very high	High	Moderate	Low	Very low	Not relevant
EE1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EE2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EE3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EE4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EE5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If your answer to one of the indicators is "Not relevant" or "Very low", please provide a brief explanation.

Your answer

**Activity 10 (A10) – Review and publication of the Kenya Green Growth Index**

**Objectives:** (i) Inform the national stakeholders of the contents of the Kenya Green Growth Index and (ii) Allow them to review the 2023 Kenya Green Growth Index report before its publication.

**Output:** First version of the Kenya Green Growth Index published in the Kenya Green Growth Index website: <http://kenya-greengrowthindex.gggi.org/>.

The last activity prior to the publication of the Kenya Green Growth Index report was the review of the draft report by the national stakeholders in December 2023. The comments and suggestions were considered in the published version of the report.

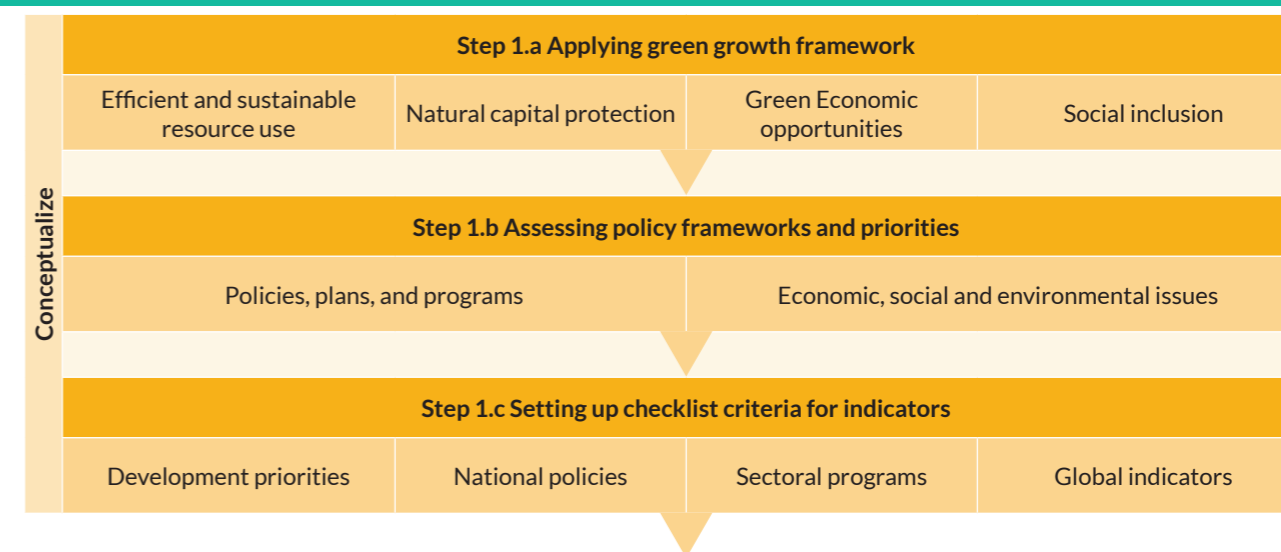




This chapter assesses Kenya's green growth contexts, national and sectoral policies, and development priorities. The assessment results inform how they are aligned with the green growth indicators, which the national stakeholders selected during the first participatory workshop. The knowledge presented here is

the outcome of Step 1 of the analytical methods, providing the rationale for including the selected 80 green growth indicators in the Kenya Green Growth Index (Figure 13). The assessment results supported the structure of the checklist criteria for the green growth indicators (see Chapter 4).

Figure 13 Conceptualization of green growth



Note: Complete diagram and description of analytical methods are in Annex 1.

# 3 Green growth in Kenya

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## 3.1 Green growth contexts

An overview of the economic, social, and environmental issues influencing Kenya's performance and transition to green growth is presented below. These issues relate to the national and sectoral policies the Government of Kenya implements to overcome development challenges and create socio-economic opportunities for sustainable growth.

### 3.1.1 Economy

Generally, in Kenya's economic landscape, the pillars of its growth are rooted in agriculture, manufacturing, real estate, and services. Agriculture is the cornerstone of the Kenyan economy, directly contributing 26 percent to the Gross Domestic Product (GDP) and indirectly contributing 25 percent.<sup>10</sup> This sector plays a pivotal role, constituting 65 percent of Kenya's overall exports and serving as the primary source of informal employment in rural areas, sustaining the livelihoods of a significant majority of the Kenyan population.<sup>11</sup> The sector's contribution to the country's GDP was 21.2 percent in 2022. However, it declined compared to 22.4 percent in 2021.<sup>12</sup> From 2010 to 2019, annual GDP growth averaged 5 percent, with a growing number of better-educated and healthier Kenyans entering the labor force and contributing more than any other factor to the country's rising GDP. Labor force expansion and rising capital stocks contributed to GDP growth (approximately 2.3 percent each year from 2004 onwards). The

economy is experiencing a notable, albeit uneven, recovery, with a GDP growth of 7.5 percent in 2021 following a contraction of 0.3 percent in 2020. Despite facing an ongoing drought, the agriculture sector demonstrated resilience.<sup>13</sup> In 2022, the economy continued the growth trajectory initiated in 2021 following the recovery from the adverse impacts of the COVID-19 pandemic, which had significantly hampered economic activity. However, the extent of growth was somewhat restrained by diminished agricultural production, attributable to adverse weather conditions throughout the year. The real GDP decelerated from a revised growth rate of 7.6 percent in 2021 to 4.8 percent in 2022. Conversely, the nominal GDP increased from 12,027.7 billion KSHS in 2021 to 13,368.3 billion KSHS in 2022. Most economic sectors exhibited slowed growth, mainly due to the notably high growth rates achieved in 2021, indicating the rebound from the economic downturn in 2020. During the review period, all economic activities recorded positive growth.<sup>14</sup>

### 3.1.2 Society

Between 1990 and 2021, Kenya has demonstrated positive changes in key human development indicators. Kenya's Human Development Index (HDI) value underwent a notable transformation, increasing from 0.474 to 0.575. The life expectancy at birth increased by 2.8 years, reflecting improvements in overall health and healthcare access.<sup>10</sup> Moreover, there was a positive change of 2.9 years in mean years of schooling and 3.1 years in expected years of schooling, indicating advancements

in the education sector. It was reflected by the secondary gross enrollment ratio (GER) reaching 70 percent in 2019.

Regarding education, Kenya has made significant advancements towards achieving universal primary education and gender parity. The country's educational landscape has witnessed remarkable efforts, including increased spending and expanded enrollments across all education levels. Kenya consistently improved learning outcomes before the pandemic, establishing itself as one of the top performers in the region. The strides in education are evident, with nearly universal primary education and a more than 50 percent increase in secondary enrollment compared to 2014. These accomplishments directly stem from augmented investments in education, contributing to enhanced enrollment rates at all levels. The financial commitment to education has met international benchmarks, both as a proportion of total government expenditure (TGE) and as a share of the gross domestic product (GDP). In 2018, TGE as a share of GDP reached 5.3 percent, surpassing the averages observed in other lower-middle-income and upper-middle-income countries, except South Africa. The government's allocation to education in the budget also rose, reaching 19 percent in 2020.<sup>16</sup>

Pupil enrolment in pre-primary 1 and 2 increased by 0.8 percent to 2,867.9 thousand in 2022, while the number of trained teachers rose by 1.4 percent to 69,561 in 2022.<sup>17</sup> Primary school enrollment slightly increased from 10,285.1 thousand in 2021 to 10,364.5 thousand in 2022. In the same year, the enrollment of girls in primary schools grew by 1.5 percent, reaching 5,116.1 thousand, whereas boys' enrollment saw a marginal increase of 0.1 percent. Transitioning to secondary schools, there was a noteworthy 5.4 percent increase in total enrollment, going from 3.7 million in 2021 to 3.9 million in 2022. The enrollment of girls in secondary schools showed a 5.1 percent increase to 2.0 million, outpacing the 3.9 percent rise in boys' enrollment, which reached 1.9 million in 2022.<sup>18</sup>

Kenya is gradually laying the groundwork for a well-functioning system in the sanitation sector. Currently, 30 percent of Kenyans have access to basic sanitation services, in contrast to 58 percent of the population with access to basic drinking water services. Notably, there has been a prioritization of investment in water supply over sanitation, particularly evident in the most marginalized rural communities where open defecation remains prevalent. Since 2000, there has been a 15 percent increase in the population using at least basic drinking water services and a 9 percent increase in the population using at least basic sanitation services.<sup>19</sup> However, 9.9 million people rely on contaminated surface water sources for drinking, and an estimated five million practice open defecation. Moreover, only 25 percent have access to hand-washing facilities with soap and water at home. With only 15 percent of water resources developed, the country's 103 m<sup>3</sup> per capita water storage capacity falls significantly below the Sub-Saharan Africa average. Piped water coverage reaches just one-third of the population, underscoring a notable disparity where twice as many Kenyans have access to electricity compared to basic sanitation. This highlights the need for comprehensive strategies to address the multifaceted challenges in Kenya's water and sanitation sector. There is a clear imperative for improvement as escalating demand for enhanced sanitation, exacerbated by urbanization trends, persists.

Despite progress in urban water access, the proliferation of unplanned settlements poses a significant challenge to the government's endeavors to ensure safe water and sufficient sanitation. Inequality also declined with the progress in education and skills development, health, water, job creation, and empowerment of citizens. As measured by the Gini coefficient, it decreased from 0.47 in 2005/2006 to 0.40 in 2015-2016.<sup>20</sup> But still, Kenya ranks among the countries with high poverty and inequality in Africa and globally. The overall poverty rate increased to 42.9 percent in 2020, with a subsequent reduction to 38.6 percent in 2021, indicating that 19.1 million individuals experienced overall poverty. Rural areas consistently exhibited higher overall poverty incidence than urban areas in 2019, 2020, and 2021. Additionally, the extreme poverty rate was 7.1 percent in 2020 and 5.8 percent in 2021, signifying that 2.9 million people each year lived in abject poverty, unable to afford the minimum required food consumption basket even if they allocated all their expenditure exclusively to food. Notably, extreme poverty incidence remained elevated in rural areas compared to urban areas over three years.<sup>21</sup>

Kenya's epidemiological landscape is marked by a dual burden of high prevalence and impact of preventable communicable diseases like human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS), tuberculosis, and malaria, alongside a growing burden of non-communicable diseases such as lower respiratory infections, stroke, and diarrheal diseases.<sup>22</sup> Traffic-related accidents also significantly contribute to both mortality and morbidity. Shifting lifestyle habits associated with increasing urbanization, unhealthy nutrition, reduced physical activity, and substance use contribute to the rise in non-communicable diseases. Despite these challenges, positive trends are evident in key national health indicators. From 2000 to 2021, improvements were observed in infant mortality, under-five mortality, maternal mortality, and HIV incidence among ages 15-49.<sup>23</sup> Life expectancy at birth increased from 45.2 years in the 1990s to an estimated 61 years by 2021<sup>24</sup>, reflecting significant progress in child health, HIV/AIDS, tuberculosis, and malaria. These gains result from strategic investments in preventive measures, including promoting insecticide-treated nets, substantial resource allocation for managing tuberculosis and HIV/AIDS, and targeted child survival interventions like increased immunization coverage.<sup>25</sup> However, persistent challenges threaten the health of Kenyans and the workforce, including inadequate health budgets, poor infrastructure, substandard health products, insufficient human resources, and governance issues. Addressing these obstacles is crucial for sustaining and expanding the positive health outcomes achieved thus far.

### 3.1.3 Environment

For Kenya's economic transformation agenda, sustainability is pivotal, as outlined in Vision 2030's current Medium-Term Plan (MTP), which aims to achieve accelerated, high, inclusive, broad-based, and sustainable economic growth. Given that natural resources and nature-based tourism serve as key drivers of the Kenyan economy and livelihoods for around 5.2 million people, there is a critical emphasis on the sustainable management of these resources and related assets. For instance, environmental and natural resources play pivotal roles as essential food and

raw materials sources for the manufacturing sector and provide safeguards for mitigating risks associated with the spread of zoonotic diseases. Recent estimates indicate that natural resources contribute approximately 42 percent to the country's GDP and support the livelihoods of about 70 percent of the population in Kenya. These statistics underscore the critical economic and societal significance of sustainable management and utilization of environmental assets.<sup>26</sup>

Recognizing the pivotal role of sustainability underscores the commitment to ensuring the long-term viability and resilience of the economy and its dependence on natural ecosystems.<sup>27</sup> This involves the sustainable use of natural resources as the foundation for wealth creation and the establishment of mechanisms to enhance the resilience of both the economy and society against the adverse impacts of climate change. The strategy encompasses implementing institutional and non-institutional measures to ensure the enduring preservation of environmental resources. Environmental governance encapsulates rules, practices, policies, and institutions and shapes human interactions with the environment and natural resources.<sup>28</sup>

Natural resources remain integral to Kenya's productive sectors, with agriculture as the primary livelihood source for a significant portion of the rural population. Despite high potential agricultural land constituting around 18 percent of the total land area, it faces the challenge of accommodating the highest population densities. Renewable natural capital contributes approximately 35 percent to Kenya's overall wealth. However, the country grapples with chronic water scarcity, featuring one of the world's lowest natural replenishment rates. Around 90 percent of the nation is either arid or semi-arid, with highly variable rainfall patterns and climate change is anticipated to exacerbate existing challenges. Persistent water scarcity, poor water quality, and conflicts over water resources are escalating. Factors contributing to Kenya's emerging water crisis include droughts, forest degradation, floods, inadequate water supply management, water contamination, and population growth. Among these challenges, catchment degradation is the most widespread issue, amplifying the risks of droughts and floods.<sup>29</sup>

Forests constitute a vital component of Kenya's diverse landscape, encompassing montane forests, western rainforests, dry forests, and coastal and riverine forests.<sup>30</sup> Despite their ecological significance, forests play a crucial, yet often underestimated, role in Kenya's economy. The forest industry, spanning formal and informal sectors, directly employs around 750,000 Kenyans and indirectly benefits at least 4 million individuals<sup>31</sup>. Government statistics indicate that forests contribute 3 - 3.6 percent to Kenya's GDP.<sup>31</sup> However, these figures do not account for the sector's contributions to household energy, non-timber forest products, and ecosystem services. Notably, charcoal production, with an annual market value exceeding 32 billion KSHS, supports the livelihoods of up to two million people.<sup>33</sup> When factoring in all added values, the overall contribution of forests to Kenya's GDP expands to about 39 percent.<sup>34</sup> Due to the rapid population growth, building on steep slopes that are vulnerable to soil erosion and encroachment into forested areas for settlement and agriculture inevitably leads to soil

degradation in Kenya. Soil degradation compels farmers to expand into natural habitats for fertile soils; however, these soon degrade into poor soils. There is, therefore, a more apparent domestic economic rationale to reduce deforestation rates and increase efforts to rehabilitate degraded forest areas.<sup>35</sup>

## 3.2 Kenya institutional frameworks

The government of Kenya has made substantial efforts to move the country towards a green economy, including establishing a supportive policy and legal frameworks. The strategy promotes investments in renewable energy, resource-efficient and clean production, pollution control, waste management, environmental planning and governance, and restoration of forest ecosystems. Some of these are highlighted in the subsequent sections.

### 3.2.1 National policies

Some of the policy and legislative frameworks that re-enforce Vision 2030 with a green economy agenda include the Kenya Constitution 2010, Medium-Term Plan 2023-2027 of Kenya Vision 2030, Climate Change Act of 2016, National Climate Change Action Plan 2018-2022, National Energy Policy of 2018, the Green Economy Strategy and Implementation Plan (GESIP) 2016-2030, Nationally Determined Contributions (NDC), National Climate Change Action Plan (NCCAP), fifth National Report to the Convention on Biological Diversity (NBSAP), the Non-motorized Transport Policy of 2015 among others.

#### The Kenyan Constitution (2010)

The Kenyan Constitution<sup>36</sup> (2010) gives rise to a devolved two-tier government structure and, hence, new and distinct governance structures at the national and county levels. Article 42 of the Constitution recognizes the right to a clean and healthy environment, while Article 60 (c) provides for sustainable and productive management of land resources. It calls for "sustainable exploitation, utilization, management and conservation of the environment and natural resources" and works "... to achieve and maintain a tree cover of at least 10 percent of the land area of Kenya" (Article 69 [(a)- (h)]).

#### Kenya Vision 2030

Kenya's Vision 2030 is a long-term development blueprint that aims to transform Kenya into a newly industrializing, middle-income country, providing a high quality of life to all its citizens by 2030 in a clean and secure environment. The vision recognizes the environment sector's critical role in achieving sustainable development. The Medium-Term Plan (MTP) is a five-year plan implementing the Kenya Vision 2030. The Fourth Medium-Term Plan (MTP IV) (2023-2027) focuses on environmental conservation and management, forest conservation and management, protection, and conservation of wetlands, and restoration and protection of water towers, among others, to ensure sustainable development.

## Green Economy Strategy and Implementation Plan 2016-2030

Green Economy Strategy and Implementation Plan (GESIP) 2016-2030 is geared towards enabling Kenya to attain a higher economic growth rate consistent with Vision 2030, which firmly embeds the principles of sustainable development in the overall national growth strategy. It is the country's blueprint for enhancing low-carbon, resource-efficient, equitable, and inclusive socio-economic transformation. Furthermore, it focuses on eliminating the social-economic constraints to attaining Kenya Vision 2030 and is aligned with the outcomes of the United Nations Conference on Sustainable Development (Rio+20). GESIP facilitates Kenya's transition to a sustainable path through five thematic areas and strategies: promoting sustainable infrastructure, building resilience, sustainable natural resource management, promoting resource efficiency, and social inclusion and sustainable livelihoods. The plan guides national and county governments and other stakeholders on the transition to sustainable development pathways to realize Kenya Vision 2030 and calls for a greater focus on green growth, a cleaner environment, and higher productivity.

Its successful execution will contribute to the socio-economic development goals consistent with the country's Vision 2030, the constitution, and commitment to the obligations of the African Union's Agenda 2063, the Paris Agreement, and the SDGs.

### Nationally Determined Contributions

Kenya's updated Nationally Determined Contributions (NDC) is a critical document reflecting Kenya's domestic ambition in the international arena. The updated NDC was submitted to the United Nations Framework Convention on Climate Change (UNFCCC), specifying mitigation and adaptation actions. It confirms Kenya's ambition to transition to a low-carbon society and reduce greenhouse gas (GHG) emissions far beyond 32 percent by 2030 (with milestone targets at 2025) relative to the business-as-usual (BAU) scenario of 143 MtCO<sub>2</sub>eq. Emission reductions are to be undertaken based on equity and in the context of sustainable development and efforts to eradicate poverty, which are critical development priorities for a green growth economy.

### National Climate Change Action Plan 2018-2022

National Climate Change Action Plan (NCCAP) 2018-2022 was developed to help Kenya adapt to climate change and reduce GHG emissions. It provides for the mainstreaming of climate change actions in all Sector Plans at the national and county levels. It outlines the priority areas to further Kenya's sustainable development by providing mechanisms and measures to achieve low-carbon and climate-resilient development. It is also informed by international commitments under the Paris Agreement 2016 and the 2030 Agenda for Sustainable Development and its SDGs. The mainstreaming of climate-smart actions promotes low-carbon climate resilience and green economy/growth development to ensure that investments are climate-proofed against climate change-related shocks. It further ensures that development in the different socio-economic sectors does not adversely impact the environment.

## Convention on Biological Diversity (CBD)

Kenya is a signatory to the Convention on Biological Diversity (CBD) and is committed to its implementation and promotion of all three objectives, namely the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising from the use of genetic resources. National Biodiversity Strategies and Action Plans (NBSAPs) are key instruments for national implementation of the CBD and other biodiversity-related multilateral environmental agreements (MEAs). The 5th National Report to the CBD provides government and non-government activities that minimize biodiversity loss to ensure that ecosystems are resilient and continue to provide essential services, thereby securing the quality of life and contributing to human well-being and poverty eradication.

## 3.2.2 Sectoral programs

### National Energy Policy 2018

The National Energy Policy 2018 aims to ensure an affordable, competitive, sustainable, and reliable energy supply at the lowest cost to meet national and county development needs while protecting and conserving the environment for inter-generational benefits. It helps mitigate climate change by encouraging the use of energy-efficient equipment and renewable energy sources. Kenya has several initiatives aimed at improving energy efficiency and conservation. These initiatives are drawn from policies such as Sessional Paper No. 4 of 2004 on Energy, Vision 2030, Energy Act 2019, the Sustainable Energy for All (SE4ALL) Initiative, the Energy (Energy Management) Regulations 2012, and the Energy (Appliances' Energy Performance and Labelling) Regulations 2016. These initiatives have helped improve energy efficiency and conservation in commercial, domestic, industrial, and institutional sectors consuming energy. The policy framework of 2018 contains recommendations for various sub-themes: coal, renewable energy (including geothermal and hydro in particular), electricity, energy efficiency and conservation, health and safety, energy services, energy financing, pricing, and socioeconomic issues.

### Sustainable Energy for All (SE4All) - Kenya Action Agenda 2016

Kenya opted to be part of the Sustainable Energy for All (SE4ALL) Initiative in 2012, one year after the former UN Secretary-General Ban Ki-Moon launched it. SE4All is expected to catalyze significant new investments to accelerate the transformation of the world's energy systems, pursue the elimination of energy poverty, and enhance prosperity. The initiative's three goals are to: 1. Mobilize all stakeholders to take concrete actions toward ensuring universal access to modern energy services; 2. Double the global rate of improvement in energy efficiency, and 3. Double the share of renewable energy in the global energy mix within the UN timeframe of 2030. The Government of Kenya fully embraces the objectives of the SE4All Initiative and appreciates that its timelines fall within those of Kenya's national development blueprint, Vision 2030. Kenya's SE4All Action Agenda (AA) and the Investment Prospectus (IP) have been developed through a highly

consultative process that provided valuable experiences in defining the country's road map for delivering clean energy to all Kenyans. This Action Agenda (AA) presents an energy sector-wide long-term vision from 2015 to 2030. It outlines how Kenya will achieve the Country's SE4All goals of 100 percent access to modern energy services, increasing to 80 percent the share of renewable energy in the Country's energy mix, and doubling the rate of improvement in energy efficiency by 2030.

### Kenya National Energy Efficiency and Conservation Strategy 2020

Energy Efficiency and Conservation is one of the key pillars of sustainable development in Kenya. The government has placed it as one of the priority areas of improvement in its efforts to enhance the quality of life of its citizens. Energy efficiency and conservation measures aim to foster the use of less energy to produce goods and services without compromising quality and quantity. Energy efficiency entails using technology that requires less energy to perform the same function. Energy conservation involves using less energy through changing behavior and habits. Improving energy efficiency will help reduce the demand for fossil fuels and related greenhouse gas emissions. It will also enhance the potential of renewable energy sources to meet a larger portion of the country's energy needs and its contribution to achieving the Paris Agreement and Sustainable Development Goal 7.

### Agricultural Policy 2021

The agriculture sector is essential for an economy-wide green economy transformation. The sector is critical in Kenya's economy, accounting for about 20 percent of Gross Domestic Product (GDP). The sector also employs over 40 percent of the population and more than 70 percent of the rural populace. Given the high correlation of economic growth to the development of agriculture and the sector's importance in absorbing the labor force, greening Kenya's agriculture sector is essential for greening the economy.

To this end, Kenya has formulated a suite of strategies and policies. Green agriculture is characterized by shifting both commercial and subsistence farming towards ecologically sound farming practices, such as efficient use of water, extensive use of organic and natural soil nutrients, optimal tillage, integrated pest control, and agroforestry.

### Kenya Climate Smart Agriculture Strategy (2017- 2026)

Kenya Climate Smart Agriculture Strategy (KCSAS) aims to adapt to climate change and build the resilience of agricultural systems while minimizing GHG emissions. It aims to achieve three main goals: Sustainably increase agricultural productivity and incomes; Adapt and build resilience to climate change; and Reduce and/or remove GHG emissions, where possible. Agroecology is one strategy that will contribute to achieving all these objectives as it substantially reduces emissions while increasing agricultural productivity. This enhances the community's resilience to climate change in line with the objectives of KCSAS.

## Kenya National REDD+ Strategy

The fundamental goal of REDD+ is to contribute to climate change mitigation by addressing drivers of deforestation and forest degradation and by removing barriers to sustainably managing or conserving existing forests and enhancing forest carbon stocks. REDD+ primarily aims to implement activities by the government to reduce human pressure on forests that result in GHG emissions. The REDD+ strategy provides a framework for improved forestry governance, resource allocation, partnerships, and collaboration with state and non-state actors. It also emphasizes monitoring to enable the sector to contribute to achieving the country's growth within a sustainable environment framework. The strategy is expected to lead to scaled-up afforestation, reforestation, and landscape restoration programs, as well as enhanced governance and policy implementation to reduce forest depletion.

### Forest Policy of Kenya, 2014

Forest policy seeks to address the threats to Kenya's forests and increase the forest cover to acceptable international standards of 10 percent. The policy aims to achieve sustainable management of natural and riverine forests within farmlands by applying soil and water conservation technologies. The policy also recognizes the role of forests in poverty alleviation and protects the customary rights of local communities to use forest resources sustainably. This Forest Policy provides a framework for improved forest governance, resource allocation, partnerships, and collaboration with the state and non-state actors to enable the sector to contribute to meeting the country's growth and poverty alleviation goals within a sustainable environment. The integration of trees into diverse farming systems has emerged as a pathway to ensuring economic growth and environmental sustainability. Agroforestry provides farmers with improved and diverse income sources, enhances soil fertility, and reduces deforestation and climate resilience.

### National Environment Policy 2013

The National Environment Policy (2013) provides a framework for an integrated approach to sustainable management of Kenya's environment and natural resources. This Policy aims to promote and enhance cooperation, collaboration, synergy, partnerships, and participation in the protection, conservation, and sustainable management of the environment and natural resources. It proposes to strengthen the legal and institutional framework for good governance. It further ensures the inclusion of cross-cutting and emerging issues such as poverty reduction, gender, disability, and other diseases in managing the environment and natural resources. The Ministry of Environment's 2023-2027 Strategic Plan provides a solid base upon which the Ministry will accomplish its mandate of managing and protecting the environment, sustainable use of natural resources, mitigation, and adaptation to climate change patterns to ensure a healthy and sustainable environment for the present and future.

**National Sustainable Waste Management Policy 2021**

The policy aims to address Waste management through regulations, guidelines, standards, and strategies in the country. It will advance Kenya towards a more sustainable, circular, green economy and move the country towards realizing the Zero Waste principle, minimizing or preventing waste generation. It will help ensure that waste is collected, separated at the source, reused, and recycled, and that the remaining waste stream is destined to a secure, sanitary landfill.

**National Water Master Plan 2030**

The policy focuses on sustainable water resource management, ecological conservation, scaling water resource management and development technologies, research and knowledge on water resources, irrigation development, disaster risk management, research, capacity development, partnerships, and collaborations on environmental management. The Plan identifies and makes planning and management projections for six water use categories: domestic, industrial, irrigation, livestock, wildlife, and inland fisheries.

**National Irrigation Policy 2020**

This policy aims to increase efficient water use in irrigation and contribute to agricultural production and productivity. This aims to enhance farmers' ownership through farmer-managed irrigation. The National Irrigation Policy aligns with the National Agriculture Policy, primarily aiming to commercialize the agriculture sector.

**Transport Policy**

Transport and logistics as a trade services sector are core parts of Kenya's economic strategy. It is also crucial for the performance of other sectors of the economy, such as manufacturing and

agriculture. A robust transport and logistics industry allows an economy to move goods to traders and consumers quickly, cost-effectively, and reliably, thus boosting trade performance, which, under appropriate circumstances, leads to higher incomes, employment gains, and lower poverty rates. Road transport is the most widely used means of transportation in Kenya. A green transport policy aims to reduce environmental impacts from transport and improve performance by minimizing noise, congestion, and disruption to others.

**Policy Action Plan for Transport Services in Kenya**

The Policy Action Plan (PAP) for transport services in Kenya has an overarching goal of contributing to the potential of trade services in Kenya in the regional value chains (RVCs) and global value chains (GVCs). Its objective is to strengthen the capacities of national and regional policymakers and stakeholders to measure and analyze value chains and design services and policies to enable higher integration into global and regional value chains. The PAP outlines the necessary policy framework to allow Kenya's transport sectors' growth by examining critical services trade policy issues as a strategic priority.

## 3.3 Development priorities for green growth

Four important development priorities that drive green growth transition are identified in the Green Economy Strategy and Implementation Plan (GESIP) 2016-2030. These include promoting sustainable infrastructure, building resilience, enhancing resource efficiency, and ensuring social inclusion and sustainable livelihoods. Each of these is discussed below, keeping in mind the current development context, policy landscape and key green economy interventions.

### 3.3.1 Sustainable infrastructure

Infrastructure development is a key foundation of Vision 2030. The Kenya government is currently implementing major projects; developing, upgrading and expanding the same<sup>36</sup>. These are manifested in several sectors including energy, transport, agriculture and irrigation, water and sanitation, waste management, housing, construction among many others. The government has constructed roads with improved traffic flow in Nairobi, such as the Thika Superhighway and the Nairobi Expressway<sup>38</sup>. Due to the increase in motorcars in the country over the years, the Transport Climate Strategies (TraCSs) project was initiated to incorporate climate change policies in the transport sector, thereby supporting the reduction of GHG emissions. Plans to build a bus rapid transport (BRT) network in Nairobi has kicked off with the public participation phase of the multi-billion-shilling project. Physical infrastructure including irrigation and water conservation structures have been developed, dams constructed while old ones regularly maintained<sup>39</sup>.

### 3.3.2 Building resilience

Kenya's resilience building efforts ensure that the economy and livelihoods are less vulnerable to risks and challenges of climate change and growth dynamics. Under this thematic area, the Government is undertaking development and implementation of policies to promote green growth, resource enhancement for green economy investment, improved livelihood diversification through enhanced social protection, and upscaling of access to medical, livestock and weather-based index insurance<sup>40</sup>. The green fiscal policies have been developed and implemented resulting in increased green financing. In addition, social protection has been enhanced to increase resilience of vulnerable groups, and health,

livelihood and climate risk insurance schemes developed and rolled out for resilience building of the vulnerable communities.<sup>41</sup> Others include promotion of drought-tolerant food crops and enhancement of disaster risk management.

### 3.3.3 Resource efficiency

The GESIP envisioned achieving more output with less resources while at the same time decoupling economic growth from environmental degradation. This has been achieved through increasing efficiency in energy and water use, as well as managing waste as a resource. The demand for improved water and sanitation services is still above the available supply sources. Policies, regulations and standards have been established to minimize people's exposure to harmful environmental pollutants<sup>42</sup>.

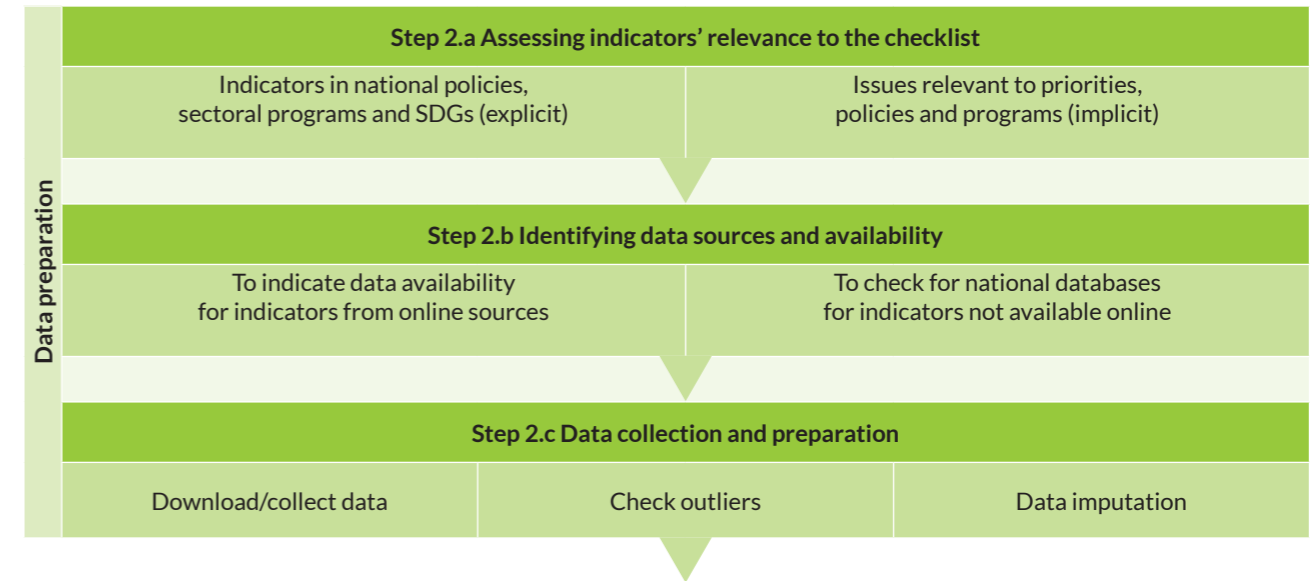
### 3.3.4 Social inclusion and sustainable livelihoods

GESIP priority area on social inclusion and sustainable livelihoods strives to include the participation of all segments of society in all regions (youth, women and persons with special needs), to be part of the transition process for green growth. It emphasizes the need for all members of society and groups to participate and benefit equitably towards the green economy. It recognizes the critical role of an informed, educated, trained and healthy population in catalyzing the transition to a green economy; and one prepared to embrace sustainable livelihoods through sustainable lifestyles, education, green skills development and behavior change; and enterprise development to create green jobs. Promoting social inclusion and sustainable livelihoods has increased revenue from green jobs, adoption of green economy innovations and technologies as well as the people's resilience to environmental-related illnesses.

This chapter applied the checklist criteria to the 80 green growth indicators, assessing their relevance to national policies, sectoral programs, and development priorities in Kenya. The data sources and availability for the indicators and the proxy variables used

to replace those with insufficient data are also discussed in this chapter. The information presented here is the outcome of Step 2 of the analytical methods, dealing with the preparation of the indicators' data before calculating the Kenya Green Growth Index (Figure 14).

Figure 14 Data preparation of green growth indicators



# 4 Green growth indicators for Kenya

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## 4.1 Indicator checklists

Applying the checklist criteria for the 80 green growth indicators aims to determine the alignment of the green growth indicators with Kenya's national policies, sectoral programs, and development priorities (see Chapter 3). Table 2 presents the green growth indicators included in the Kenya Green Growth Index. Except for the proportion of mothers with newborns receiving maternity cash benefits % of women (GB4), which were drawn from the Kenya National Bureau of Statistics (KNBS), the data for all indicators were developed and published by the international organizations. The indicators are valuable tools for monitoring green growth performance and will be useful to integrate into national policies and sectoral programs.

The green growth indicators are mapped against the criteria in a checklist table (see 2.3.2 Data preparation). Two colors represent the checks: First, a green check ✓ indicates direct relevance, where indicators with their measurement units are explicitly part of the criteria. Second, a yellow check ⚠ shows only indirect relevance, with no implicit mention of the indicator and its measurement unit. The following provides an interpretation of the checks for the different criteria.

- Criteria 1 (national policies) and 2 (sectoral programs) – The green checks suggest that green and inclusive growth is vigorously pursued in Kenya, where the indicators are used to measure performance in achieving green and inclusive growth goals. The yellow checks indicate that, while issues relevant to the green growth transition are recognized, they are not purposely pursued or addressed. No checks indicate gaps in

national policies and sectoral programs, which could slow or hinder the transition.

- Criteria 3 (development priorities) – The checks are used to inform the relevance of the green growth indicators to challenges and opportunities in achieving Kenya's development priorities, including promoting sustainable infrastructure, building resilience, enhancing resource efficiency, and ensuring social inclusion and sustainable livelihoods. Only yellow checks are used in these criteria because the discussion on development priorities focused on highlighting challenges and opportunities.
- Criteria 4 (climate actions) – The green checks inform the significance of the green growth indicators on climate mitigation and adaptation. Mitigation contributes to a low-carbon economy, and adaptation builds a resilient society, enabling a green growth transition. The yellow checks indicate that the green growth indicators are only indirectly relevant to mitigation and/or adaptation.
- Criteria 5 (global issues) – The green checks inform that the green growth indicators are included in the SDGs and Green Growth Index. The yellow checks indicate that, although not in the SDGs and Green Growth Index, the indicators are nonetheless relevant and contribute to sustainable development and green growth.

On the one hand, many checks (particularly the green ones) on Criteria 1 and 2 indicate that Azerbaijan is clearly pursuing green growth. On the other hand, many checks on Criteria 3-5 inform about the value of using the indicators to track progress in the green growth transition.

**Table 2** Green growth indicators selected by the Kenyan participants for the Green Growth Index, by dimensions and pillars

Code	Indicator name	Unit	Publisher
<b>EFFICIENT AND SUSTAINABLE RESOURCE USE</b>			
EE1	Ratio of total primary energy supply to GDP	Megajoules per constant 2017 purchasing power parity GDP	IEA
EE2	Share of renewable to total final energy consumption	Percent	IEA
EE3	Logistics performance index: Quality of trade and transport-related infrastructure	Score (1=low to 5=high)	WB
EE4	Electricity generation from renewables	Terawatt-hours	BP, Ember
EE5	Per capita electricity consumption	Kilowatt-hours per capita	EIA
EW1	Water use efficiency	United States dollars per cubic meter	FAO
EW2	Share of freshwater withdrawal to available freshwater resources (Level of water stress)	Percent	FAO
EW3	Sustainable fisheries as a proportion of GDP	Percent	UNSD, OECD
EW4	Share of surface irrigation to total irrigation	Percent	FAO
EW5	Renewable internal freshwater resources per capita	Cubic meters	FAO
SL1	Nutrient balance per unit area	Nitrogen kilogram per hectare	FAO
SL2	Share of agriculture organic to total agriculture land area	Percent	FAO
SL3	Share of ruminant livestock population to agricultural area	Livestock units per hectare	FAO
SL4	Agricultural production divided by total area of arable land under crops and pasture	Current thousand US\$/ hectare	FAO
SL5	Farm machinery per unit of agricultural land	Horsepower per 1000 hectares	USDA
ME1	Total domestic material consumption (DMC) per unit of GDP	Kilograms per GDP	OECD, WB
ME2	Total material footprint (MF) per capita	Tonnes per capita	UNEP
ME3	Average of food loss to production and food waste to consumption	Ratio	FAO
ME4	Municipal solid waste recycled	Percent	FAO
ME5	Municipal wastewater treatment facilities	Number	FAO
<b>NATURAL CAPITAL PROTECTION</b>			
EQ1	PM2.5 air pollution, mean annual population-weighted exposure	Micrograms per cubic meter	Brauer et al. 2017
EQ2	DALY rate due to unsafe water sources	DALY lost per 100,000 persons	IHME
EQ3	Municipal solid waste generation per capita	Tonnes per capita	WB
EQ4	Chlorophyll-a deviations, remote sensing	Percent	UNEP
EQ5	Proportion of bodies of water with good ambient water quality	Percent	UNEP
GE1	Ratio of CO2 emissions to population, including AFOLU	Tonnes per capita	CW, WB
GE2	Ratio of non-CO2 emissions (CH4, N2O and F-gas) excluding AFOLU to population	CO2eq tons per capita	CAIT, WB
GE3	Ratio of non-CO2 emissions (CH4, N2O and F-gas) in Agriculture and LUCF to population	CO2eq tons per capita	CAIT, WB
GE4	Carbon Intensity of energy production	kilograms of CO2 per kilowatt-hour	GCB
GE5	Carbon dioxide emissions per unit of manufacturing value added	kilogrammes of CO2 per constant 2015 United States dollars	IEA, UNSD, UNIDO
BE1	Average proportion of Key Biodiversity Areas covered by protected areas	Percent	IUCN, UNEP-WCMC
BE3	Above-ground biomass stock in forest	Tonnes per hectare	FAO

**Table 2** Green growth indicators selected by the Kenyan participants for the Green Growth Index, by dimensions and pillars (continued)

Code	Indicator name	Unit	Publisher
BE4	Forest area under an independently verified forest management certification scheme	Thousands of hectares	FAO
BE5	Change in the extent of water related ecosystems over time: Lakes and rivers permanent water areas	Percent of total land area	UNEP
CV1	Proportion of local breeds, classified as being at risk, not at risk or unknown level of risk of extinction	Index	FAO
CV2	Share of terrestrial protected areas to total territorial areas	Percent	WDPA, UNEP-WCMC
CV3	Travel and Tourism direct contribution to GDP	Percent	WTTC
CV4	Plant genetic resources accessions stored ex situ to total agricultural area	Number per hectare	FAO
CV5	Share of exports of cultural goods to exports of total goods	Percent	UNESCO
<b>GREEN ECONOMIC OPPORTUNITIES</b>			
GV1	Adjusted net savings, including particulate emission damage (% of GNI)	% of GNI, 5 years moving average	WB
GV2	Installed renewable energy-generating capacity in developing countries	watts per capita	IRENA
GV3	International financial flows to developing countries in support of clean energy research and development and renewable energy production	Share to GDP (millions of constant 2020 United States dollars divided by the constant GDP)	OECD, IRENA
GV4	The agriculture orientation index for government expenditures	Percent	IMF, UNSD
GV5	Roads quality	1-7 (best)	The global economy
GJ1	Share of green employment in total manufacturing employment	Percent	UNIDO
GJ2	Employed population below international poverty line	Percent	ILO
GJ3	Vulnerable employment, total	% of total employment	ILOSTAT
GJ4	Firms offering formal training	% of firms	WB
GJ5	Volume of official development assistance flows for scholarships by sector and type of study	millions of constant 2021 United States dollars	OECD
GT1	Share of export of environmental goods (OECD and APEC classifications) to total export	Percent	OECD
GT2	Share of amount of tracked exported Environmentally Sound Technologies (USD) to total exports (USD)	Percent	UNEP, OECD
GT3	Number of ISO 14001 certificates issued	Number	ISO
GT4	Ease of doing business	New registrations per 1,000 people ages 15-64	WB
GT5	High-technology exports	% of manufactured exports	UN-COMTRADE
GN1	Share of patent publications in environmental technology to total patents	Percent	OECD
GN2	Annual articles published in scientific and technical journals per million people	Number per million people	WB, UN
GN3	Researchers (in full-time equivalent) per million inhabitants	per 1,000,000 population	UNESCO
GN4	Proportion of medium and high-tech industry value added in total value added	1-7 (best)	UNIDO
GN5	Trademark applications, direct resident	resident, by count	WIPO
<b>SOCIAL INCLUSION</b>			
AB1	Population with access to safely managed water and sanitation	Percent	WHO/UNICEF

**Table 2** Green growth indicators selected by the Kenyan participants for the Green Growth Index, by dimensions and pillars *(continued)*

Code	Indicator name	Unit	Publisher
AB2	Population with access to electricity and clean fuels	Number	WB, WHO
AB3	Prevalence of undernourishment	Percent	FAO
AB4	Proportion of population that has convenient access to public transport	Percent	UN-Habitat
AB5	Property rights	Score	Heritage Foundation
GB1	Proportion of seats held by women in national parliaments	% of total number of seats	IPU
GB2	Gender ratio of account at a financial institution or mobile-money-service provider	Parity ratio	WB, WHO
GB3	Getting paid, laws and regulations for equal gender pay	Score	WB, WHO
GB4	Proportion of mothers with newborns receiving maternity cash benefits	% of women aged 15-49 years	KNBS
GB5	School enrollment, primary (gross), gender parity index	Parity ratio	UNESCO
SE1	Inequality in income based on Palma ratio	Ratio	WB, WHO
SE2	Population with access to basic services by urban/rural, i.e. electricity and clean fuels	Ratio	WB, IEA, IRENA, UNSD, WHO
SE3	Disparity of unemployment: Ratio of Youth (15-24 yrs. old) and above 25 yrs. old unemployment	Ratio	ILO
SE4	Age dependency ratio, old	% of working-age population	WB
SE5	Proportion of population with severe disabilities receiving disability cash benefit	Percent	ILO
SP1	Proportion of population above statutory pensionable age receiving a pension	Percent	ILO
SP2	Universal health coverage (UHC) service coverage index	Score	WHO
SP3	Proportion of urban population living in slums	Percent	UN-Habitat
SP4	Number of victims of intentional homicide per 100,000 population	Number per 100,000 population	UNODC
SP5	Score of Hyogo Framework for Action self-assessment reports of the countries.	Score	UNISDR

Definitions: International Energy Agency (IEA), World Bank (WB), British Petroleum Company plc (BP), U.S. Energy Information Administration (EIA), Food and Agriculture Organization (FAO), United Nations Statistics Division (UNSD), Organization for Economic Cooperation and Development (OECD), United States Department for Agriculture (USDA), United Nations Environment Programme (UNEP), International Union for Conservation of Nature (IUCN), UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC), Forest Certification Organizations (FSC), Programme for the Endorsement of Forest Certification (PEFC), World Database on Protected Areas (WDPA), World Travel & Tourism Council (WTTC), United Nations Educational, Scientific and Cultural Organization (UNESCO), World Health Organization (WHO), Institute for Health Metrics and Evaluation (IHME), Climate Watch (CW), Climate Analysis Indicators Tool (CAIT), Global Carbon Budget (GCB), BP and Shift Energy Data Portal (BP), United Nations Industrial Development Organization (UNIDO), International Labour Organization (ILO), United Nations (UN), World Intellectual Property Organization (WIPO), United Nations Commodity Trade Statistics Database (UN COMTRADE), International Organization for Standardization (ISO), International Renewable Energy Agency (IRENA), International Monetary Fund (IMF), United Nations Conference on Trade and Development (UNCTAD), United Nations International Children's Emergency Fund (UNICEF), Inter-Parliamentary Union (IPU), Kenya National Bureau of Statistics (KNBS), United Nations Human Settlements Programme (UN-Habitat), United Nations Office on Drugs and Crime (UNODC), United Nations International Strategy for Disaster Reduction Secretariat (UNISDR)

### 4.1.1 Efficient and sustainable resource use

Table 3 presents the checklist table for the indicators in the efficient and sustainable resource use pillar, including efficient and sustainable energy, efficient and sustainable water use, sustainable land use, and material use efficiency. This section briefly discusses the relevance of the efficient and sustainable resource use indicators to the criteria in the checklist table.

Efficient and sustainable energy: The five green growth indicators in this pillar include energy intensity (EE1), renewable energy share (EE2), efficient transport (EE3), low-carbon electricity (EE4), and per capita electricity consumption (EE5). Across the efficient and sustainable resource use dimension, efficient and sustainable energy indicators are the most frequently mentioned issue in national policies and sectoral programs (Table 3). Moreover, two indicators are directly mentioned (i.e., with a green check) in national policies and four in sectoral policies. Regarding the national policies, EE2 and EE4 indicators are discussed in GESIP, Big 4, and NCCAP. Except for EE3, all efficient and sustainable

energy indicators are directly mentioned in at least one sectoral program, including SE4ALL - Kenya Action Agenda, Kenya National Energy Efficiency and Conservation Strategy 2020, National Energy Policy, and National Environmental Policy 2013. EE3 is the only efficient and sustainable energy indicator not explicitly mentioned in national policies and sectoral programs. Many efficient and sustainable energy indicators support two of Kenya's development priorities, including sustainable infrastructure and resource efficiency. All five indicators directly contribute (i.e., with a green check) to climate mitigation, and some can support climate adaptation. EE1 and EE2 are SDG indicators included in the Global Green Growth Index. The other indicators contribute to achieving SDGs; for example, EE3 contributes to 11.2.1 proportion of the population that has convenient access to public transport, EE4 contributes to SDG 7.b.1 Installed renewable energy-generating capacity, and EE5 contributes to SDG 7.1.1 proportion of the population with access to electricity.

Efficient and sustainable water use: The five green growth indicators in this pillar include water use efficiency (EW1), level of water stress (EW2), sustainable fisheries (EW3), share of surface irrigation (EW4), and renewable water resources per capita (EW5). National policies and sectoral programs explicitly mention no efficient and sustainable water use indicators. The EW4 indicator is discussed most frequently in national policies, including Vision 2030, GESIP, and Big 4. Moreover, it is also discussed in sectoral programs like SE4All - Kenya Action Agenda 2016 and Kenya Agricultural Policy 2021. In contrast, EW5 receives the least focus on national policies, with only the GESIP mentioning this indicator. Only two efficient and sustainable water use indicators are mentioned in the sectoral programs; the EW5 indicator is not one of them. Many efficient and sustainable water use indicators are relevant to Kenya's development priorities, including resource efficiency, resilience building, and social inclusion and sustainable livelihoods. All five indicators directly contribute (i.e., with a green check) to climate adaptation. EW1, EW2, and EW3 are SDG indicators that are included in the Global Green Growth Index. However, EW4 contributes to achieving the SDG 2.4.1

proportion of agricultural land area that has achieved an acceptable or desirable level of variation in water availability, and EW5 contributes to achieving the SDG 6.1.1 Proportion of population using safely managed drinking water services.

Sustainable land use: The five green growth indicators in this pillar include Soil nutrient balance (SL1), organic agriculture area (SL2), share ruminant livestock (SL3), agricultural productivity (SL4), and farm machinery per unit land (SL5). Except for SL4, only some national policies discuss sustainable land use issues. The SL2 and SL5 indicators are only mentioned in one national policy document, the NBSAP and Big 4, respectively. Moreover, they are discussed in one of the sectoral programs, with the National Environment Policy 2013 looking into the former and the Agricultural Policy 2021 referring to the latter indicator. The SL1 indicator is not mentioned in any national policies but in the sectoral program (i.e., Agricultural Policy 2021). SL3 is the most neglected issue, with no mention in national policies and sectoral programs. Many sustainable land use indicators are relevant to Kenya's development priorities, including resource efficiency as well as social inclusion and sustainable livelihoods. Some indicators directly contribute (i.e., with a green check) to climate mitigation and adaptation. Although none are SDG indicators, some contribute to achieving the SDGs (i.e., with a yellow check). On the one hand, SL1 and SL2 contribute to SDG 2.4.1 proportion of agricultural land area that has achieved an acceptable or desirable level of management of fertilizers. On the other hand, SL4 and SL5 contribute to SDG 2.4.1 proportion of agricultural land area that has achieved an acceptable or desirable level of farm output value per hectare. The SL1, SL2, and SL3 indicators are part of the Global Green Growth Index.

Material use efficiency: The five green growth indicators in this pillar include material consumption per GDP (ME1), material footprint (ME2), food loss and food waste (ME3), municipal solid waste recycled (ME4), and wastewater treatment facilities (ME5). Besides efficient and sustainable energy, material use efficiency is the pillar with an indicator directly mentioned (i.e., with a green check) in national policies. However, this refers only to



one indicator, particularly ME4, explicitly mentioned in NCCAP. As in other efficient and sustainable resource use pillars, the GESIP mentions many of the indicators in material use efficiency, except for ME2, which is mentioned neither in GESIP nor other national policies. The issue relating to material footprint is the most neglected because it is also not mentioned in any sectoral programs. Among the material use efficiency indicators, however, only the ME5 indicator is discussed in the sectoral program, particularly the National Environment Policy 2013. All material use efficiency indicators are essential for Kenya's development priority on resource efficiency, and a few indicators are relevant to sustainable infrastructure. Many indicators can directly contribute to climate mitigation and adaptation. Except for ME5, all material use efficiency indicators are part of the SDGs. However, ME5 contributes to achieving SDG 6.3.1 proportion of domestic and industrial wastewater flows safely treated. Moreover, ME1, ME2, and ME3 are part of the Global Green Growth Index.

## 4.1.2 Natural capital protection

Table 4 presents the checklist table for the indicators in the natural capital protection pillar, including environmental quality, GHG emissions reduction, biodiversity and ecosystem protection, and cultural and social value. This section briefly discusses the relevance of the natural capital protection indicators to the checklist table criteria.

**Environmental quality:** The five green growth indicators in this pillar include PM2.5 air pollution (EQ1), DALY rate from unsafe water (EQ2), solid waste generation (EQ3), chlorophyll-a deviations (EQ4), and water with good ambient quality (EQ5). EQ2 is the only indicator explicitly mentioned (i.e., with a green check) among these five indicators, particularly in the sectoral program on Kenya Health Policy 2012-2030. The indicator on the coastal environment, EQ4, is the most frequent issue addressed in national policies (i.e., GESIP, NCCAP, and NDC) and sectoral programs (i.e., National Environment Policy 2013). While EQ5 is mentioned in the GESIP and NBSAP, it is not covered in the sectoral programs. The sectoral programs cover three environmental quality indicators, including EQ1, EQ2, and EQ4. The EQ2 indicator is explicitly mentioned (i.e., with a green check) in the Kenya Health Policy 2012-2030. EQ3 is not mentioned in any national policies and sectoral programs. The five environmental quality indicators are relevant to Kenya's development priorities on resilience building, and social inclusion and sustainable livelihoods. They also directly contribute to climate adaptation and some to climate mitigation. Except for EQ2, all are SDG indicators. EQ2 only partly contributes to SDG 3.9.2 mortality rate attributed to unsafe water, unsafe sanitation, and lack of hygiene. EQ1, EQ2, and EQ3 are part of the Global Green Growth Index.

**GHG emissions reduction:** This pillar's five green growth indicators include CO2 emissions per capita (GE1), non-CO2 per capita excl. AFOLU (GE2), non-CO2 emissions in AFOLU (GE3), carbon intensity of energy production (GE4), and CO2 emissions per manufacturing value-added (GE5). Only three of these five GHG emissions reduction indicators are mentioned in national policies and three in the sectoral programs. The NCCAP and NDC mention GE1, GE2, and GE3 indicators. In addition, the GESIP mentions the GE1 indicator. Of these three indicators, GE2 is not mentioned

in the sectoral programs. The sectoral programs, including the Kenya National Energy Efficiency and Conservation Strategy 2020, National REDD+ Strategy 2022, and SE4All - Kenya Action Agenda 2016, discuss the issues related to GE1 and GE3 indicators as well as GE4. The GE5 indicator is not mentioned in any national policies or sectoral programs. The GHG emissions reduction indicators are closely linked to sustainable infrastructure and directly contribute to climate mitigation. GE1, GE2, and GE3 are parts of SDG indicators relating to GHG emissions and the Global Green Growth Index.

**Biodiversity and ecosystem protection:** The five green growth indicators in this pillar include protected key biodiversity areas (BE1), share of forest areas (BE2), forest above-ground biomass (BE3), forest under certification scheme (BE4), and change in extent of water ecosystems (BE5). Biodiversity and ecosystem protection is the only pillar with an indicator explicitly mentioned in national policies and sectoral programs, albeit only BE2. Regarding national policies, BE2 is explicitly mentioned (i.e., with a green check) in Vision 2030, GESIP, NDC, and NBSAP and implicitly mentioned (i.e., with a yellow check) in the NCCAP. The sectoral programs explicitly mentioning BE2 include the Agricultural Policy 2021, National REDD+ Strategy 2022, Forest Policy 2014, and National Environmental Policy 2013. Other indicators received little, if any at all, attention in the national policies and sectoral programs. BE1 is only discussed in NBSAP, while BE3 is covered in NCCAP and National REDD+ Strategy 2022. Although not receiving attention in national policies, BE4 is discussed in sectoral programs, including the National REDD+ Strategy 2022 and Forest Policy 2014. The BE5 indicator is discussed in neither national policies nor sectoral programs. The biodiversity and ecosystem protection indicators are important to Kenya's development priorities on resilience building and sustainable livelihoods. They also directly contribute to climate adaptation and, partly, mitigation. The five green growth indicators in the biodiversity and ecosystem protection pillar are all SDG indicators, and three of them (BE1, BE2, and BE3) are part of the Global Green Growth Index.

**Cultural and social value:** The five green growth indicators in this pillar include local breeds risk of extinction (CV1), terrestrial protected areas (CV2), travel and tourism direct contribution to GDP (CV3), plant genetic resources accessions (CV4), and share of exports of cultural goods (CV5). All cultural and social value indicators are mentioned in national policies, albeit in only a few. CV2, CV4, and CV5 are only mentioned in one national policy, i.e., CV2 and CV4 in the NBSAP and CV5 in Vision 2030. None of these three indicators are discussed in the sectoral programs. The other two indicators, CV1 and CV3, are mentioned not only in several national policies but also in one of the sectoral programs, i.e., National Environment Policy 2013. Unlike other natural capital protection pillars, all five cultural and social value indicators are mentioned in either national policies or sectoral programs, albeit only explicitly. Many cultural and social value indicators are relevant to Kenya's development priorities on resilience building, and social inclusion and sustainable livelihoods. Except for CV3, the indicators support climate adaptation. CV1, CV2, and CV4 are SDG indicators, but only CV2 is part of the Global Green Growth Index. CV5 supports the achievement of SDG 11.4.1 total per capita expenditure on the preservation, protection, and conservation of all cultural and natural heritage.

## 4.1.3 Green economic opportunities

Table 5 presents the checklist table for the indicators in the green economics opportunities pillar, including green investment, green trade, green employment, and green innovation. This section briefly discusses the relevance of the green economic opportunities indicators to the checklist table criteria.

**Green investment:** The five green growth indicators in this pillar include adjusted net savings (GV1), renewable electricity capacity (GV2), financial flows for clean energy R&D (GV3), agriculture orientation index (GV4), and road quality (GV5). Of the five green investment indicators, only two are mentioned in the national policies and three in sectoral programs. The GV2 indicator is explicitly mentioned (i.e., with a green check) in the Big 4 and NCCAP and implicitly mentioned (i.e., with a yellow check) in the GESIP. Moreover, the importance of the GV2 indicator in Kenya is explicitly mentioned in three sectoral programs, including the SE4All - Kenya Action Agenda 2016, Kenya National Energy Efficiency and Conservation Strategy 2020, and National Energy Policy. GV5 is the other green investment indicator mentioned, albeit only implicitly, in the national policy (i.e., GESIP) and sectoral program (i.e., Policy Action Plan for Transport Services). GV4 is mentioned in the Agricultural Policy 2021 but not in any national policies. GV1 and GV3 are not considered in any national policies and sectoral programs. A few green investment indicators are relevant to Kenya's development priorities on resilience building and resource efficiency. They have varying contributions to climate mitigation and adaptation, with some directly supporting the former, including GV2, GV3, and GV4. These three green investment indicators are also SDG indicators, but only GV1 is part of the Global Green Growth Index.

**Green trade:** The five green growth indicators in this pillar include exports of environmental goods (GT1), environmental technologies exported (GT2), ISO 14001 certificates issued (GT3), new business density (GT4), and high-technology exports (GT5). Of the five green trade indicators, only GT4 is mentioned in national policies, including Vision 2030, GESIP, and Big 4, with the latter mentioning it explicitly (i.e., with a green check). None of the five indicators is discussed in any sectoral policies. The green trade indicators receive the least attention in the green economic opportunities dimension. The green trade indicators have varying contributions to the development priorities and climate actions. Only GT2 is an SDG indicator, and GT1 is part of the Global Green Growth Index. But many green trade indicators contribute to achieving SDG 9.b.1 proportion of medium and high-tech industry value added in total value added and SDG 17.7.1 total amount of funding for developing countries to promote the development, transfer, dissemination, and diffusion of environmentally sound technologies.

**Green employment:** The five green growth indicators in this pillar include green employment in manufacturing (GJ1), employed below the poverty line (GJ2), vulnerable employment (GJ3), firms offering formal training (GJ4), and ODA flows for scholarships (GJ5). Only two indicators are mentioned in the green employment pillar, GJ1 in the GESIP and GJ2 in the SE4All - Kenya Action Agenda 2016. All green employment indicators contribute to sustainable infrastructure, and three support resilience building, enabling the

achievement of development priorities. GJ2, GJ3, and GJ4 will support climate adaptation, particularly among vulnerable people. GJ2 and GJ5 are SDG indicators, but other indicators contribute to achieving other SDGs. GJ1 is part of SDG 9.2.2 manufacturing employment as a proportion of total employment, GJ3 is directly linked with SDG 8.3.1 proportion of informal employment in total employment, and GJ4 directly contributes to SDG 4.3.1 participation rate of youth and adults in formal and non-formal education and training. Only GJ1 is part of the Global Green Growth Index.

**Green innovation:** The five green growth indicators in this pillar include environmental technologies (GN1), scientific and technical journals (GN2), researchers per million inhabitants (GN3), medium/high-tech manufacturing value-added (GN4), trademark applications (GN5). The two green innovation indicators implicitly mentioned in national policies are GN2 and GN3. Like in the green trade pillar, the sectoral programs do not discuss green innovation indicators. The green innovation indicators have varying impacts on development priorities and climate actions. GN3 and GN4 are SDG indicators, and GN1 is part of the Global Green Growth Index. The other non-SDG indicators can support the achievement of the SDGs. GN1 and GN5 directly contribute to SDG 17.7 promote the development, transfer, dissemination, and diffusion of environmentally sound technologies. GN2 is directly linked with SDG 9.5.1 research and development expenditure as a proportion of GDP.

## 4.1.4 Social inclusion

Table 6 presents the checklist table for the indicators in the social inclusion pillar, including access to basic services and resources, gender balance, social equity, and social protection. This section briefly discusses the relevance of the social inclusion indicators to the criteria in the checklist table.

**Access to basic services and resources:** The five green growth indicators in this pillar include access to safe water and sanitation (AB1), access to electricity and clean fuels (AB2), prevalence of undernourishment (AB3), convenient access to public transport (AB4), property rights (AB5). All five indicators are mentioned in at least one of the national policies and a few sectoral programs, showing the importance of improving access to basic services and resources in Kenya. The AB2 indicator is the most frequently mentioned, albeit only implicitly (i.e., with a yellow check), in the national policies, including the GESIP, Big 4, NCCAP, NDC, and NBSAP. Moreover, sectoral programs such as the SE4ALL -Kenya Action Agenda, Kenya National Energy Efficiency and Conservation Strategy 2020, and

National Energy Policy mentions AB2. Although only three national policies discuss issues related to AB1, one explicitly mentions it (i.e., with a green check), particularly the GESIP. While AB4 and AB5 receive attention in at least one national policy and sectoral program, AB3 is mentioned only in the Big 4. Many indicators for access to basic services and resources are relevant to achieving Kenya's development priorities on resilience building, social inclusion, and sustainable livelihoods. The five indicators are essential to society's adaptation to climate change. Except for AB5, all indicators are SDGs. However, AB5 is directly linked to SDG



1.4.2 proportion of the total adult population with secure tenure rights to land. AB1 and AB2 are part of the Global Green Growth Index.

**Gender balance:** The five green growth indicators in this pillar include women in national parliaments (GB1), gender account in financial institutions (GB2), equal gender pay (GB3), mothers with maternity cash benefits (GB4), and school enrollment gender parity (GB5). Gender balance is the least discussed issue in the national policies and sectoral programs across the social inclusion pillars and compared to other green growth dimensions. Only GB1 is explicitly mentioned (i.e., with a green check) but also in only one national policy, i.e., Vision 2030. The gender balance indicators are essential to achieving Kenya's development priority of social inclusion and supporting society's adaptation to climate change. GB1, GB2, and

GB4 are SDG indicators, and GB3 and GB5 directly contribute to achieving the other SDGs. GB3 supports SDG 5.1.1 Whether or not legal frameworks are in place to promote, enforce and monitor equality and non-discrimination on the basis of sex. GB5 is linked to SDG 4.5.1 adjusted gender parity index for completion rate, by location, wealth quintile and education level.

**Social equity:** The five green growth indicators in this pillar include inequality in income (SE1), rural-urban access to electricity (SE2), youth unemployment disparity (SE3), age dependency ratio (SE4), and cash benefits for people with disabilities (SE5). Three social equity indicators are implicitly mentioned in national policies or sectoral programs. SE3 and SE5 are discussed in the GESIP but not in any sectoral programs. SE2 is discussed in sectoral programs like the SE4All - Kenya Action Agenda 2016 and Kenya National Energy Efficiency and Conservation Strategy 2020, but not in any national

policies. SE1 and SE4 are mentioned neither in national policies nor sectoral programs. The social equity indicators significantly contribute to Kenya's development priorities, particularly in building resilience and enhancing social inclusion. Consequently, these indicators are also critical in climate adaptation. SE2, SE3, and SE5 are SDG indicators, with the latter also part of the Global Green Growth Index. SE1 and SE4 contribute to achieving other SDGs, with the former contributing to SDG 10.4.2 redistributive impact of fiscal policy, Gini index, and the latter to SDG 1.3.1 proportion of population above statutory pensionable age receiving a pension.

**Social Protection:** The five green growth indicators in this pillar include the share of old people receiving a pension (SP1), universal health coverage (SP2), the population living in slums (SP3), victims

of intentional homicides (SP4), a score of Hyogo Framework (SP5). After access to basic services and resources, social protection receives sufficient attention in national policies and sectoral programs. Two indicators, SP2 and SP3, are explicitly mentioned (i.e., with a green check) in the Big 4. Moreover, other national policies and sectoral programs implicitly mention them (i.e., with a yellow check). Issues related to SP4 and SP5 are discussed in Vision 2030 and GESIP, respectively. SP1 is discussed in neither national policies nor sectoral programs. The social protection indicators are essential to achieving Kenya's development priorities on resilience building, and social inclusion and sustainable infrastructure. They are also critical in increasing society's adaptive capacity to the impacts of climate change. All the indicators in this pillar are SDG indicators, with the first three being part of the Global Green Growth Index.



**Table 3 Checklist for the green growth indicators in efficient and sustainable resource use**

Indicator code	Indicator name	National policies*						Sectoral programs**	Development Priorities				Climate action		Global issues	
		Vision 2030	GESIP	Big 4	NCCAP	NDC	NBSAP		INFR	RESI	EFFI	SOCI	MITI	ADAP	GG Index	SDG
EE1	Energy intensity		☑		☑	☑		☑	☑		☑		☑		☑	☑
EE2	Renewable energy share		☑	☑	☑	☑		☑	☑	☑	☑		☑		☑	☑
EE3	Efficient transport	☑			☑	☑		☑	☑		☑		☑	☑		☑
EE4	Low-carbon electricity	☑	☑	☑	☑	☑		☑	☑		☑		☑	☑		☑
EE5	Per capita electricity consumption	☑			☑			☑			☑		☑	☑		☑
EW1	Water use efficiency	☑	☑			☑					☑			☑	☑	☑
EW2	Level of water stress		☑			☑				☑	☑			☑	☑	☑
EW3	Capture fisheries						☑	☑		☑		☑		☑	☑	☑
EW4	Agriculture water use efficiency	☑	☑	☑				☑	☑	☑	☑	☑		☑		
EW5	Renewable water resources per capita		☑								☑	☑		☑		☑
SL1	Soil nutrient balance							☑		☑	☑	☑		☑	☑	☑
SL2	Organic agriculture area						☑	☑			☑	☑	☑	☑	☑	☑
SL3	Cereal yield										☑		☑		☑	
SL4	Agricultural productivity	☑	☑	☑	☑	☑		☑		☑	☑	☑		☑		☑
SL5	Natural capital productivity			☑				☑			☑	☑		☑		
ME1	Domestic material consumption		☑								☑		☑	☑	☑	☑
ME2	Material footprint										☑		☑	☑	☑	☑
ME3	Food loss and food waste		☑	☑							☑		☑	☑	☑	☑
ME4	Sanitation coverage		☑		☑	☑			☑		☑		☑	☑		☑
ME5	Sewer, septic and latrine coverage		☑					☑	☑		☑			☑		

Indicators: EE1 - Energy intensity, EE2 - Renewable energy share, EE3 - Efficient transport, EE4 - Low-carbon electricity, EE5 - Per capita electricity consumption, EW1 - Water use efficiency, EW2 - Level of water stress, EW3 - Sustainable fisheries, EW4 - Share of surface irrigation, EW5 - Renewable water resources per capita, SL1 - Soil nutrient balance, SL2 - Organic agriculture area, SL3 - Share ruminant livestock, SL4 - Agricultural productivity, SL5 - Farm machinery per unit land, ME1 - Material consumption per GDP, ME2 - Material footprint, ME3 - Food loss and food waste, ME4 - Municipal solid waste recycled, ME5 - Waste water treatment facilities

Legend: ☑ direct relevance, explicit mention of the indicator with the same measurement unit ☑ indirect relevance, implicit mention of the indicator with no relevant unit

Notes: \* Green Economy Strategy and Implementation Plan (GESIP), National Climate Change Action Plan (NCCAP), Nationally Determined Contributions (NDC), National Biodiversity Strategies and Action Plan (NBSAP)

\*\* SE4All - Kenya Action Agenda 2016, Kenya National Energy Efficiency and Conservation Strategy 2020, National Energy Policy 2018, Agricultural Policy 2021, Policy on Revitalization of the Sugar Industry 2023, Kenya National REDD+ Strategy, Forest Policy of Kenya 2014, Kenya Health Policy 2012-2030, Policy Action Plan for Transport Services in Kenya, National Environment Policy 2013

INFR - sustainable infrastructure, RESI - resilience building, EFFI - resource efficiency, and SOCI - social inclusion and sustainable livelihoods MITI - climate mitigation, ADAP - climate adaptation, GG Index - Green Growth Index, SDG - Sustainable Development Goals

Table 4 Checklist for the green growth indicators in natural capital protection

Indicator code	Indicator name	National policies						Sectoral programs*	Development Priorities				Climate action		Global issues	
		Vision 2030	GESIP	Big 4	NCCAP	NDC	NBSAP		INFR	RESI	EFFI	SOCI	MITI	ADAP	GG Index	SDG
EE1	Energy intensity				☑			☑		☑		☑	☑	☑	☑	☑
EE2	Renewable energy share							☑		☑		☑		☑	☑	☑
EE3	Efficient transport				☑					☑		☑	☑	☑	☑	☑
EE4	Low-carbon electricity		☑		☑	☑	☑	☑		☑		☑		☑		☑
EE5	Per capita electricity consumption		☑				☑			☑		☑		☑		☑
EW1	Water use efficiency		☑		☑	☑		☑	☑				☑		☑	☑
EW2	Level of water stress				☑	☑			☑				☑		☑	☑
EW3	Capture fisheries				☑	☑		☑	☑				☑		☑	☑
EW4	Agriculture water use efficiency							☑	☑				☑			
EW5	Renewable water resources per capita								☑				☑			
SL1	Soil nutrient balance						☑			☑				☑	☑	☑
SL2	Organic agriculture area	☑	☑		☑	☑	☑	☑		☑			☑	☑	☑	☑
SL3	Cereal yield				☑			☑		☑			☑	☑	☑	☑
SL4	Agricultural productivity							☑		☑		☑		☑		☑
SL5	Natural capital productivity									☑		☑	☑	☑		☑
ME1	Domestic material consumption	☑	☑				☑	☑		☑		☑		☑		☑
ME2	Material footprint						☑			☑		☑	☑	☑	☑	☑
ME3	Food loss and food waste	☑				☑		☑		☑		☑				
ME4	Sanitation coverage						☑			☑		☑		☑		☑
ME5	Sewer, septic and latrine coverage	☑										☑		☑		☑

Indicators: EQ1 - PM2.5 air pollution, EQ2 - DALY rate from unsafe water, EQ3 - Solid waste generation, EQ4 - Chlorophyll-a deviations, EQ5 - Water with good ambient quality, GE1 - CO2 emissions per capita, GE2 - Non-CO2 per capita excl. AFOLU, GE3 - Non-CO2 emissions in AFOLU, GE4 - Carbon intensity of energy production, GE5 - CO2 emissions per manufacturing value-added, BE1 - Protected key biodiversity areas, BE2 - Share of forest areas, BE3 - Forest above-ground biomass, BE4 - Forest under certification scheme, BE5 - Change in extent of water ecosystems, CV1 - Local breeds risk of extinction, CV2 - Terrestrial protected areas, CV3 - Travel and Tourism direct contribution to GDP, CV4 - Plant genetic resources accessions, CV5 - Share of exports of cultural goods

Legend: ☑ direct relevance, explicit mention of the indicator with the same measurement unit ☑ indirect relevance, implicit mention of the indicator with no relevant unit

Notes: \* SE4All - Kenya Action Agenda 2016, Kenya National Energy Efficiency and Conservation Strategy 2020, National Energy Policy 2018, Agricultural Policy 2021, Policy on Revitalization of the Sugar Industry 2023, Kenya National REDD+ Strategy, Forest Policy of Kenya 2014, Kenya Health Policy 2012-2030, Policy Action Plan for Transport Services in Kenya, National Environment Policy 2013

INFR - sustainable infrastructure, RESI - resilience building, EFFI - resource efficiency, and SOCI - social inclusion and sustainable livelihoods

MITI - climate mitigation, ADAP - climate adaptation, GG Index - Green Growth Index, SDG - Sustainable Development Goals

**Table 5 Checklist for the green growth indicators in green economic opportunities**

Indicator code	Indicator name	National policies						Sectoral programs*	Development Priorities				Climate action		Global issues	
		Vision 2030	GESIP	Big 4	NCCAP	NDC	NBSAP		INFR	RESI	EFFI	SOCI	MITI	ADAP	GG Index	SDG
GV1	Adjusted net savings													☑	☑	
GV2	Renewable electricity capacity		☑	☑	☑			☑	☑		☑		☑	☑		☑
GV3	Revenue from biodiversity economic instruments									☑	☑		☑	☑		☑
GV4	Agriculture orientation index							☑		☑			☑	☑		☑
GV5	Transport productive capacity		☑					☑	☑	☑				☑		
GT1	Exports of environmental goods									☑		☑	☑		☑	☑
GT2	Ores and metals exports									☑			☑	☑		☑
GT3	Medium and high-tech exports										☑		☑	☑		
GT4	New business density	☑	☑	☑								☑				
GT5	Exports of manufactured goods									☑			☑	☑		☑
GJ1	Renewable energy employment		☑							☑		☑	☑	☑	☑	☑
GJ2	Employed below poverty line							☑		☑		☑		☑		☑
GJ3	Vulnerable employment									☑		☑		☑		☑
GJ4	Youth not in education, employment, training											☑		☑		☑
GJ5	ODA flows for scholarships											☑		☑		☑
GN1	Environmental technologies										☑	☑	☑	☑	☑	☑
GN2	Collaboration in research & development	☑														
GN3	Share of education expenditure	☑										☑	☑	☑		☑
GN4	Medium/high-tech manufacturing value added									☑			☑	☑		☑
GN5	Intellectual property charges											☑				

Indicators: GV1 - Adjusted net savings, GV2 - Renewable electricity capacity, GV3 - Financial flows for clean energy R&D, GV4 - Agriculture orientation index, GV5 - Roads quality, GT1 - Exports of environmental goods, GT2 - Environmental technologies exported, GT3 - ISO 14001 certificates issued, GT4 - New business density, GT5 - High-technology exports, GJ1 - Green employment in manufacturing, GJ2 - Employed below poverty line, GJ3 - Vulnerable employment, GJ4 - Firms offering formal training, GJ5 - ODA flows for scholarships, GN1 - Environmental technologies, GN2 - Scientific and technical journals, GN3 - Researchers per million inhabitants, GN4 - Medium/high-tech manufacturing value-added, GN5 - Trademark applications

Legend: ☑ direct relevance, explicit mention of the indicator with the same measurement unit ☑ indirect relevance, implicit mention of the indicator with no relevant unit

Notes: \* SE4All - Kenya Action Agenda 2016, Kenya National Energy Efficiency and Conservation Strategy 2020, National Energy Policy 2018, Agricultural Policy 2021, Policy on Revitalization of the Sugar Industry 2023, Kenya National REDD+ Strategy, Forest Policy of Kenya 2014, Kenya Health Policy 2012-2030, Policy Action Plan for Transport Services in Kenya, National Environment Policy 2013

INFR - sustainable infrastructure, RESI - resilience building, EFFI - resource efficiency, and SOCI - social inclusion and sustainable livelihoods MITI - climate mitigation, ADAP - climate adaptation, GG Index - Green Growth Index, SDG - Sustainable Development Goals

Table 6 Checklist for the green growth indicators in social inclusion

Indicator code	Indicator name	National policies						Sectoral programs*	Development Priorities				Climate action		Global issues	
		Vision 2030	GESIP	Big 4	NCCAP	NDC	NBSAP		INFR	RESI	EFFI	SOCI	MITI	ADAP	GG Index	SDG
GV1	Adjusted net savings	☑	☑			☑		☑	☑	☑	☑	☑		☑	☑	☑
GV2	Renewable electricity capacity		☑	☑	☑	☑	☑	☑	☑	☑		☑	☑	☑	☑	☑
GV3	Revenue from biodiversity economic instruments			☑						☑		☑		☑		☑
GV4	Agriculture orientation index	☑	☑					☑	☑	☑		☑	☑			☑
GV5	Transport productive capacity	☑				☑				☑		☑		☑		☑
GT1	Exports of environmental goods	☑										☑		☑	☑	☑
GT2	Ores and metals exports									☑		☑		☑	☑	☑
GT3	Medium and high-tech exports									☑		☑		☑	☑	☑
GT4	New business density									☑		☑		☑		☑
GT5	Exports of manufactured goods											☑		☑		☑
GJ1	Renewable energy employment									☑		☑		☑	☑	☑
GJ2	Employed below poverty line							☑	☑	☑		☑	☑	☑	☑	☑
GJ3	Vulnerable employment		☑							☑		☑		☑		☑
GJ4	Youth not in education, employment, training									☑		☑		☑		☑
GJ5	ODA flows for scholarships		☑							☑		☑		☑		☑
GN1	Environmental technologies									☑		☑		☑	☑	☑
GN2	Collaboration in research & development	☑		☑				☑		☑		☑		☑	☑	☑
GN3	Share of education expenditure	☑	☑	☑			☑	☑	☑	☑		☑		☑	☑	☑
GN4	Medium/high-tech manufacturing value added	☑										☑		☑		☑
GN5	Intellectual property charges		☑							☑		☑		☑		☑

Indicators: AB1 - Access to safe water and sanitation, AB2 - Access to electricity and clean fuels, AB3 - Prevalence of undernourishment, AB4 - Convenient access to public transport, AB5 - Property rights, GB1 - Women in national parliaments, GB2 - Gender account in financial institution, GB3 - Equal gender pay, GB4 - Mothers with maternity cash benefits, GB5 - School enrollment gender parity, SE1 - Inequality in income, SE2 - Rural-urban access to electricity, SE3 - Youth unemployment disparity, SE4 - Age dependency ratio, SE5 - Cash benefit for people with disabilities, SP1 - Share of old people receiving pension, SP2 - Universal health coverage, SP3 - Population living in slums, SP4 - Victims of intentional homicides, SP5 - Score of Hyogo Framework

Legend: ☑ direct relevance, explicit mention of the indicator with the same measurement unit ☑ indirect relevance, implicit mention of the indicator with no relevant unit

Notes: \* SE4All - Kenya Action Agenda 2016, Kenya National Energy Efficiency and Conservation Strategy 2020, National Energy Policy 2018, Agricultural Policy 2021, Policy on Revitalization of the Sugar Industry 2023, Kenya National REDD+ Strategy, Forest Policy of Kenya 2014, Kenya Health Policy 2012-2030, Policy Action Plan for Transport Services in Kenya, National Environment Policy 2013

INFR - sustainable infrastructure, RESI - resilience building, EFFI - resource efficiency, and SOCI - social inclusion and sustainable livelihoods MITI - climate mitigation, ADAP - climate adaptation, GG Index - Green Growth Index, SDG - Sustainable Development Goals

## 4.2 Data availability

### 4.2.1 Green growth indicators and sustainability targets

Table 7 presents the data availability and sources for the 80 green growth indicators covering the four dimensions – efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion. In the case of efficient and sustainable resource use indicators, only electricity generation from renewables (EE4) and per capita electricity consumption (EE5) have data for 2022. For most of the indicators, most recent data are available for 2020. Only three indicators do not have time-series data from 2010, including sustainable fisheries as a proportion of GDP (EW3), municipal solid waste recycled (ME4), and municipal wastewater treatment facilities (ME5). Most data of the green growth indicators in the efficient and sustainable resource use dimensions were downloaded from the Food and Agriculture Organization of the United Nations (FAO) databases, including FAOSTAT and FAO Aquastat. For the SDG indicators, if data coverage from other international data sources is better than in the UNSTATS database, data were downloaded from the former. This is the case for five efficient and sustainable resource use indicators, including sustainable fisheries as a proportion of GDP (EW3), total domestic material consumption (DMC) per unit of GDP (ME1), total material footprint (MF) per capita (ME2), average of food loss to production and food waste to consumption (ME3), and municipal solid waste recycled (ME4). Nine (9) is the total number of SDG indicators in the efficient and sustainable resource use dimension.

Half of the 20 green growth indicators in the natural capital protection have time-series data until 2022. Six indicators have intermittent time-series data, needing imputation to fill in data gaps. The municipal solid waste (MSW) generation per capita tons per capita (EQ3) has only one data point in 2018. This indicator is important, and no proxy variable is available. It was thus assumed that the value in 2018 holds for all years from 2010 to 2022. This is an SDG indicator, so data availability is expected to improve in the coming years. The EQ3 data was available in World Bank’s What a Waste Global Database. The data for all natural capital protection indicators were downloaded from international data sources, many were from UNSTATS database, Climate Watch Data, and WB Open Data. There are 15 SDG indicators in the natural capital protection dimension, but data for only five of them was downloaded from the UNSTATS database. These include average proportion of Key Biodiversity Areas covered by protected

areas (BE1), Forest area under an independently verified forest management certification scheme (BE4), change in the extent of water related ecosystems over time: Lakes and rivers permanent water areas (BE5), and proportion of local breeds, classified as being at risk, not at risk or unknown level of risk of extinction (CV1). Other databases were used for the other SDG indicators due to better data availability.

Three indicators in the green economic opportunities dimension have the most recent data available for 2022. Like in natural capital protection, six indicators have intermittent time-series data. Moreover, firms offering formal training (GJ4) and Researchers (in full-time equivalent) per million inhabitants (GN3) have only two data points, requiring data imputations. The data for the eight SDG indicators in the green economic opportunities dimension were all downloaded from the UNSTATS database. Many of the other green growth indicators were downloaded from the WB Open Data, including share of vulnerable employment to total employment (GJ3), firms offering formal training (GJ4), Trademark applications, direct resident (GN5), ease of doing business: New registrations (GT4), share of high-technology exports to manufactured exports (GT5), and adjusted net savings, including particulate emission damage (GV1). Among the four pillars, green investment has the most number of green growth indicators represented by the SDGs, including installed renewable energy-generating capacity in developing countries (GV2), international financial flows to developing countries in support of clean energy R&D and renewable energy production (GV3), and agriculture orientation index for government expenditures (GV4).

Almost half of the 20 green growth indicators in the social inclusion dimension have data for 2022, many of them have completed time-series data from 2010. However, six indicators have only intermittent time-series data requiring imputation to close data gaps. Like in natural capital protection, one of the indicators in the social inclusion dimension has only one data point – the proportion of population that has convenient access to public transport (AB4). Data availability for indicators related to sustainable transport is poor, thus it was difficult to find a proxy variable. The 2020 data for AB4 was thus assumed to hold for all years from 2010 to 2022. After natural capital protection, the social inclusion dimension has the most number of indicators representing SDGs, with 14 SDG indicators. Unlike in the former, the data for the SDG indicators in the latter dimension were all downloaded from the UNSTATS database. Four out of five indicators in access to basic services and resources as well as social protection pillar were taken from this database. The World Bank databases like the Open Data, TCdata360, and Women, Business and the Law were the other important sources of data for social inclusion indicators.

**Table 7 Data availability and sources of the green growth indicators (continued)**

Indicator Code	Available years	Source of downloaded data	Relationship to green growth	Sustainability targets	Source of the targets
EE4	2000 - 2022	Our World in Data	positive	100	Top 5 developing countries
EE5	2000 - 2022	Our World in Data	negative	19.81076	Top 5 developing countries
EW1 *	2000 - 2020	UNSTATS database	positive	98.296	Top 5 developing countries
EW2 *	2000 - 2020	UNSTATS database	negative	25.0 - 75.0	SDG target
EW3 *	2011 - 2019 (2 years range)	WB Open Data	positive	5.812	Top 5 developing countries
EW4	1992 - 2020	FAO Aquastat	negative	23.7048	Top 5 developing countries
EW5	1961 - 2020	FAO Aquastat	positive	126409.8	Top 5 developing countries
SL1	1961 - 2018	FAOSTAT	negative	5	Expert opinion
SL2	2005 - 2020	FAOSTAT	positive	23.6389	Top 5 developing countries
SL3	1961 - 2020	FAOSTAT	negative	0.038	Top 5 developing countries
SL4	2000 - 2020	FAOSTAT	positive	121637.9	Top 5 developing countries
SL5	1961 - 2019	Our World in Data	positive	1.093224	Top 5 developing countries
ME1 *	1970 - 2019	WB Open Data and OECD database	negative	1.63E-08	Top 5 developing countries
ME2 *	1970 - 2019	UNEP Global Material Flows Database	negative	9.280505	Top 5 developing countries
ME3 *	2014 - 2018	FAOSTAT	negative	10.06336	Top 5 developing countries
ME4 *	2012, 2014, 2016 - 2021	FAOSTAT	positive	99.32	Top 5 developing countries
ME5	2011 - 2020	FAOSTAT	positive	849.4	Top 5 developing countries
<b>NATURAL CAPITAL PROTECTION</b>					
EQ1 *	1990, 1995, 2000, 2005, 2010 - 2019	WB Open Data	negative	10	SDG target
EQ2	1990 - 2019	IHME GHDx database	negative	0	SDG targets
EQ3 *	2018	WB What a Waste Global Database	negative	0.069268	Top 5 developing countries
EQ4 *	2005 - 2022	UNEP	negative	0.067283	Top 5 developing countries
EQ5 *	2017, 2020	WHO	positive	99.54	Top 5 developing countries
GE1 *	1990 - 2022	Climate Watch Data and WB Open Data	negative	0.179311	Top 5 developing countries
GE2 *	1990 - 2022	Climate Watch Data and WB Open Data	negative	0.12259	Top 5 developing countries
GE3 *	1990 - 2022	Climate Watch Data and WB Open Data	negative	0.046822	Top 5 developing countries
GE4	1980 - 2019	Our World in Data	negative	0.08808	Top 5 developing countries
GE5	2000 - 2020	UNSTATS database	negative	0.014	Top 5 developing countries
BE1 *	2000 - 2022	UNSTATS database	positive	100	SDG target
BE2 *	1990 - 2021	WB Open Data	positive	17	SDG target
BE3 *	2000, 2010, 2015 - 2020	FAOSTAT	positive	331.74	Top 5 developing countries
BE4 *	2000, 2005, 2010, 2015 - 2022	UNSTATS database	positive	3418.442	Top 5 developing countries
BE5 *	2000 - 2022	UNSTATS database	positive	0.115079	Top 5 developing countries
CV1 *	2000 - 2002, 2007 - 2022	UNSTATS database	negative	0.98922	Top 5 developing countries

**Table 7 Data availability and sources of the green growth indicators**

Indicator Code	Available years	Source of downloaded data	Relationship to green growth	Sustainability targets	Source of the targets
<b>EFFICIENT AND SUSTAINABLE RESOURCE USE</b>					
EE1 *	2000 - 2020	UNSTATS database	negative	1.756	Top 5 developing countries
EE2 *	2000 - 2020	UNSTATS database	positive	92.606	Top 5 developing countries
EE3	2007, 2010 - 2018 (2 years range)	WB Logistics Performance Index	positive	5	Highest score

**Table 7** Data availability and sources of the green growth indicators (continued)

Indicator Code	Available years	Source of downloaded data	Relationship to green growth	Sustainability targets	Source of the targets
CV2 *	2016 - 2022	WB Open Data	positive	17	SDG targets
CV3	1995 - 2022	WB TCdata360	positive	18.75101	Top 5 developing countries
CV4 *	1995, 2000, 2005, 2010, 2012, 2014, 2016 - 2021	FAOSTAT	positive	89991.2	Top 5 developing countries
CV5	2013, 2015 - 2019	UNESCO UIS Data	positive	5.8554	Top 5 developing countries
<b>GREEN ECONOMIC OPPORTUNITIES</b>					
GJ1	2010, 2013, 2015 - 2018	IRENA database	positive	0.081603	Top 5 developing countries
GJ2 *	2000 - 2022	UNSTATS database	negative	0	SDG target
GJ3	1991 - 2021	WB Open Data	negative	0	Top 5 developing countries
GJ4	2013, 2018	WB Open Data	positive	64.62	Top 5 developing countries
GJ5 *	2006 - 2021	UNSTATS database	positive	14.15132	Top 5 developing countries
GN1	1973, 1995 - 1997, 1999 - 2002, 2004 - 2006, 2008 - 2019	IRENA database	positive	96.66667	Top 5 developing countries
GN2	2000 - 2018	Our World in Data	positive	365.7653	Top 5 developing countries
GN3 *	2007, 2010	UNSTATS database	positive	825.3456	Top 5 developing countries
GN4 *	2000 - 2020	UNSTATS database	positive	38.192	Top 5 developing countries
GN5	2015, 2017, 2019 - 2020	WB Open Data	positive	99796.9	Top 5 developing countries
GT1	2000 - 2010, 2013, 2015 - 2019	COMTRADE DATA	positive	7.898476	Top 5 developing countries
GT2 *	2000 - 2022	UNSTATS database	positive	5.246833	Top 5 developing countries
GT3	2000 - 2009, 2011 - 2022	ISO database	positive	2040.8	Top 5 developing countries
GT4	2017 - 2020	WB Open Data	positive	12.53749	Top 5 developing countries
GT5	2008 - 2010, 2013, 2015 - 2021	WB Open Data	positive	25.51204	Top 5 developing countries
GV1	1990 - 2019	WB Open Data	positive	25.79957	Top 5 developing countries
GV2 *	2000 - 2021	UNSTATS database	positive	880.6453	Top 5 developing countries
GV3 *	2000 - 2021	UNSTATS database	positive	321.024	Top 5 developing countries
GV4 *	2001 - 2021	UNSTATS database	positive	1.83	Top 5 developing countries
GV5	2006 - 2019	UNCTADSTAT	positive	4.98	Top 5 developing countries
<b>SOCIAL INCLUSION</b>					
AB1 *	2000 - 2022	UNSTATS database	positive	100	SDG targets
AB2 *	2000 - 2022	UNSTATS database	positive	100	SDG targets
AB3 *	2001 - 2020	UNSTATS database	negative	0	Expert opinion
AB4 *	2020	UNSTATS database	positive	100	Highest score
AB5	1995 - 2021	WB TCdata360	positive	100	Highest score
GB1 *	2000 - 2022	UNSTATS database	positive	50	SDG targets
GB2 *	2000 - 2022	UNSTATS database	negative	1	SDG targets
GB3	1971 - 2021	WB Women, Business and the Law	positive	100	Highest score
GB4 *	2003, 2008, 2014 - 2020	UNSTATS database	positive	100	Highest score
GB5	1970 - 1995, 1998 - 2009, 2012, 2014 - 2016, 2019	WB Open Data	negative	1	Expert opinion

**Table 7** Data availability and sources of the green growth indicators (continued)

Indicator Code	Available years	Source of downloaded data	Relationship to green growth	Sustainability targets	Source of the targets
SE1	1972 - 2022	WB Open Data	negative	0.968122	Top 5 developing countries
SE2 *	1990 - 2022	UNSTATS database	negative	1	Top 5 developing countries
SE3 *	2000 - 2022	UNSTATS database	negative	1	Expert opinion
SE4	1960 - 2022	WB Open Data	negative	0	Expert opinion
SE5 *	2019, 2021	UNSTATS database	positive	95.815	Top 5 developing countries
SP1 *	2000, 2016, 2019	UNSTATS database	positive	100	SDG targets
SP2 *	2000, 2005, 2010, 2015, 2017, 2019, 2021	UNSTATS database	positive	100	SDG targets
SP3 *	2000 - 2020 (2 years range)	UNSTATS database	negative	6.618574	SDG target
SP4 *	2004 - 2012, 2014 - 2021	UNSTATS database	negative	0	SDG target
SP5	2014 - 2022	Index for Risk Management database	positive	5	Highest score

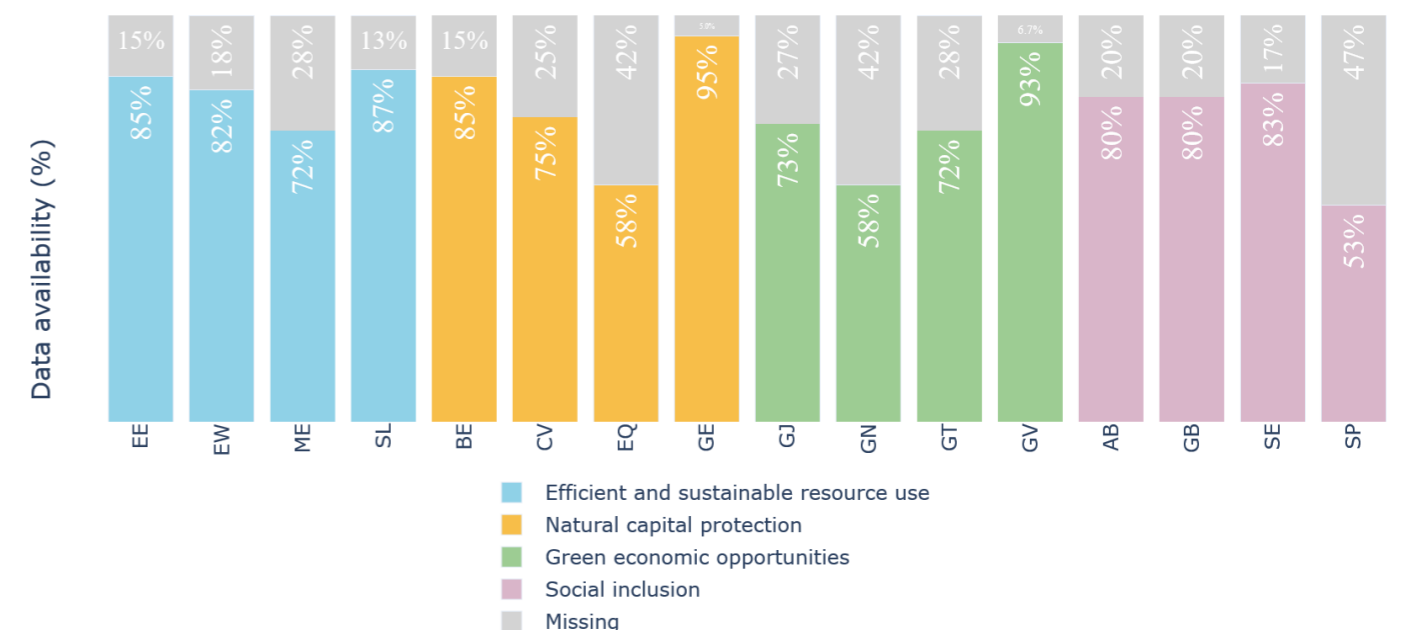
\*SDG indicators

Definitions: UNSTATS - United Nations Statistics Division, WB - World Bank, FAO - Food and Agriculture Organization, FAOSTAT - Food and Agriculture Organization Statistics, OECD - Organization for Economic Cooperation and Development, UNEP - United Nations Environment Programme, IHME - Institute for Health Metrics and Evaluation, GDHx - Global Health Data Exchange, WHO - World Health Organization, CW - Climate Watch, UNESCO - United Nations Educational, Scientific and Cultural Organization, UNCTAD - United Nations Conference on Trade and Development, UN COMTRADE - United Nations Commodity Trade Statistics Database, ISO - International Organization for Standardization, IRENA - International Renewable Energy Agency

Data availability and gaps for the different green growth indicators in each pillar are presented in Figure 15. The indicators for GHG emissions reduction (GE) and green investment (GV) have the best data availability with 95 and 93 percent, respectively. Most of the pillars have data availability ranging from 72 percent to

87 percent. The indicators with the most significant data gaps are those in social protection (SP), environmental quality (EQ), and green innovation (GN). To allow computation of the Green Growth Index, simple imputations were done to fill in the data gaps. The imputation methods are discussed in section 2.3.2 Data preparation.

**Figure 15** Data preparation of green growth indicators



Through normalization, the different units of the green growth indicators (see details in Table 2) have been rescaled to a uniform unit with a scale of 1 to 100 to allow their aggregations (see methods in section 2.3.2 Data preparation). In addition, the green growth indicators were benchmarked against sustainability targets so that the normalized scores would measure how far the indicators are from the sustainability targets (i.e., distance to targets). For example, a score of 100 would mean that the sustainability target for an indicator was achieved. Table 7 shows the different sustainability targets used to benchmark the 80 green growth indicators. The identification of sustainability targets was based on the following rules:

**1. For SDG indicators**

- a. Explicit targets defined in SDG documents or relevant literature, e.g., 17 percent for the share of forest to total land area.
- b. Implicit targets which are the expected norm, e.g., 0 percent for the proportion of the urban population living in slums.
- c. If explicit and implicit targets are not available, the average value of the top 5 performing developing countries, which the national stakeholders selected as the target to benchmark Kenya's performance

**2. For non-SDG indicators**

- a. National stakeholders opinion from the publisher of the indicator, e.g., 0-5 tons per hectare for nutrient balance per unit area according to FAO, zero for the share of unemployment to represent expected norm
- b. Average value of top 5 performing developing countries, which the national stakeholders selected as target to benchmark Kenya's performance

**4.2.2 Green growth indicators and proxy variables**

Three proxy variables were used in the Kenya Green Growth Index due to a lack of data for the indicators selected by the national stakeholders (Table 8), including the ratio treated to not treated municipal wastewater (ME5), international tourism, receipts (CV3), and proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies (SP5). The last green growth indicator is an SDG indicator. The proxy variable for ME5 is Municipal wastewater treatment facilities with data available from 2011 to 2020; for CV3 Travel and Tourism direct contribution to GDP with data available from 1995 to 2022, and for SP5 Score of Hyogo Framework for Action self-assessment reports of the countries with data available from 2014 to 2022 (Table 7). The proxy variables used instead of these indicators will be replaced as the data availability for the indicators improves in the coming years. The proxy variables were drawn from the list presented to the participants as alternative indicators during the first participatory workshop.

**Table 8 Proxy variables for green growth indicators with insufficient data**

Indicator Code	Name of proxy variables	Initial green growth indicators
<b>EFFICIENT AND SUSTAINABLE RESOURCE USE</b>		
ME5	Municipal wastewater treatment facilities	Ratio treated to not treated municipal wastewater
<b>NATURAL CAPITAL PROTECTION</b>		
CV3	Travel and Tourism direct contribution to GDP	International tourism, receipts
<b>SOCIAL INCLUSION</b>		
SP5	Score of Hyogo Framework for Action self-assessment reports of the countries	Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies

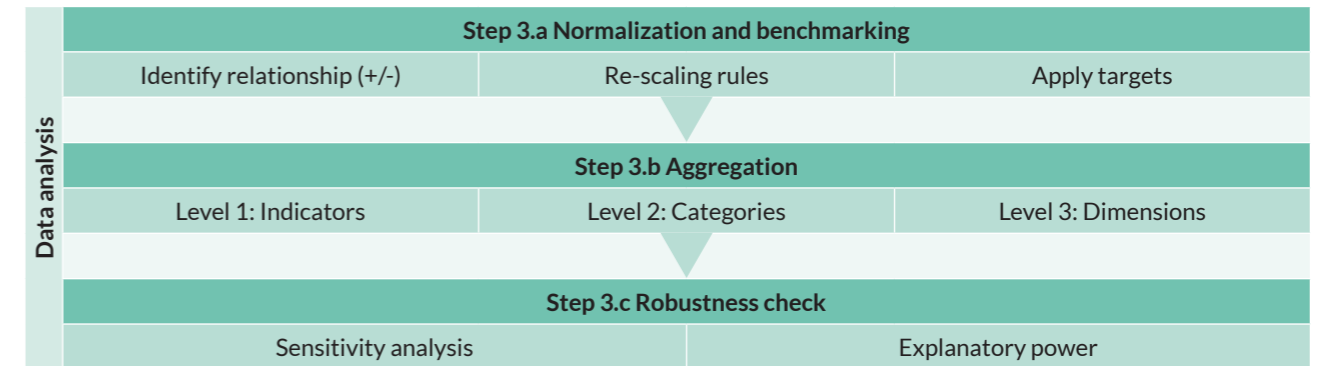




This chapter provides a comprehensive analysis of the green performance of Kenya, focusing on its Green Growth Index from 2010 to 2022. The methodology, outlined in Step 3 of the analytical process (refer to Figure 16 and Annex 1), involves

aggregating scores at different levels, including pillars (combining normalized scores of indicators), dimensions (combining average scores of the pillars), and overall Index (combining average scores of the dimensions).

Figure 16 Data analysis of the green growth indicators



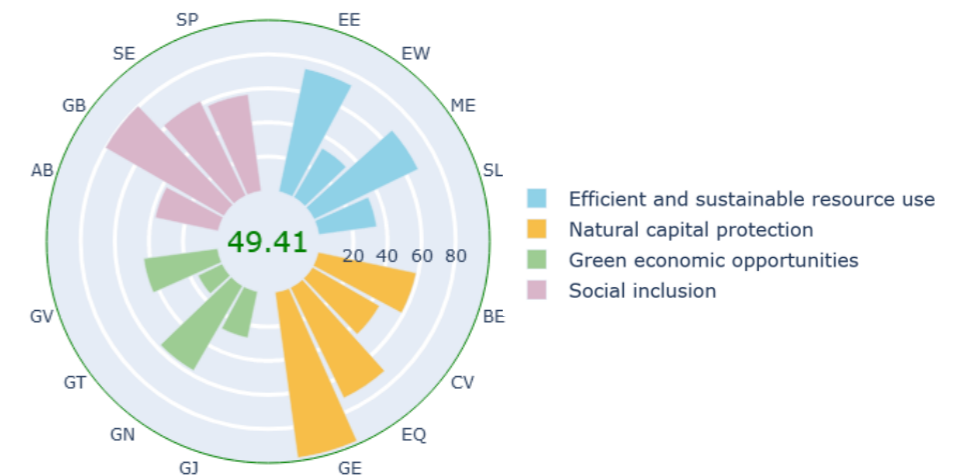
## 5.1 Overall green growth performance

### 5.1.1 Distance to sustainability targets

Figure 17 shows the distance to sustainability targets, gauging Kenya's progress in achieving them. A score of 100 indicates the successful attainment of sustainability targets across various pillars within each dimension. The interpretation of scores is categorized as follows: 1-20 denotes very low performance, 21-40 signifies low performance, 41-60 reflects moderate performance, 61-80 indicates high performance and 81-100 represents very high performance in achieving sustainability targets for the transition to green growth.

In 2022, Kenya achieved a Green Growth Index score of 47.95 (Figure 17). This score, derived from averaging the scores across four dimensions—efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion—reflects the country's moderate green growth performance. The context of Kenya's green growth transition is integral to understanding its scores. As East Africa's largest economy, Kenya's commitment to sustainable development and a low-carbon economy has significant national and international implications. This commitment is encapsulated in the Kenya Green Economy Strategy and Implementation Plan (GESIP), which runs from 2016 to 2030. GESIP aims to transition Kenya towards a socioeconomic landscape characterized by low carbon emissions, resource efficiency, equity, and inclusivity. The moderate Green Growth Index score suggests that Kenya will need to persistently implement GESIP to improve its performance. The opportunities and challenges lie in achieving this are discussed next.

Figure 17 Distance to sustainability targets by pillar



#### Green growth pillars

EE – efficient and sustainable resource use, EW – efficient and sustainable water use, ME – waste and material use efficiency, and SL – sustainable land use  
BE – biodiversity and ecosystem protection, CV – cultural and social value, EQ – environmental quality, and GE – greenhouse gas emissions reduction  
GJ – green employment, GN – green innovation, GT – green trade, and GV – green investment  
AB – access to basic services and resources, GB – gender balance, SE – social equity, and SP social protection

# 5

## Kenya's green growth performance

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The analysis of individual pillars sheds light on Kenya's green growth performance (Figure 17). Notably, Kenya's moderate score for the Green Growth Index in 2022 was attributed to the very high scores in GHG emissions reduction (GE), environmental quality (EQ), and gender balance (GB) and high scores in efficient and sustainable energy (EE), waste and material use efficiency (ME), and social equity (SE). Specifically, Kenya achieved an impressive score of 91.53 for GHG emissions reduction, nearing the sustainability target. This success is attributed to indicators such as the ratio of CO<sub>2</sub> and non-CO<sub>2</sub> emissions to population, CO<sub>2</sub> emissions growth rate, and carbon intensity of energy production.

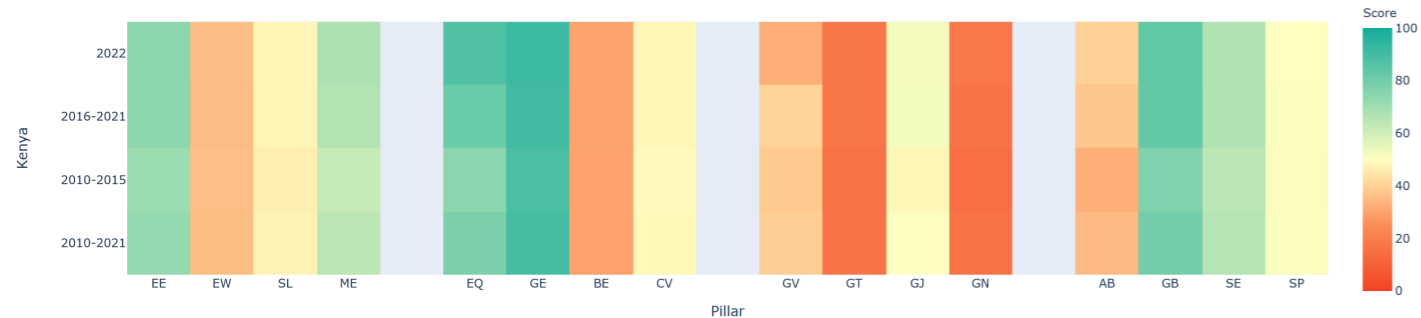
However, the good performance in certain pillars compensated for the low performance in others. Green trade (GT) and green innovation (GN) received notably very low scores. Additional pillars, including efficient and sustainable water use (EW), biodiversity and ecosystem protection (BE), green investment (GV), and access to basic services and resources (AB), received low scores. Kenya's weak performance in green trade, with a score of 17.07 in

2022, highlighted challenges in areas such as the share of export of environmental goods to total export, the share of ores and metals exports to total merchandise exports, the share of manufactured exports to total merchandise exports, the share of medium and high-tech exports to total manufactured exports, and the capacity in doing business as represented by new business density. Despite strides in green policy implementation, challenges persisted. Notably, the weak performance in green trade emphasized a need for targeted interventions. As recommended in the Medium-Term Review of GESIP, strengthening collaboration and institutional coordination is crucial for effective implementation.

### 5.1.2 Performance dashboards

Figure 18 compares Kenya's scores across different pillars in 2022 against the average scores for three distinct periods: 2016-2021, 2010-2015, and 2010-2021. The analysis reveals minimal differences in scores, predominantly falling within consistent ranges over the specified periods.

Figure 18 Performance dashboard by pillars



**Green growth pillars**  
 EE – efficient and sustainable resource use, EW – efficient and sustainable water use, ME – waste and material use efficiency, and SL – sustainable land use  
 BE – biodiversity and ecosystem protection, CV – cultural and social value, EQ – environmental quality, and GE – greenhouse gas emissions reduction  
 GJ – green employment, GN – green innovation, GT – green trade, and GV – green investment  
 AB – access to basic services and resources, GB – gender balance, SE – social equity, and SP social protection

For the efficient and sustainable resource use dimension, material use efficiency (ME) had the most discernable improvement between 2010-2015, with a score of 61.87, and in 2022 with a score of 67.68 (Figure 18). Despite this positive trend, the scores

maintained a consistently high level (i.e., not moving to a very high level). Conversely, there was a very insignificant decline in the efficient and sustainable water use (EW) scores from 35.91 in 2010-2015 to 35.67 in 2022, with scores remaining low. Efficient

and sustainable energy (EE) and sustainable land use (SL) both showed improvements, although the former pillar achieved a high score, and the latter maintained a moderate level.

For natural capital protection, environmental quality (EQ) had the most visible improvement between 2010 and 2015, with a score of 74.69, and in 2022, with a score of 87.23. This pillar improved from having a high to a very high score. Similarly, the very high GHG emissions reduction (GE) score further improved from 88.60 in 2010-2015 to 91.53 in 2022. In contrast, biodiversity and ecosystem protection (BE), with a low score, and cultural and social value (CV), with a moderate score, showed no visible changes.

Green economic opportunities witnessed mixed trends. Notably, the low green investment (GV) score further declined from 38.29 in 2010-2015 to 32.14 in 2022. On the other hand, the moderate score for green employment (GJ) slightly improved from 48.24 in 2010-2015 to 52.40 in 2022. Despite minimal changes, the very low scores for green trade (GT) and green innovation (GN) showed slight improvements from 16.12 and 14.98 in 2010-2015 to 17.07 and 17.48 in 2022, respectively.

Two pillars in the social Inclusion dimension revealed notable changes. While the score for access to basic services and resources (AB) increased by almost eight points from 32.39 in 2010-2015 to 40.01 in 2022, this pillar's performance remained at a low level. On the other hand, the gender balance (GB) score increased by six points from 77.27 in 2020-2015 to 83.79 in 2022, shifting the level of performance from high to very high. Also, the social equity (SE) score slightly increased from 64.39 in 2010-2015 to 67.03 in 2022. Only the social protection (SP) score showed a decline from 51.00 in 2010-2015 to 49.72 in 2022.

### 5.1.3 Green growth trends

Figure 19 shows a positive trajectory in Kenya's Green Growth Index scores, ascending from 43.33 in 2010 to 47.95 in 2022. These scores were derived from the geometric average of the four green growth dimensions. From 2010 to 2022, the upward

trend in Index scores was primarily attributed to improvements in all dimensions (Figure 20). Notably, social inclusion exhibited the most significant improvement, with its score increasing from 52.49 in 2010 to 57.81 in 2022. Significantly, this dimension showcased sustained growth from 2010 to 2020, followed by a slight decline from 58.02 in 2020 to 57.81 in 2022. As discussed in the preceding section, the noteworthy improvements in the scores for access to basic services and resources (AB) and gender balance (GB) stood out as key catalysts for the positive trend observed in the social inclusion dimension (Figure 18).

Despite the sustained improvement in social inclusion performance from 2010 to 2020, it is notable that natural capital protection retained its position as the major contributor to Kenya's moderate Index score. During the second participatory workshop, the national stakeholders attributed the impressive natural capital protection performance to the policies and initiatives addressing climate change impacts and ecosystem degradation (Box 1). Moreover, there is a noticeable trend of nearly a one-point increase observed between 2012 and 2013, as well as between 2018 and 2019. The trend between 2012 and 2013 can be primarily attributed to a two-point surge in the score for the green economic opportunities dimension, accompanied by improvements in the social inclusion and efficient and sustainable resource use dimensions. Conversely, the trend observed from 2018 to 2019 can be attributed to progress across all dimensions, notably marked by a one-point increase in both natural capital protection and social inclusion dimensions.

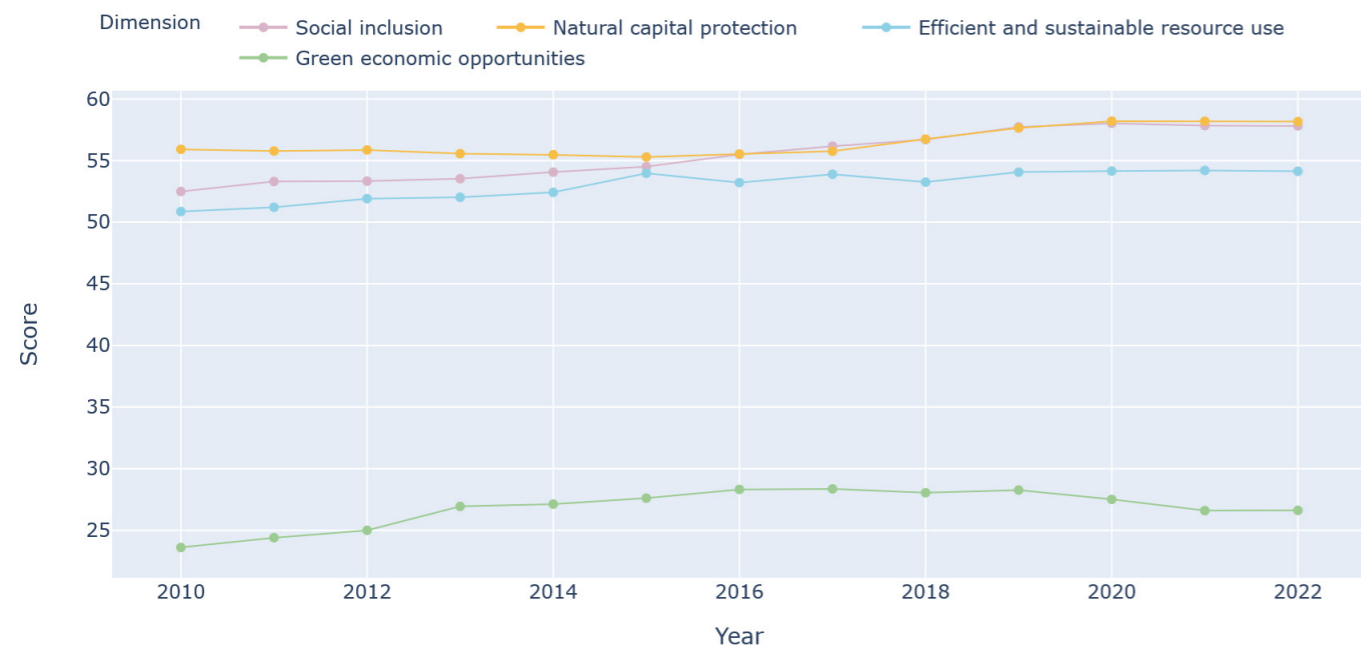
The only dimension exhibiting a consistent declining trend, beginning in 2019, is the performance in the green economic opportunities dimension. This can be attributed to the low score for green investment (GV), which declined from 38.29 in 2010-2015 to 32.14 in 2022. Reversing this downward trend within this dimension would significantly contribute to an overall improvement in Kenya's Green Growth Index. The national stakeholders recognized the country's poor performance in green economic opportunities and that this dimension offers enormous opportunities to improve green growth performance (Box 1).



Figure 19 Trend in the Green Growth Index in Kenya, 2010-2022



Figure 20 Trend in the green growth dimensions in Kenya, 2010-2022



Box 1 National stakeholders' rating and opinion on the opportunities for improving Kenya's performance in the four green growth dimensions

**Rating on efficient and sustainable resource use: HIGH**

The national stakeholders argued that their institutions have policies, laws, initiatives, and strategies to improve the sector in the ESRU dimension and the indicators. Although challenges exist the opportunities outweigh the challenges. Kenya has a solid policy, legal, and institutional framework that can govern and support the execution of actions to support green growth. Particularly, Kenya is rapidly urbanizing and hence presents a huge opportunity for recycling. Also, Kenya is endowed with abundant renewable energy resources, which are yet to be exploited while efficiently using the resources. Overall, the country's opportunities for improving green growth performance are high. Specifically, through the Long-term strategy (LTS) and Energy Transition and Investment plan, Kenya has set a net zero target by 2050, both highlighting green growth opportunities. The Sustainable Waste Management Policy 2021 and the Sustainable Waste Management Act 2022 provide the framework for Kenya's transition to a circular economy for material efficiency. The Water Master Plan, under review, will highlight new technologies and opportunities for wastewater treatment and matching the demand and supply of water.

**Rating on natural capital protection: HIGH**

Kenya is among the nations that are ahead in terms of review of National Biodiversity Strategy and Action Plan, the reviewed updated NDC ambition for reducing emissions from 30 to 32 percent GHG relative to BAU, commitment to increase domestic sources of funding for the NDC, updating National Climate Change Action Plan (2023-2027) as the framework to implement the NDC, the Climate Change Act 2016 provides a strong institutional arrangement for implementation and coordination of climate action, with a national climate change council chaired by the President indicating the good political backing commitment. Kenya hosted the First Africa Climate Summit for uniting Africa in one voice at COP28. The draft Green Fiscal Policy and Incentives Framework currently under Cabinet review seeks to create fiscal and non-fiscal incentives to spur investments in natural capital and green goods and services. The national climate finance policy, 2016 seeks to improve our ability to mobilize and effectively manage and track adequate and predictable climate finance. Nearly all the 47 counties, have developed the county climate change fund acts for providing mechanism for financing priority climate change actions and interventions. The national landscape and ecosystem restoration strategy seeks to increase tree cover by 32 percent by 2032- 15 billion tree growing campaign. The financial sector has also adopted the Taskforce for Nature Related Financial Disclosure framework to direct climate positive investments.

**Rating on green economic opportunities: VERY HIGH**

The green economic opportunities have the lowest score among the four dimensions, and thus needs improvement. It offers very high opportunity to improve Kenya's green growth performance.

**Rating on social inclusion: VERY HIGH**

Referring to the Kenya Integrated Household Budget Survey (KIHBS) 2015-2016, the national stakeholders emphasized that poverty levels in the country are still high at 36.1 percent. The suggested that inclusivity by creating awareness on issues of rights, opportunities, etc. The existing legal frameworks (i.e., Constitution, various policies) require that no more than two-third of a particular gender should benefit from available opportunities, providing opportunity to foster social inclusivity.

Figure 21 Scores for indicators in the efficient and sustainable resource use dimension



## 5.2 Green growth indicators

### 5.2.1 Efficient and sustainable resource use

Figure 21 shows the scores for the 20 green growth indicators in the efficient and sustainable resource use dimension. Kenya's high performance in efficient and sustainable energy (EE), as shown in Figure 17, was attributed to very high scores in electricity generation from renewables (EE4) and the reduction of per capita electricity consumption (EE5). Additionally, high scores in the ratio of total primary energy supply to GDP (EE1) and the increase in the share of renewables in energy consumption (EE2) further contributed to this good performance. During the second workshop, the national stakeholders highlighted robust policies, laws, initiatives, and strategies within Kenya's solid policy, legal, and institutional framework supporting green growth in the ESRU dimension (Box 2). These initiatives align with key indicators such as EE1 and EE2, as outlined in GESIP, NCCAP, and NDC, emphasizing the country's commitment to enhancing national energy efficiency and promoting renewable energy resources. Furthermore, Kenya's Long-term strategy, Energy Transition and Investment plan, Sustainable Waste Management Policy, and Sustainable Waste Management Act underscore the nation's concerted efforts towards circular economy principles and material efficiency within the ESRU dimension. Inclusion in policies extends to logistics performance (EE3) and electricity generation from renewables (EE4), aligning with Vision 2030 and various national programs to improve trade infrastructure and increase the share of renewable energy in the national grid.

Figure 24 delineates the consistent and remarkably very high per capita electricity consumption (EE5) scores, maintaining an approximately constant value of around 99.06 from 2010 to 2022.

This sustained high performance can be attributed to concerted efforts in the energy sector, where increased electricity generation has been a forefront initiative. However, national stakeholders emphasized that the challenge lies in the sector's uptake, particularly in terms of connectivity and the absence of an enabling environment to stimulate demand (Box 2). To further enhance the performance in efficient and sustainable energy, stakeholders suggested including indicators for energy efficiency and access to clean fuels and technology in the review process. While the former can be addressed by adding electric power transmission and distribution losses when updating the Kenya Green Growth Index in the following year, the latter indicator is already represented in the indicators for the social inclusion dimension. Conversely, the weak performance in efficient sustainable transport (EE3), with a score of only 27.09 in 2022, is evident. As the Logistics Performance Index indicates, logistical challenges and an underdeveloped transport infrastructure underscore this sector's struggle. Despite policies outlined in Vision 2030, NCCAP, and NDC aiming for low-carbon and efficient transport systems, the scores have remained consistently low, reflecting a need for more comprehensive measures to address the challenges in sustainable transport.

In 2022, the low score of 35.67 for efficient and sustainable water use (EW) (Figure 17) can be traced from the very low scores for three green growth indicators – water use efficiency (EW1) at 15.84, sustainable fisheries as a proportion of GDP (EW3) at 1.85, and renewable water resources per capita (EW5) at 1.31 (Figure 21). This underperformance is apparent from challenges identified by the national stakeholders, including limited technical know-how on water use efficiency among farmers, inadequate farmer extension services, dilapidated infrastructure, and insufficient financial resources (Box 2). Notwithstanding the challenges, the government's consideration of these issues in policies demonstrates a commitment to addressing them, such as the Vision 2030 objective to commission public-private partnerships for improved efficiency in water and sanitation delivery, GESIP's goal to enhance water use efficiency, and NDC's promotion of

water harvesting at county and household levels. Despite these efforts, the comprehensive review and incorporation of emerging trends, climate change adaptation, and climate-proofing measures outlined in the water master plan and other strategies are critical to improving the efficiency and sustainability of water use in Kenya.

The high performance in waste and material use efficiency (ME), with a score of 67.68 in 2022 (Figure 17), can be attributed to robust policies and practices outlined in Kenya's Sustainable Waste Management Act 2022. Comprehensive measures advocate for a circular economy approach, including establishing Producer Responsibility Organizations for material recovery, reuse, and recycling. The high scores in total domestic material consumption per unit of GDP (ME1) and total material footprint per capita (ME2) reflect the success of initiatives to reduce post-harvest losses and promote sustainable waste management practices, as indicated by the national stakeholders during the second participatory workshop (Box 2). The high scores in average food loss to production and food waste to consumption (ME3) and municipal solid waste recycled (ME4) underscore Kenya's progress in implementing strategies outlined in the Green Economy and Strategy Implementation Plan (GESIP) and the National Climate Change Action Plan (NCCAP), which aim to reduce waste, encourage recycling, and create green job opportunities. However, according to national stakeholders, the very low score in municipal wastewater treatment facilities (ME5) signals a significant infrastructure and policy implementation gap, including costly waste and wastewater infrastructure, limited financing, and technological constraints. Efforts outlined in GESIP's Objective 1.2 to enhance water and sanitation services need further attention to improve wastewater treatment facilities. Kenya's commitment to a circular economy is evident in the opportunities identified by the national stakeholders, such as the potential for recovery, reuse, and recycling of solid waste. While challenges persist, including financial constraints and technological limitations, considering these issues in policies, such as GESIP's focus on waste recovery, reuse, and recycling infrastructure, presents opportunities for improving green

growth performance. The Sustainable Waste Management Act of 2022, emphasizing waste segregation at the source and the closure of dumpsites, aligns with the country's green growth trajectory. Addressing challenges and further aligning policies with ongoing developments, like the sanitation management policy, will enhance Kenya's overall waste and material use efficiency performance.

In 2022, Kenya moderately performed in efficient and sustainable land use (SL), scoring 47.93 (Figure 17). The notable contributors to this performance were the very high scores in nutrient balance per unit area (SL1) at 99.31 and the share of the ruminant livestock population to agricultural area (SL3) at 98.82 (Figure 21). The effectiveness of national and sectoral policies, such as the National Land Use Policy and the Physical Land Use and Planning Act, provided a framework for optimal land use and productivity, contributing to the high scores in SL1 and SL3. Additionally, the national stakeholders noted the potential of tapping into organic fertilizer, improving mechanization, and utilizing climate-smart agriculture strategies, aligning with sustainable land use practices (Box 2). Conversely, the low scores in agricultural production divided by the total area of arable land under crops and pasture (SL4) at 23.49, and the very low scores of the share of agriculture organic to total agriculture land area (SL2) at 4.88 and farm machinery per unit of agricultural land (SL5) at 13.15 were influenced by various challenges, as highlighted by national stakeholders during the second participatory workshop (Figure 21, Box 2). Limited adoption of organic farming practices and undifferentiated markets for organic and inorganic produce contributed to the low score in SL2. Challenges such as land tenure issues, inadequate access to inputs, resource constraints, and poor agricultural practices impacted SL4, reflecting lower agricultural productivity per unit of land. The low score in SL5 can be attributed to challenges like high dependency on rain-fed agriculture, subsistence farming, and finance and resource constraints, hindering farm machinery's widespread availability and utilization in the agricultural sector. Addressing these challenges and integrating sustainable practices into policies could enhance Kenya's overall efficiency and sustainability of land use.



**Box 2 National stakeholders' rating and opinion on the opportunities for improving Kenya's performance in efficient and sustainable resource use****Rating on efficient and sustainable energy (EE): HIGH**

The national stakeholders explained that the energy sector has been at the forefront of increasing electricity generation. However, the challenge to the sector is uptake in terms of connectivity and the need for an enabling environment to stimulate demand. Moreover, the indicators for energy efficiency and access to clean fuels and technology need to be included in the review. This will give a clear picture and adequate efficient and sustainable energy score. According to national stakeholders, there is a high opportunity to reduce energy waste at the household level, particularly by switching to energy-saving bulbs for lighting and cooking appliances. Policies encouraging fuel-efficient vehicles, including hybrid vehicles and efficient transport systems, are essential to improve efficient and sustainable energy performance. The Green Fiscal Incentives Policy Framework will provide incentives to catalyze investments in renewable energy. Kenya has joined the Africa Alliance for Green Hydrogen to tap into green hydrogen. The Least Cost Power Development Plan, Kenya Electrification Strategy, and Kenya National Energy Efficiency and Conservation Strategy all seek to reduce demand for fossil fuel-based energy, enhance sustainable energy, and improve energy efficiency in the country.

The national stakeholders selected energy intensity (EE1), renewable energy share (EE2), efficient transport (EE3), and low-carbon electricity (EE4) as the indicators providing the most significant opportunities to improve Kenya's efficient and sustainable energy performance. The energy sector is an enabler and supports economic and social growth; thus, increasing the supply of primary energy sources (EE1), specifically from renewable sources (EE2), provides an opportunity to improve Kenya's green growth performance from the energy sector. The generation of power from renewable sources is high, above 80 percent, but there is a need to create opportunities to increase renewable consumption, including electricity (EE4). The potential to exploit renewable sources is very high in geothermal, tidal wind, and solar. Kenya plans to implement an e-mobility program to enhance efficient transport (EE3). The Government has initiatives to stimulate investment in e-mobility, including infrastructure development and zero rating on electric motorbikes and vehicle imports, thus reducing reliance on fossil fuels. However, the national stakeholders identified several challenges in improving performance in these indicators, including limited enabling environment/ incentives to increase electricity demand; inadequate implementation of strategies due to limited resources; little synergy in data sharing and documentation; financial constraints to meet the capital intensive nature of establishing renewable technology; limited robustness of the grid; implementation and management challenges and political environment and public acceptability.

**Rating on efficient and sustainable water use (EW): HIGH**

The national stakeholders mentioned several policy frameworks supporting the high rating regarding the opportunities for improving Kenya's green growth performance in efficient and sustainable water use. For example, the Water Master Plan (2013-2030) is under review to incorporate emerging trends such as climate change; the National Water Resources Strategy (2021) supports the protection, conservation, and management of water resources; the National Climate Change Action Plan 2023-2023 seeks to increase the area under irrigation as part of climate resilience; the Horn of Africa, groundwater initiative project, will support the exploitation of groundwater in the arid and semi-arid (ASAL) regions; the Fourth Medium Term

Plan (MTPIV) prioritizes the climate proofing of water infrastructure measures for the ASAL region, such as underground water tanks; the Irrigation Master Plan is under development to increase the scope and identify technologies for efficient water use; and water harvesting program through the construction of storage dams that will improve water capacity. According to national stakeholders, there is a high potential for saving water used for irrigation by implementing water-efficient irrigation approaches. But Kenya has yet to fully exploit the opportunities to capture rainwater, including the current water from the El Niño rains.

The national stakeholders selected water use efficiency (EW1), level of water stress (EW2), and renewable water resources per capita (EW5) as the indicators providing the most significant opportunities to improve Kenya's efficient and sustainable water use performance. Kenya's climate-smart agriculture strategy and framework and the Green Economy and Strategy Implementation Plan support the efficient use of water (EW1). Kenya is classified as a country with a water deficit (EW2). Hence, practices that help to reduce or increase water availability (EW5), including water-saving equipment and water harvesting, are essential. However, the national stakeholders identified several challenges in improving performance in these indicators, including limited technical know-how for farmers on water use efficiency; lack of farmer extension services; dilapidated and obsolete water infrastructure; water storage facilities (for water harvesting) are capital-intensive and not prioritized and implemented due to inadequate financial resources; low adoption of smart technology; and low compliance of policies and laws.

**Box 2 National stakeholders' rating and opinion on the opportunities for improving Kenya's performance in efficient and sustainable resource use****Rating on sustainable land use (SL): HIGH**

Several policy frameworks support sustainable land use, including the National and County Policies on Sustainable Land Use, Landscape Restoration Programme, Ending Drought Emergencies, Climate-smart Agriculture Strategy, National Land Use Policy, Physical Land Use and Planning Act, etc. For example, the National Land Use Policy of 2016 provides for optimal utilization and productivity of land-related resources in a sustainable and desirable manner at the national, county, and community levels. Moreover, the Physical Land Use and Planning Act of 2019 seeks to ensure that planning and development are undertaken rationally and cohesively nationally and at the county level. There are also opportunities to improve land use practices. The country is overly dependent on inorganic fertilizer, yet there is a high opportunity to tap into organic fertilizer, which is readily available and relatively cheap. Only a few small-scale farmers have embraced organic agriculture. Hence, there is an opportunity to draw more of them to practice organic farming. However, the markets need to differentiate between organic and inorganic products to provide incentives for organic farmers. Large and small-scale farmers can benefit significantly from a mind shift, i.e., the importance of adopting mechanized cultivation and harvesting versus manual labor. Kenya is 80 percent ASAL, providing opportunities for increased agricultural production, land restoration and regeneration, and land degradation neutrality.

The national stakeholders selected soil nutrient balance (SL1) and agricultural productivity (SL4) as the indicators providing the most significant opportunities to improve Kenya's sustainable land use performance. They recognized the positive relationship between the two indicators and that enhancing the nutrient balance would increase agricultural yields per unit area. They also mentioned the importance of Kenya Climate SMART Agriculture Strategy (2017 - 2026) to improve performance in agricultural productivity, which seeks to increase agricultural productivity through resilient practices and mitigation of emissions from the agriculture sector. The challenges to improving soil nutrient balance and agricultural productivity in Kenya include land tenure system, land degradation, inadequate access to inputs; resource constraints (Human, material, and financial), poor agricultural practices, high dependence on rainfed agriculture, subsistence farming; impacts of climate change; land subdivision; and finance and resource constraints.

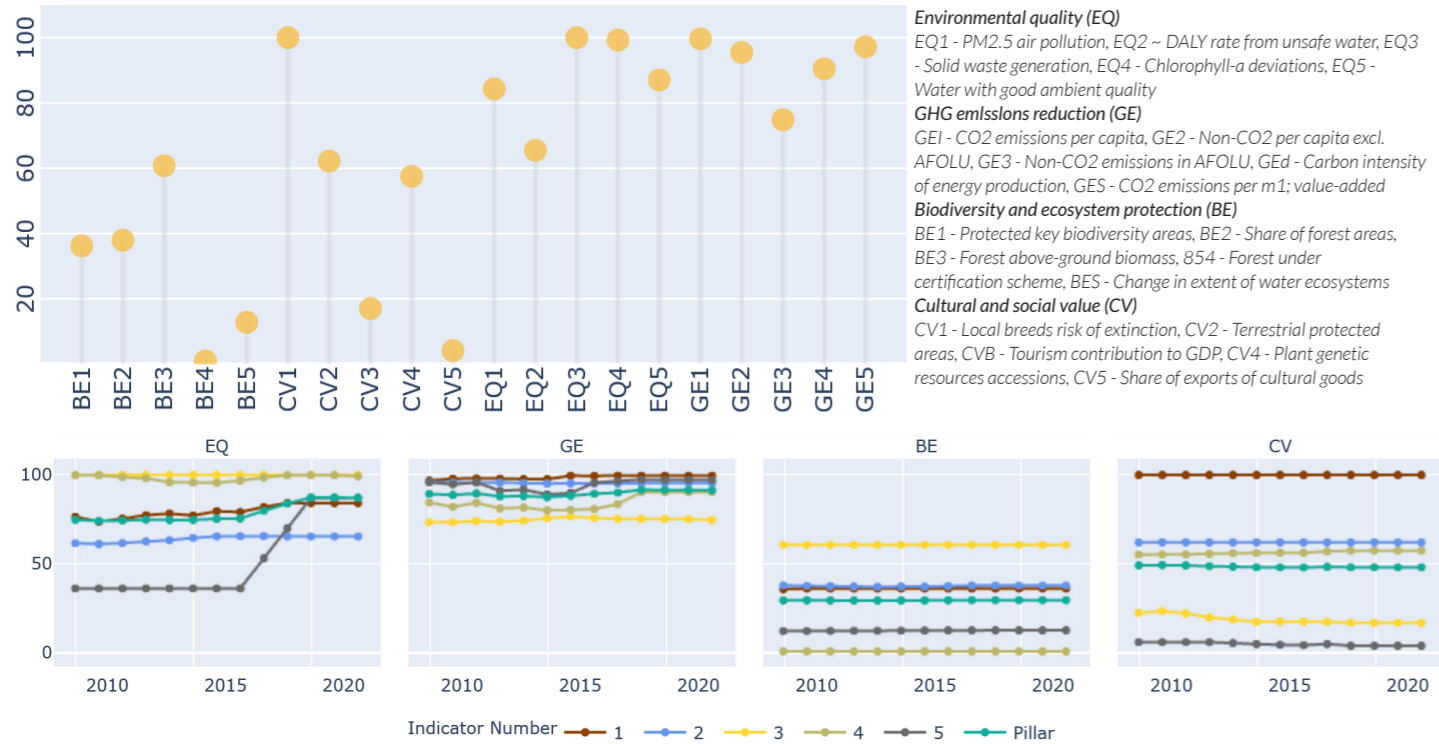
**Rating on material use efficiency (ME): VERY HIGH**

The national stakeholders highlighted policies supporting material use efficiency in Kenya. The National Sustainable Waste Management Policy (2021) and Sustainable Waste Management Act (2022) provide a comprehensive circular economy approach to waste management at the national and county levels, which handles municipal waste. Moreover, there are measures to reduce single-use plastics and establish material recovery facilities in the counties. Kenya has high levels of material waste and thus poses a high potential of improving material use efficiency performance, for example, by managing postharvest losses from food items such as tomatoes, mangoes, vegetables, and meat products, and recycling wastewater, metals, glass, plastic, and paper.

The national stakeholders selected municipal solid waste recycled (ME4) and wastewater treatment facilities (ME5) as the indicators that provide the most significant opportunities to improve Kenya's material use efficiency. The policies mentioned above will support the recovery, reuse, and recycling of solid waste. Specifically, the Sustainable Waste Management Act obligates waste segregation at source by all waste generators and seeks to close all dumpsites. There has been a feasibility study on material recovery technologies, e.g., energy recovery from waste. There was a gazette notice of a ban on single-use plastics, and good progress was made in implementing extended producer responsibility. There are advanced technologies for wastewater treatment and reuse that the country can tap into. The ongoing development of the sanitation management policy will respond to the sanitation sector's prevailing governance, management regulations, service delivery, investment, and financing challenges. Nonetheless, several challenges confront the country in improving performance in municipal solid waste recycled (ME4) and wastewater treatment facilities (ME5), including costly waste and wastewater infrastructure, thus poor infrastructure for waste management; lack of prioritization, hence limited financing, because they are not considered as high impact development issues; recycling technologies, finance, and resource constraints; porous borders for control of transboundary movement of plastic waste; weak enforcement of laws; and low consumer awareness.



Figure 22 Scores for indicators in the natural capital protection dimension



## 5.2.2 Natural capital protection

In the natural capital protection dimension, Figure 22 highlights Kenya's commendable performance in environmental quality (EQ) and GHG emissions reduction (GE) in 2022. These can be attributed to Kenya's proactive stance in addressing climate-related challenges. During the participatory workshop, the national stakeholders underscored the nation's strategic advantage, marked by a comprehensive review and update of climate-related strategies and plans (Box 3). Moreover, Kenya boasts strong institutional arrangements and unwavering political support for climate action, exemplified by various policies and frameworks geared towards fostering green investments and climate finance. Furthermore, county-level initiatives dedicated to climate change funds and ecosystem restoration reflect a decentralized commitment to sustainable practices.

The national stakeholders' statements further elucidated Kenya's proactive measures, showcasing the nation's leadership in various climate-related endeavors (Box 3). The combined institutional, policy and grassroots approach contributed significantly to the commendable performance observed in the environmental quality (EQ) and GHG emissions reduction (GE) indicators in the natural capital protection dimension. GHG emissions reduction (GE) stood out as the best-performing pillar for natural capital protection in 2022, with a very high score of 91.53 (Figure 17). This pillar's very high performance is underscored by four indicators nearing sustainability targets, indicating Kenya's substantial potential to sustain its very high environmental performance. As shown in Figure 22, the indicators, including the ratio of CO2 emissions to population, including AFOLU (GE1), the ratio of non-CO2 emissions to population, excluding AFOLU (GE2), carbon intensity of energy production (GE4), and CO2 emissions per unit of manufacturing

value added (GE5), all scored above 90 in 2022. According to the national stakeholders, the remarkable performance in these indicators can be attributed to Kenya's national policies, strategic opportunities, and robust institutional framework (Box 3). GE1 had a consistently high trend since 2010, reaching an almost perfect score of 99.65 in 2022. This exceptional performance is closely aligned with Kenya's forward-looking policies, as articulated in the NCCAP and NDC. These documents outline ambitious targets for renewable energy, climate-resilient development, and GHG emissions reduction, reflecting Kenya's commitment to sustainable practices. The NCCAP emphasizes mitigation actions across various sectors, including energy, aligning with the commendable performance observed in GE1. According to national stakeholders, Kenya's pursuit of a 100 percent Renewable Energy Grid by 2030, encapsulated in the National Electrification Strategy, positions the nation favorably, fostering high economic growth and contributing to the positive trajectory of GE indicators.

Kenya also attained a high score in GE2, reflecting its concerted efforts in reducing emissions. The NCCAP, aligned with GE2, underscores mitigation actions across sectors, reinforcing the commitment to abate GHG emissions. Moreover, the NDC's explicit goal of reducing GHG emissions by 32 percent compared to the Business-As-Usual (BAU) scenario further strengthens the alignment between policy objectives and the observed environmental performance. The positive trend in carbon intensity of energy production (GE4) and CO2 emissions per unit of manufacturing value added (GE5) can be attributed to Kenya's high renewable energy potential and strategies to reduce fossil fuel dependence. Implementing programs promoting electric mobility and the recent launch of electric vehicle (EV) policies and guidelines align with GE4, indicating the nation's commitment to cleaner energy sources. The financial sector's adoption of the

Taskforce for Nature Related Financial Disclosure framework further underscores the country's emphasis on climate-positive investments. However, the ratio of non-CO2 emissions in AFOLU (GE3), despite consistently high performance since 2010, recorded the lowest score at 74.87 in 2022. While indicating challenges in the agricultural sector, this indicator presents an opportunity for targeted interventions, as highlighted by expert discussions on climate-smart initiatives in agriculture during the participatory workshop (Box 3). As noted by national stakeholders, the capital-intensive nature of renewable energy infrastructure and cultural values affecting interventions in agriculture are crucial challenges that need to be addressed to ensure sustained high performance in the GHG emissions reduction (GE) pillar.

Following GHG emissions reduction (GE), Kenya excelled in environmental quality (EQ), securing a very high score of 87.23 in 2022 (Figure 17). The country's good performance in this pillar can be attributed to a synergy of robust policies, strategic opportunities, and proactive initiatives. The EQ pillar, mirroring the GE pillar, showcased outstanding achievements across various indicators (Figure 22). Municipal solid waste generation per capita (EQ3) emerged as a standout contributor, attaining a perfect score of 100 in 2022, signifying a consistent commitment to waste management excellence since 2010. This indicator aligns with the National Climate Change Action Plan (NCCAP), specifically addressing solid waste generation forecasts for Nairobi, thereby projecting significant emission reductions. Additionally, the chlorophyll-a deviations observed through remote sensing (EQ4) played a pivotal role in Kenya's natural capital protection performance, with a noteworthy score of 99.28 in 2022, reflecting concerted efforts in monitoring and enhancing marine resources, as outlined in the Green Economy and Sustainable Industrialization Policy (GESIP) and National Biodiversity Strategy and Action Plan (NBSAP).

The insights from the national stakeholders during the second participatory workshop provided valuable context to these achievements (Box 3). Opportunities highlighted, such as water and air quality improvement regulations and projects, underscore the concerted efforts to address environmental challenges. Notably, regarding the DALY rate due to unsafe water sources (EQ2), the national stakeholders emphasized the need for continued emphasis, given the high proportion of deaths associated with unsafe water sources. Expert statements shed light on the ongoing development of Water Resources Regulations, demonstrating a commitment to the polluter-pay principle for water pollution. Challenges outlined, such as policy priorities and budget constraints, align with the need for sustained commitment and resource allocation. Integrating expert insights emphasized addressing challenges like limited technology adoption, public acceptability, and inadequate infrastructure to ensure continued success in environmental quality management. The observed substantial increase in water with good ambient quality (EQ5), from a moderate level in 2018 to a very high level by 2022, underscores the positive impact of strategic interventions, specifically focusing on the quality of bodies of water. This trajectory aligns with policy measures outlined in GESIP and NBSAP, emphasizing improved water quality levels.

Cultural and social value (CV) exhibited a moderate score of 48.17 in 2022 (Figure 17). Figure 22 highlights noteworthy aspects, such as the perfect score of 100 attained by the proportion of local breeds, classified as being at risk, not at risk, or unknown level of extinction risk (CV1) in 2022. This showcases the country's commitment to preserving its indigenous biodiversity. Adjacently, the share of terrestrial protected areas to total territorial areas (CV2) achieved a high score of 62.18 in the same year. Both CV1 and CV2 have consistently maintained their scores since 2010. These indicators underscore Kenya's sustained efforts in wildlife conservation and habitat protection, aligning with the National Wildlife Strategy 2018-2030. However, the CV pillar's ability to contribute to Kenya's green growth performance could be affected by challenges identified by the national stakeholders during the participatory workshop (Box 3), including climate change impacts, the low value of cultural goods, data scarcity, and responses to global crises. These challenges are further accentuated by the moderate score of plant genetic resources accessions stored ex-situ to the total agricultural area (CV4) and the very low scores in travel and tourism direct contribution to GDP (CV3) and cultural goods exports (CV5). The importance of the tourism sector in cultural and social value is acknowledged, with national stakeholders emphasizing its role as a key foreign exchange earner and a significant contributor to the country's cultural fabric. Despite these challenges, opportunities abound, particularly in tourism's recovery and growth strategies, including diversification efforts, outlined in the national tourism strategy for Kenya 2021-2025. Inclusion in policies reflects the government's commitment to wildlife conservation, habitat protection, and promoting cultural goods through strategic initiatives outlined in Vision 2030, NBSAP, and GESIP. Biodiversity and ecosystem protection (BE) in Kenya faced a notable challenge marked by a low overall score of 29.76 in 2022, representing the lowest score in Kenya's natural capital protection dimension (Figure 17). Notably, the above-ground biomass stock in the forest (BE3) was the only indicator with a high score of 60.80 in 2022 (Figure 22). The low scores observed in Key Biodiversity Areas covered by protected areas (BE1) and share of forest areas (BE2), coupled with the very low scores in forest areas under an independently verified forest management certification scheme (BE4) and the extent of water-related ecosystems over time (BE5), significantly contributed to Kenya's underperformance in this pillar. Particularly, BE4 appeared as the weakest indicator, obtaining a mere score of 1 in 2022. All these indicators maintained their scores consistently from 2010 to 2022, experiencing only marginal changes in specific years. Insights from the participatory workshop and expert statements highlighted the intricate challenges and opportunities within Kenya's biodiversity and ecosystem protection efforts (Box 3). Conversely, the country's GDP's reliance on nature-based sectors, including agriculture and tourism, presents substantial opportunities for enhancing biodiversity. The national landscape and restoration strategy's ambitious goals, aiming to grow 15 billion trees and increase tree cover by 30% by 2030, underscore Kenya's commitment to nature-based solutions and reversing biodiversity loss. Challenges such as invasive species and high encroachment rates on protected areas are acknowledged, emphasizing the need for strategic interventions. Policies outlined in Vision 2030, GESIP, NCCAP, NDC, and NBSAP align with the objectives of biodiversity and ecosystem protection. However, certain indicators, such as BE4 and BE5, need more specific mentions in existing policies, suggesting potential policy refinement and enhancement areas.

### Box 3 National stakeholders' rating and opinion on the opportunities for improving Kenya's performance in natural capital protection

#### Rating on environmental quality (EQ): HIGH

The national stakeholders mentioned that Water Resources Regulations under development incorporate the polluter pays principle, where any person or activity that causes water pollution should bear the full restoration cost. Moreover, the Nairobi Rivers Commission is in place to support river protection and pollution control of the Nairobi River. Similarly, the Rivers Protection and Pollution project under the Ministry of Water Irrigation and Sanitation seeks to clean, restore, and monitor water quality for water bodies in the country. Meanwhile, the Air Quality Regulations aim to provide for air pollution prevention, control, and abatement.

The PM2.5 air pollution, mean annual exposure (EQ1) and DALY rate due to unsafe water sources (EQ2) are the two indicators identified by the national stakeholders to provide the most significant opportunities to improve Kenya's environmental quality performance. Kenya's transport sector is heavily dependent on fossil fuels; hence, the Air Quality Index is relatively low compared to the WHO thresholds. Many industries are developing and are heavily reliant on fossil fuels, needing to monitor impacts on air pollution (EQ1). The proportion of deaths due to unsafe water sources is still very high (EQ2), hence the need to emphasize the EQ2 indicator.

Several challenges were identified by the national stakeholders in improving performance in these indicators, including lack of policy priorities, budgetary constraints, encroachment of riparian areas and water bodies, limited adoption of technologies to monitor air and water pollution levels, public acceptability of transitioning from fossil fuel-based transport, inadequate infrastructure, and limited fiscal incentives.

#### Rating on GHG emissions reduction (GE): HIGH

Kenya is implementing policies supporting GHG emissions reduction: the National Climate Change Action Plan provides for low-carbon and climate-resilient development; the updated NDC Kenya aims to reduce GHG emissions by 32 percent compared to the BAU of 143 MTCO<sub>2e</sub>; and the National Energy Efficiency and Conservation Strategy aims to have 5 percent electric vehicles (EVs) annually by 2030. The Kenya Carbon Emission Reduction Tool (KCERT) 2050 aims to monitor emissions. Moreover, through the Financing Locally-Led Climate Action (FLLoCA) program, Kenya conducts a feasibility study for e-mobility in Lamu and HomaBay Islands. The country has a high renewable energy potential, and it targets to achieve a 100 percent Renewable Energy Grid by 2030.

Due to the above-mentioned policies and targets, the national stakeholders suggested that the ratio of CO<sub>2</sub> emissions to population, including AFOLU (GE1), and carbon intensity of energy production (GE4) offer the best opportunities for Kenya to improve its GHG emissions reduction performance. Moreover, Agriculture is the backbone of the economy and presents the highest potential for reducing emissions through climate-smart interventions (GE1). The energy sector has already undertaken a project under the clean development mechanism and has the opportunity to translate to Article 6 cooperative approaches. The FLLoCA program is implemented in all 47 counties to increase adaptation and locally-led climate action. Moreover, the GGGI is undertaking a pilot of adaptation in collaboration with the Ministry of Agriculture to enhance resilience. The capital-intensive nature of renewable energy infrastructure, cultural values affecting interventions in AFOLU, and land subdivision impacts on agricultural productivity are the challenges identified by the national stakeholders in improving performance in GE1 and GE4 indicators.

#### Rating on biodiversity and ecosystem protection (BE): HIGH

According to national stakeholders, Kenya's GDP significantly relies on nature-based sectors, including agriculture and tourism, presenting large opportunities for enhancing our biodiversity. Political goodwill exists to reverse biodiversity loss by using nature-based solutions and ecosystem-based approaches. Several policies support biodiversity and ecosystem protection: the National Landscape and Restoration Strategy, aiming to increase the country's tree cover by 30 percent by 2030; the Kenya National Biodiversity Strategy and Action Plan is currently under development, seeking to conserve Kenya's biodiversity to sustainably use its components to fairly and equitably share the benefits arising; the National REDD+ Strategy demonstrates Kenya's preparatory process towards REDD+ implementation; the Water Act provides for the gazettement of water catchment areas; and the Water National Master Plan will assist in monitoring the changes in water-related ecosystems.

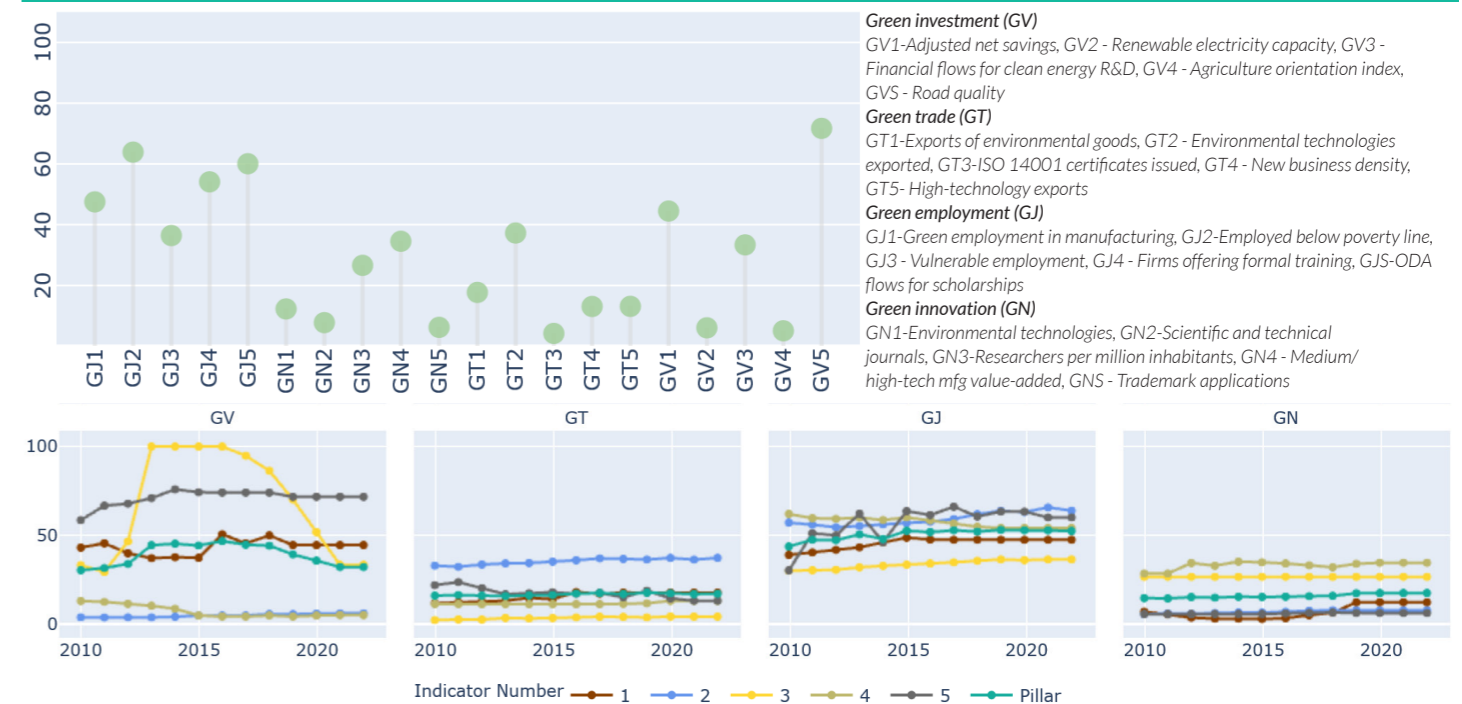
Protected key biodiversity areas (BE1) and share of forest areas (BE2) were identified as the indicators offering the most significant opportunities to improve biodiversity and ecosystem protection performance in Kenya. This is because of the plan to grow 15 billion trees through the National Landscape and Restoration Strategy, in addition to increasing tree cover by 2030. Moreover, Kenya is part of the Kunming Montreal Biodiversity Framework, requiring degraded areas to be effectively restored to at least 30 percent of degraded terrestrial, inland waters, marine, and coastal ecosystems by 2030. However, critical challenges will have to be overcome to create green growth opportunities from protecting key biodiversity areas (BE1) and increasing share of forest areas, including invasive species, high encroachment rate in protected areas, increasing population and urbanization, rising human-wildlife conflict, high use of synthetic fertilizer, deforestation, and financial constraints.

#### Rating on cultural and social value (CV): HIGH

Tourism is a key foreign exchange earner and plays a significant role in the cultural and social value of the country. The National Wildlife Strategy 2018-2030 provides a blueprint for addressing threats and challenges and transforming wildlife conservation in the country.

Among the five cultural and social value indicators, travel and tourism's direct contribution to GDP (CV3) was identified as the most promising to improve green growth performance in Kenya. The Kenya National Tourism Strategy 2021-2025 set out priorities and ambitions for both the sector's recovery and growth, including diversification of tourism services. Moreover, Kenya seeks to increase air connectivity by widening the national carrier's route networks and bilateral air services agreements. However, the impacts of climate change, low-value cultural goods, lack of data, and global crisis pose challenges to improving travel and tourism's direct contribution to GDP.

Figure 23 Scores for indicators in the green economic opportunities dimension



### 5.2.3 Green economic opportunities

Green employment (GJ) was the best-performing pillar for green economic opportunities, with a moderate score of 52.40 in 2022 (Figure 17). This performance was mainly influenced by the high score of 63.88 achieved in the employed population below the international poverty line (GJ2) (Figure 23). This indicator positively elevates the overall pillar score, reflecting a robust commitment to reducing poverty through sustainable employment practices. Despite this positive contribution, the overall score was moderated by the weak performances of other indicators, such as the share of green employment in total manufacturing employment (GJ1), firms providing formal training (GJ4), and the volume of official development assistance flows for scholarships (GJ5). Particularly noteworthy in Figure 23 is the distinct trend observed in GJ5. Unlike other indicators, GJ5 displayed fluctuating trends from 2010 to 2022. Starting at a score of 30.26 in 2010, it saw a significant increase to 51.15 in 2011, transitioning from a low to a moderate level of performance. Subsequently, it displayed a fluctuating trend until 2022. Conversely, the vulnerable employment indicator (GJ3) emerged as the least performer in the green employment pillar, with a low score of 36.43 in 2022. This signals challenges in the proportion of employment categorized as vulnerable, highlighting potential issues related to job insecurity and precarious working conditions. During the second participatory workshop, the national stakeholders discussed the challenges faced in improving performance in this indicator, i.e., inadequate financial resources for green production as a key obstacle (Box 4). Despite the high employed population below the international poverty line (GJ2) score, the national stakeholders' discussions underscored the ongoing challenges in ensuring financial resources for the broader scope of green production, which includes fostering employment in

environmentally sustainable practices. This points to the nuanced nature of green employment, where certain indicators may excel.

In addressing these nuanced performances, opportunities highlighted by national stakeholders during the second participatory workshop, such as the country's transition to a green economy and the potential for strengthening sector capacity for green jobs, indicate a positive trajectory. Yet, challenges, particularly those related to inadequate financial resources for green production, underscore the need for comprehensive policy measures. Establishing schemes to support green businesses and creating one million green jobs annually, as outlined in policies such as the Green Economy and Sustainable Industrialization Policy (GESIP), demonstrate a concerted effort to address these challenges and enhance the overall performance of the green employment pillar.

Kenya's green investment (GV) pillar reflected a low overall performance, with a score of 32.14 in 2022 (Figure 17). A standout performer within this pillar was the quality of roads (GV5), attaining a high score of 71.71 in 2022 (Figure 23). Notably, GV5 demonstrated growth, starting with a moderate score of 58.55 in 2010 and progressively ascending to a commendable high score over the subsequent years. However, despite the high GV5 performance, the pillar's overall score was influenced by the moderate score of adjusted net savings, including particulate emission damage (GV1), and the very low scores associated with international financial flows to developing countries supporting clean energy research and development and renewable energy production (GV3). Additionally, the very low performance of installed renewable energy-generating capacity (GV2), with a score of 6.05, and the agriculture orientation index for government expenditures (GV4), with a score of 5.08, dragged down the pillar's

overall performance. According to the national stakeholders, GV5's high score aligns with the enabling environment for green investment, as underscored by participants and national stakeholders citing the Climate Change Act, Strategy, National Determined Contributions (NDC), Climate-smart Agriculture, and County-based Strategies as contributors to a favorable environment. Conversely, GV2, reflecting installed renewable energy-generating capacity, and GV4, indicating the agriculture orientation index for government expenditures, exhibited very low scores. The challenges elucidated by participants and national stakeholders shed light on the constraints faced, such as limited resources for project implementation, low policy implementation, and insufficient climate finance (Box 4). Notably, the low score for GV2 is attributed to data constraints, illustrating the critical role of data availability and quality in assessing green investment indicators.

Addressing these challenges and leveraging opportunities, such as the national target to increase installed renewable energy capacity and the agricultural focus on the economy, requires comprehensive policy measures. The policies outlined, including those in the Green Economy and Sustainable Industrialization Policy (GESIP) and the National Climate Change Action Plan (NCCAP), indicate ongoing efforts to enhance green investment. However, the challenges of limited resources and low climate finance underscore the need for strategic policy interventions and resource allocation to bolster the performances of installed renewable energy-generating capacity (GV2) and agriculture orientation index for government expenditures (GV4) and elevate the overall effectiveness of the green investment pillar.

Kenya's green innovation (GN) pillar shows a significantly low score of 17.48 in 2022 (Figure 17), reflecting the underperformance of key indicators. The researchers (in full-time equivalent) per million inhabitants (GN3) and the proportion of medium and high-tech industry value added in total value added (GN4) contributed to this overall low performance, registering scores of 26.62 and 34.54, respectively (Figure 23). GN3's low score suggests challenges in cultivating a robust research ecosystem, as highlighted by the participants and national stakeholders, who pointed out inadequate capacity to issue patents on green innovations and low awareness of patent-related matters (Box 4). The low emphasis on research and technical capabilities, as indicated by Vision 2030, may have contributed to the struggles of GN3, highlighting a critical area for improvement in fostering a knowledge-based economy. Moreover, the very low scores observed in patent publications in environmental technology (GN1), annual articles published in scientific and technical journals (GN2), and trademark applications (GN5) further dampened the overall performance of the GN pillar. The challenges articulated by the national stakeholders during the second participatory workshop, such as inadequate capacity for issuing patents on green innovations and low awareness of patent issues, provide valuable context. These challenges underscore the need for strategic interventions to enhance the intellectual

property landscape, promoting a conducive environment for innovation. The opportunities highlighted, particularly the potential to implement the National Science, Technology, and Innovation (STI) Strategy, present a promising avenue for addressing these challenges and elevating Kenya's performance in GN1, GN2, and GN5. The STI Strategy's implementation aligns with the aspirations of a knowledge-based and inclusive sustainable economy, offering a transformative pathway to overcome existing challenges and capitalize on innovation opportunities.

The existing policies lack explicit mentions of GN1, GN2, GN4, and GN5. This signifies a potential gap in policy frameworks directly addressing these indicators. Addressing this gap could involve integrating measures in policies to enhance patent issuance capacity, raising awareness of patent-related issues, and fostering an environment conducive to trademark applications. Such policy interventions, coupled with the implementation of the STI Strategy, can uplift the green innovation (GN) pillar's overall performance and advance Kenya's position in green innovation. Kenya's green trade (GT) pillar exhibited a very low score of 17.07 in 2022, mirroring the challenges faced by key indicators. Notably, the primary contributor to this overall low performance was the low score observed in tracked exported Environmentally Sound Technologies (GT2). This indicator, alongside the very low scores of the remaining four indicators—the share of export of environmental goods (GT1), number of ISO 14001 certificates issued (GT3), ease of doing business (GT4), and high-technology exports (GT5)—collectively accounted for the pillar's underperformance. Particularly noteworthy in Figure 23 is the consistent declining trend in the performance of GT5, starting from a low score in 2011 and persisting until 2022, reflecting sustained challenges in high-technology exports. The national stakeholders highlighted Kenya's reliance on technology imports more than exports, emphasizing inadequate policy support for technology exports and the crucial need for value addition. National stakeholders echoed these sentiments, underscoring the deficiency in incentives, capacity, green financing, collaboration, and comprehensive strategies to harmonize greening processes. This thorough understanding reinforces the intricate challenges embedded in GT1, GT3, GT4, and GT5, explaining their very low scores. In contrast, the moderate score of GT2 may indicate some capability in tracking exported environmentally sound technologies but still falls short of achieving a higher level of performance.

Analyzing the policies reveals a notable absence of explicit mentions of GT1, GT2, GT3, and GT5 in existing policies. This gap highlights the need for targeted policy interventions to address challenges related to the export of environmental goods, tracking environmentally sound technologies, issuing ISO 14001 certificates, and fostering high-technology exports. Aligning policies with the opportunities identified, such as promoting green production and encouraging industries to adopt green manufacturing practices (GT3), could serve as a strategic approach to enhance the green trade (GT) pillar's performance.

#### Box 4 National stakeholders' rating and opinion on the opportunities for improving Kenya's performance in green economic opportunities (continued)

##### Rating on green investment (GV): VERY HIGH

During the second participatory workshop, the national stakeholders highlighted the enabling environment provided by several policies and regulations for green investment in Kenya, including the Climate Change Act and Strategy, NDC, Climate-smart Agriculture, and County-based Strategies (see Boxes 2 and 3).

Among the five green investment indicators, the national stakeholders identified renewable electricity capacity (GV2) and agriculture orientation index (GV4) as those offering significant opportunities to improve Kenya's green investment performance. They mentioned national targets that will support increasing renewable electricity capacity (GV2), including raising the current installed renewable electricity capacity from 3322MW to 5000MW and achieving 100 percent renewable energy sources for electricity generation. However, they also emphasized that the low scores for these indicators may be attributed to data quality and availability. Opportunities to improve the agriculture orientation index (GV4) score are high because Kenya's economy is based on agriculture. Moreover, there is a need to achieve food security in the country. The challenges identified by the national stakeholders in creating opportunities for these two green investment indicators were limited resources to implement agricultural projects, low implementation of policies, and low climate finance funding for different projects. The national stakeholders also emphasized that costly implementation of renewable energy projects affects renewable electricity capacity (GV2) performance, and inadequate water resources for irrigation affect agriculture orientation index (GV4) performance.

##### Rating on green trade (GT): MODERATE

The moderate rating given to green trade by the national stakeholders was due to Kenya's reliance on imports rather than on exports of technologies. More policies are needed to support the export of technologies and implement value addition.

The ISO 14001 certificates issued (GT3) were identified to support the improvement of green trade performance in Kenya, particularly in green production. The national stakeholders highlighted that industries are continuously adopting green manufacturing practices. However, several challenges exist that will affect improving green trade performance, including lack of incentives, inadequate capacity, inadequate green financing, poor collaboration between circular economy and sustainability actors and financial institutions, lack of metrics to account for levels of sustainability, and lack of comprehensive integrative strategies to harmonize greening processes.

##### Rating on green employment (GJ): HIGH

Because the country is transitioning to a green economy, the national stakeholders expect this to create more green employment opportunities.

Green employment in manufacturing (GJ1) and firms offering formal training (GJ4) were identified to support improving green employment performance in Kenya. Specifically, according to national stakeholders, there are opportunities to strengthen the capacity of sectors to adopt green employment approaches. Among others, transitioning to green production, jobs requiring formal training/skilled labor, undertaking technology transfer, and allocating resources to TVEs on green training have been improving over time. A significant challenge, however, is the need for more financial resources for green production.

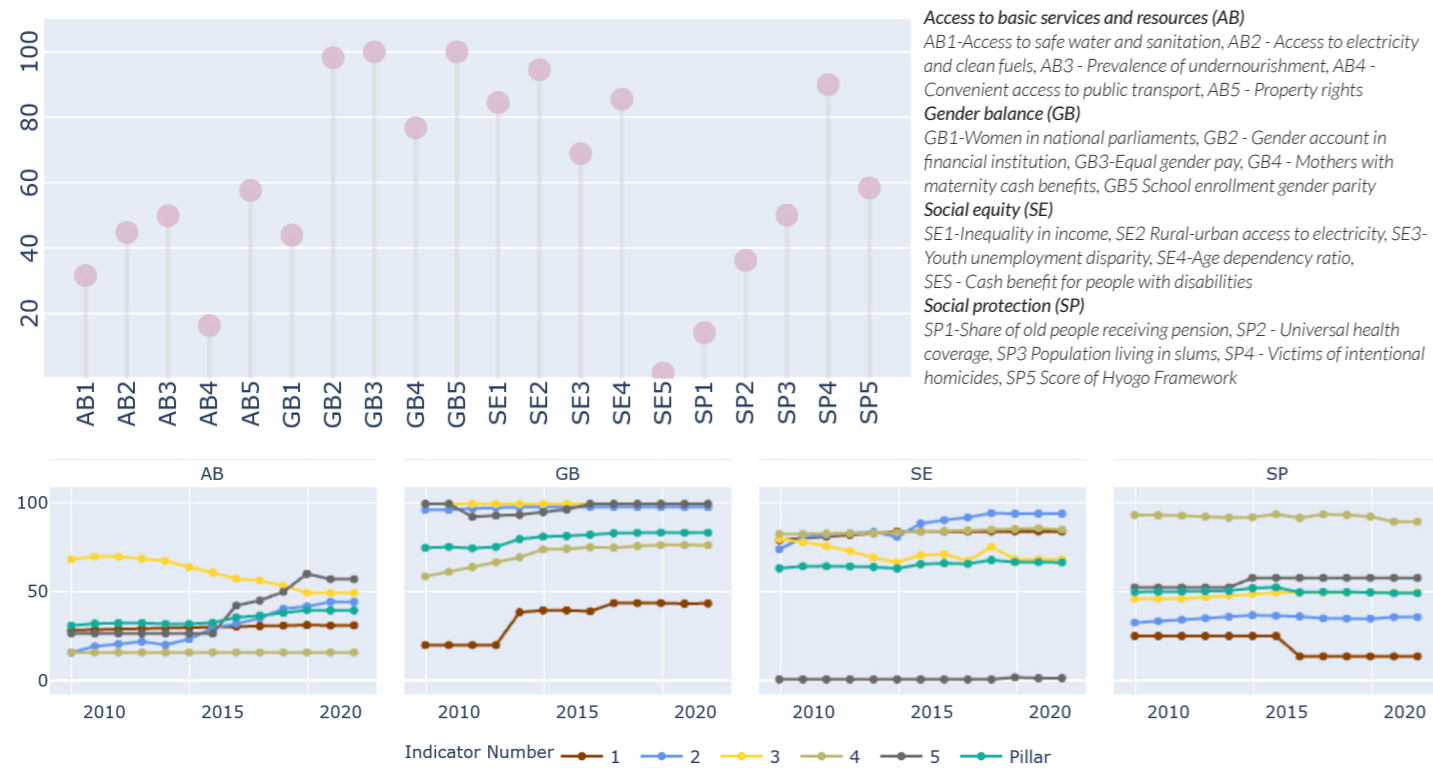
##### Rating on green innovation (GN): HIGH

There is an opportunity to implement the National Science, Technology, and Innovation (STI) Policy and Strategy to facilitate the transformation of the economy from a factor-based to a knowledge-based and inclusive sustainable economy.

The medium/high-tech manufacturing (Mfg) value-added (GN4) and trademark applications (GN5) indicators in green innovation pillars were considered to offer opportunities to improve Kenya's performance, with the former indicator creating the potential for innovation and value additions and the latter securing patents and intellectual property. The national stakeholders added that patents have the potential to increase green innovation. The challenges confronting Kenya in these green innovation indicators are the inadequate capacity to issue patents on green innovations and low awareness of patent issues.



Figure 24 Scores for indicators in the social inclusion dimension4



## 5.2.4 Social inclusion

For the social inclusion dimension, the gender balance (GB) was the best-performing pillar, with a very high score of 83.79 in 2022 (Figure 17). This outstanding performance is attributed to the very high scores attained by key indicators: laws and regulations for equal gender pay (GB3) and gender parity in primary school enrollment (GB5). Remarkably, GB3 has consistently achieved a 100 score since 2010, underscoring sustained efforts in promoting equal gender pay practices. While GB5 experienced a minor dip in score from 100 in 2011 to 92.77 in 2012, it demonstrated resilience by gradually increasing and, subsequently, maintaining the highest score from 2017 to 2022 (Figure 24). The very high score in the gender ratio of accounts at a financial institution or mobile money service provider (GB2) and the high score in the proportion of mothers with newborns receiving maternity cash benefits (GB4) also contributed to the very good performance of this pillar. The least-performing indicator was the proportion of seats held by women in national parliaments (GB1), with a moderate score of 43.96 in 2022.

During the second participatory workshop, the national stakeholders highlighted significant opportunities for enhancing gender balance, rating the potential as high (Box 5). The constitutional guarantee of equality, coupled with gender policies in private and public institutions, offers a solid foundation for progress. The national stakeholders emphasized the pivotal role

of education as an equalizer and empowerment tool, aligning with the high score in the school enrollment gender parity index (GB5). However, challenges such as cultural beliefs and norms, sanitation issues, and inadequate infrastructure hinder further advancements, particularly in Arid and Semi-Arid Areas. In policy frameworks, while GB3, GB4, and GB5 are not explicitly mentioned, the Vision 2030 initiative underscores the commitment to increasing the participation of women in all decision-making processes, including higher representation in Parliament (GB1). The absence of specific policies for GB2 and GB4 suggests an area for potential policy development and implementation to consolidate the gains made in gender balance within financial access and maternity benefits.

The social equity (SE) pillar stood out as another strong performer in Kenya, securing a notable high score of 67.03 in 2022 (Figure 17). This commendable performance was underpinned by very high scores in key indicators, including inequality in income based on the Palma ratio (SE1), population access to basic services categorized by urban/rural areas (SE2), and the age dependency ratio (SE4). Additionally, a high score was achieved in addressing the disparity of unemployment, specifically the ratio of youth (15-24 years old) to those above 25 years old unemployment (SE3). This success underscored the effectiveness of policies and initiatives to ensure equitable access to services and address unemployment disparities across age groups. However, the overall SE performance was moderated by the suboptimal score in the proportion of the population with severe disabilities receiving disability cash benefits (SE5), registering a very low score of only 1.77 in 2022 (Figure 24). This significant challenge is consistent with the national stakeholders' concerns during the second participatory workshop,

where inadequate resources for implementing initiatives were highlighted as a key hurdle (Box 5). Additionally, the lack of tapping into talents and innovation, coupled with a low entrepreneurship culture, contributes to the challenges in providing adequate support to individuals with severe disabilities. These challenges align with the national stakeholders' emphasis on the need for comprehensive social protection policies and youth empowerment initiatives to address the specific needs of vulnerable groups, including orphans, children, persons with disabilities, and the elderly.

Opportunities identified during the participatory workshop emphasized a high potential for improvement, particularly through social protection policies targeting vulnerable groups and youth empowerment initiatives. While existing policies like GESIP acknowledge the importance of addressing disparities, the current implementation gaps, as noted by national stakeholders, need to be revised to fully realize the potential of these initiatives. Bridging these gaps and leveraging identified opportunities could enhance the SE pillar's overall performance, fostering a more inclusive and equitable society in Kenya.

The social protection (SP) pillar moderately performed, scoring 49.72 in 2022 (Figure 17). Within this pillar, the indicator measuring the number of victims of intentional homicide (SP4) stood out, with a remarkably high score of 89.98 in 2022 (Figure 24). This robust performance aligns with the national vision articulated in Vision 2030, emphasizing a "society free from danger and fear," with a commitment to providing a more secure living and working environment for the citizens. However, the overall performance of the SP pillar was notably impacted by the significant underperformance in the proportion of the population above the statutory pensionable age receiving a pension (SP1). Over the years, SP1 consistently registered a low score of 25.55 from 2010 to 2016, which further declined to a very low score of 14.07 from 2017 to 2022. This decline aligns with the lack of explicit mention in policies addressing the provision of pensions to the elderly. Additionally, the low score associated with the universal health coverage (UHC) service coverage index (SP2) contributed to the poor performance observed in this pillar. SP2 reflects the challenges in providing health care to those financially excluded. Despite the commitment outlined in Vision 2030 and the Big 4 initiative to ensure access to health care for all citizens, the actual implementation falls short. The national stakeholders identified financing challenges and low uptake of health insurance as contributing factors (Box 5), highlighting the need for a robust and comprehensive approach to achieving affordable and universal health coverage. Their opinion highlighted the importance of social protection policies, including cash transfers to the elderly and the expansion of Universal Health Care. Furthermore, universal health coverage was emphasized as a pivotal element for improvement, resonating with the national stakeholders' acknowledgment that a healthy population contributes significantly to overall wealth.

Meanwhile, the proportion of the urban population residing in slums (SP3) and the score of the Hyogo Framework for Action self-assessment reports of the countries (SP5) achieved moderate scores, offering a balanced perspective on social protection. Inclusive policies addressing SP3 reveal a balanced perspective.

Vision 2030, GESIP, and the Big 4 initiative all emphasize the commitment to upgrading slum areas and providing affordable housing, aligning to reduce the proportion of the urban population residing in slums. SP5 is positioned within the context of disaster risk reduction measures. GESIP's objective to enhance disaster risk reduction aligns with the national stakeholders' perspective that scaling up disaster management contributes to sustainable development and strengthens economic, social, health, and environmental resilience.

The pillar demonstrating the lowest performance in Kenya was access to basic services and resources (AB), registering a score of 40.01 in 2022 (Figure 17). The country's struggle in this pillar was predominantly linked to the remarkably low performance in the proportion of the population with convenient access to public transport (AB4), maintaining a consistently low score of 16.27 from 2010 to 2022. Additionally, the low performance in the population with access to safely managed water and sanitation (AB1), scoring 31.56 in 2022 (Figure 24), further contributed to the challenges faced in this dimension. AB4 consistently garnered a low score of 16.27 from 2010 to 2022. This low performance aligns with the challenges highlighted during the second participatory workshop, where rapid urbanization and infrastructure pressure were identified as contributing factors. The Vision 2030 initiative acknowledges the need for improvements in public transport, emphasizing the expansion of access across different social and political dimensions. The government's commitment to enhancing sustainable mobility, as outlined in GESIP, includes the establishment of Bus Rapid Transit in major urban areas, particularly in Nairobi, Mombasa, and Kisumu. However, the persistently low score underscored the challenges in implementing effective and convenient public transport systems.

Similarly, AB1 garnered a score of 31.56 in 2022 (Figure 24). The low score was reinforced by the challenges highlighted in the workshop, such as weak management of water catchment areas and difficulties in reducing non-revenue water. The national stakeholders emphasized the need for solid water services institutions, frameworks, and regulatory authorities to address water and sanitation issues. The challenges persist despite the policy inclusions in Vision 2030, GESIP, and the NDC outlining the government's commitment to ensuring improved water and sanitation for all. The NDC explicitly highlights drought's impact on water access, with 23 counties affected and many Kenyans experiencing food insecurity and limited water access. Conversely, indicators such as the population with access to electricity and clean fuels (AB2), the prevalence of undernourishment (AB3), and property rights (AB5) achieved moderate scores. AB2 and AB5 exhibited an upward trajectory, transitioning from very low scores in 2010 to gradually attaining moderate scores in 2022. As outlined in GESIP, Big 4, NCCAP, NDC, and NBSAP, the policy framework underscores the commitment to improving access to clean energy and property rights. However, challenges such as the capital-intensive nature of clean energy generation and weak enforcement of legal and policy frameworks for property rights (Box 5) may have contributed to the moderation in scores. AB3 displayed a declining trend from a high score in 2010 to a moderate score in 2022. The commitment to a 27 percent reduction in under-5 nutrition, as outlined in the Big 4 initiative, should have made a positive trajectory. However, the complexity of addressing undernourishment and the challenges associated with achieving substantial reductions contribute to the moderate scores observed.

**Box 5 National stakeholders' rating and opinion on the opportunities for improving Kenya's performance in social inclusion****Rating on access to basic services and resources (AB): HIGH**

The national stakeholders considered the proportion of the population with access to clean drinking water low at 67 percent (national) and 87 percent (urban), as well as access to sanitation. Nonetheless, they highlighted that the government agenda (i.e., Bottom Up Economic Transformation Agenda, Kenya Vision 2030) prioritizes increasing access to water and sanitation, electricity and clean energy, transport and communication, agriculture and food security, and property rights through the issuance and title deed. Improving water and sanitation access depends on strong water services institutions nationwide, frameworks, and regulatory authorities. According to them, there is a high potential for generating clean energy (i.e., from solar, wind, geothermal, and biogas).

The national stakeholders identified two indicators to offer opportunities to improve Kenya's performance in providing access to basic services and resources, including access to safe water and sanitation (AB1) and access to electricity and clean fuels (AB2). Regarding water and sanitation, the national stakeholders mentioned that strong water services institutions exist nationwide through frameworks and regulatory authority. On electricity and clean fuels, improving performance will come from the high potential for generating solar, wind, geothermal, and biogas energy. But several challenges exist, including rapid urbanization, exerting pressure on current water and sanitation, electricity and transport and communication infrastructure; weak management of water catchment areas; prevalence of non-revenue water; weak enforcement of legal and policy frameworks for water and sanitation; and high capital-intensive nature for generation of clean energy.

**Rating on gender balance (GB): HIGH**

The Constitution of Kenya 2010 guarantees equality between females and males, supporting their full participation and representation in social, economic, and political spheres. Gender policies exist in private and public institutions.

School enrollment gender parity (GB5) was considered the most promising indicator for improving gender balance performance because education promotes equality and empowers the population, both women and men. The challenges confronting the country in providing equality in school enrolment include cultural beliefs and norms, sanitation issues (i.e., low access to sanitary towels for girls), and inadequate school infrastructure, particularly in Arid and Semi-Arid Areas.

**Box 5 National stakeholders' rating and opinion on the opportunities for improving Kenya's performance in social inclusion (continued)****Rating on social equity (SE): HIGH**

Kenya's Social Protection Policy empowers orphans, children, persons with disabilities (PWD), and the elderly through cash transfers and health insurance. Various initiatives exist to empower the youth, including the Youth Employment Opportunities Project (KYEOP), the Youth Enterprise Development Fund (YEDF), Access to Government Procurement Opportunities (AGPO) Program, AGPO, ICT hubs, internship programs, and youth training and skills development, etc.

The national stakeholders selected youth unemployment disparity (SE3) to create opportunities for improving social equity performance. The government is implementing multiple interventions aimed at reducing disparity in youth employment. However, various challenges hinder youth unemployment, including youth perception of the type of employment (i.e., white collar vs. blue collar jobs), low entrepreneurship culture, inadequate tapping of talents and innovation, and inadequate resources for fully implementing government initiatives.

**Rating on social protection (SP): HIGH**

The national stakeholders listed several government initiatives supporting social protection, including social protection policy, providing cash transfers to the elderly, expanded Universal Health Care, affordable housing programs, and slum upgrading programs (i.e., Kenya Slum Upgrading Program).

Universal health coverage (SP2) and a Hyogo Framework (SP5) score were considered helpful in improving social protection performance. "A healthy population is a wealthy population" was the argument provided for the former indicator.

In the case of the latter indicator, scaling up disaster management will contribute to sustainable developments and strengthen economic, social, health, and environmental resilience. Various initiatives support the score of the Hyogo Framework (SP5), including early warning systems, National Disaster Risk Management 2017, improved disaster preparedness, national and county government coordination framework on disaster risk management, etc. Challenges to improving performance in the score of the Hyogo Framework include financing, high rate of non-communicable disease, requiring citizens to incur high costs, low uptake of health insurance, and unpredictable weather and climate conditions brought about by climate change.





# 6

## Conclusions

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### 6.1 Challenges and opportunities

Kenya's Green Growth Index score was 47.95 in 2022, a moderate score about halfway to achieving the sustainability targets. It provides the country enormous opportunities to achieve its development priorities, including sustainable infrastructure, building resilience, resource efficiency, social inclusion, and sustainable livelihoods, by improving green growth performance, particularly in green economic opportunities indicators. Kenya's performance was lowest in green economic opportunities compared to efficient and sustainable resource use, natural capital protection, and social inclusion dimensions. The Green Growth Index framework highlighted the interlinkages between the different green growth dimensions; hence, improving performance in green economic opportunities will positively impact the other dimensions. While the national stakeholders identified opportunities in efficient and sustainable resource use, natural capital protection, and social inclusion, they also highlighted the challenges requiring policy attention.

In the efficient and sustainable resource use dimension, the national stakeholders emphasized that rapidly growing urban areas pose a challenge to waste management and recycling. The Sustainable Waste Management Policy 2021 and the Sustainable Waste Management Act 2022 provide the framework for Kenya's transition to a circular economy, addressing material use efficiency. The Water Master Plan, under review, will highlight new technologies and opportunities for wastewater treatment and matching the demand and supply of water. Through these policies and plans, green innovation and investment in the waste sector will create an enabling environment to overcome the challenges posed by urbanization. Regarding natural capital protection, performance in biodiversity and ecosystem protection was the lowest at 29.76. Kenya has various initiatives supporting biodiversity and ecosystem protection: First, Kenya is among the nations that are ahead reviewing the NBSAPs; Second, the draft Green Fiscal Policy and Incentives Framework, currently under Cabinet review, will create fiscal and non-fiscal incentives to spur investments in natural capital and green goods and services; Third, the national landscape and ecosystem restoration strategy seeks to increase tree cover by 32 percent by 2032; and Fourth, the financial sector has adopted the Taskforce for Nature Related Financial Disclosure Framework to direct climate positive investments. Green innovation and green investment embedded in these initiatives would support biodiversity and ecosystem protection. Finally, the national stakeholders identified the country's high poverty level as the most significant challenge to social inclusion. They identified creating people's awareness of their rights and opportunities as a critical measure to reducing poverty. While existing legal frameworks (i.e., the Constitution and various policies) require that no more than two-thirds of a particular gender benefit from available opportunities, further initiatives and investments would be needed to implement them.

### 6.2 Policy recommendations

During the second participatory workshop, the national stakeholders identified several challenges needing policy attention based on their interpretation of the Kenya Green Growth Index scores. The following highlights these challenges for each green growth dimension:

- Efficient and sustainable resource use**
- In efficient and sustainable energy, the challenges include enabling environment/incentives to increase electricity demand; inadequate implementation of strategies due to limited resources; little synergy in data sharing and documentation; financial constraints to meet the capital-intensive nature of establishing renewable technology; limited robustness of the grid; implementation and management challenges and political environment and public acceptability.
  - In efficient and sustainable water use, the challenges include limited technical knowhow for farmers on water use efficiency; lack of farmer extension services; dilapidated and obsolete water infrastructure; water storage facilities (for water harvesting) are capital-intensive and not prioritized and implemented due to inadequate financial resources; low adoption of smart technology; and low compliance of policies and laws.
  - In sustainable land use, the challenges include land tenure system, land degradation, inadequate access to inputs; resource constraints (Human, material, and financial), poor agricultural practices, high dependence on rainfed agriculture, subsistence farming; impacts of climate change; land subdivision; and finance and resource constraints.
  - In material use efficiency, the challenges include costly waste and wastewater infrastructure, thus poor infrastructure for waste management; lack of prioritization, hence limited financing, because they are not considered as high-impact development issues; recycling technologies, finance, and resource constraints; porous borders for control of transboundary movement of plastic waste; weak enforcement of laws; and low consumer awareness.

In addition, the national stakeholders provided recommendations to improve green growth performance in the efficient and sustainable resource use dimension, including (1) Switching to energy-saving bulbs for lighting and cooking appliances and encouraging fuel-efficient vehicles, including hybrid vehicles and efficient transport systems, will help improve efficient and sustainable energy use; (2) Applying water-efficient irrigation systems and capturing rainwater, including the current water from the El Nino rains, have a high potential for saving and generating water for agriculture; (3) Embracing organic farming that taps organic fertilizer, readily available and relatively cheap, and differentiating between organic and inorganic products, providing incentives for organic farmers, will contribute to sustainable land use; and (4) Reducing single-use plastics and establishing material recovery facilities, recycling wastewater as well as managing postharvest losses from agricultural products will improve material use efficiency.

**Natural capital protection**

- In environmental quality, the challenges include lack of policy priorities, budgetary constraints, encroachment of riparian areas and water bodies, limited adoption of technologies to monitor air and water pollution levels, public acceptability of transitioning from fossil fuel-based transport, inadequate infrastructure, and limited fiscal incentives.
- In GHG emissions reduction, the challenges include the capital-intensive nature of renewable energy infrastructure, cultural values affecting interventions in AFOLU, and land subdivision impacts on agricultural productivity.
- In biodiversity and ecosystem protection, the challenges include invasive species, high encroachment rate in protected areas, increasing population and urbanization, rising human-wildlife conflict, high use of synthetic fertilizer, deforestation, and financial constraints.
- In social and cultural value, the challenges include impacts of climate change, low-value cultural goods, lack of data, and global crisis.

The national stakeholders did not provide specific recommendations for natural capital protection, but they referred to a comprehensive list of policy frameworks supporting Kenya’s performance in this dimension.

**Green economic opportunities**

- In green innovation, the challenges include limited resources to implement agricultural projects, low implementation of policies, insufficient climate finance funding for different

projects, costly implementation of renewable energy projects, and inadequate water resources for irrigation.

- In green trade, the challenges include lack of incentives, inadequate capacity, inadequate green financing, poor collaboration between circular economy and sustainability actors and financial institutions, lack of metrics to account for levels of sustainability, and lack of comprehensive integrative strategies to harmonize greening processes.
- In green employment, the challenges include a lack of financial resources to support formal training/skilled labor, technology transfer, and green production.
- In green innovation, the challenges include inadequate capacity to issue patents on green innovations and low awareness of patent issues.

The national stakeholders recommended that more policies are needed to support the export of technologies and implement value addition. Moreover, because the country is transitioning to a green economy, national stakeholders expect this to create more green employment opportunities. There is an opportunity to implement the National Science, Technology, and Innovation (STI) Policy and Strategy to facilitate the transformation of the economy from a factor-based to a knowledge-based and inclusive sustainable economy.

**Social inclusion**

- In access to basic services and resources, the challenges include rapid urbanization, exerting pressure on current water and sanitation, electricity and transport and communication infrastructure; weak management of water catchment areas; prevalence of non-revenue water; weak enforcement of legal and policy frameworks for water and sanitation; and high capital-intensive nature for generation of clean energy.

- In gender balance, the challenges include inequality in school enrolment due to cultural beliefs and norms, sanitation issues (i.e., low access to sanitary towels for girls), and inadequate school infrastructure, particularly in Arid and Semi-Arid Areas.
- In social equity, the challenges to youth employment included youth perception of the type of employment (i.e., white collar vs. blue collar jobs), low entrepreneurship culture, inadequate tapping of talents and innovation, and inadequate resources for fully implementing government initiatives.
- In social protection, the challenges to improve Hyogo Framework score include financing, high rate of non-communicable disease, requiring citizens to incur high costs, low uptake of health insurance, and unpredictable weather and climate conditions brought about by climate change.

The national stakeholders highlighted that improving water and sanitation access depends on strong water services institutions nationwide, frameworks, and regulatory authorities. According to them, there is a high potential for generating clean energy (i.e., from solar, wind, geothermal, and biogas). They also referred to several policy frameworks supporting Kenya’s performance in social inclusion.

**6.3 Next steps forward**

In addition to identifying project pipelines (section 6.2), the development of the Kenya Green Growth Index provides the groundwork for other policy-related initiatives, including the following:

- The Kenya Green Growth Index informs about the green growth indicators for measuring and tracking green growth performance. It will thus be helpful to update the Index scores every year. Proxy variables need to be replaced by the green growth indicators selected by national stakeholders in the coming years. The data availability of the excluded indicators in this first edition of the Green Growth Index due to insufficient data will need to be monitored, collected, and improved. The national stakeholders should also review the list of green growth indicators if more policy-relevant indicators become available.
- The Green Growth Index, which highlights the challenges and opportunities in the green growth transition, should be used to inform the future GESIP revisions. The trend and scores for the green growth indicators, pillars, and dimensions can inform the policy priorities in different sectors.
- The green growth indicators can be used in Kenya’s Medium Term Plan to improve the “greenness” of the development goals and targets. In addition to the SDG targets, national targets can also be used to benchmark the green growth indicators, enabling the tracking of performance against both SDG and MTP targets.
- Using the Green Growth Simulation Tool (GGSim), a complementary approach to the Green Growth Index, one can assess SDG co-benefits of policy interventions and green investments up to the year 2050. The data-driven and scenario-based assessments of SDG co-benefits can be integrated into the Green Growth Strategy, Low-Emission Development Strategy, National Adaptation Plan, etc. Like the Green Growth Index, GGsim’s applications follow a participatory approach to ensure the policy relevance of the results and facilitate capacity building among the national stakeholders.



## 7.1 Normalized scores for the green growth indicators

Table 9 Normalized scores for the green growth indicators, 2011-2022

Code	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
EFFICIENT AND SUSTAINABLE RESOURCE USE (ESRU)												
EE1	77.51	77.46	75.59	76.17	74.27	74.57	73.21	74.84	76.98	76.48	76.48	76.48
EE2	83.09	82.96	82.84	80.44	77.93	76.98	76.93	77.58	77.35	78.51	78.51	78.51
EE3	19.33	19.61	23.04	26.46	37.21	32.86	36.84	27.08	27.08	27.1	27.11	27.09
EE4	68.65	75.16	70.61	80.25	85.66	85.39	85.52	87.15	89.23	92.25	91.88	89.88
EE5	99.17	99.14	99.11	99.16	99.01	99.05	98.96	98.91	98.96	98.99	99.06	99.06
EW1	14.75	15.51	16.3	16.98	17.44	14.57	14.86	15.64	15.73	15.84	15.84	15.84
EW2	96.97	96.95	96.95	96.95	96.93	83.68	83.68	83.68	83.68	83.68	83.68	83.68
EW3	1.34	1.26	1.3	1.26	1.26	1.51	1.68	1.68	1.85	1.85	1.85	1.85
EW4	58.46	62.78	66.62	70.05	73.11	70.88	75.65	75.65	75.65	75.65	75.65	75.65
EW5	1.38	1.37	1.36	1.35	1.35	1.34	1.33	1.32	1.32	1.31	1.31	1.31
SL1	95.12	97.27	94.93	94.87	93.96	95.63	97.48	99.31	99.31	99.31	99.31	99.31
SL2	1.17	1.17	1.17	1.17	5.66	5.83	5.83	5.83	5.83	4.88	4.88	4.88
SL3	98.82	98.9	98.98	98.99	98.99	99	99.04	98.98	98.8	98.82	98.82	98.82
SL4	23.49	23.49	23.49	23.49	23.49	23.49	23.49	23.49	23.49	23.49	23.49	23.49
SL5	12.27	12.13	12.32	12.74	13.16	13.14	13.16	13.16	13.15	13.15	13.15	13.15
ME1	99.39	99.47	99.53	99.65	99.64	99.66	99.76	99.78	99.81	99.81	99.81	99.81
ME2	96.39	95.75	95.7	95.41	95.12	94.94	94.71	94.81	94.66	94.66	94.66	94.66
ME3	60.69	60.69	60.69	60.69	60.19	60.56	62.53	64.17	64.17	64.17	64.17	64.17
ME4	49.26	49.26	49.26	41.96	57.94	73.92	74.13	57.94	74.13	74.13	75.74	75.74
ME5	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03	4.03
NATURAL CAPITAL PROTECTION (NCP)												
EQ1	73.89	75.47	77.46	78.36	77.24	79.67	79.23	81.99	84.29	84.29	84.29	84.29
EQ2	61.27	61.8	62.66	63.35	64.68	65.56	65.68	65.68	65.5	65.5	65.5	65.5
EQ3	100	100	100	100	100	100	100	100	100	100	100	100
EQ4	99.9	98.74	98.18	95.92	95.78	95.64	96.88	98.64	99.88	99.94	99.89	99.28
EQ5	36.31	36.31	36.31	36.31	36.31	36.31	36.31	53.22	70.14	87.05	87.05	87.05
GE1	97.91	98.12	97.98	97.72	97.64	99.61	99.54	99.67	99.67	99.67	99.64	99.65
GE2	95.78	95.79	95.81	95.46	95.18	95.33	95.32	95.25	95.44	95.53	95.41	95.47
GE3	73.46	74.14	73.72	74.34	75.73	76.64	75.88	75.37	75.38	75.3	75.18	74.87
GE4	82.12	84.41	81.24	81.77	80.18	80.41	80.89	83.69	90.44	90.44	90.44	90.44
GE5	94.74	95.79	91.14	91.76	89.1	89.87	95.7	96.63	97.4	97.22	97.22	97.22
BE1	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24
BE2	37.81	37.62	37.43	37.23	37.39	37.34	37.65	37.95	37.95	37.95	37.95	37.95
BE3	60.8	60.8	60.8	60.8	60.8	60.8	60.8	60.8	60.8	60.8	60.8	60.8
BE4	1	1	1	1	1	1	1	1	1	1	1	1
BE5	12.43	12.47	12.52	12.55	12.63	12.69	12.74	12.76	12.79	12.79	12.79	12.79
CV1	100	100	100	100	100	100	100	100	100	100	100	100

# 7 Statistical Tables

- 7.1 Normalized scores for the green growth indicators 71
- 7.2 Aggregated scores for pillars, dimensions, and Green Growth Index 76

**Table 9** Normalized scores for the green growth indicators (continued)

Code	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
CV2	62.18	62.18	62.18	62.18	62.18	62.18	62.18	62.18	62.18	62.18	62.18	62.18
CV3	23.59	22.31	20.03	18.9	17.51	17.68	17.66	17.46	17.16	17.04	17.05	17.02
CV4	55.4	55.46	55.77	56.08	56.22	56.36	56.34	57.11	57.52	57.52	57.52	57.52
CV5	6.18	6.18	6.18	5.62	5.1	4.69	4.49	5.15	4.13	4.13	4.13	4.13
GREEN ECONOMIC OPPORTUNITIES (GEO)												
GV1	45.5	39.89	37.12	37.67	37.33	50.6	45.48	49.96	44.49	44.49	44.49	44.49
GV2	3.74	3.82	3.78	4.13	4.82	4.83	4.83	5.63	5.55	5.84	6.05	6.05
GV3	29.38	46.54	100	100	100	100	94.85	86.35	70.2	51.78	33.36	33.36
GV4	12.49	11.39	10.3	8.62	4.83	4.28	4.28	4.81	4.28	4.81	5.08	5.08
GV5	66.69	67.82	70.96	75.9	74.27	74.09	74.09	74.09	71.71	71.71	71.71	71.71
GT1	12.17	12.66	13.15	14.77	13.98	18.04	17.06	17.74	17.71	17.71	17.71	17.71
GT2	32.26	33.54	34.15	34.42	35.18	35.93	37.03	36.7	36.37	37.26	36.33	37.26
GT3	2.6	2.55	3.47	3.18	3.43	3.77	4.15	4.01	3.77	4.25	4.2	4.2
GT4	11.29	11.24	11.23	11.22	11.25	11.25	11.25	11.43	11.69	13.08	13.08	13.08
GT5	23.64	20.21	16.79	17.36	17.94	17.07	17.65	15.02	18.81	14.5	13.12	13.12
GJ1	40.38	41.81	43.24	45.97	48.7	47.65	47.5	47.5	47.5	47.5	47.5	47.5
GJ2	55.97	54.58	55.22	56.13	56.97	57.6	59.18	61.85	63.82	63.07	65.7	63.88
GJ3	30.32	30.54	31.99	32.83	33.47	34.14	34.79	35.63	36.42	36.03	36.43	36.43
GJ4	59.64	59.3	59.98	58.6	60.07	58.37	56.62	54.8	54.11	54.11	54.11	54.11
GJ5	51.15	49.93	62.2	46.29	63.61	61.41	66.11	60.61	63.37	63.36	60.06	60.06
GN1	5.38	3.6	3.06	3.05	2.86	3.34	5	6.41	12.27	12.27	12.27	12.27
GN2	6.07	5.82	6.21	6.53	6.47	6.98	7.52	7.76	7.76	7.76	7.76	7.76
GN3	26.62	26.62	26.62	26.62	26.62	26.62	26.62	26.62	26.62	26.62	26.62	26.62
GN4	28.48	34.38	32.87	35.22	34.8	34.16	33.1	32.01	33.96	34.54	34.54	34.54
GN5	5.64	5.64	5.64	5.64	5.64	5.96	6.27	6.52	6.24	6.21	6.21	6.21
SOCIAL INCLUSION (SI)												
AB1	29.13	29.42	29.71	30	30.29	30.58	30.87	31.16	31.44	31.73	31.47	31.56
AB2	19.74	21.03	22.38	20.57	23.79	30.11	32.43	35.56	40.92	42.23	44.75	44.75
AB3	70.31	70.25	69.06	67.87	64.47	61.36	57.81	56.8	53.75	49.85	49.85	49.85
AB4	16.27	16.27	16.27	16.27	16.27	16.27	16.27	16.27	16.27	16.27	16.27	16.27
AB5	27.02	27.02	27.02	27.02	27.02	27.02	42.71	45.58	50.49	60.6	57.6	57.6
GB1	20.44	20.44	20.44	38.9	40.03	40.03	39.47	44.12	44.12	44.12	43.79	43.96
GB2	96.66	97.43	97.89	98.2	98.21	98.22	98.23	98.23	98.22	98.22	98.22	98.22
GB3	100	100	100	100	100	100	100	100	100	100	100	100
GB4	61.73	64.46	67.16	69.84	74.37	74.68	75.6	75.3	76.26	76.82	76.82	76.75
GB5	100	92.77	93.46	93.9	95.41	96.9	100	100	100	100	100	100
SE1	80.63	81.61	82.57	83.51	84.49	84.49	84.49	84.49	84.49	84.49	84.49	84.49
SE2	81.13	82.33	83.41	84.27	81.38	88.96	90.89	92.38	94.81	94.5	94.5	94.5
SE3	78.45	76.19	73.4	69.77	67.02	71.2	71.61	67.88	75.8	68.86	68.86	68.86
SE4	83.12	83.28	83.44	83.58	83.89	84.36	84.81	85.13	85.45	85.83	86.25	85.5

**Table 9** Normalized scores for the green growth indicators (continued)

Code	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
SE5	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	2.24	1.77	1.77
SP1	25.55	25.55	25.55	25.55	25.55	25.55	14.07	14.07	14.07	14.07	14.07	14.07
SP2	33.91	34.73	35.56	36.4	37.27	36.93	36.57	35.49	35.39	35.29	36.2	36.2
SP3	46.53	46.55	47.42	48.3	49.17	50.04	50.04	50.04	50.04	50.04	50.04	50.04
SP4	93.6	93.41	92.78	92.28	92.44	94.21	92.11	94.16	93.83	92.87	89.98	89.98
SP5	52.93	52.93	52.93	52.93	58.33	58.33	58.33	58.33	58.33	58.33	58.33	58.33

## 7.2 Aggregated scores for pillars, dimensions, and Green Growth Index

**Table 10** Aggregated scores for pillars, dimensions, and Green Growth Index, 2011-2022

Code	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
EFFICIENT AND SUSTAINABLE RESOURCE USE (ESRU)												
EE	69.55	70.87	70.23	72.5	74.82	73.77	74.29	73.11	73.92	74.66	74.61	74.2
EW	34.58	35.57	36.51	37.32	38.02	34.4	35.44	35.6	35.65	35.67	35.67	35.67
SL	46.17	46.59	46.18	46.25	47.05	47.42	47.8	48.15	48.11	47.93	47.93	47.93
ME	61.95	61.84	61.84	60.35	63.39	66.62	67.03	64.15	67.36	67.36	67.68	67.68
GREEN ECONOMIC OPPORTUNITIES (GEO)												
GV	31.56	33.89	44.43	45.26	44.25	46.76	44.71	44.17	39.25	35.73	32.14	32.14
GT	16.39	16.04	15.76	16.19	16.35	17.21	17.43	16.98	17.67	17.36	16.89	17.07
GJ	47.49	47.23	50.52	47.96	52.56	51.83	52.84	52.08	53.04	52.81	52.76	52.4
GN	14.44	15.22	14.88	15.41	15.28	15.41	15.7	15.86	17.37	17.48	17.48	17.48
NATURAL CAPITAL PROTECTION (NCP)												
EQ	74.27	74.46	74.92	74.79	74.8	75.43	75.62	79.91	83.96	87.36	87.35	87.23
GE	88.8	89.65	87.98	88.21	87.57	88.37	89.47	90.12	91.67	91.63	91.58	91.53
BE	29.66	29.62	29.6	29.56	29.61	29.61	29.68	29.75	29.75	29.76	29.76	29.76
CV	49.47	49.23	48.83	48.56	48.2	48.18	48.13	48.38	48.2	48.17	48.18	48.17
SOCIAL INCLUSION (SI)												
AB	32.5	32.8	32.89	32.35	32.37	33.07	36.02	37.07	38.57	40.14	39.99	40.01
GB	75.77	75.02	75.79	80.17	81.6	81.96	82.66	83.53	83.72	83.83	83.76	83.79
SE	64.89	64.9	64.78	64.45	63.58	66.02	66.58	66.2	68.33	67.19	67.18	67.03
SP	50.5	50.63	50.85	51.09	52.55	53.01	50.22	50.42	50.33	50.12	49.72	49.72
DIMENSIONS												
ESRU	53.06	53.72	53.69	54.1	55.82	55.55	56.14	55.25	56.26	56.41	56.47	56.37
NCP	60.55	60.74	60.33	60.28	60.04	60.4	60.73	62.04	63.4	64.23	64.21	64.17
GEO	27.47	28.09	31.4	31.21	32.11	32.8	32.67	32.27	31.83	30.84	29.82	29.77
SI	55.91	55.84	56.08	57.01	57.52	58.52	58.87	59.3	60.24	60.32	60.16	60.14
<b>Index</b>	<b>43.9</b>	<b>44.34</b>	<b>45.18</b>	<b>45.44</b>	<b>46.03</b>	<b>46.42</b>	<b>46.77</b>	<b>46.82</b>	<b>47.49</b>	<b>47.54</b>	<b>47.73</b>	<b>47.95</b>



# Annexes

<b>Annex 1</b>	Stepwise Analytical Approach
<b>Annex 2</b>	Robustness check
<b>Annex 3</b>	Results of the first online survey with national stakeholders
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<b>Annex 8</b>	List of stakeholders
<b>Annex 9</b>	List of reviewers
<b>Annex 10</b>	GGGI/GGPM Team

# Annex 1

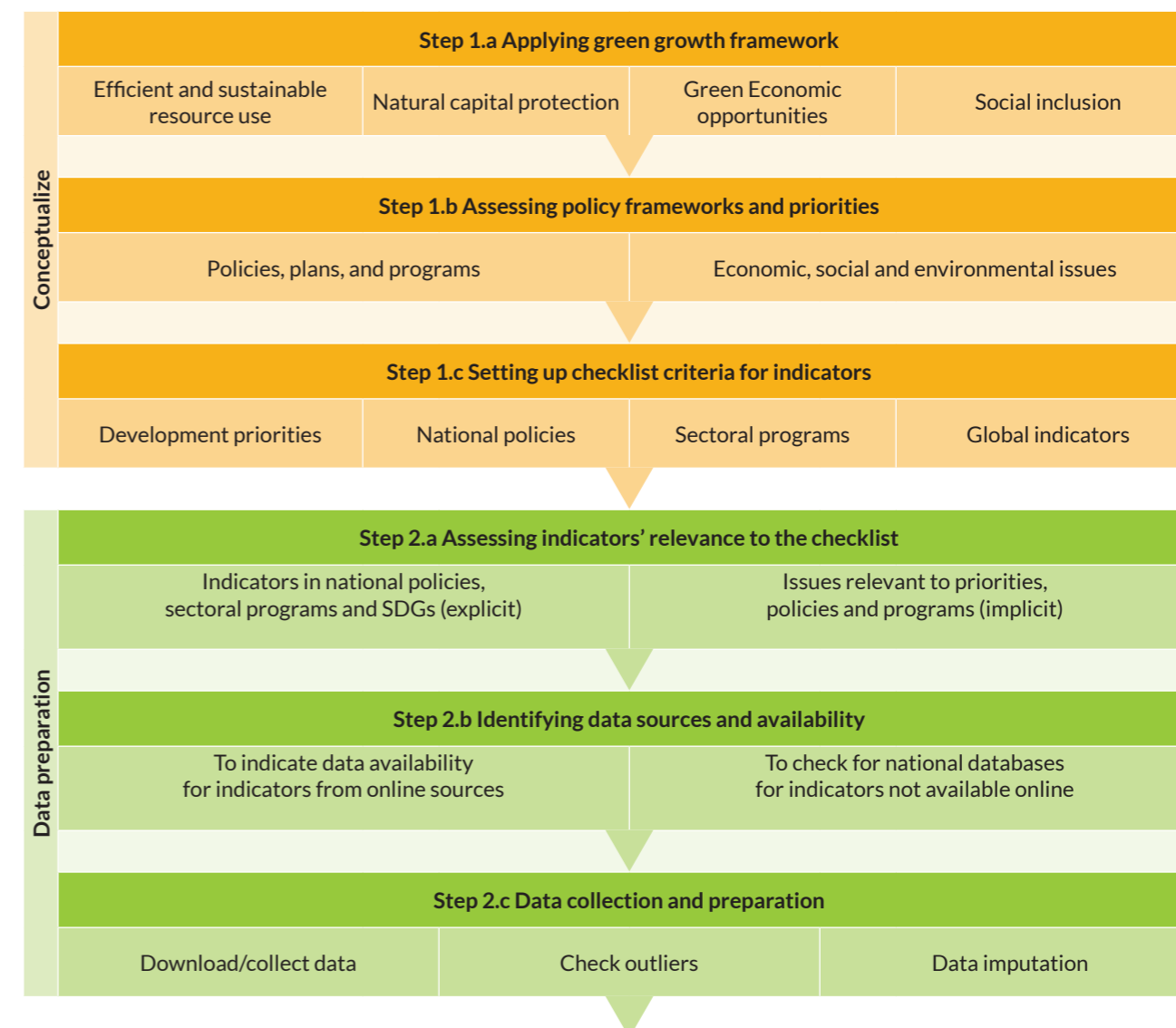
## Stepwise Analytical Approach

The methods applied in the report have three components – concept, data preparation, and data analysis (Figure 13). Each component consists of three steps, which are described below.

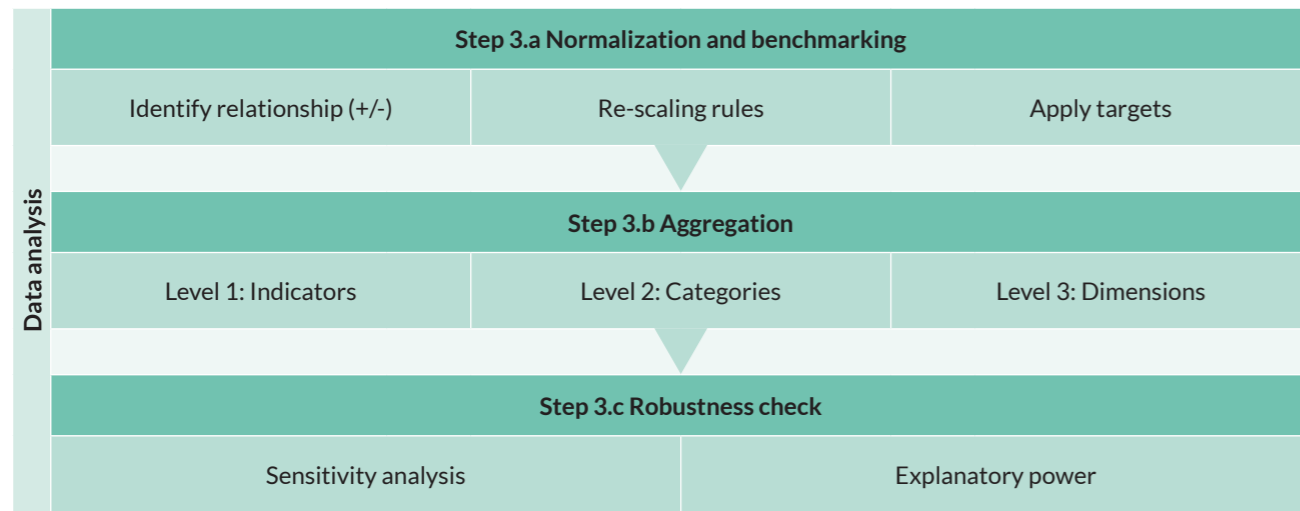
The steps for the concept include applying the framework (Step 1.a), assessing policy frameworks and priorities (Step 1.b), and setting up checklist criteria for the indicators (Step 1.c). In Step 1.a, the framework for the Green Growth Index, discussed in Chapter 1

(Figure 1), was applied to guide the selection of the indicators and to organize the indicator selection systematically. In Step 1.b, policy frameworks and priorities in Kenya were identified by assessing policy documents, sectoral programs, and relevant literature. The assessment results, providing useful knowledge to form the criteria for the next step, are presented in Chapter 3. In Step 1.c, the checklist criteria were set up to guide the selection of the green growth indicators.

**Figure A.1** Stepwise approach to develop the Kenya Green Growth Index



**Figure A.1** Stepwise approach to develop the Kenya Green Growth Index (continued)



The steps for the data preparation include assessing indicators' relevance to the checklist (Step 2.a), identifying data sources and availability (Step 2.b), and collecting and preparing data (Step 2.c). Step 2.a dealt with assessing the green growth indicators, whether directly or indirectly linked to the checklist criteria. The assessment results are presented in Chapter 4. Step 2.b focused on finding data for the green growth indicators previously identified in Step 1. The results on the inventory of data sources and availability are presented in Chapter 4. Step 2.c is essential before the data analysis because checking for outliers ensures that data is accurate, and imputing data corrects for data gaps. Inaccuracy and gaps in data will affect the aggregated scores of the indicators.

The steps for the data analysis include normalization and benchmarking of data (Step 3.a), aggregation of normalized indicators (Step 3.b), and robustness check of the scores (Step 3.c). In Step 3.a, data were normalized to transform the units of the indicators into the same numerical scale, i.e., 1-100. Benchmarking integrates sustainability targets in the normalized scores, allowing interpretation of distance to targets, i.e., a score of 100 implies the targets have been achieved for the indicators. Step 3.b follows the aggregation of normalized indicators at different levels to facilitate interpretability of results, e.g., at the pillar, dimension, and overall scores. Step 3.c is essential to check the robustness of the selected indicators and the relevance of the results to green growth.

### A.1.1 Concept

#### Step 1.a Green growth framework

The objective in Step 1.a is to use the Green Growth Index framework to guide the selection of green growth indicators. Without a framework, the indicators may not be aligned with the

challenges and opportunities for green growth transition. The framework for the Green Growth Index consists of four dimensions – efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion (Figure 1). Each dimension in the green growth framework is represented by four sustainability pillars, which are essential considerations for transitioning to green growth pathways. The efficient and sustainable resource use dimension covers energy, water, land use, and waste and material use. The natural capital protection dimension includes improving environmental quality, reducing GHG emissions, protecting biodiversity and ecosystem, and preserving cultural and social value. The green economic opportunities dimension includes investment, trade, innovation, and employment. The social inclusion dimension includes access to basic services and resources, gender balance, social equity, and social protection.

#### Step 1.b Policy frameworks and priorities

The objective in Step 1.b is to identify green growth indicators that are emphasized in documents published by the government and issues that indicate priorities as well as challenges and opportunities for sustainable development in Kenya. In the case of the latter, policy documents such as Kenya Vision 2030, Green Economy Strategy and Implementation Plan (GESIP) 2016-2030, Big Four Agenda, Nationally Determined Contributions (NDC), National Climate Change Action Plan (NCCAP), and Fifth National Report to the Conference of Parties to the Convention on Biological Diversity (NBSAP) have been reviewed. At the sectoral level, the reviews focused on sectors like energy, agriculture, forest, health, transport, and environment. Development priorities can also provide knowledge on the green growth indicators that must be considered when assessing green growth transition. In addition to the policy documents, relevant literature was reviewed to understand the

social, economic, and environmental contexts that underpin challenges and opportunities for sustainable development in Kenya.

#### Step 1.c Checklist criteria

The objective in Step 1.c is to set up checklist criteria based on the knowledge generated from the assessment of policy frameworks and development priorities. Five checklists were identified and provided the rationale for selecting the green growth indicators.

**Checklist 1:** Policies relevant to economic development and climate actions provide information on the goals and targets of the government to overcome challenges and maximize opportunities, including those mentioned in the national policy documents (i.e., Vision 2030, GESIP 2016-2030, Big Four Agenda, NDC, NCCAP, and NBSAP).

**Checklist 2:** Programs and strategies implemented for different sectors to support the achievement of national goals and targets, including Sustainable Energy for All (SE4All)- Kenya Action Agenda 2016, Kenya National Energy Efficiency and Conservation Strategy 2020, National Energy Policy 2018, Agricultural Policy 2021, Policy on Revitalization of the Sugar Industry 2023, Kenya National REDD+ Strategy, Forest Policy of Kenya 2014, Kenya Health Policy 2012-2030, Policy Action Plan for Transport Services, and National Environment Policy 2013.

**Checklist 3:** National issues that are considered priorities for sustainable development in Kenya, including promotion of sustainable infrastructure, resilience building, promotion of



resource efficiency, and social inclusion and sustainable livelihoods.

**Checklist 4:** Climate actions can be aimed at reducing GHG emissions through mitigation or increasing the resilience of the society and ecosystem through adaptation.

**Checklist 5:** Global issues that UN Member Countries commit to address, particularly those in the Sustainable Development Goals (SDGs). Due to the lack of indicators for green economic opportunities in the SDGs, the Global Green Growth Index was also considered in the list of criteria to address this gap in green growth indicators.

### A.1.2. Data preparation

#### Step 2.a Relevance to the checklist

The objective in Step 2.a is to create a checklist table informing about the relevance of the green growth indicators to the criteria (Table 2). The two categories for relevance are direct and indirect. Direct relevance, represented by the icon  in the checklist table, indicates that the indicators directly correspond to the criteria, i.e., with the same names and measurement units as mentioned in the documents. Indirect relevance, represented by the icon , indicates that indicators have been implied from the documents without mentioning names and measurement units. In the case of indirect relevance, the selected indicators were based on expert judgment. Table 2 provides an example of the checklist table for the five efficient and sustainable energy indicators. It summarizes the indicators' presence and level of relevance to the five criteria described in Step 1.c.

**Table A.1** Checklist for the green growth indicators in efficient and sustainable energy

Indicator code	National Policies						Development Priorities	Climate action		Global issues					
	Vision 2030	8NDP	NPCC	NDC	NAP	NBSAP		polices	ECON	HUMA	ENVI	NEXU	MITI	ADAP	GG Index
EE1															
EE2															
EE3															
EE4															
EE5															

Legend:  direct relevance, explicit mention of the indicator with the same measurement unit  indirect relevance, implicit mention of the indicator with no relevant unit

Notes: INFR - sustainable infrastructure, RESI - resilience building, RESO - resource efficiency, and SOCI - social inclusion and sustainable livelihoods  
MITI - climate mitigation, ADAP - climate adaptation, GG Index - Green Growth Index, SDG - Sustainable Development Goals



most important methods to prepare the data and improve the comparability of the indicators. Scaling the data by an appropriate denominator (e.g., population, GDP, land area, etc.) allows an objective comparison across countries. Although the assessment focused on Kenya, normalization and benchmarking required global data. Imputing data based on available time-series data helps improve the country's coverage of the indicators. To minimize the effects of imputation on data uncertainty, the simple method of imputing data from the closest years was applied. The most essential methods to validate the indicator data's statistical appropriateness are checking for outliers and correlation. Since outliers can distort the indicators' statistical properties and normalized values, they were capped using lower or upper fences based on the interquartile range (IQR) from the 75th and 25th percentiles. The correlation analysis aims to identify redundant indicators with very strong correlations to improve the explanatory power of the indicators and verify whether indicators have acceptable levels of association in their respective dimensions.

### A.1.3. Data analysis <sup>9</sup>

#### Step 3.a Normalization and benchmarking

The objective in Step 3.a is to transform the data so that the indicators have the same units of measurement and facilitate the interpretation of the results. It is necessary to apply a normalization method to translate the indicators with different units into a standard scale. Normalization allows the indicator values measured in different units to be adjusted to a single scale to make the data comparable across the indicators. The re-scaling method (min-max transformation) for normalization was applied for the following reasons: it is the simplest and most widely used method that will facilitate ease of comprehensibility and replication; using upper and lower bounds will reduce issues related to outliers; and integrating targets will allow benchmarking against sustainability targets. Through benchmarking, the indicators are assigned values between 1 and 100, where a score of 100 implies that the target for a given indicator has been achieved. For the SDG indicators, sustainability targets are based on explicit or implicit SDG targets. For non-SDG indicators, sustainability targets are represented by the average values of the top five performing developing countries.

#### Step 3.b Aggregation of normalized indicators

The objective in Step 3.b is to aggregate the indicators' scores to provide an overall score for the four green growth dimensions – efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion. The two most common and straightforward aggregation methods include linear aggregation using arithmetic mean and geometric aggregation using geometric mean. These two methods have different underlying assumptions. Linear aggregation allows full and constant compensability, i.e., low values in one indicator can be traded off (substituted) by high values in another. On the other hand, geometric aggregation allows only partial compensability, limiting the ability of the indicators with very low scores to be fully compensated by indicators with high scores. The two methods were applied in the different aggregation models so that, as the level of aggregation increases, the level of substitutability decreases:

**Level 1:** Arithmetic mean was applied to linearly aggregate the normalized indicators, allowing compensability of the individual indicators in each pillar.

**Level 2:** Geometric aggregation was applied to the pillars to allow only partial compensability between indicators in each dimension.

**Level 3:** Geometric aggregation was applied to the dimensions. No dimension was allowed to substitute the other dimensions.

#### Step 3.c Robustness check

The objective in Step 3.c is to evaluate the confidence level of the scores. Composite indices often face criticism because they can be misleading if poorly constructed and interpreted. Thus, the final critical step in developing a composite index is evaluating the confidence in the model and its underlying assumptions (i.e., robustness check). Two methods were applied: First, to check the sensitivity of the aggregated scores to changes in the input variables of the aggregation models. Monte Carlo methods, an easy and efficient class of algorithms often used for sensitivity analysis, were used to simulate perturbations to the Kenya Green Growth Index, estimating its sensitivity to the changes in the values and missing values of the indicators. Each simulation is run 1000 times, and each run's number was determined empirically. Second, to check the explanatory power, regression models are applied to analyze the ability of the indicators to explain the structure of dimension scores. The regression analysis was conducted to identify the extent to which the indicators' variance explains the Green Growth Index scores.

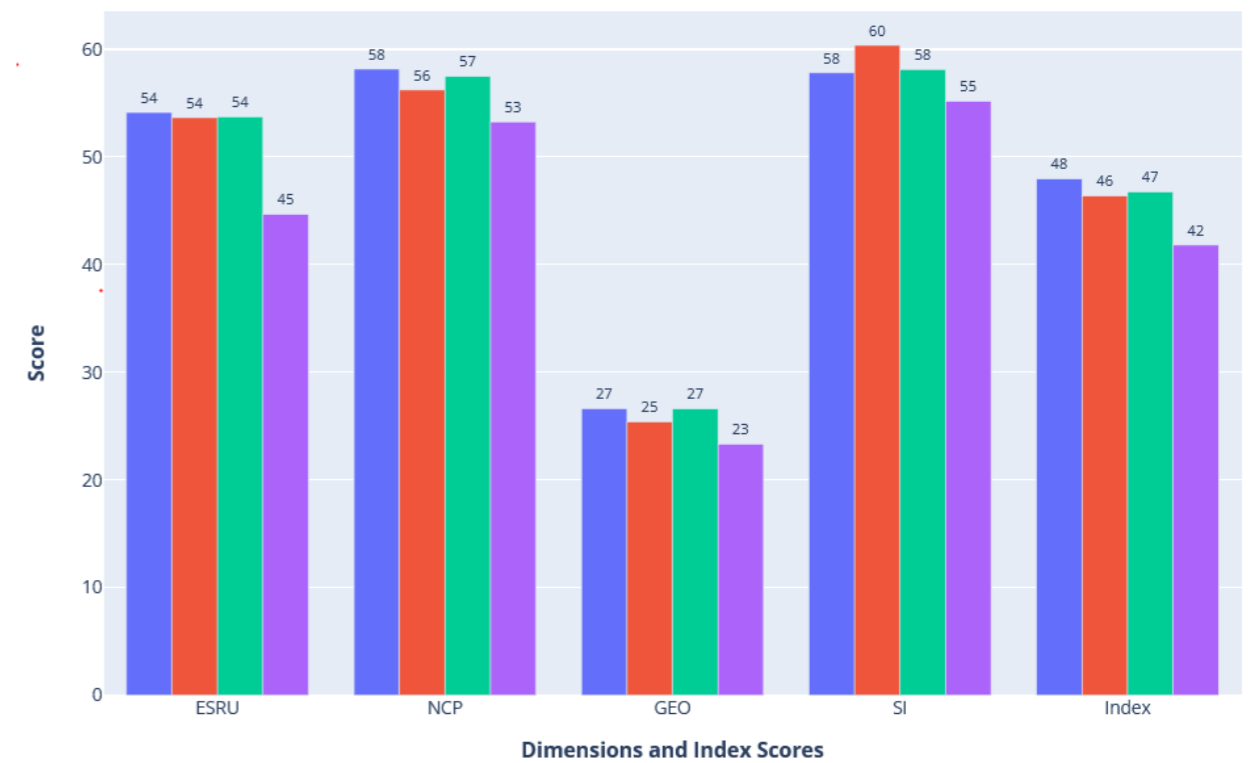
## Annex 2 Robustness check

Two methods were applied to check the robustness of the Green Growth Index - Monte Carlo and regression analyses.

The Monte Carlo analysis was applied to check the sensitivity of the Green Growth Index, evaluating its model's confidence level and underlying assumptions. Specifically, it measures the relative contribution of uncertainties in the data inputs to the output variance. It aims to assess the stability and reliability of the Green Growth Index by introducing uncertainties to the models, including 10 percent missing data (scenario 1), 10 percent changes in variable values (scenario 2), and a combination of both (scenario 3). The scenario on missing data aims to check the impacts of data gaps in several indicators. The scenario on the changes in the values of the indicators aims to check the effects of using alternative databases, which have different values in some data points.

Figure A.2 presents outcomes derived from the analysis, providing a detailed insight into the Green Growth Index's robustness across various scenario analyses. Introducing a 10 percent missing value resulted in contrasting results for green economic opportunities and social inclusion, with the former decreasing and the latter increasing the dimension score by 2 points. The effects of this scenario on the score are relatively small. Introducing a 10 percent change in the variable values resulted in a lesser impact on the dimension and Index scores. However, combining a 10 percent missing value and a 10 percent change in the variable values showed relatively higher changes in the scores, albeit only for the efficient and sustainable resource use dimension and Green Growth Index, decreasing the former by 9 points and the latter by 5 points. These results indicate that the dimension and Index scores are relatively robust to various uncertainties.

Figure A.2 Results of the Monte Carlo analysis to check sensitivity of the dimension and Index scores



■ Actual scores of Green Growth Index  
■ Analyzed scores with 10% missing data (a)  
■ Analyzed scores with 10% changes in values (b)  
■ Combined analyzed scores for (a) and (b)

Table A.2 Results of the regression analysis of pillar and dimension scores

Codes	Pillar Names	Coefficient	Standard Error	P-Value
<b>MODEL 1 EFFICIENT AND SUSTAINABLE RESOURCE USE: R2 = 1.000, ADJ. R2 = 1.000</b>				
EE	Efficient and Sustainable Energy	0.1741	0.003	0.000
EW	Efficient and Sustainable Water Use	0.3719	0.003	0.000
SL	Sustainable Land Use	0.2953	0.005	0.000
ME	Material Use Efficiency	0.2079	0.002	0.000
<b>MODEL 2 NATURAL CAPITAL PROTECTION: R2 = 1.000, ADJ. R2 = 1.000</b>				
EQ	Environmental Quality	0.1734	0.006	0.000
GE	Greenhouse Gas Emissions Reduction	0.1590	0.001	0.000
BE	Biodiversity and Ecosystem Protection	0.6188	0.097	0.000
CV	Cultural and Social Value	0.2739	0.008	0.000
<b>MODEL 3 GREEN ECONOMIC OPPORTUNITIES: R2 = 0.999, ADJ. R2 = 0.999</b>				
GV	Green Investment	0.1738	0.003	0.000
GT	Green Trade	0.4480	0.034	0.000
GJ	Green Employment	0.1287	0.010	0.000
GN	Green Innovation	0.4025	0.024	0.000
<b>MODEL 4 SOCIAL INCLUSION: R2 = 0.967, ADJ. R2 = 0.948</b>				
AB	Access to Basic Services and Resources	0.3728	0.006	0.000
GB	Gender Balance	0.1777	0.003	0.000
SE	Social Equity	0.2318	0.008	0.000
SP	Social Protection	0.2509	0.010	0.000

The regression analysis was applied to assess the ability of the aggregated green growth indicators at the pillar level to explain the variation in the dimension scores. The analysis consisted of four regression models corresponding to the four green growth dimensions - efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion. The models used cross-sectional and longitudinal global data covering 2010 to 2022. The P-value data resulting from the regression analysis are presented in Table 10, where a P-value less than 0.05 shows statistical significance. All pillars in the four green growth dimensions have P-values less than 0.05, indicating high

statistical significance. R-squared values suggest that the variance in independent factors (green growth pillars) explains between 95 and 100 percent of the variance in dependent variables (i.e., green growth dimensions). These results support the Kenya Green Growth Index's robustness. The pillars contributing most to the variations in the dimensions scores include efficient and sustainable resource use in the efficient and sustainable resource use dimension, biodiversity and ecosystem protection in the natural capital protection dimension, green trade in the green economic opportunities dimension, and access to basic services and resources in the social inclusion dimension.

# Annex 3

## Results of the first online survey with national stakeholders

Table A.3 Checklist for the green growth indicators in efficient and sustainable energy

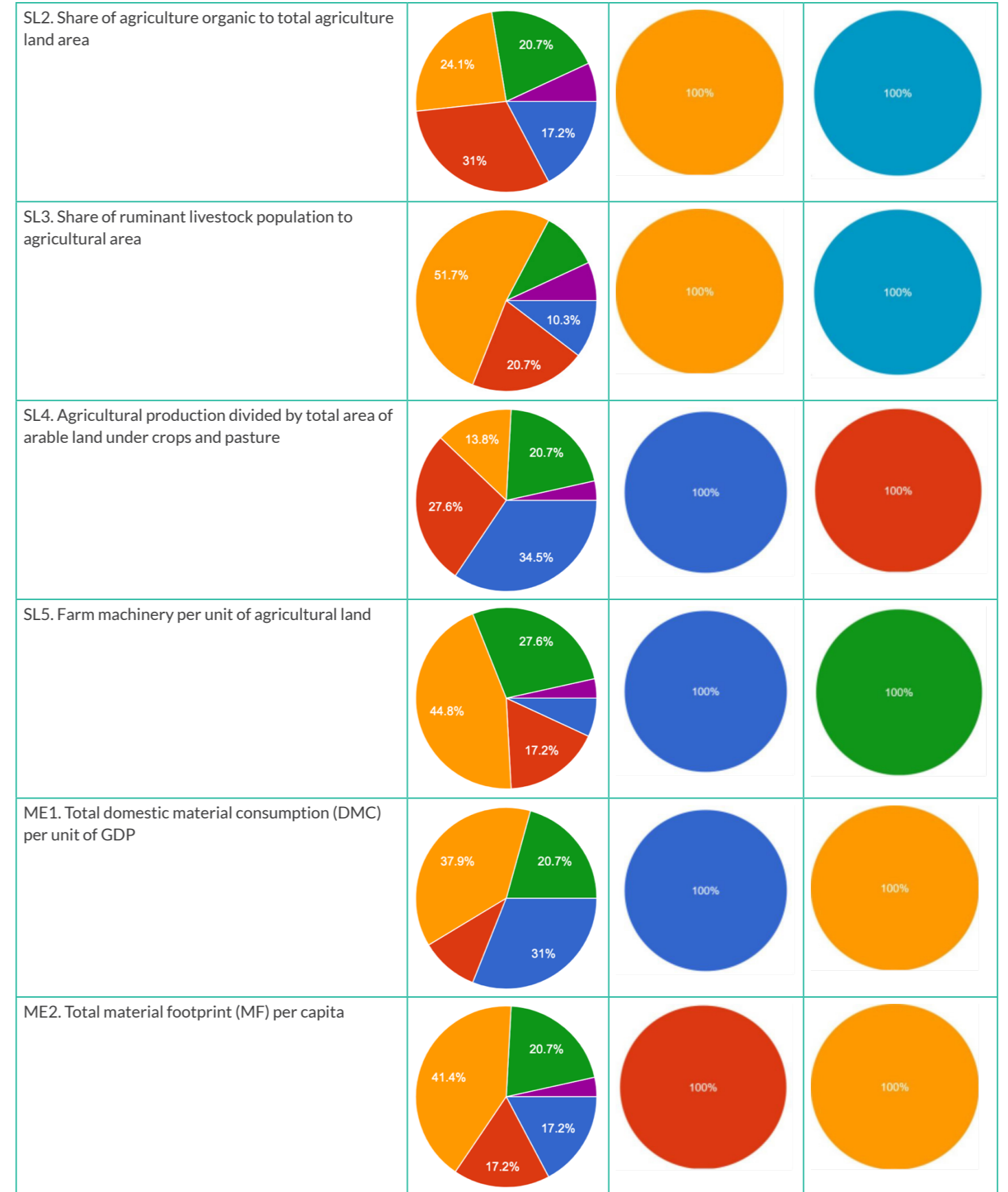
Indicators	Individual online surveys (29 experts)	Breakout sessions during 1st participatory workshop	
		Group 1	Group 2
EE1. Ratio of total primary energy supply to GDP, or energy intensity level of primary energy			
EE2. Share of renewable to total final energy consumption			
EE3. Logistics performance index: Quality of trade and transport-related infrastructure			
EE4. Electricity generation from renewables			
EE5. Per capita electricity consumption			

Legend:

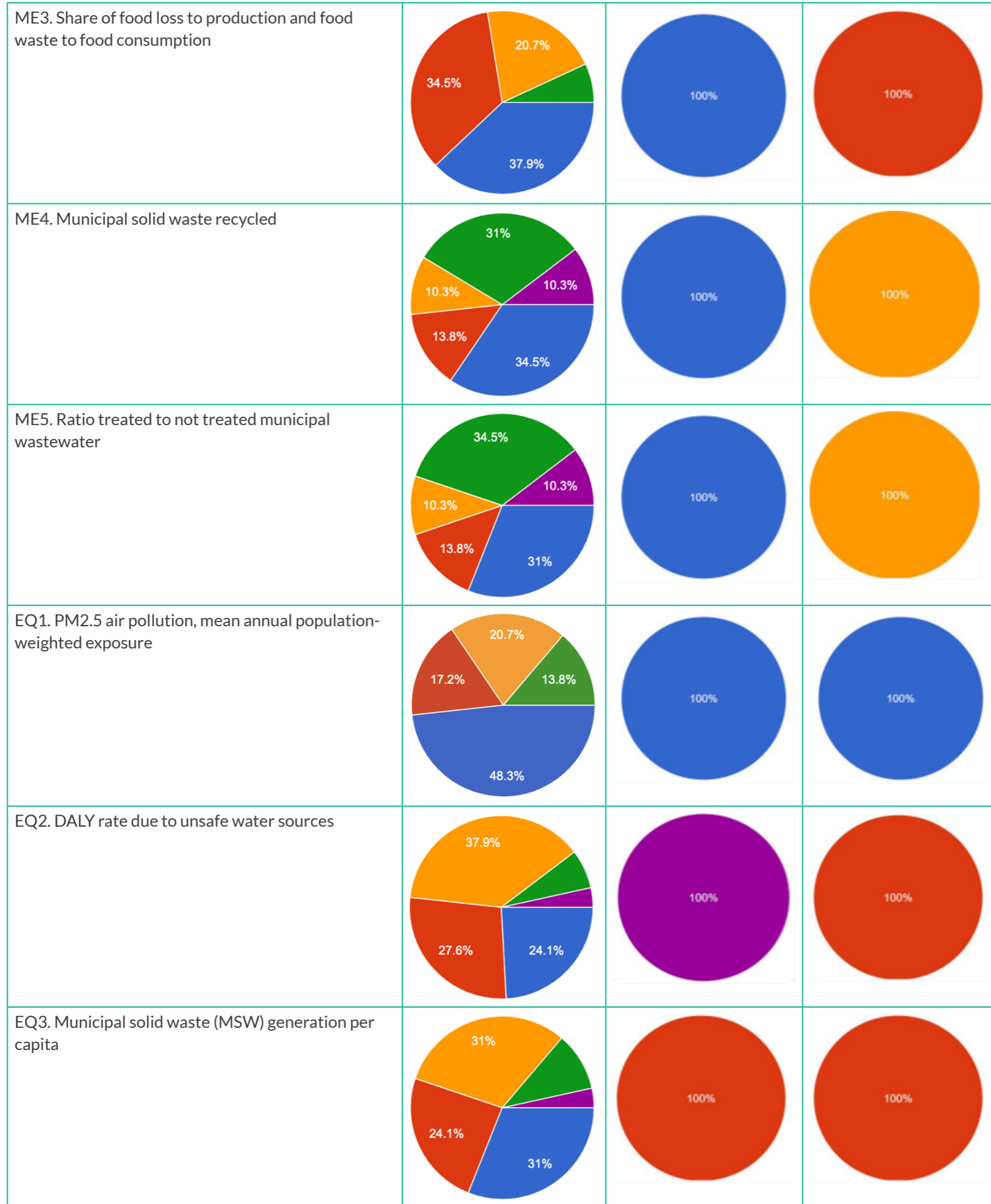
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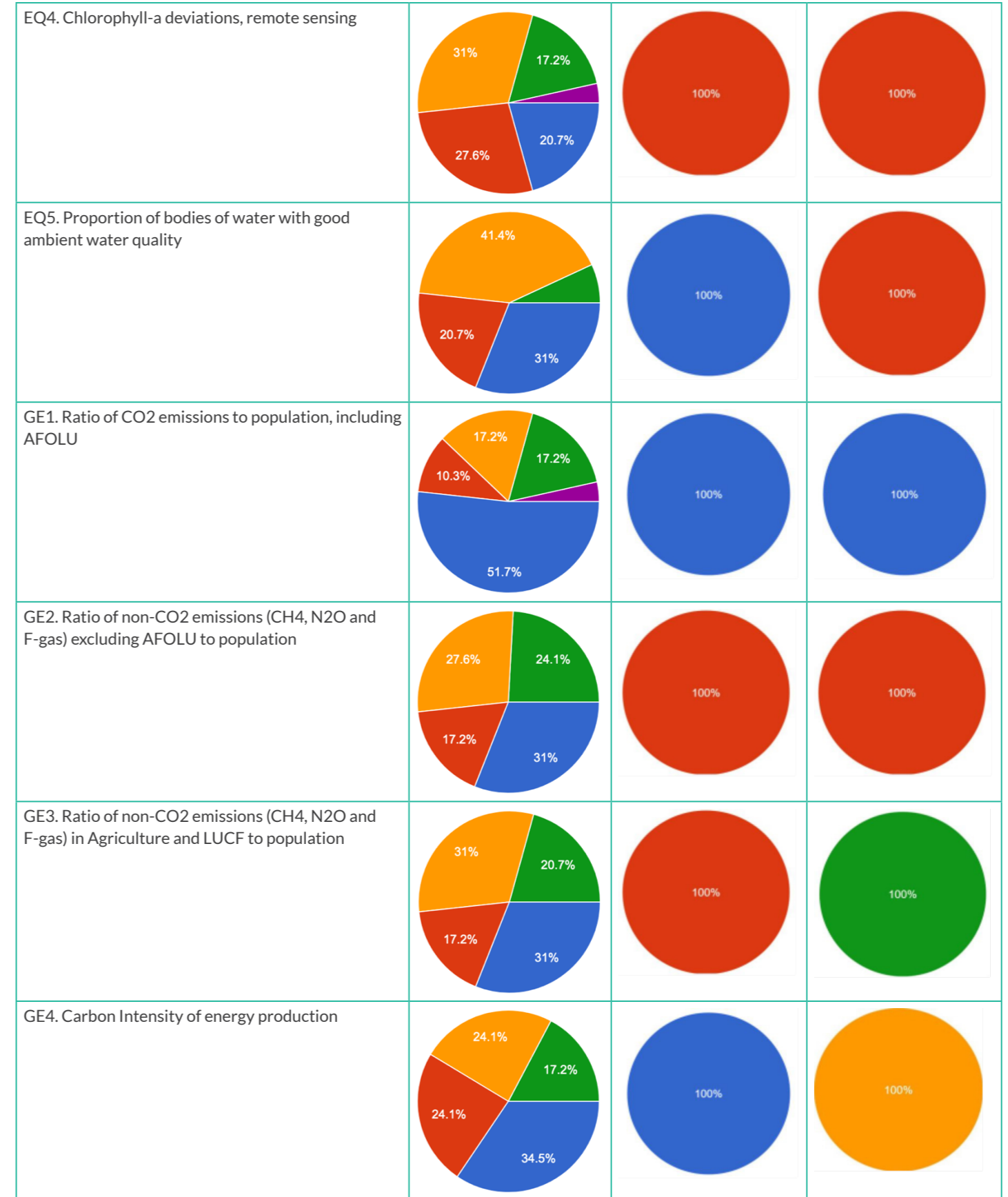
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Legend:  
● Very High ● High ● Moderate ● Low ● Very Low ● Not relevant



Legend:  
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GE5. Carbon dioxide emissions per unit of manufacturing value added			
BE1. Average proportion of Key Biodiversity Areas covered by protected areas			
BE2. Share of forest area to total land area			
BE3. Above-ground biomass stock in forest			
BE4. Forest area under an independently verified forest management certification scheme			
BE5. Change in the extent of water related ecosystems over time: Lakes and rivers permanent water areas			

Legend: ● Very High ● High ● Moderate ● Low ● Very Low ● Not relevant

CV1. Red list index			
CV2. Share of terrestrial and marine protected areas to total territorial areas			
CV3. International tourism, receipts			
CV4. Plant genetic resources accessions stored ex-situ to total agricultural area			
CV5. Share of exports of cultural goods to exports of total goods			
GV1. Ratio of adjusted net savings to GNI, including particulate emissions damage			

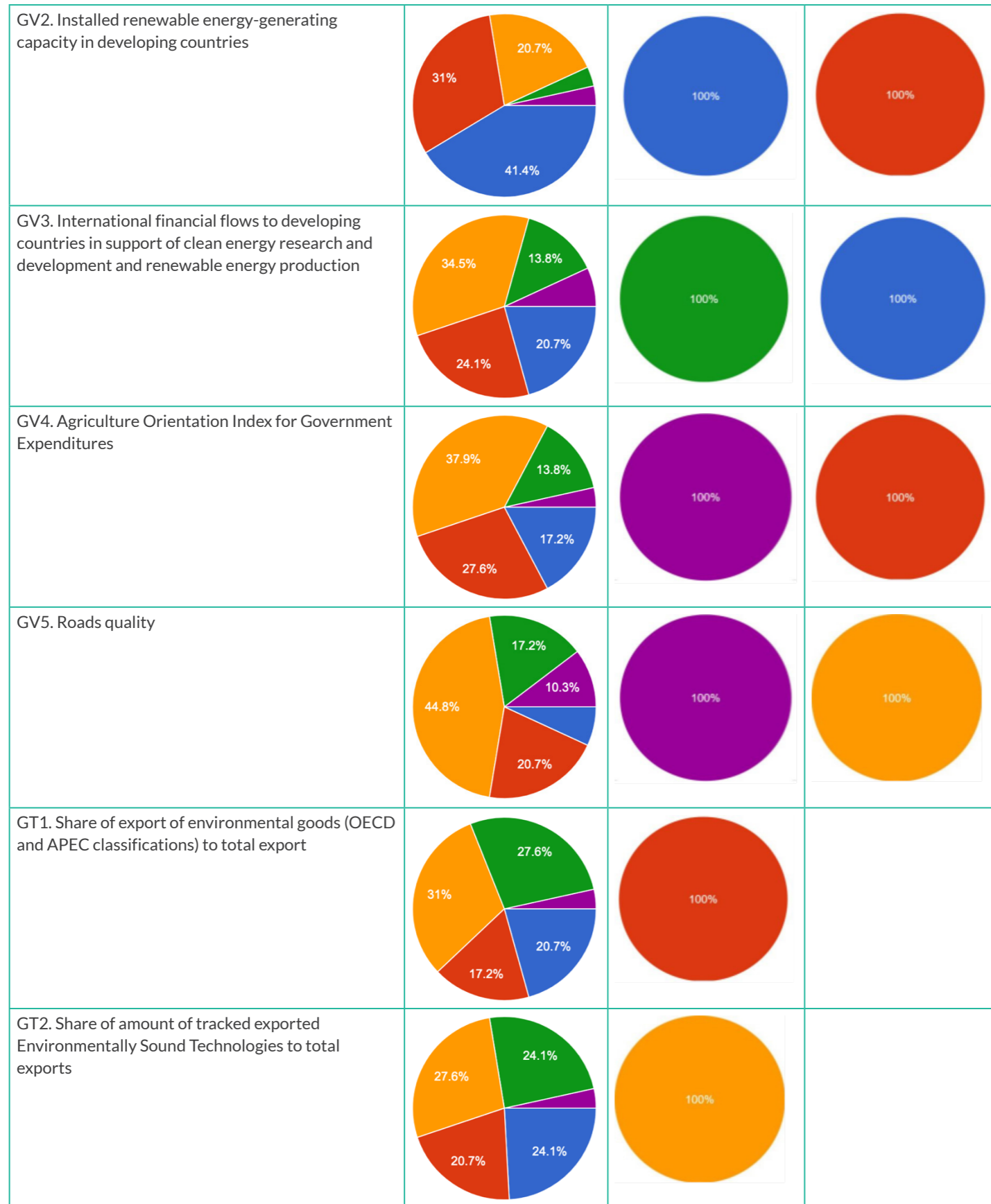
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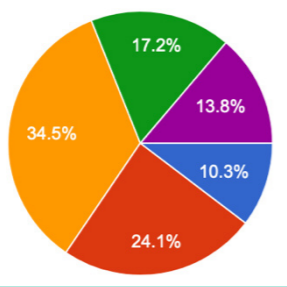
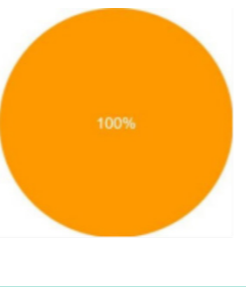
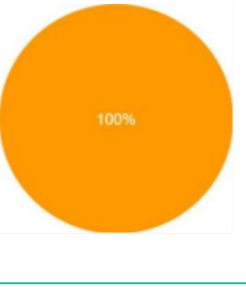
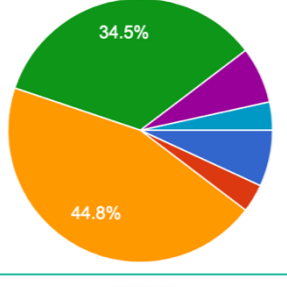

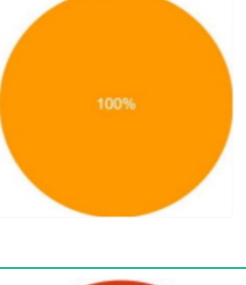
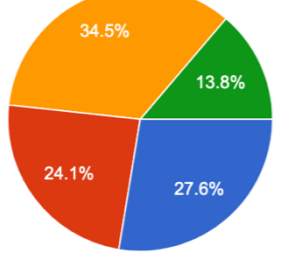

GJ4. Firms offering formal training			
GJ5. Volume of official development assistance flows for scholarships by sector and type of study			
GN1. Share of patent publications in environmental technology to total patents			
GN2. Annual articles published in scientific and technical journals per million people			
GN3. Researchers (in full-time equivalent) per million inhabitants			
GN4. Proportion of medium and high-tech industry value added in total value added			

Legend:  
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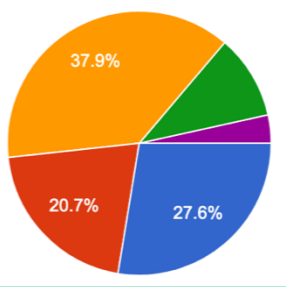
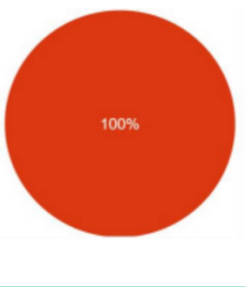
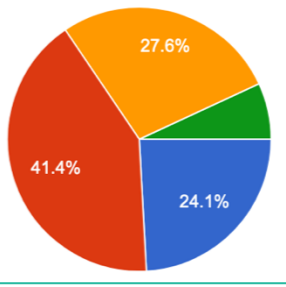
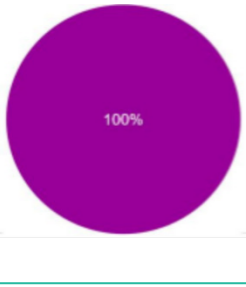
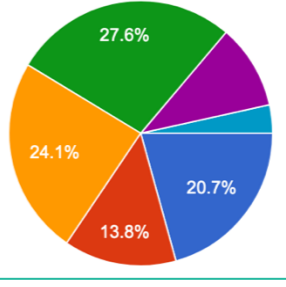
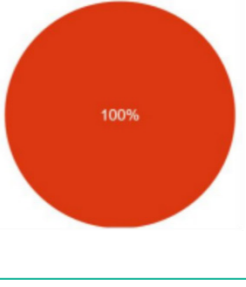
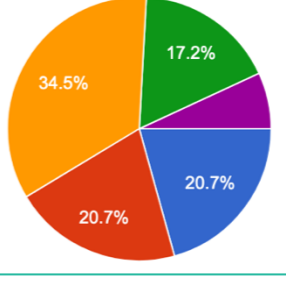
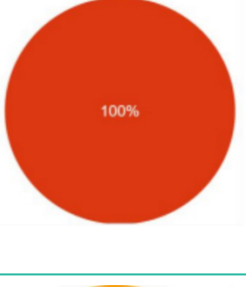
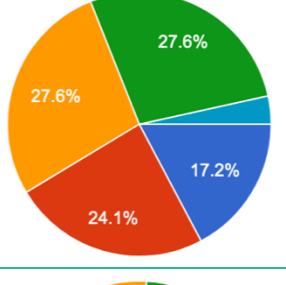
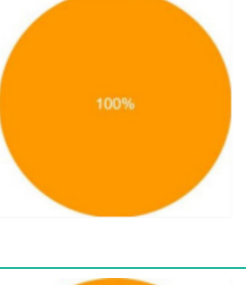
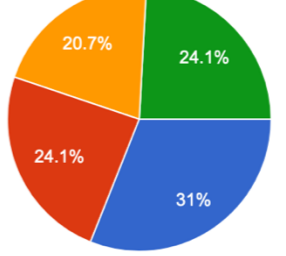
GN5. Trademark applications, direct resident			
AB1. Population with access to safely managed water and sanitation			
AB2. Population with access to electricity and clean fuels			
AB3. Prevalence of undernourishment			
AB4. Proportion of population that has convenient access to public transport			
AB5. Property rights			

Legend:  
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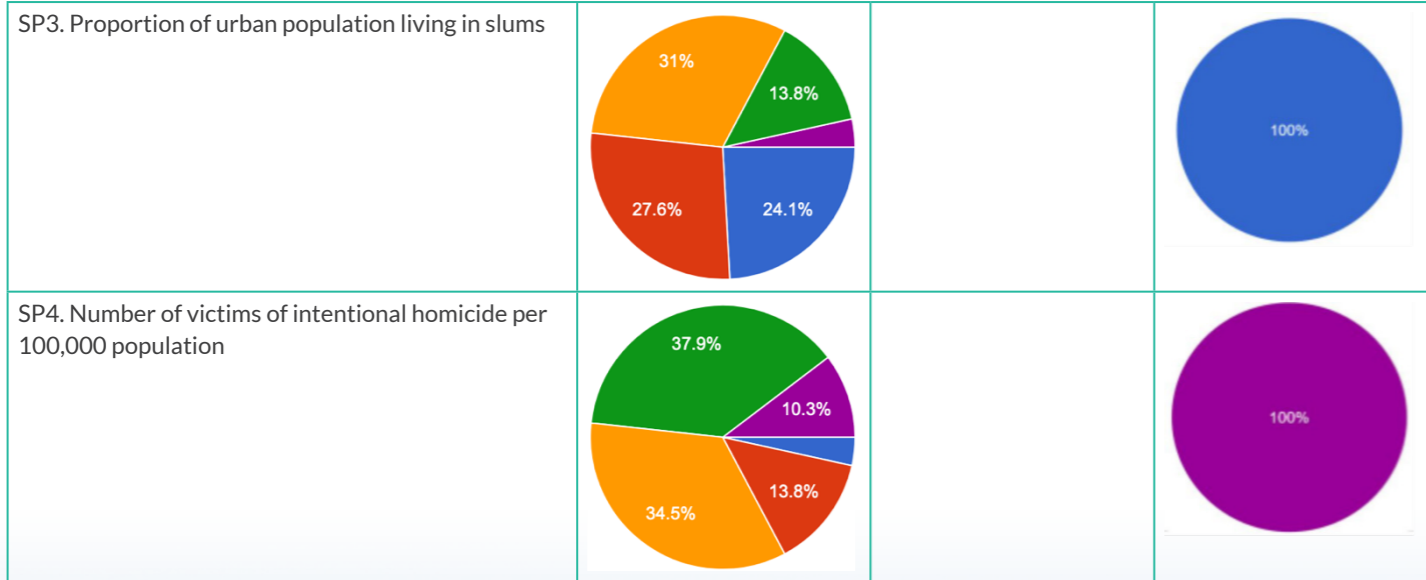


GB1. Proportion of seats held by women in national parliaments			
GB2. Gender ratio of account at a financial institution or mobile-money-service provider			
GB3. Getting paid, laws and regulations for equal gender pay			
GB4. Proportion of mothers with newborns receiving maternity cash benefits			
GB5. School enrollment, primary (gross), gender parity index (GPI)			
SE1. Inequality in income based on Palma ratio			

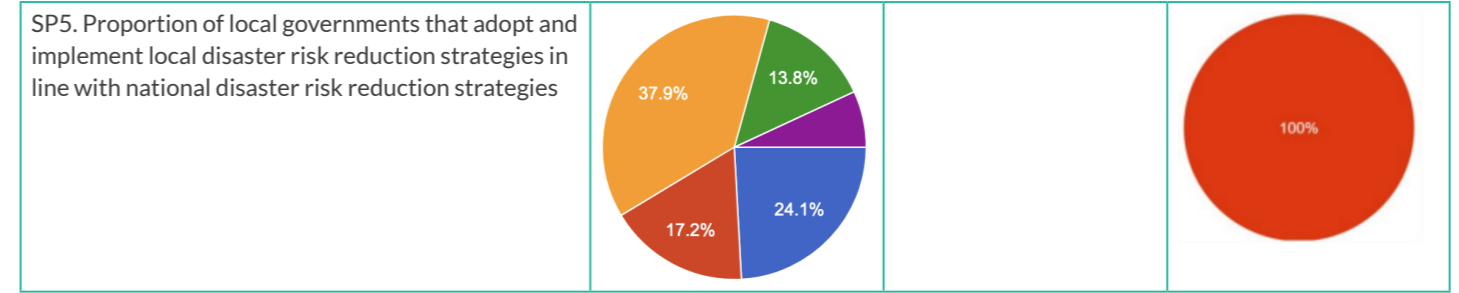
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SE2. Population with access to basic services by urban/rural, i.e. electricity			
SE3. Disparity of unemployment: Ratio of Youth (15-24 yrs old) and above 25 years old unemployment			
SE4. Percentage of elderly people receiving support			
SE5. Proportion of population with severe disabilities receiving disability cash benefit			
SP1. Proportion of population above statutory pensionable age receiving a pension			
SP2. Universal health coverage (UHC) service coverage index			

Legend:  
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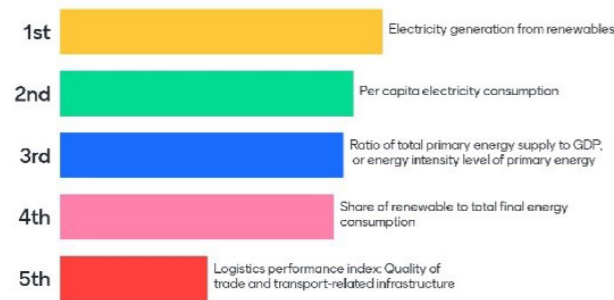
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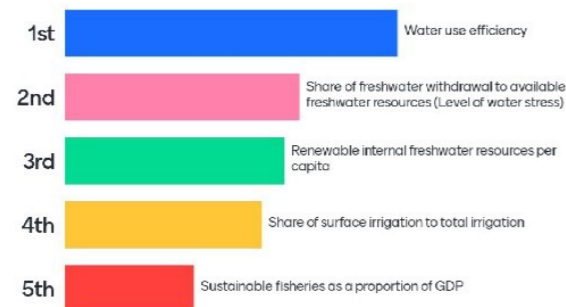
# Annex 4

## Results of Mentimeter votes from first participatory workshop

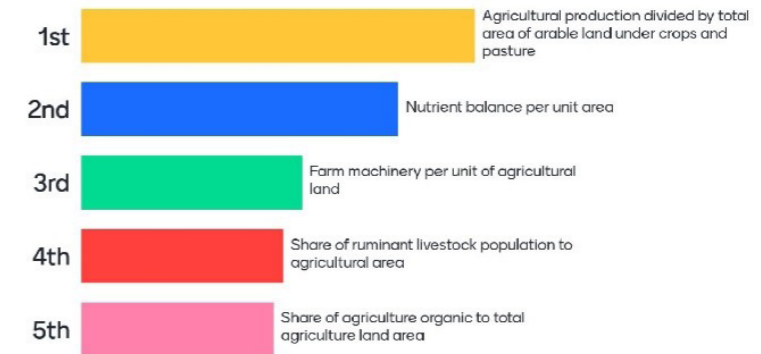
### Initial voting: Efficient and Sustainable Energy



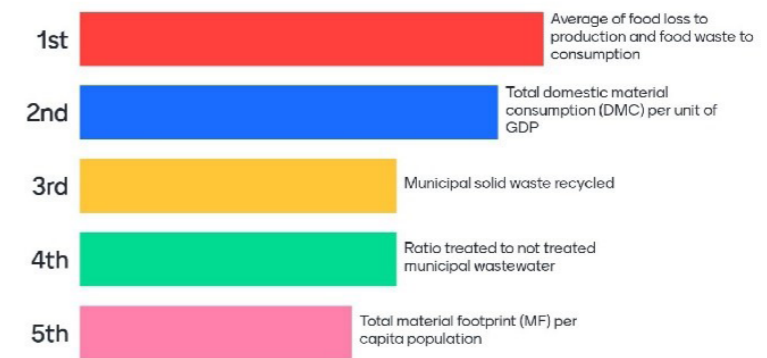
### Initial voting: Efficient and Sustainable Water Use



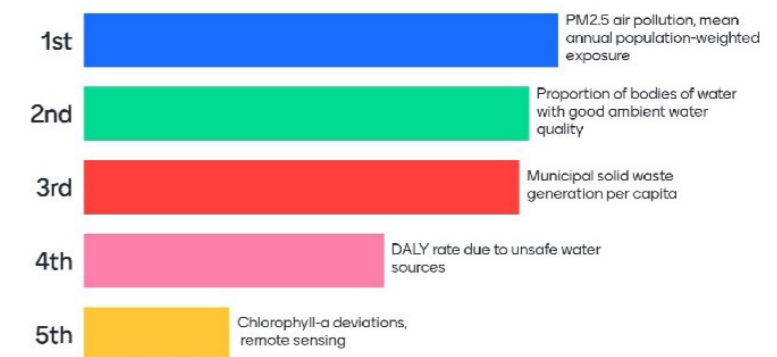
### Initial voting: Sustainable Land Use



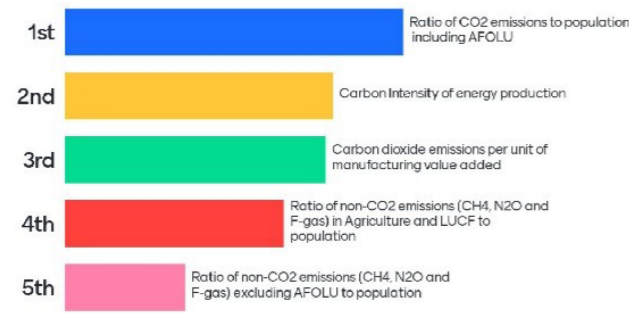
### Initial voting: Material Use Efficiency



### Initial voting: Environmental Quality



### Initial voting: Greenhouse Gas Emissions Reductions



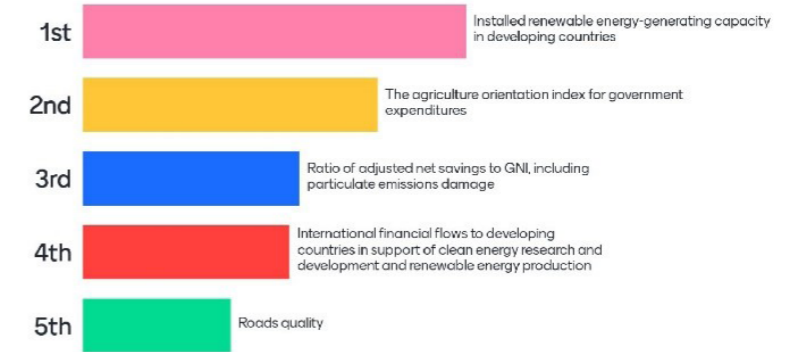
### Initial voting: Biodiversity and Ecosystem Protection



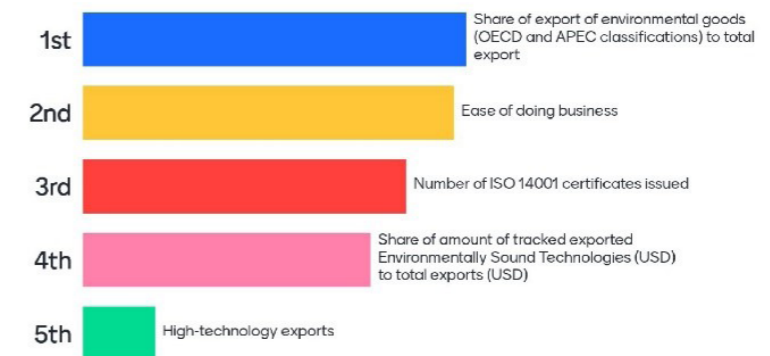
### Initial voting: Cultural and Social Value



### Initial voting: Green Investment



### Initial voting: Green Trade



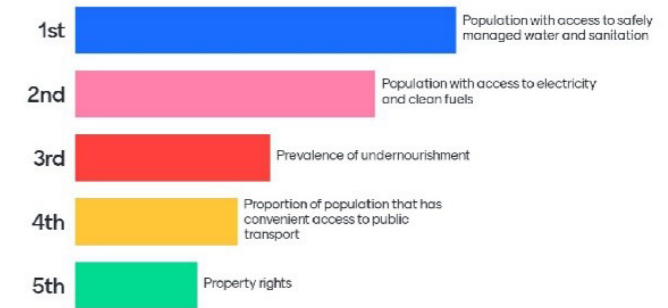
### Initial voting: Green Employment



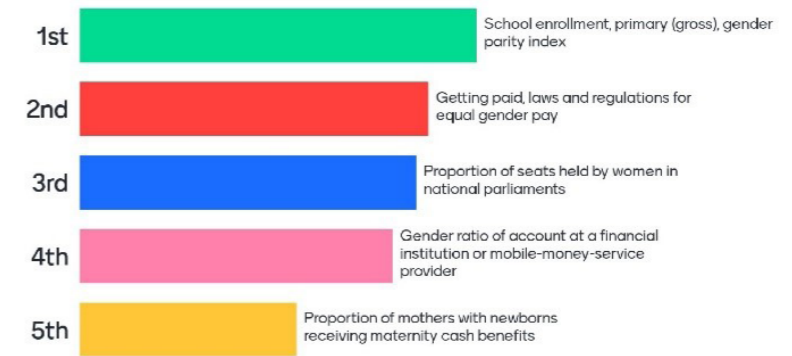
### Initial voting: Green Innovation



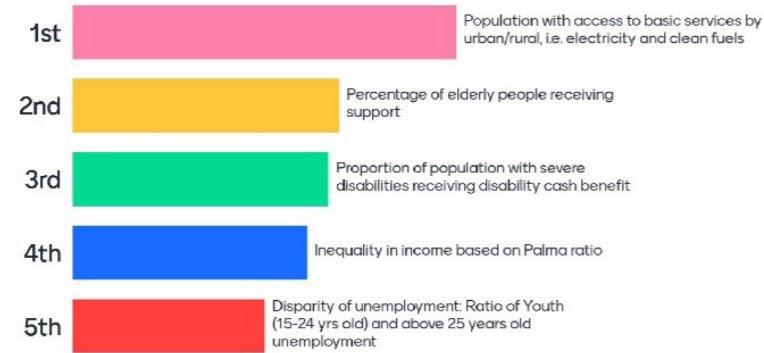
### Initial voting: Access to basic services and resources



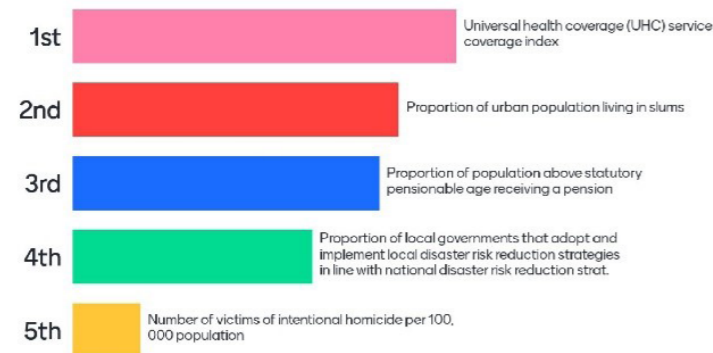
### Initial voting: Gender Balance



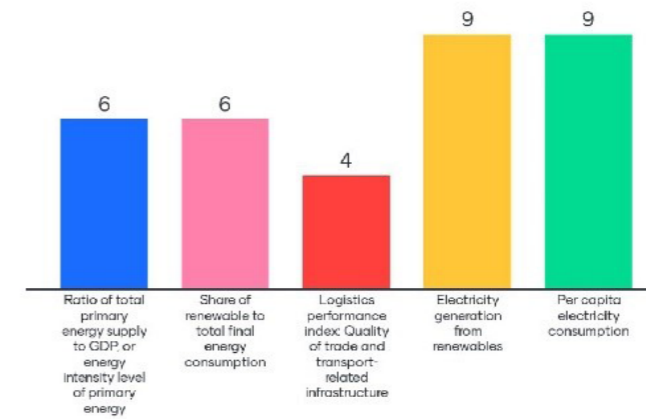
### Initial voting: Social Equity



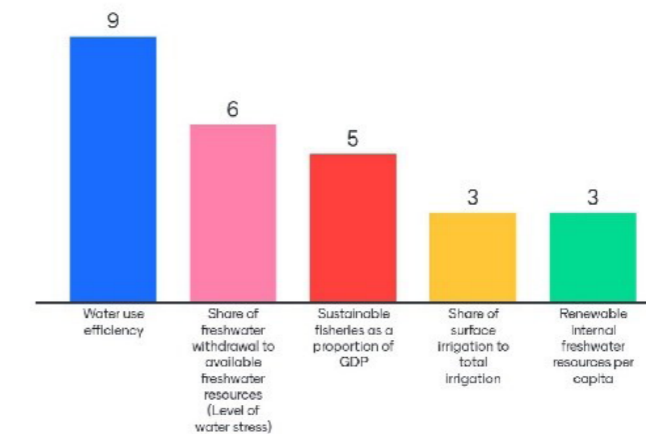
### Initial voting: Social Protection



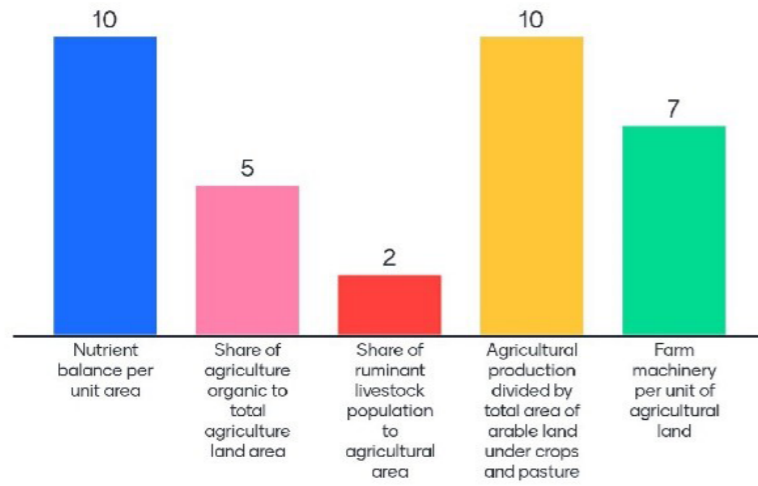
### Final voting: Efficient and Sustainable Energy



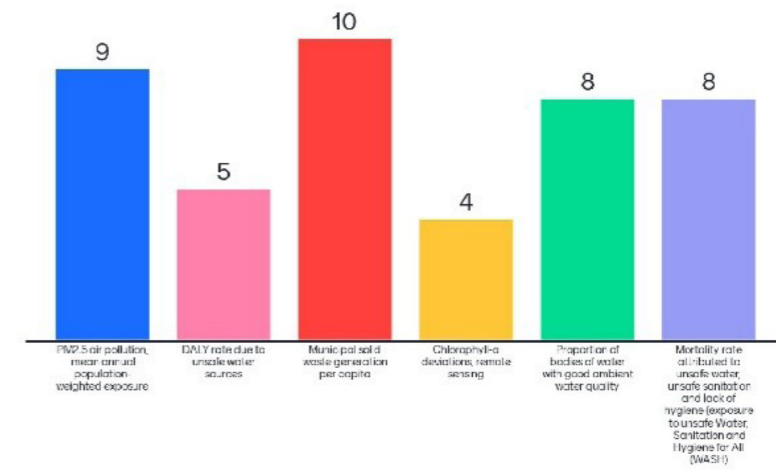
### Final voting: Efficient and Sustainable Water Use



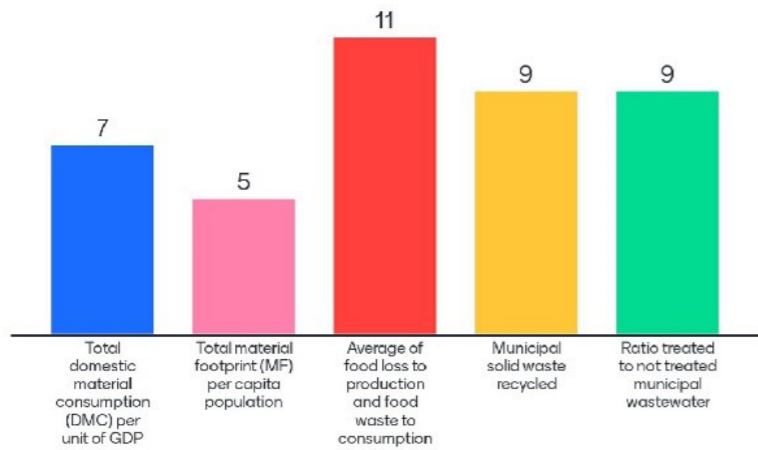
## Final voting: Sustainable Land Use



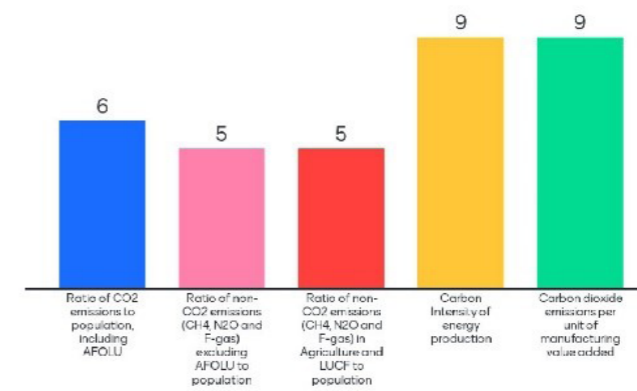
## Final voting: Environmental Quality



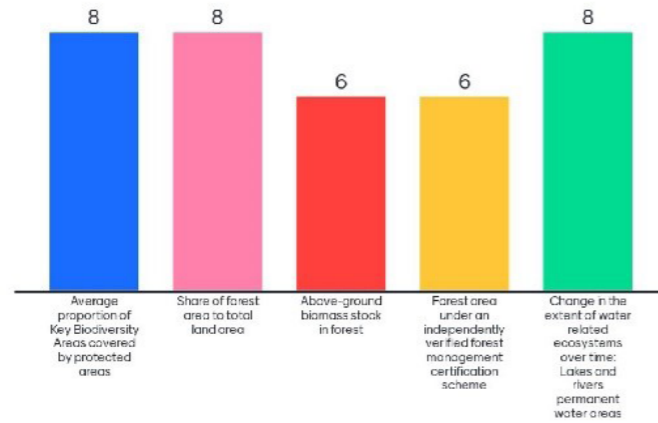
## Final voting: Material Use Efficiency



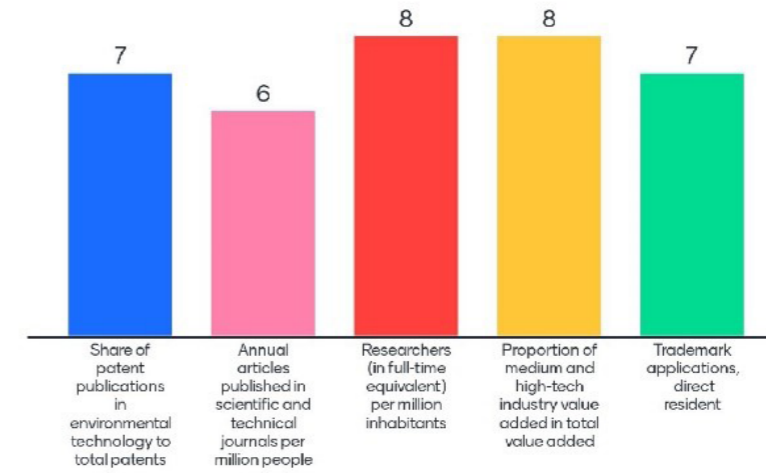
## Final voting: Greenhouse Gas Emissions Reductions



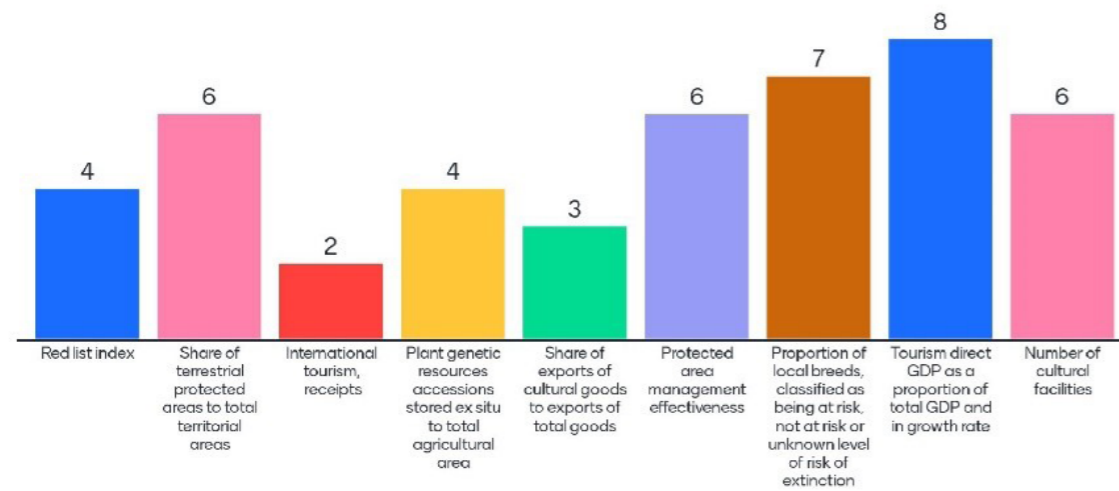
## Final voting: Biodiversity and Ecosystem Protection



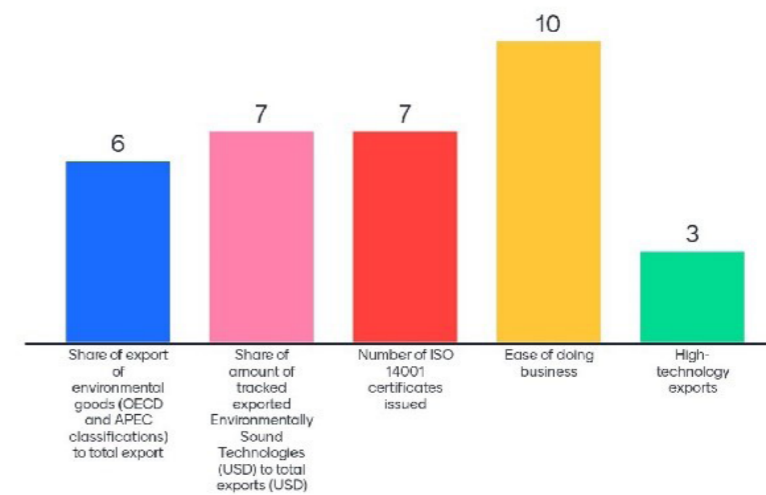
## Final voting: Green Innovation



## Final voting: Cultural and Social Value

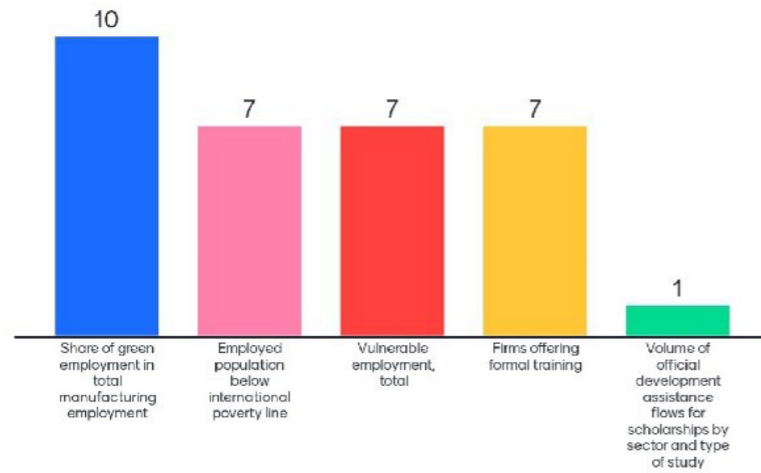


## Final voting: Green Trade

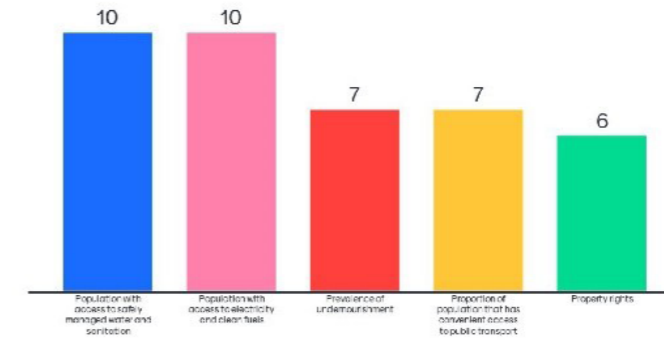




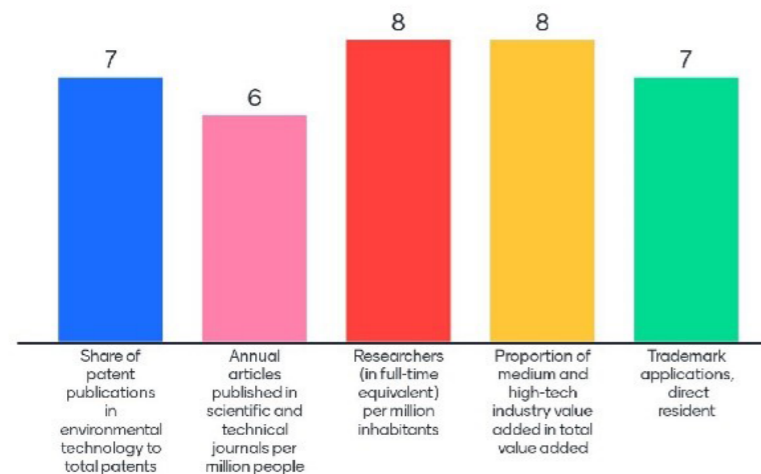
## Final voting: Green Employment



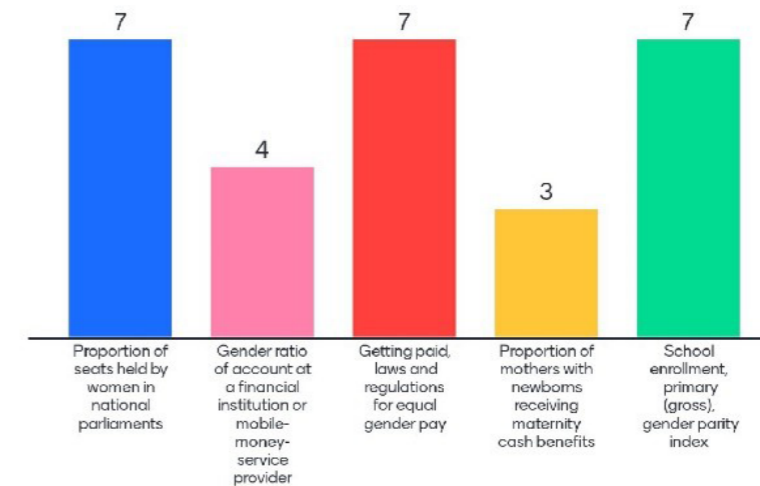
## Final voting: Access to basic services and resources



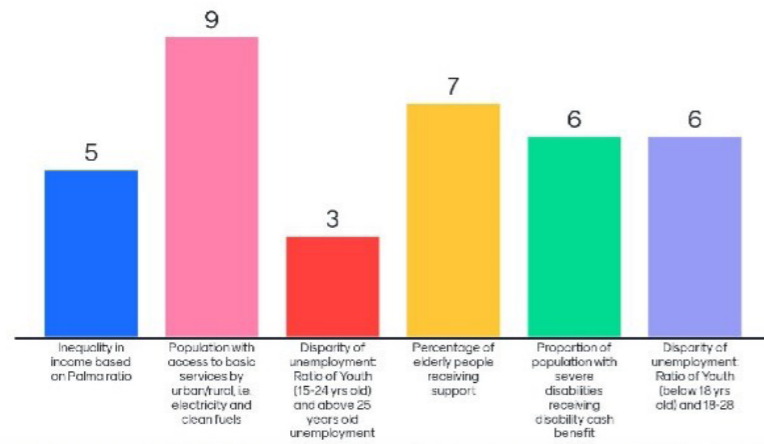
## Final voting: Green Innovation



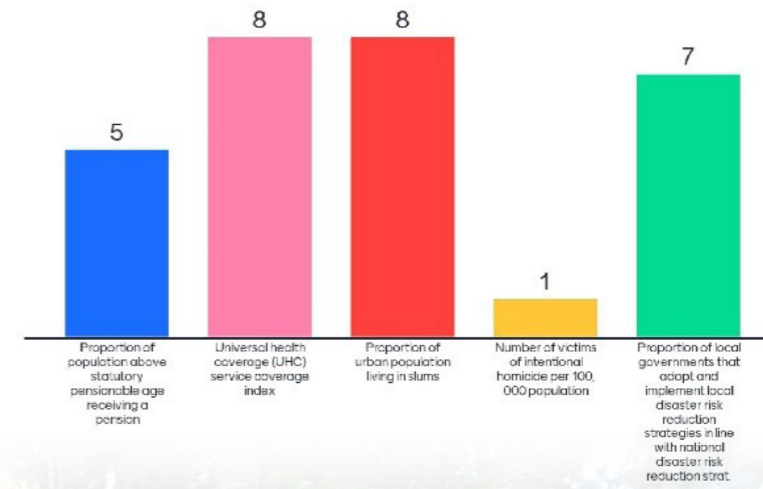
## Final voting: Gender Balance



## Final voting: Social Equity



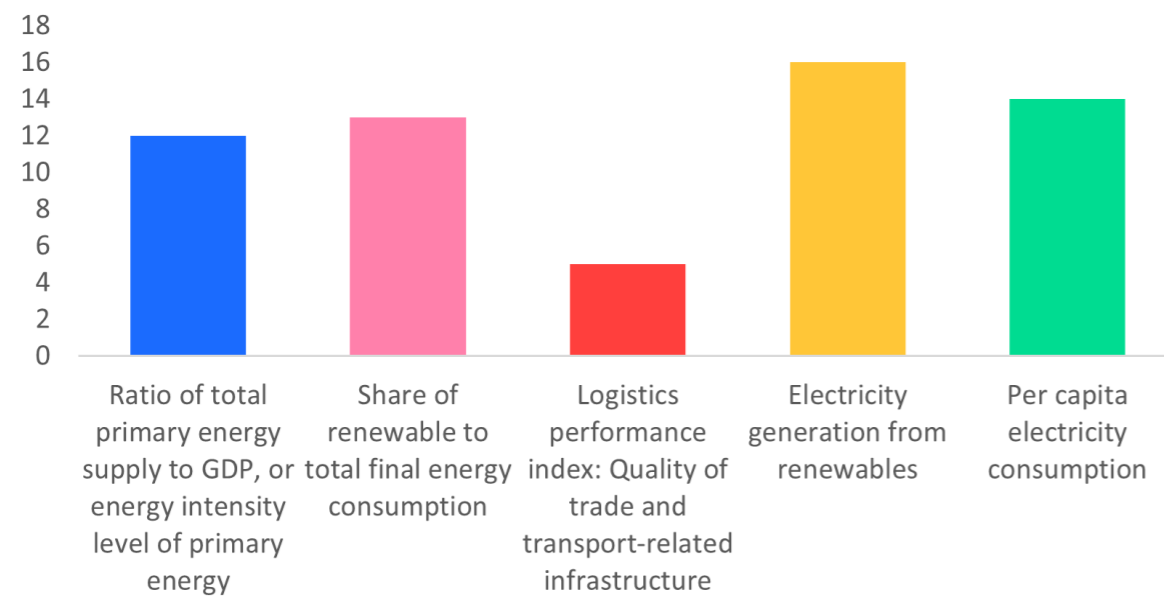
## Final voting: Social Protection



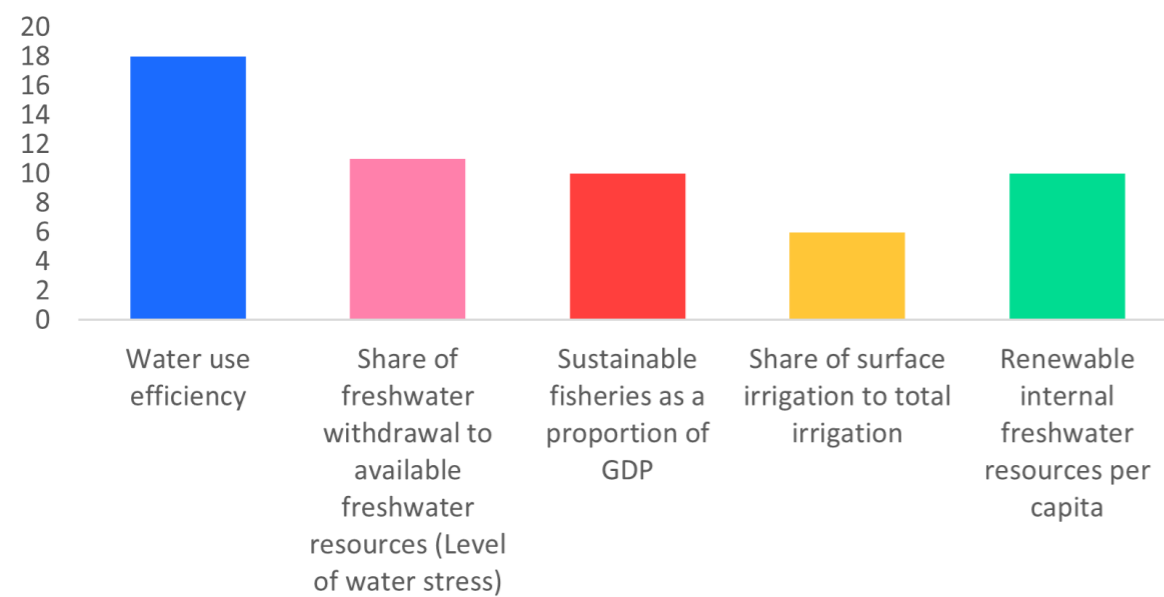
# Annex 5

## Results of combined Mentimeter votes from first participatory workshop and webinar 2

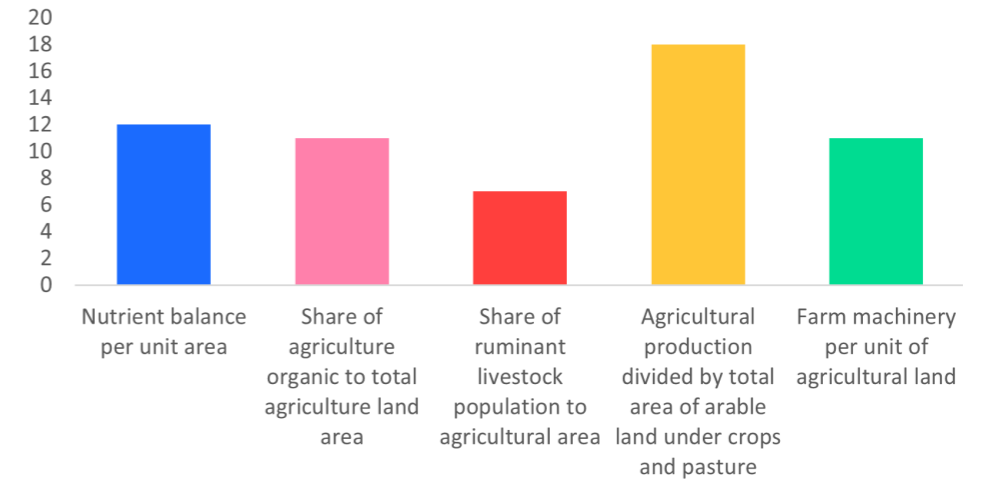
### EE: Efficient and sustainable energy



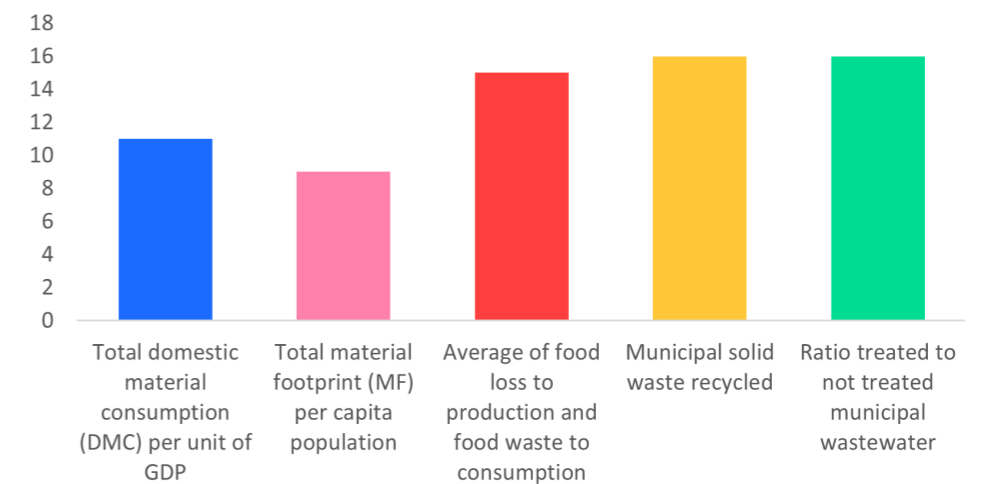
### EW: Efficient and sustainable water use



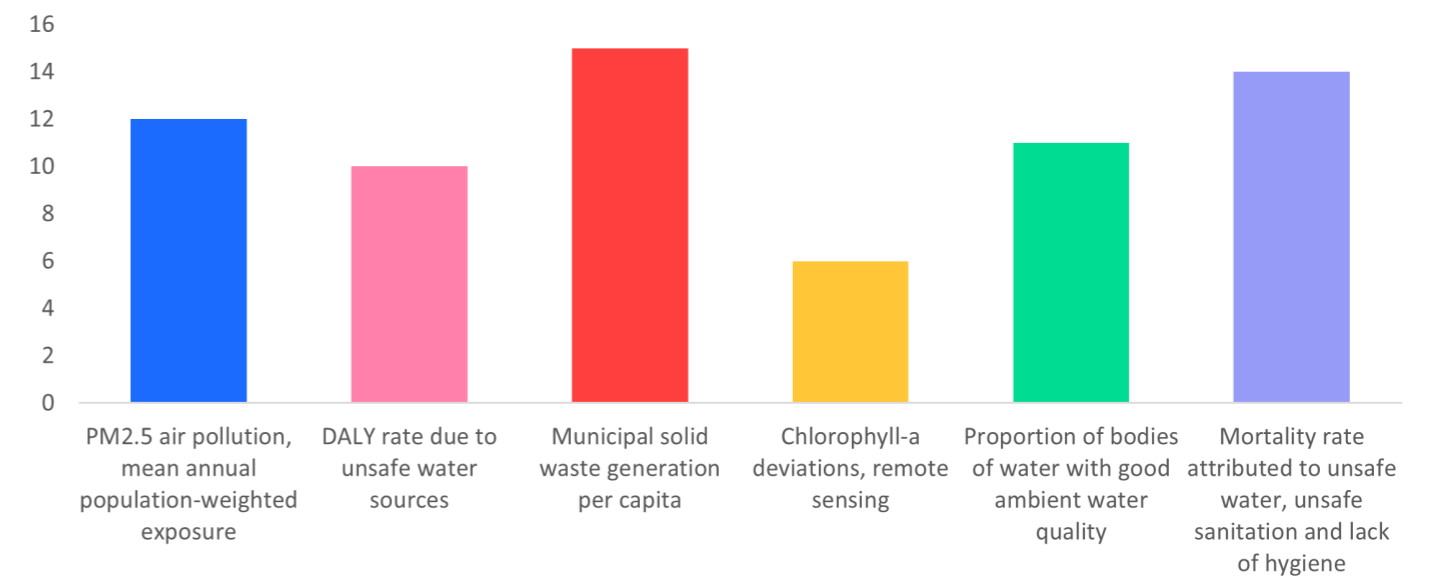
### SL: Sustainable land use



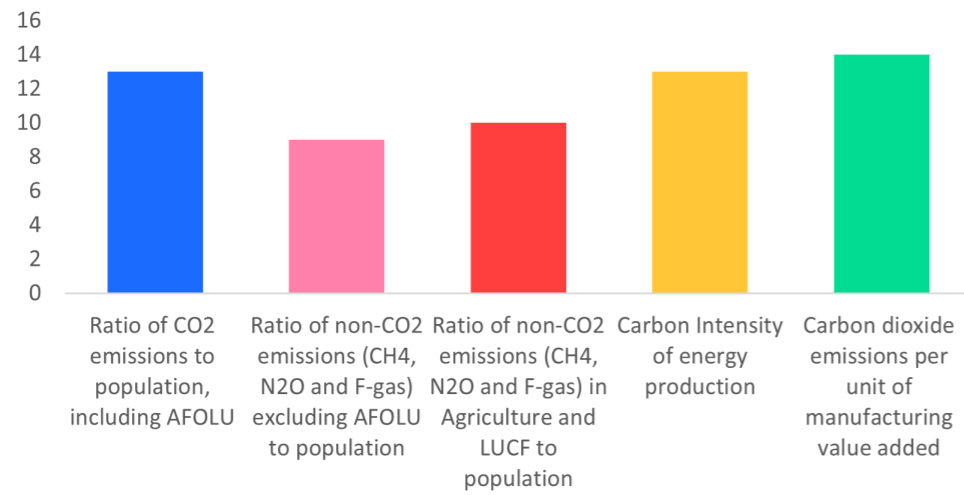
### ME: Material use efficiency



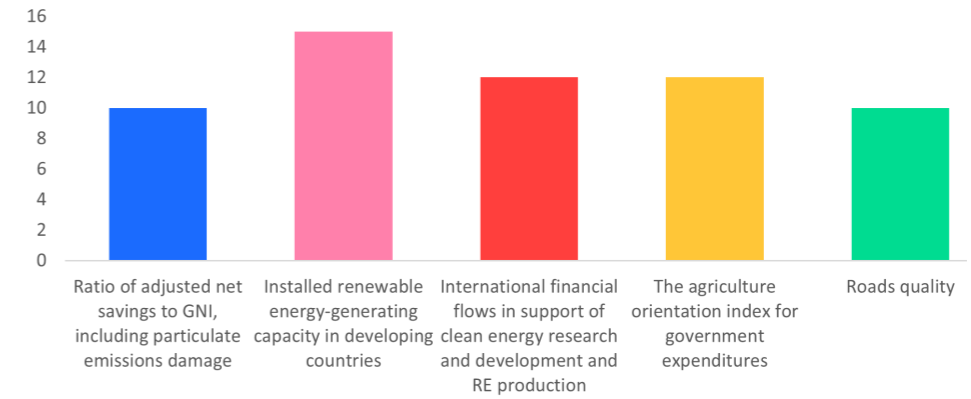
### EQ: Environmental quality



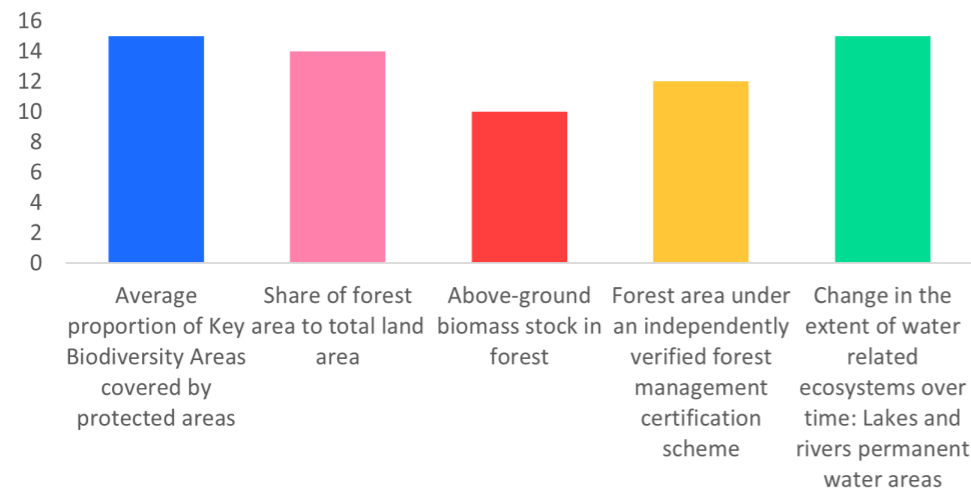
GE: Greenhouse gas emissions reductions



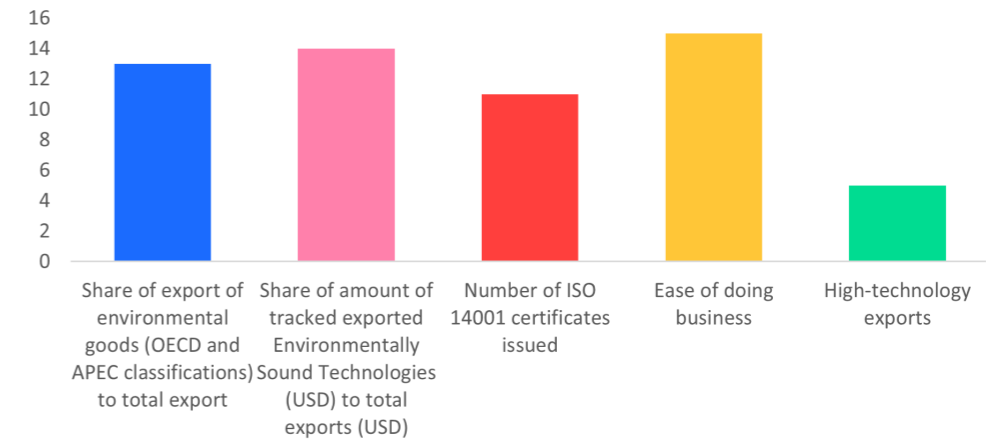
GV: Green investment



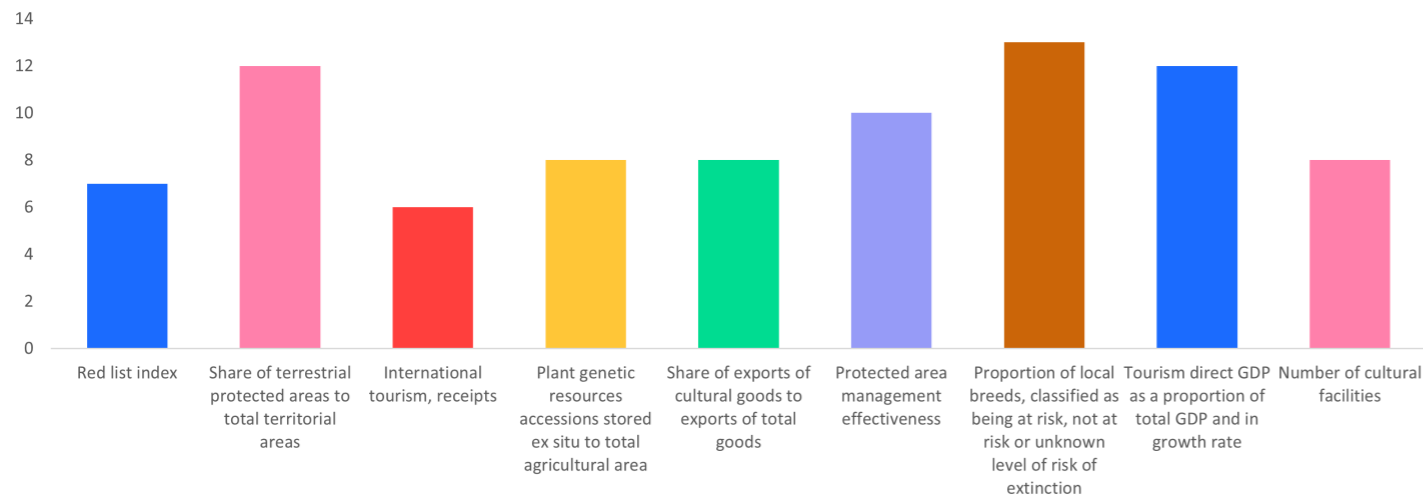
BE: Biodiversity and ecosystem protection



GT: Green trade



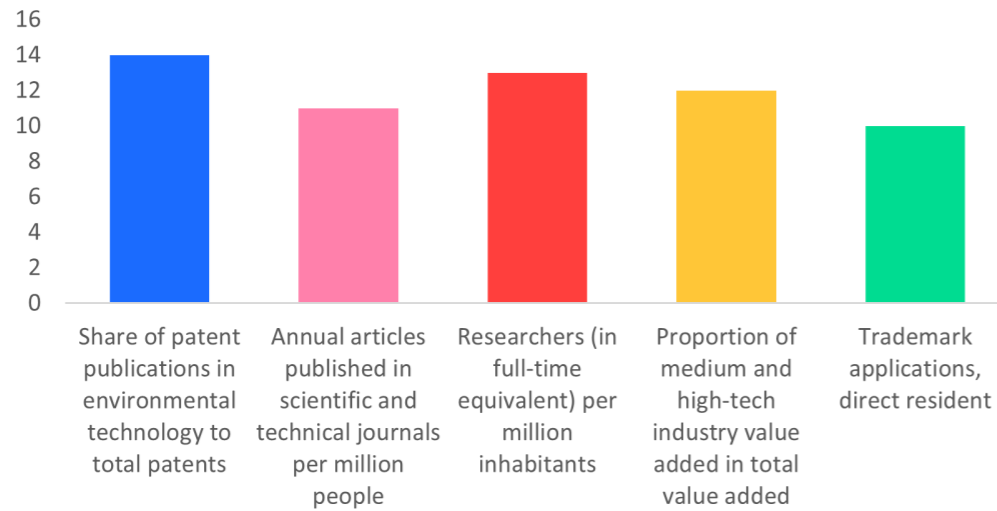
CV: Cultural and social value



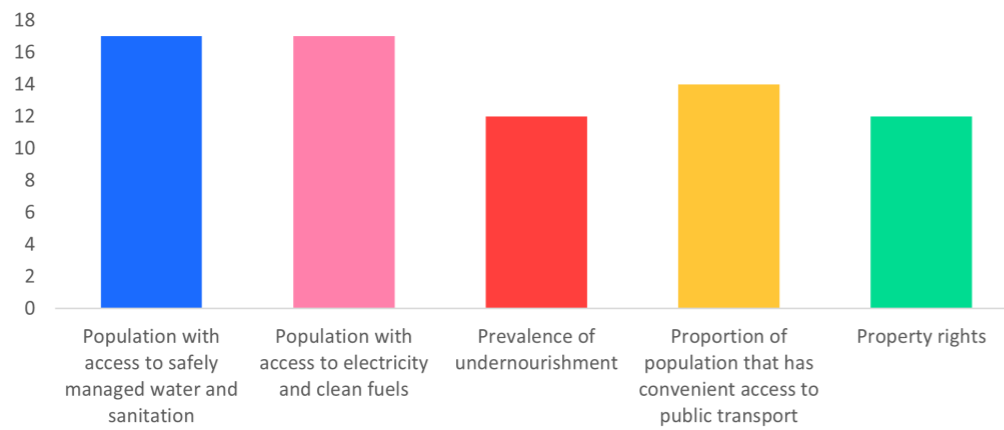
GJ: Green employment



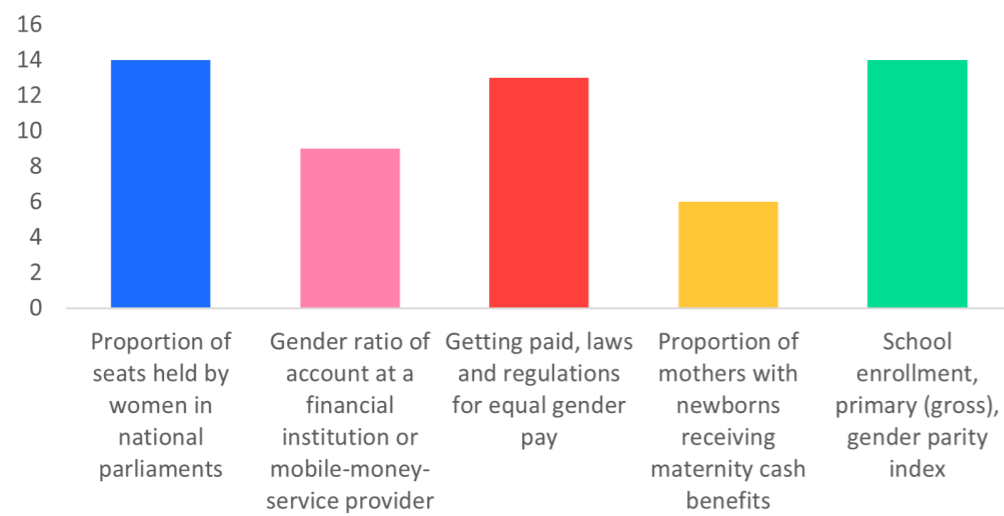
GN: Green innovation



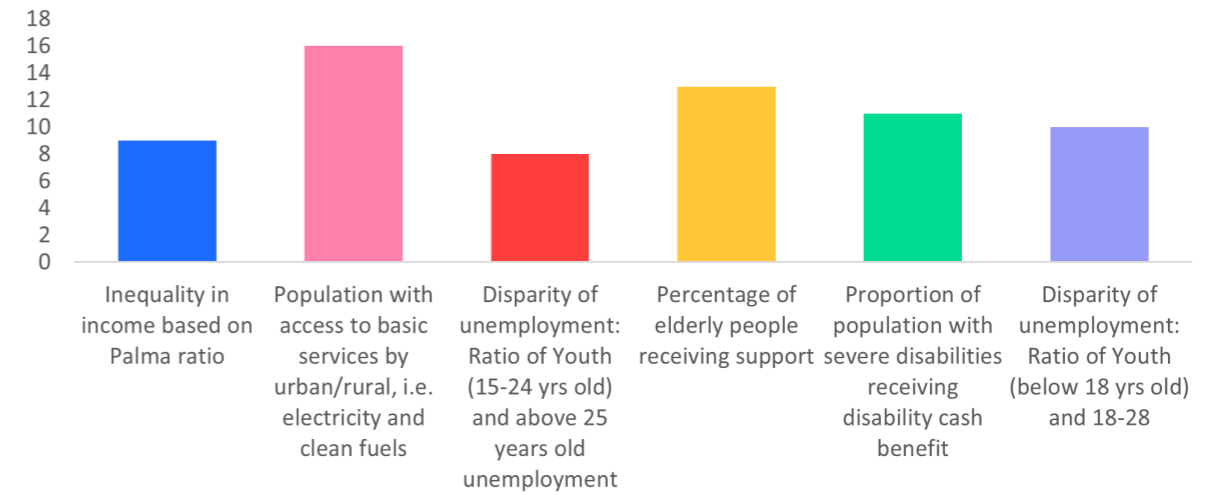
AB: Access to basic services and resources



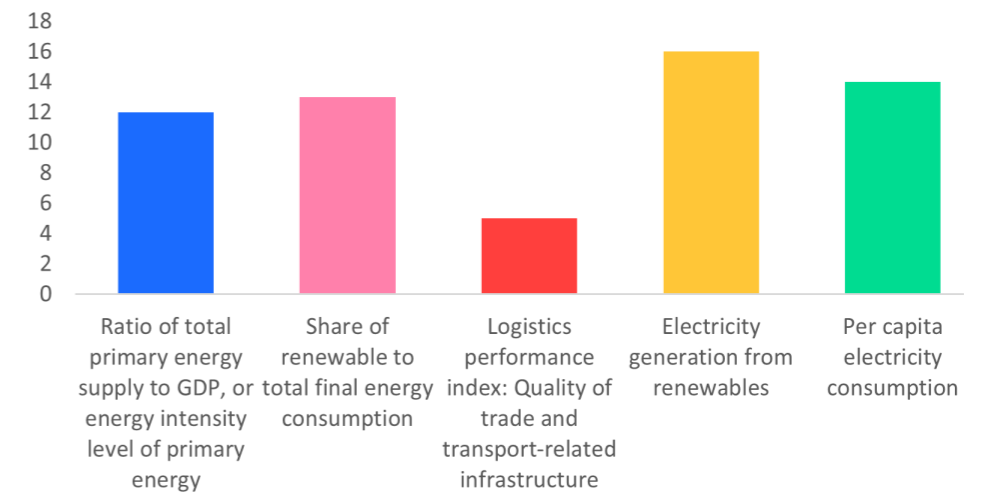
GB: Gender balance



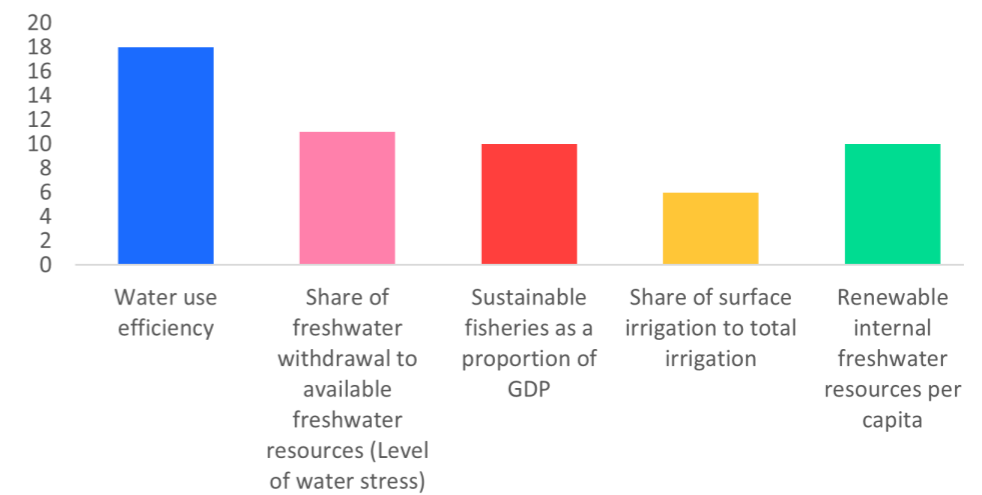
SE: Social equity



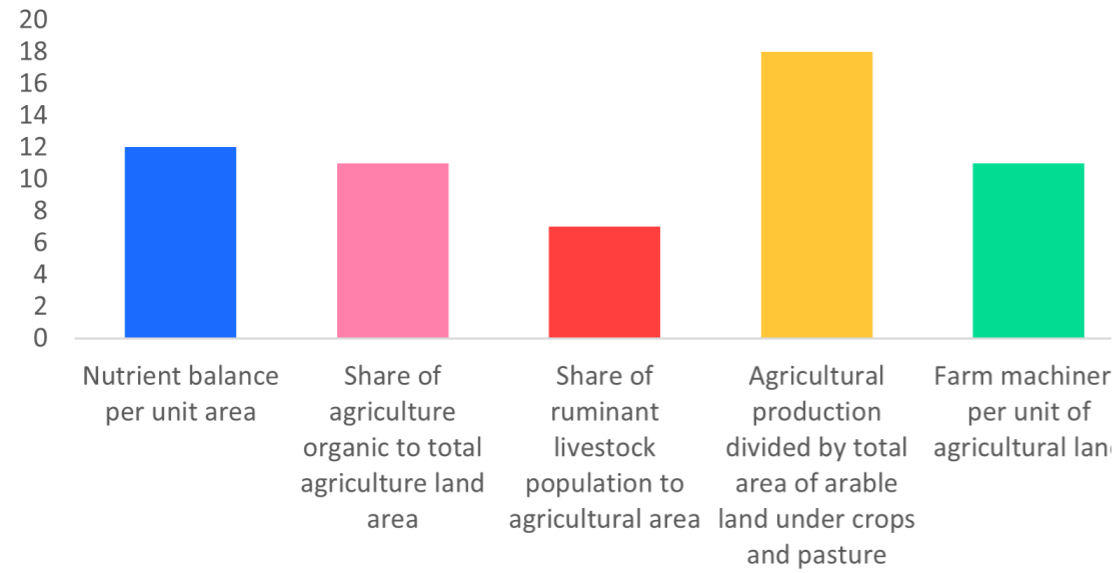
EE: Efficient and sustainable energy



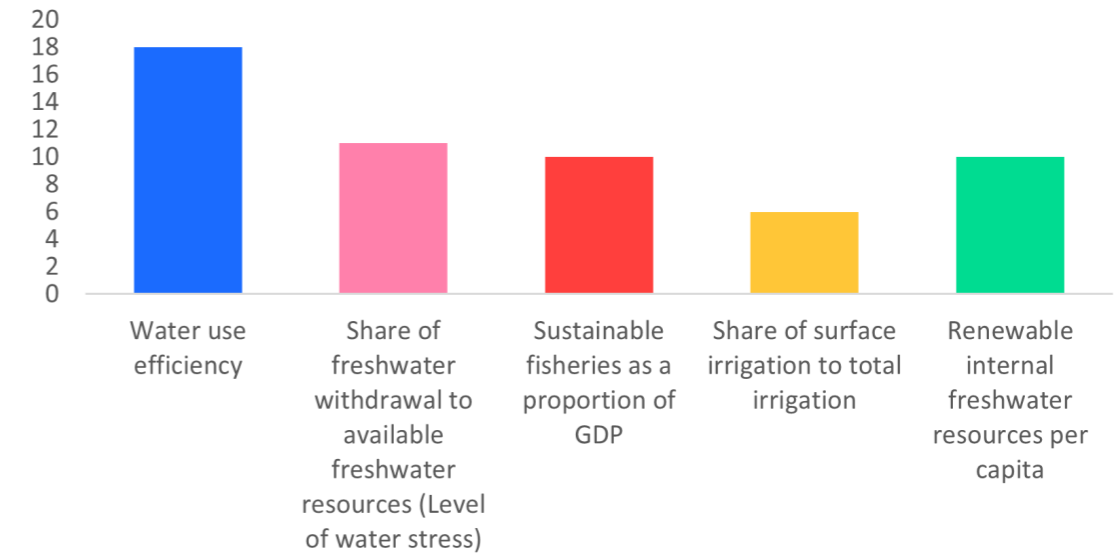
EW: Efficient and sustainable water use



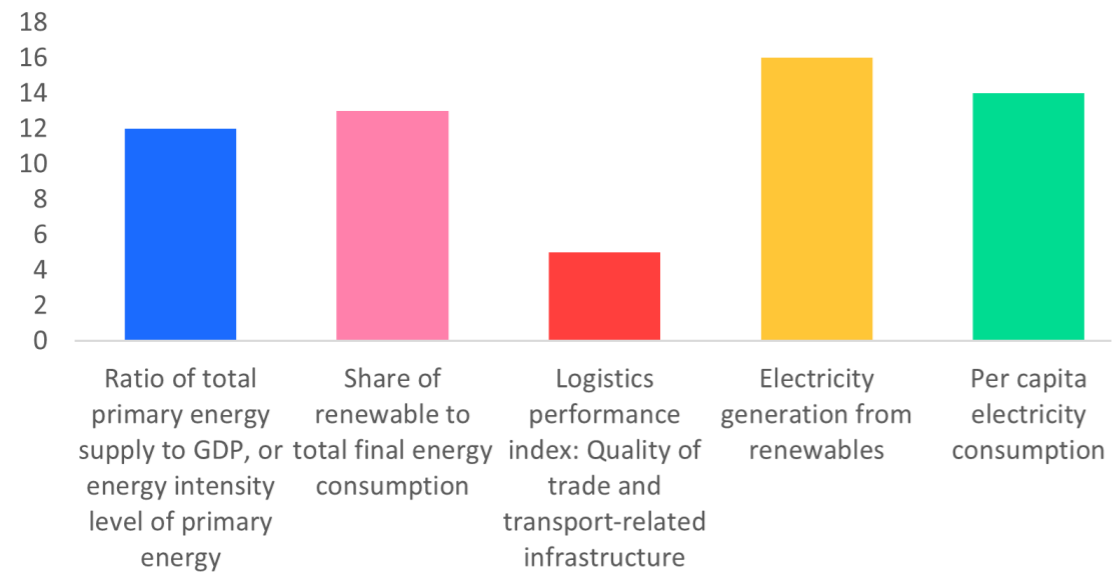
### SL: Sustainable land use



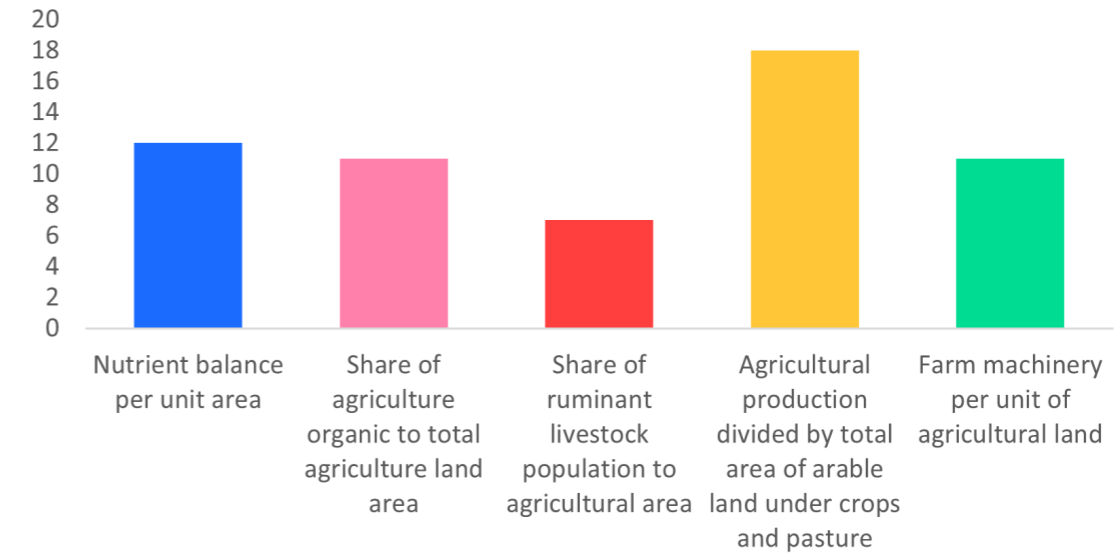
### EW: Efficient and sustainable water use



### EE: Efficient and sustainable energy



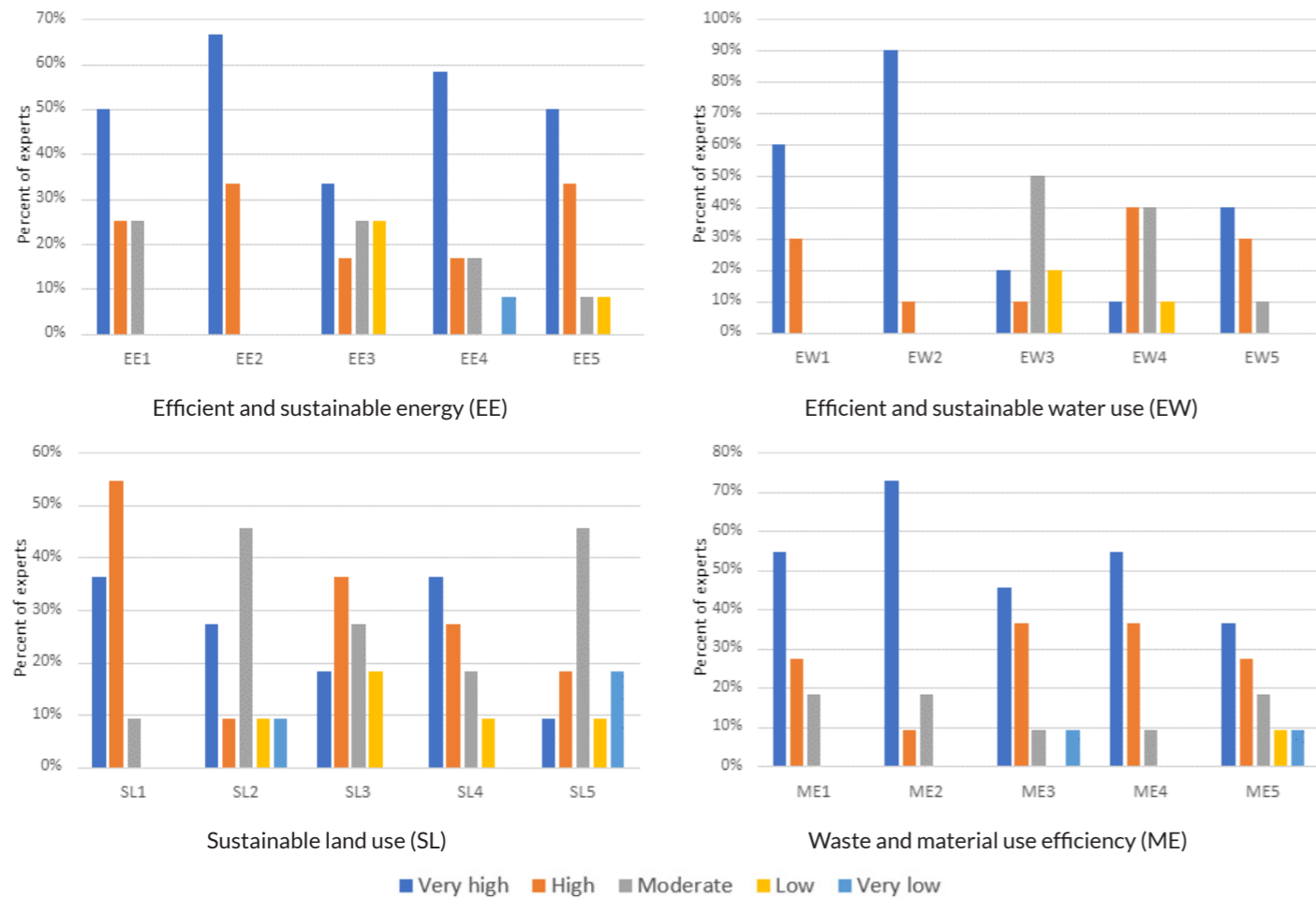
### SL: Sustainable land use



# Annex 6

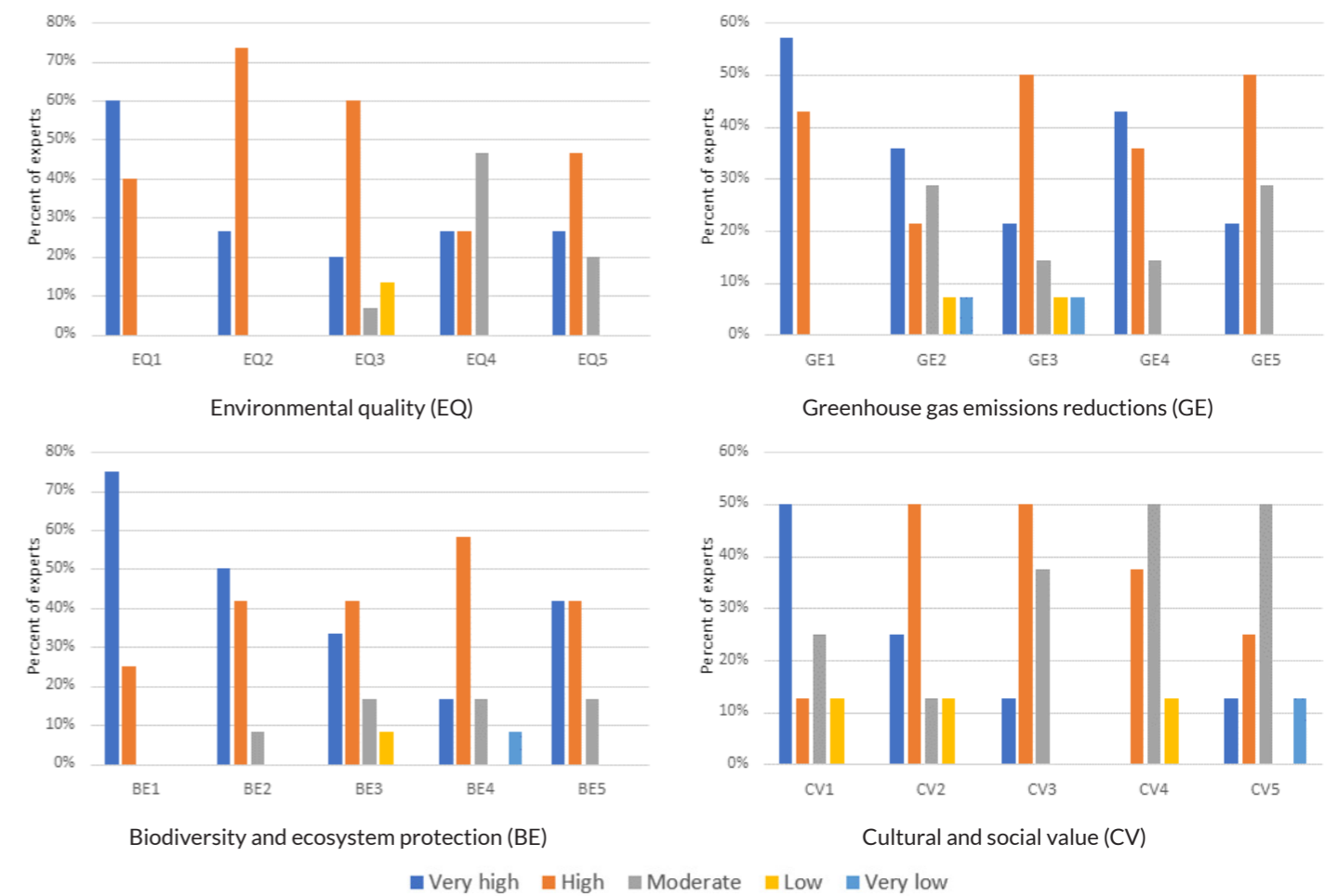
## Results of the second online survey with international experts

### Efficient and sustainable resource use



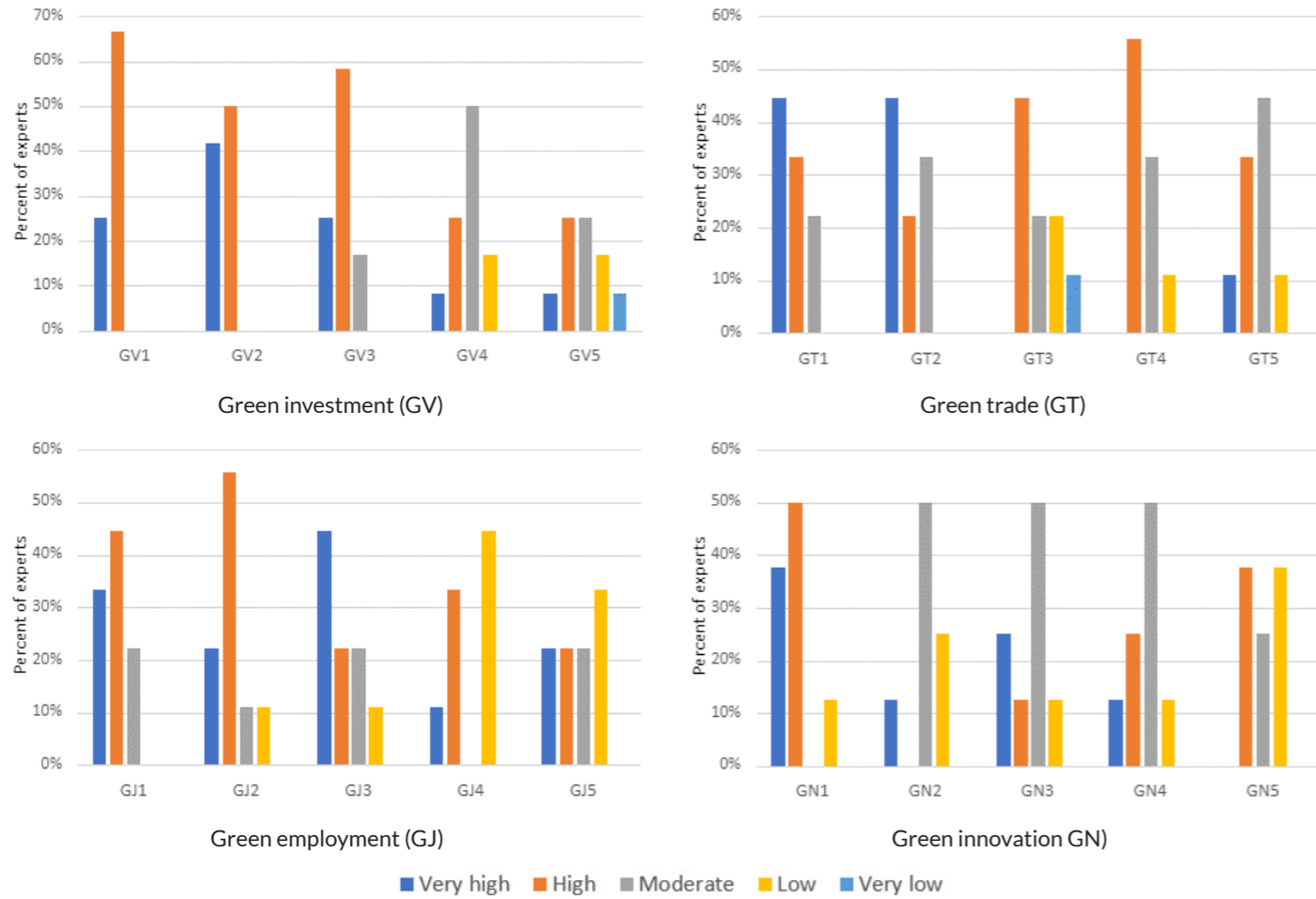
EE1 - Energy intensity, EE2 - Renewable energy share, EE3 - Efficient transport, EE4 - Low-carbon electricity, EE5 - Per capita electricity consumption  
 EW1 - Water use efficiency, EW2 - Level of water stress, EW3 - Sustainable fisheries, EW4 - Share of surface irrigation, EW5 - Renewable water resources per capita  
 SL1 - Soil nutrient balance, SL2 - Organic agriculture area, SL3 - Share ruminant livestock, SL4 - Agricultural productivity, SL5 - Farm machinery per unit land  
 ME1 - Material consumption per GDP, ME2 - Material footprint, ME3 - Food loss and food waste, ME4 - Municipal solid waste recycled, ME5 - Waste water treatment facilities

### Natural capital protection



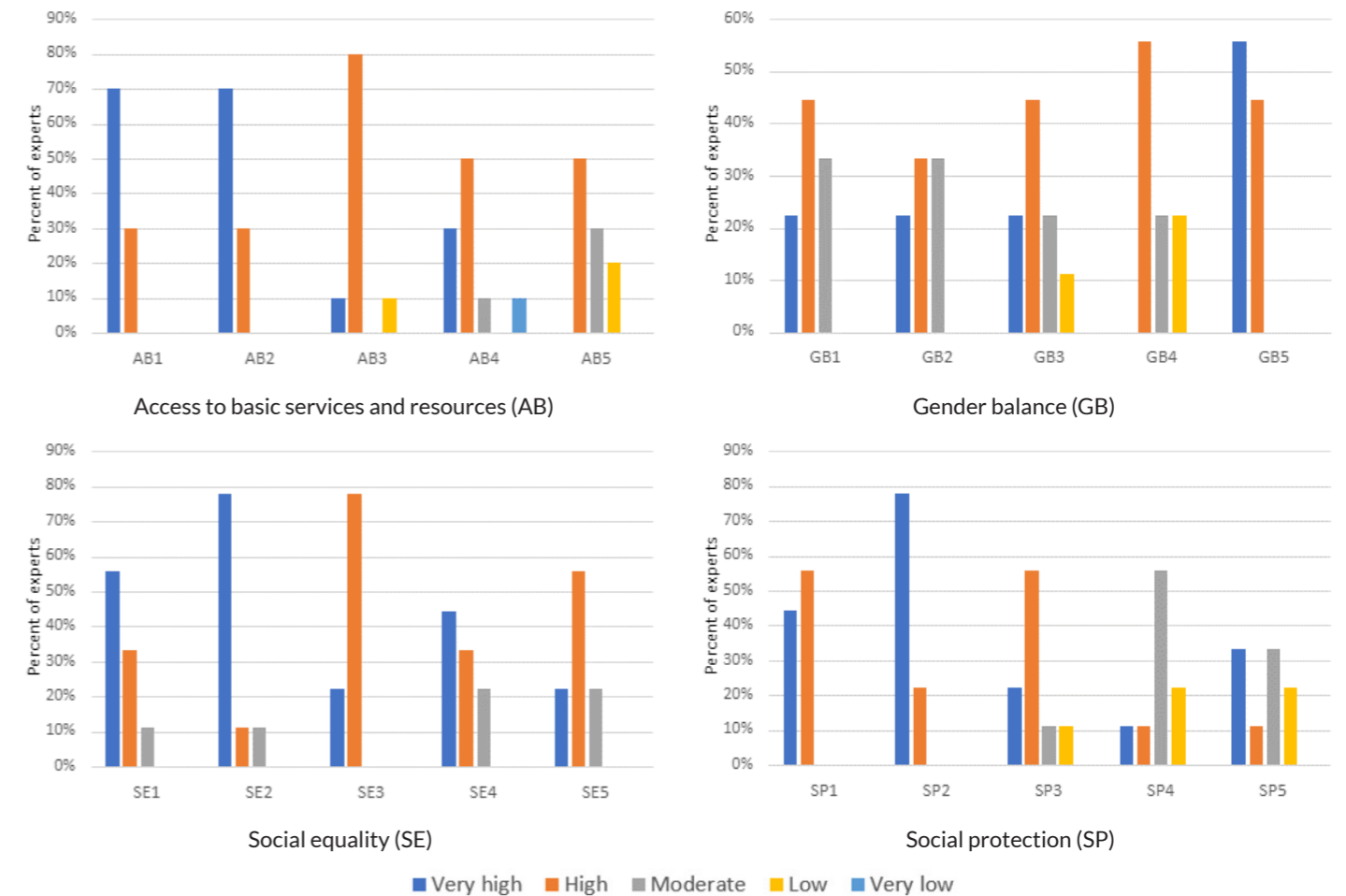
EQ1 - PM2.5 air pollution, EQ2 - DALY rate from unsafe water, EQ3 - Solid waste generation, EQ4 - Chlorophyll-a deviations, EQ5 - Water with good ambient quality  
 GE1 - CO2 emissions per capita, GE2 - Non-CO2 per capita excl. AFOLU, GE3 - Non-CO2 emissions in AFOLU, GE4 - Carbon intensity of energy production, GE5 - CO2 emissions per mfg value-added  
 BE1 - Protected key biodiversity areas, BE2 - Share of forest areas, BE3 - Forest above-ground biomass, BE4 - Forest under certification scheme, BE5 - Change in extent of water ecosystems  
 CV1 - Local breeds risk of extinction, CV2 - Terrestrial protected areas, CV3 - Tourism contribution to GDP, CV4 - Plant genetic resources accessions, CV5 - Share of exports of cultural goods

### Green economic opportunities



GV1 - Adjusted net savings, GV2 - Renewable electricity capacity, GV3 - Financial flows for clean energy R&D, GV4 - Agriculture orientation index, GV5 - Road quality  
 GT1 - Exports of environmental goods, GT2 - Environmental technologies exported, GT3 - ISO 14001 certificates issued, GT4 - New business density, GT5 - High-technology exports  
 GJ1 - Green employment in manufacturing, GJ2 - Employed below poverty line, GJ3 - Vulnerable employment, GJ4 - Firms offering formal training, GJ5 - ODA flows for scholarships  
 GN1 - Environmental technologies, GN2 - Scientific and technical journals, GN3 - Researchers per million inhabitants, GN4 - Medium/ high-tech mfg value-added, GN5 - Trademark applications

### Social inclusion



AB1 - Access to safe water and sanitation, AB2 - Access to electricity and clean fuels, AB3 - Prevalence of undernourishment, AB4 - Convenient access to public transport, AB5 - Property rights  
 GB1 - Women in national parliaments, GB2 - Gender account in financial institution, GB3 - Equal gender pay, GB4 - Mothers with maternity cash benefits, GB5 - School enrollment gender parity  
 SE1 - Inequality in income, SE2 - Rural-urban access to electricity, SE3 - Youth unemployment disparity, SE4 - Age dependency ratio, SE5 - Cash benefit for people with disabilities  
 SP1 - Share of old people receiving pension, SP2 - Universal health coverage, SP3 - Population living in slums, SP4 - Victims of intentional homicides, SP5 - Score of Hyogo Framework



# Annex 7

## List of the Kenyan stakeholders

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### Prof Oludhe Christopher

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### Richard Mulwa

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# Annex 8

## List of stakeholders



**The National Treasury & Economic Planning**  
The National Treasury



**STATE DEPARTMENT FOR ENERGY**



**MINISTRY OF FOREIGN AND DIASPORA AFFAIRS**



**Ministry of Energy and Petroleum**  
State Department for Energy



**Ministry of Mining, Blue Economy and Maritime Affairs**



**Ministry of Information, Communications and The Digital Economy**



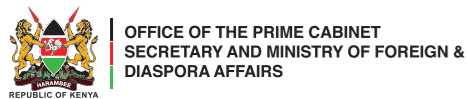
**MINISTRY OF ROADS AND TRANSPORT**



**MINISTRY OF LANDS, PUBLICWORKS, HOUSING AND URBAN DEVELOPMENT**  
State Department for Housing and Urban Development



**MINISTRY OF WATER, SANITATION AND IRRIGATION**



**OFFICE OF THE PRIME CABINET SECRETARY AND MINISTRY OF FOREIGN & DIASPORA AFFAIRS**



**Ministry of Agriculture & Livestock Development**



Centre for Training and Integrated Research in ASAL Development



KENYA PRIVATE SECTOR ALLIANCE



SUSTAINABLE ENERGY FOR ALL



**KenGen**



**KIPPDA**  
The KENYA INSTITUTE for PUBLIC POLICY RESEARCH and ANALYSIS



UNIVERSITY OF NAIROBI



**KAM 60+**  
KENYA ASSOCIATION OF MANUFACTURERS  
60 Years  
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Kenya Agricultural & Livestock Research Organization

# Annex 9

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