Ministry of Tourism and Wildlife

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Situational Analysis on the Adoption of Sustainable best Practices,

Evaluation of the Impact of Climate Change on the Tourism Sector in Kenya, and Design Appropriate Climate Response

and

Sustainable best practices in Line with Global Benchmarks

FINAL REPORT

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JUNE 2024

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Prepared For:

Tourism Research Institute
P. O. BOX 42131 – 00100 NAIROBI
E-mail: ceo@tri.go.ke
Website: https://www.tri.go.ke

Prepared By:

Technical University of Mombasa Enterprises Limited (TUMEL)
P.O Box 90420 – 80100, Mombasa
Tel: 0723311542/0716772140
Email: managingdirector@tumel.co.ke
Website: https://www.tumel.co.ke

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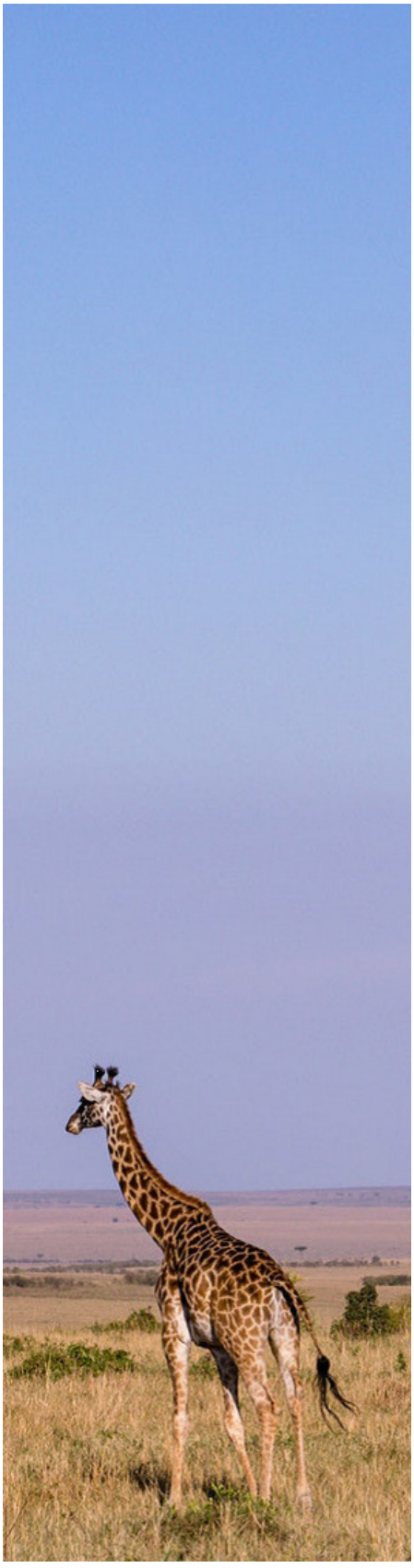
Mr. Vincent O. Bwire
Chair, Project Implementation Committee.

FOREWORD

The tourism sector in Kenya plays a significant role in driving social and economic development. Specifically, it contributes 10% to the Gross Domestic Product (GDP), provides 6% of direct formal employment, and consists of 4% of the National Gross Fixed Capital Formation (NGFCF). This contribution is projected to increase, with the sector's earnings expected to grow to Ksh 430 billion in 2024 and further reach Ksh 1.024 trillion by 2028, attributed to the anticipated rise in visitor numbers from 2.4 million in 2024 to 5.7 million in 2028. The sector also contributes to safeguarding cultural heritage, climate change mitigation, and environmental preservation. This demonstrates the vibrancy of the tourism sector in enabling Kenya to achieve sustainable development goals in a changing climate.



However, the tourism sector's contribution to the economy may be jeopardized due to the impacts of climate change. The Intergovernmental Panel on Climate Change (IPCC) data shows that with the rise in global temperatures due to emissions of greenhouse gases, climate-sensitive sectors such as tourism, which largely depend on natural resources, will be severely affected. The impacts include changes in destination attractiveness, increased operational costs (e.g., heating and cooling), limited water availability, reduced food diversity, infrastructure damage, and increased incidences of vector-borne diseases. These impacts may worsen, as the tourism sector's emissions are projected to rise by 25% in 2030 compared to 2016 emission levels.

Studies have shown that the hotel industry consumes significant quantities of resources and generates substantial amounts of waste. A five-star hotel for instance has been established to consume approximately 130 Megajoules of energy per guest per night, and on average, a guest generates 0.9 kg of waste daily. Additionally, daily water consumption per guest ranges from 170 to 440 liters, significantly higher than in a residential household.

Tourism and travel transport make significant contributions to global carbon emissions, with the aviation industry alone responsible for 2% of global emissions. Other tourism-related businesses also produce greenhouse gases, resulting in the tourism sector accounting for about 5% of global Carbon Dioxide (CO_2) emissions into the atmosphere.

It is in this context that during the twenty-fifth Conference of Parties (COP 25) of the United Nations Framework Convention on Climate Change (UNFCCC), the tourism sector declared a climate crisis. Parties were urged to embrace low-carbon pathways in their tourism activities. Kenya committed to this declaration, recognizing that its tourism sector is primarily nature-based, relying on wildlife-protected areas, natural landscapes, coastal ecosystems, and resources. The tourism sector must prioritize climate-resilient sustainable practices to minimize environmental degradation and preserve natural resources for future generations. This demands that adoption of best practices in sustainable tourism is paramount to mitigate adverse impacts on the environment, society, and culture, nurturing long-term climate-resilient positive outcomes. These practices aim to strike a balance between economic benefits, social responsibility, and environmental conservation.

In view of this, Kenya aims to remain globally competitive in the tourism sector as the destination of choice. This implies that the country has to develop actions, strategies, and programs that follow global benchmarks in order to curve the country's niche in the tourism sector. The country during the twenty-sixth Conference of Parties (COP 26) of the UNFCCC that was held in Glasgow, United Kingdom (UK) in 2021, pledged by 2030 to conserve and sustainably manage the tourism sector by committing to: restrict use of vehicular transportation within all national parks and game reserves that use non-fossil renewable energy; require all hospitality and tourism enterprises to adopt renewable energy and circular economy in their operations; mobilize the ecological assets in vast protected areas that act as carbon sinks to maximize on global carbon credit facilities available in order to raise additional resources to play an active role in meeting national goals of a net carbon neutral nation; restore degraded areas in national parks and games reserves with a concerted effort om reforestation; increase marine conservation areas network; establish a framework for documentation and measuring the economic impacts of climate change on tourism sector as basis of mainstreaming practical, quantifiable and accountable required measures on climate actions by tourism actors in the entire tourism value chain; and develop and enforce minimum sustainability standards that are in line with the global benchmarks for businesses in the sector that form the basis for operations of sustainable tourism businesses with accompanying incentives and disincentives.

This study generated various deliverables including; baseline report, best practices report, incentive and disincentives framework, system of environmental-economic accounting (SEEA) for the tourism sector, stakeholders engagement report, final and closure reports in response to undertaking a situational analysis on the adoption of sustainable best practices, evaluate the impacts of climate change on the tourism sector in Kenya and design appropriate climate response and sustainable best practices in line with global benchmarks. The key findings established and recommendations provided lays a foundation on how to track and report

Kenya's progress in regard to commitments the country made during COP26.

I therefore welcome the stakeholders in Tourism Sector to take into consideration relevant findings and action areas for implementation so as to revitalize and spur growth of the tourism sector in Kenya. The Government of Kenya through the Ministry of Tourism and Wildlife remains steadfast in ensuring that right incentives and policy frameworks are place to provide required enabling environment for investment in tourism value chain.

Mr. David Gitonga
Ag. Chief Executive Officer,
Tourism Research Institute

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GLOSSARY OF TERMS

Adaptation	The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects
Behavioural climate adaptation	The process of adapting to climate change through changes in individual behaviour
Benchmark	A standard or point of reference against which other things can be compared. Benchmarks can be used to measure progress, identify areas for improvement, and set goals
Brand reputation	The perception that people have of a brand. This can be influenced by a number of factors, including the quality of the products or services, the environmental impact of the business, and the social responsibility of the business
Business management adaptation	The process of adapting to climate change through changes in business practices
Carbon footprint	The total amount of greenhouse gases, primarily carbon dioxide, emitted directly or indirectly by human activities, expressed as a carbon dioxide equivalent
Climate change	Long-term change in the average weather patterns that have come to define Earth's local, regional and global climates.
Climate change impacts	The effects of climate change on people, ecosystems, and the environment. These impacts can be both positive and negative, and they can vary depending on the location and severity of climate change
Decarbonisation	The process of reducing the amount of carbon dioxide emissions. This can be done by switching to renewable energy sources, improving energy efficiency, and reducing deforestation.
Disincentives	Measures or policies designed to discourage certain behaviours or activities by making them less attractive or more costly.
Energy efficiency	The use of less energy to achieve the same result. This can be done by using more efficient appliances, lighting, and insulation
Energy products	Products that are produced from energy sources, such as oil, gas, coal, and renewable energy sources
Energy residuals	The waste products that are produced from the production and use of energy
Fair trade in Tourism	A movement that seeks to ensure that tourists, host communities, and the environment benefit from tourism
Field reconnaissance survey	A preliminary survey conducted to gather information about a particular area

Greenhouse gasses emission	Gasses that trap heat in the atmosphere. They can cause the Earth's temperature to rise, which can lead to climate change
Green transport	Transportation that is environmentally friendly
Incentives	Rewards or benefits that are given to encourage people to behave in a certain way. Incentives can be used to encourage people to adopt sustainable practices
Inland water abstraction	The process of taking water from rivers, lakes, and other inland water bodies often used for drinking, irrigation, and industrial purposes
Quantitative risk assessment	A process of assessing the risk of a particular event by assigning numerical values to the likelihood and impact of the event
Representative Concentration Pathways	A set of scenarios that describe how greenhouse gas emissions might evolve in the future. These scenarios are used to assess the impacts of climate change
Resilience	The ability to withstand and recover from shocks and stresses to individuals, communities, businesses, and ecosystems
Return flows to the environment	The water that is released back into the environment after it has been used for irrigation, industrial purposes, or other purposes
	Risk assessment: The process of identifying, assessing, and managing risks. Risks can be physical, financial, or reputational. Risk assessment can help to identify potential problems and to develop strategies to mitigate those problems
Risk monitoring	The process of tracking risks over time to ensure that they are being managed effectively. Risk monitoring can help to identify new risks and to make adjustments to risk management strategies as needed
Risk preparedness	The process of preparing for and responding to risks. This can include things like developing risk management plans, conducting risk assessments, and training employees on how to respond to risks
Situational analysis	A process of gathering and analysing information about a particular situation. This information can be used to identify the strengths, weaknesses, opportunities, and threats (SWOT) of the situation
Social licencing	The degree to which a business or organization has the permission of society to operate. This can be affected by factors such as the environmental impact of the business, the treatment of employees, and the social responsibility of the business
Solid waste	Any garbage or refuse that is produced by households, businesses, and institutions. Solid waste can include things like food scraps, paper, plastic, and metal
Stakeholder engagement	The process of involving people who may be affected by the decisions of an organization or can influence the implementation of its decisions
Sustainability barriers	Factors that hinder sustainability and Sustainable practice

Sustainability best practices	Methods or approaches that have been shown to be effective in achieving sustainability goals
Sustainability communication	The process of communicating about sustainability to stakeholders
Sustainability drivers	Factors that help to promote sustainability
Sustainability education	The process of teaching people about sustainability through a variety of channels, such as schools, universities, and community organizations
Sustainability reporting	The process of providing information about a Tourism enterprise's sustainability performance
Sustainable planning and management	A process of developing and implementing plans and management practices that are designed to achieve sustainability goals. This process involves considering the environmental, social, and economic dimensions of sustainability
System of Environmental-Economic Accounting	A framework for measuring the economic and environmental dimensions of sustainability. The SEEA provides a way to track the flows of natural resources, energy, and materials through the economy, and to assess the environmental impacts of economic activity
Technical climate adaptation	The process of adapting to climate change through technological means
Tourism enterprises	Businesses and organizations that provide goods and services primarily to tourists and include accommodation, food and beverage services, passenger transport, travel agencies, and cultural and recreational activities
Tourism Industries	Sectors such as accommodation, transportation, food and beverage services, recreation, retail, travel agencies, and other indirect sectors, providing a comprehensive measure of the economic impact of tourism
Water flows	The movement of water resources between different environmental compartments, such as surface water, groundwater, and atmospheric water, accounting for both natural processes and human activities
Waste management	The process of collecting, transporting, treating, and disposing of waste.
Water treatment	The process of removing impurities from water. This is done to make water safe to drink and to improve its quality for other purposes

LIST OF ABBREVIATIONS

APELL	Awareness and Preparedness for Emergencies at the Local Level
ACKO	Association of Kenya Cruise Operators
AHPK	Association of Hotel Professionals Kenya
AKMPG	Association of Kenya Mountain Guides and Porters
BETA	Bottom-Up Economic Transformation Agenda
CBD	Convention on Biological Diversity
CBOs	Community-Based Organizations
CEO	Chief Executive Officer
CFI	Comparative Fit Index
CH4	Methane
CO2	Carbon dioxide
CoP25	25th Conference of Parties
CoP26	26th Conference of The Parties
CPD	Continuous Professional Development
CS	Criticality score
CSR	Corporate Social Responsibility
DPSIR	Drivers, Pressures, State, Impacts, Response
EEA	Environmental Economic Accounts
EFTs	Ecological Fiscal Transfers
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Conservation Act
ESG	Environmental, Social, and Governance factors
ESMMR	Exploratory Sequential Mixed Method Research
ESOK	Ecotourism Society of Kenya
EVs	Electrical Vehicles
FGD	Focus Group Discussion
FGDs	Focus Group Discussions
GCF	Green Climate Fund
GDP	Gross Domestic Product
GFI	Goodness of Fit Index
GHGs	Greenhouse gases
GIS	Geographic Information System
GoK	Government of Kenya
GRI	Global Reporting Initiative
GSBMP	Generic Statistics Business Process Model
GSTC	Global Sustainable Tourism Council

GTK	Green Tour Kenya
HFC	Hydrofluorocarbons
HSPAK	Homestay Service Providers Association of Kenya
IEA	International Energy Authority
IPCC	Intergovernmental Panel on Climate Change
ISIC	International System of Sector Classification
ISO	International Organization for Standardization
KAAO	Kenya Association of Air Operators
KABHAL	Kenya Association of Beach Hotels and Lodges
KACETO	Kenya Association of Cultural Tourism Operators
KAEO	Kenya Association of Ecotourism Operators
KAHC	Kenya Association of Hotelkeepers and Caterers
KATA	Kenya Association of Travel Agencies
KATGD	Kenya Association of Tour Guides and Drivers
KATO	Kenya Association of Tour Operators
KCAA	Kenya Civil Aviation Authority
KenInvest	Kenya Investment Authority
KFS	Kenya Forest Service
KIIs	Key Informant Interviews
KNBS	Kenya National Bureau of Statistics
KOBO	Knowledge Organization for Better Outcomes
KPLC	Kenya Power & Lighting Company
KR	Kenya Railways
KTB	Kenya Tourism Board
KTDGA	Kenya Tour Driver Guides Association
KTF	Kenya Tourism Federation
KWS	Kenya Wildlife Service
LPG	Liquid Petroleum Gas
MDAs	Ministries, Departments, and Government Agencies
MEA	Multilateral Environmental Agreement.
MITI	Ministry of Investment Trade and Industry
MoT&W	Ministry Of Tourism and Wildlife
MSMEs	Micro, Small, and Medium Enterprises
MWCT	Masai Wilderness Conservation Trust
NACE	National Association for Catering and Events
N2O	Nitrogen oxide
NAP	National Adaptation Plan

NCCRS	National Climate Change Response Strategy
NCCS	National Climate Change Secretariat
NDC	Nationally Determined Contributions
NEMA	National Environment Management Authority
NFI	Normed Fit Index
NGOs	Non-Governmental Organization
NO2	Nitrous oxide
NRT	North Rangeland Trust
NTSA	National Transport Safety Authority
NWHSA	National Water Harvesting Storage Authority
ODK	Open Data Kit
PERAK	Pubs, Entertainment and Restaurants Association of Kenya
PES	Payment for Ecosystem Services
PESTLEG	Political, Economic, Social, Technological, Legal, Environmental, and Governmental factors
PFC	Perfluorocarbons
PFM	Public Finance Management Act
PIC	Project Implementation Committee
PSC	Public Service Commission
PSUT	Physical Supply Use Tables
PWDs	People Living with Disabilities
R&D	Research and Development
RAMSAR	Convention on Wetlands of International Importance
RMSEA	Root Mean Square Error of Approximation
SAGAs	Semi-Autonomous Government Agencies
SDGs	Sustainable Development Goals
SEEA	System of Environmental Economic Accounts
SEEA-CF	System of Environmental Economic Accounts Central Framework
SEM	Structural Equation Modelling
SF6	Sulphur Hexafluoride
SMEs	Small and Medium Size Enterprises
SNA	System of National Accounts
STPs	Sustainable Tourism Practices
STPs	Sustainable Tourism Practices
SUT	Supply Use Tables
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TBL	Triple Bottom Line

TDGDP	Direct Gross Domestic Product
TF	Tourism Fund
TFC	Tourism Finance Corporation
TLI	Tucker-Lewis Index
T-O-E	Technical, Organizational and Environmental
TOE	Technology, Organization, and Environment
TOR	Terms of Reference
TOSK	Tour Operators Society of Kenya
TPAK	Tourism Professionals Association of Kenya
TRA	Tourism Regulatory Authority
TRI PSC	TRI Project steering committee
TRI	Tourism Research Institute
TSAK	Tourism Students Association of Kenya
TUMEL	Technical University of Mombasa Enterprises Limited
TVET	Technical Vocational Education and Training
UK	United Kingdom
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environmental Program
UNFCCC	United Nations Framework Convention on Climate Change
UNWTO	United Nations World Tourism Organization
UV	Ultra-violet
VAT	Value Added Tax
WASREB	Water Resources Regulatory Authority
WRA	Water Resource Authority
WTTC	World Travel and Tourism Council

EXECUTIVE SUMMARY

Kenya's tourism sector plays a vital role in driving economic development, creating employment, generating income, and fostering growth in other sectors. Given that over 80% of Kenya's tourism is nature-based, it is highly vulnerable to the impacts of climate change and climate variability. Conversely, the tourism sector significantly contributes to greenhouse gas emissions, waste generation, and the depletion of natural resources. If these negative impacts remain unmitigated, they can hinder the supply of ecosystem services, leading to adverse economic and social consequences. Thus, it is imperative for Kenya's tourism sector to adopt sustainable tourism practices that address climate change challenges while promoting social and economic development.

This study aimed to conduct a situational analysis of the adoption of sustainable best practices, evaluate the impact of climate change on Kenya's tourism sector, and design appropriate climate responses and sustainable practices aligned with global benchmarks. The primary objectives included mapping and evaluating the impacts of climate change on the tourism sector, assessing the climate change response strategies adopted by local tourism enterprises, conducting a situational analysis to gauge the current adoption level of sustainable tourism practices compared to global best practices, evaluating the drivers and barriers influencing the tourism sector's embrace of sustainability practices and constructing a system of environmental-economic accounting for Energy, Greenhouse Gas (GHG), Water, and Solid Waste accounts.

The study targeted 16,438 tourism enterprises across seven regions and involved key national industry stakeholders. Using a mixed research method design, it collected quantitative data from 1,253 tourism enterprises via surveys and qualitative insights from 26 informants through key informant interviews and 12 focus group discussions across the country. Supplementary data on climate change and sustainable tourism were obtained from document reviews. The Regional Tourism Sustainable Adaptation Framework (RTSAF) served as the foundation for evaluating climate change impacts on Kenya's tourism industry and the sector's responses. The triple bottom line theory (TBL) was used to identify and assess sustainable tourism practices across economic, social, and environmental dimensions. The Technological, Organizational, and Environmental (T-O-E) Factors Model provided a framework for studying the barriers and drivers of adopting sustainable tourism and climate change adaptation and mitigation practices. Benchmarks for comparing baseline climate change responses and sustainability practices by Kenyan tourism enterprises against global standards were provided by the UNEP Tools and Framework for Climate Change Adaptation and Mitigation for Tourism (UNEP, 2008) and the Global Sustainable Tourism Council (GSTC) criteria. The System of Environmental Economic Accounting Central Framework (SEEA-CF, 2012) and the Tourism Satellite Account Recommended Methodological Framework (TSA-RMF-2008) guided the compilation of SEEA accounts for the tourism sector. The study used Mendelow's Power-Interest Matrix (Mendelow, 1991) for stakeholder identification and analysis.

Quantitative data analysis used descriptive statistics, including mean and frequencies, to profile respondents and tourism enterprises. Techniques like analysis of variance (ANOVA) and the student t-test compared means across categories. Binary regression and ordinary least squares regression models were estimated to study predictive and causal effects, respectively. Structural equation modelling created measurement models for latent variables and examined direct and mediated relationships. Qualitative analysis employed thematic and content analysis to uncover key themes from stakeholder feedback.

The analysis revealed that tourism practitioners across all regions were somewhat aware to moderately aware of most climate change events ($1.50 > \bar{x} < 4.00$), with significant differences in awareness levels between respondents' gender ($t(645.31)=2.61, p<.05$) – the males ($n=883, \bar{x} = 3.50$, SD = 0.82) were more aware of physical climate change impacts compared to their female colleagues ($n=370, \bar{x} = 3.36$, SD = 0.88). Similar variations were noted for education level for biological impacts ($F_((3,1248))=8.98, p<.001$) and physical impacts ($F_((3,1248))=23.52, p<.001$) and across years of experience in the tourism industry for biological impact ($F_((2,1250))=6.78, p<.001$) and physical impacts ($F_((2,1250))=10.05, p<.001$). On the other hand, the results reveal that the level of awareness of biological climate change impacts was not significantly different across tourism regions ($F_((6,1246))=1.28, p=.27ns$). but was significantly different for physical climate change impacts across tourism regions ($F_((6,1246))=9.09, p<.001$)

Regarding climate change response, the results show that the adoption of climate change adaptations by tourism enterprises was generally low ($\bar{x} < 3.50$). Adaptation measures requiring substantial investment, such as rainwater collection, protection against rising water levels, special insurance, structural modifications, and tree planting, were only adopted to a limited extent ($1.50 < \bar{x} < 2.50$). Water recycling and desalination were practiced to no extent ($1.00 < \bar{x} < 1.50$). Conversely, employee training emerged as the most widely implemented measure ($\bar{x} = 3.03$, SD = 1.32), adopted by 77% to 88% of enterprises across classes A, B, C, and E to at least a limited extent.

Regarding climate change mitigation, the results show that enterprises had adopted tree planting to a limited extent ($\bar{x} = 2.31$, SD = 1.38) and were engaging in conservation activities to some extent ($\bar{x} = 2.96$, SD = 1.34). However, a majority of hotels (79%), restaurants (72%), tour operators (77%), and small-scale tourism enterprises like curio shops and safari photographers (88%) participated in conservation activities at least to a limited extent. Conversely, fewer hotels (64%), restaurants (56%), tour operators (42%), and smaller enterprises (58%) had implemented tree planting to at least a limited extent.

The study found that tourism enterprises have implemented environmentally sustainable practices like monitoring pollution, creating environmental awareness, and adopting ecological building designs. At least 75% of Class A, 74% of Class B, 64% of Class C, and 83% of Class E enterprises had created employee awareness. Over 85% of hotels and 78% of restaurants adopted eco-building designs to a limited extent. For economic sustainability, monitoring energy use was implemented to a moderate extent ($2.5 < \bar{x} < 3.5$) across Class A, B, C, and

E enterprises. The majority of hotels (90%), restaurants (87%), tour operators (74%), and Class E enterprises (81%) had implemented this practice to at least a limited extent. Recycling materials was the least implemented, practiced to a limited extent ($1.5 < \bar{x} < 2.5$) by slightly more than half of the enterprises (51%-52%). Compliance with laws was the most widely adopted social sustainability practice, implemented to a considerable extent across all four classes ($3.5 < \bar{x} < 4.5$). Most hotels (99%), restaurants (93%), tour operators (92%), and Class E enterprises (95%) reported compliance. Anti-sexual harassment policies were also widely implemented ($3.5 < \bar{x} < 4.5$). Budgeting for CSR programs was the least adopted, with 74%-76% of Classes A, B, and C implementing it to at least a limited extent.

The study revealed that enterprise firmographics—ownership, legal status, size, and classification—and perceptions of climate change impacts were significant predictors of adopting climate change response practices ($x2 = 121.78\text{-}469.44$, $p < .001$). The combined accuracy, sensitivity, and specificity results indicate that these factors correctly predict the likelihood of adopting adaptation and mitigation practices, with accuracy ranging from 66% to 81%. These results suggest the importance of these factors in promoting climate change response strategies. The study found that eleven technological, organizational, and environmental factors collectively drove the adoption of sustainable tourism practices (BTOE = 0.54, $t = 12.18$, $p < .001$). Technological factors—policies on technology, access to digital technology, payment accelerators, and energy use efficiency—were identified as the top drivers for implementing sustainable practices across social, environmental, and economic dimensions.

A comparison of climate change adaptation practices with best practices revealed significant adoption gaps within the sector. Implementation rates were limited for protection against rising water levels (37%), rainwater collection (32%), water recycling (23%), and saltwater desalination (15%). Additionally, only 58% of enterprises had implemented tree planting. Qualitative analysis confirmed low adoption of waste recycling, waste reduction, phasing out fossil fuels, optimizing vehicular transport, shifting to open-air spaces, and investing in carbon offset markets. For sustainable tourism practices, gaps were identified with low to moderate implementation rates for material recycling (53%), environmental fleet management (60%), eco-building design (73%), and budgeting for Corporate Social Responsibility (76%).

The study prioritized climate adaptation, mitigation, and sustainability practices for tourism enterprises based on their effectiveness in promoting sustainability and achieving climate change objectives. Eleven (11) best practices were identified: water and energy conservation; ecosystem and environmental restoration; product market diversification; changes in product use and shifting to open-air spaces; waste management; capacity building, training, and research; compliance with government policies and regulations; protection of fragile ecosystems and watersheds; investment in carbon offset projects; and use of electric transportation systems.

The situational analysis on Environmental Economic Accounting (EEA) for tourism in Kenya revealed gaps in environmental reporting, especially in documenting GHG emissions and solid waste management. Challenges include a lack of knowledge, tools, and perceived costs, which hinder comprehensive reporting. However, awareness and application exist in sectors like travel and hospitality, indicating potential for broader implementation. Although there are no specific laws for environmental-economic accounting in tourism, existing policies and strategies offer a foundation for integration.

The study compiled SEEA core accounts for Kenya's tourism sector. The SEEA energy account reveals that the accommodation and food & beverage industries generated 640.8 TJ of energy, with only 5% of tourism enterprises producing off-grid electricity. The tourism sector consumed 14% of electricity (5,050.60 TJ) from the Electricity, Gas, Steam, and Air Conditioning sector, 11% of motor spirit petroleum, and 10% of imported light diesel. Total intermediate energy consumption was 7,357.9 TJ, with 58% (4,281.83 TJ) linked to tourist expenditures. The SEEA greenhouse gas (GHG) account for 2022 shows the sector's emissions were relatively low at 0.76 Mt CO2e, mainly from passenger transport, accommodation, food and beverage services, and travel agencies. The water account indicates that the tourism industry used 21.30 MCM of water, yet 97% of establishments did not treat sewage for reuse, highlighting gaps in wastewater management. The solid waste account estimates that tourism contributed 64.28 tonnes of the 8 million tons of solid waste produced in 2022, primarily from accommodation (82%) and food & beverage services (11%). Minimal recycling and composting (4%) by the sector underscore significant environmental implications from waste disposal practices.

Based on the survey results and a comparison of existing practices with global benchmarks, the study proposes best practices for Kenya's tourism sector. Implementing these practices can improve resource use, reduce environmental impacts, and enhance resilience to climate challenges, aligning more closely with global sustainability standards.

To institutionalize environmental economic accounting, the report recommends establishing robust data collection mechanisms for solid waste, water, and energy to create a centralized accounting system. It also advises investing in capacity-building through training and incentivizing EEA practices. Strengthening partnerships and policy integration will mainstream EEA in tourism policies and regulations. Tourism enterprises are encouraged to improve internal data collection, adopt sustainable practices, foster partnerships, and invest in capacity-building to monitor environmental impacts, reduce their footprints, and engage in sustainable development.

Introduction

CHAPTER ONE

1. INTRODUCTION

1.1 Background

The tourism sector in Kenya plays a significant role in driving social and economic development. It contributes 10% to the Gross Domestic Product (GDP), provides 6% of direct formal employment, and accounts for 4% of the National Gross Fixed Capital Formation (NGFCF) (Tourism Research Institute [TRI], 2023). This contribution is projected to increase, with sector earnings expected to grow to Ksh 430 billion in 2024 and Ksh 1.024 trillion by 2028, due to the anticipated rise in visitor numbers from 2.4million in 2024 to 5.7million in 2028 (TRI, 2023). The sector also plays a crucial role in safeguarding cultural heritage and environmental conservation, demonstrating its importance in enabling Kenya to achieve sustainable development goals.

However, the tourism sector's economic contribution is increasingly threatened by climate change. According to the Intergovernmental Panel on Climate Change (IPCC, 2022), rising global temperatures due to greenhouse gas emissions will severely impact climate-sensitive sectors like tourism, which heavily depend on natural resources. These impacts include changes in destination attractiveness, increased operational costs (e.g., heating and cooling), limited water availability, reduced food diversity, infrastructure damage, and increased incidences of vector-borne diseases (IPCC, 2022; Chemeli et al., 2021; Njoroge, 2020). Furthermore, the tourism sector's emissions are projected to rise by 25% by 2030 compared to 2016 levels (United Nations World Tourism Organization [UNWTO], 2019). In response, the tourism sector declared a climate crisis in 2020 (Scott & Gossling, 2022), aligning with the emphasis on the need for low-carbon pathways at the 25th Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC COP 25) (UNWTO, 2019).

Indirect impacts of climate change on tourism include environmental changes that strain social and economic systems, such as altered water availability, biodiversity loss, compromised landscape authenticity, reduced food production, increased natural hazards, coastal erosion, coral bleaching, and rising vector-borne diseases (Chemeli et al., 2020; Njoroge, 2020; Becken & Hay, 2007). Thus, implementing climate adaptation and mitigation measures is crucial for the tourism sector's survival. Tourism also has adverse environmental impacts due to the consumption of natural resources and waste generation. For instance, the hotel industry consumes significant water and energy and produces considerable waste (Verma & Chandra, 2016). The UNWTO estimates that tourism contributes about 5% of global CO2 emissions (UNWTO, 2012), highlighting the need for effective impact management to ensure sustainability.

At the UNFCCC COP 25, the tourism sector's climate crisis declaration urged for adoption of low-carbon pathways (Scott & Gossling, 2022). Kenya committed to this, recognizing its tourism sector's reliance on natural landscapes, wildlife-protected areas, coastal ecosystems, and resources. To minimize environmental degradation and preserve natural resources for future generations, climate-resilient sustainable practices must be prioritized. Mitigating

tourism's climate impact requires reducing GHG emissions, adopting cleaner methods, and offsetting emissions to transition to a low-carbon tourism sector.

While the tourism industry acknowledges the imperative of climate change adaptation, mitigation, and sustainable practices, their widespread adoption remains elusive (Hall & Higham, 2015). The heterogeneity of practices among industry players underscores the necessity for standardized, globally benchmarked minimum requirements (Weaver, 2018). By establishing such benchmarks, Kenya's tourism sector can effectively position itself as a climate-conscious and sustainable destination, gaining a competitive advantage over rivals (Scott et al., 2015). This strategic approach not only safeguards the environment but also unlocks substantial economic and social benefits through the implementation of best practices in sustainable tourism, climate change adaptation, and mitigation.

At the same time, disparities in the adoption of climate change response and sustainable tourism practices underscore the need to address barriers to implementation and evaluate the effectiveness of the current legal, regulatory, and institutional framework supporting these initiatives (Bramwell & Lane, 2014). This assessment should consider the efficacy of existing incentives and disincentives in promoting industry-wide adoption of best practices for climate change and sustainable tourism (Gössling et al., 2018). Enhancing these mechanisms is crucial for fostering widespread adoption and improving the overall sustainability of the tourism sector (UNWTO, 2020).

Noting the significant impacts of tourism activities on resource consumption and waste generation, it is imperative for the industry to measure, monitor, and track its use of energy and water resources, as well as emissions of GHGs and solid waste generated. Experts agree that the increasing trend in CO2 emissions from fuel combustion necessitates robust monitoring and accounting mechanisms (UNWTO, 2021). Accurate tracking of emissions is crucial for assessing progress toward climate goals, formulating effective policies, and implementing mitigation strategies (IPCC, 2021). The System of Environmental-Economic Accounting (SEEA) provides a robust framework for measuring exchanges of materials—energy, water, GHGs, and solid waste—between the environment and the tourism sector as part of the economy (United Nations, 2022). The SEEA framework allows for systematically accounting for environmental flows and integrating environmental data with national economic accounts.

1.2 Rationale of the Consultancy

At the twenty-sixth Conference of Parties (COP 26) of the UNFCCC held in Glasgow, United Kingdom (UK) in 2021, Kenya committed to: restrict use of vehicular transportation within all national parks and game reserves that use non-fossil renewable energy; require all hospitality and tourism enterprises to adopt renewable energy and circular economy in their operations; mobilize the ecological assets in vast protected area that act as carbon sinks to maximize on global carbon credit facilities available in order to raise additional resources to play an active role in meeting national goal of a net carbon neutral nation; restore degraded areas in national parks and game reserves with a concerted effort on reforestation; increase marine conservation areas network; establish a framework for documentation and measuring the

economic impacts of climate change on tourism sector as basis of mainstreaming practical, quantifiable and accountable required measures on climate actions by tourism actors in the entire tourism value chain; and develop and enforce minimum sustainability standards that are in line with the global benchmarks for business in the sector. These commitments aim to minimize environmental degradation and preserve natural resources for future generations.

Kenya outlined several actions for conserving and managing its tourism sector. These include establishing frameworks for documenting and measuring the economic impacts of climate change on the tourism sector as a basis for mainstreaming practical, quantifiable, and accountable measures on climate action throughout the tourism value chain. For instance, accurate tracking of greenhouse gas (GHG) emissions is crucial for assessing progress towards climate goals, formulating effective policies, and implementing mitigation strategies. It is also important for the country's tourism sector to monitor its progress towards implementing sustainable practices and contributing to the country's attainment of global sustainable development goals.

Against this backdrop, the TRI conducted a comprehensive national study focusing on Kenya's tourism enterprises and stakeholders. The study aimed to assess the current adoption of sustainable best practices, evaluate the impacts of climate change on the tourism sector, and design climate response strategies and sustainable practices aligned with global benchmarks. Additionally, the study involved developing a framework of incentives and disincentives to encourage the adoption of these best practices. It also included creating a System for Environmental and Economic Accounting (SEEA) to better integrate tourism environmental data with national economic accounts.

1.3 Objectives of the Consultancy

1.3.1 General Objectives

The overall objective of the study was to undertake a situational analysis on the adoption of sustainable best practices, evaluate the impact of climate change on the tourism sector in Kenya, and design appropriate climate response and sustainable best practices in line with global benchmarks.

1.3.2 Specific Objectives

Specifically, the study sought to:

i. Undertake a baseline survey on the adoption of sustainable best practices within Kenya's tourism sector (all enterprises as listed in the 9th schedule of the Tourism Act 2011);
ii. Carry out a situational analysis on the adoption of sustainable best practices and assess the drivers and barriers to the adoption of sustainability practices by the tourism sector in Kenya;
iii. Evaluate the impact of climate change on tourism in Kenya

iv. Develop measures and practices to ensure the adoption of sustainable practices and response to climate change for the tourism sector in Kenya;
v. Recommend (identify and prioritize) climate adaptation, mitigation, and sustainable best practices for tourism in Kenya;
vi. Develop a framework of incentives for the tourism sector in Kenya to adopt sustainable best practices and climate-resilient strategies and disincentives for those who do not; and
vii. Develop a System of Environmental-Economic Accounting (SEEA) Framework for the tourism sector in Kenya.

Methodology

CHAPTER TWO

2. METHODOLOGY

2.1 Theoretical Approach

The study was guided by the following theoretical approaches in conducting the empirical research:

2.1.1 The Regional Tourism Sustainable Adaptation Framework (RTSAF)

The Regional Tourism Sustainable Adaptation Framework (RTSAF), adapted from Njoroge et al. (2020), was the foundation for evaluating climate change impacts on Kenya's tourism industry. This framework assesses the vulnerability and resilience of tourism destinations, providing parameters for defining the tourism system and determining risks and opportunities. The framework has been effective in identifying region-specific adaptation options and assessing the Coastal region's climate change resilience using both secondary and primary data.

The study relied on the RTSAF's tourism system approach to identify key stakeholders in tourism and evaluate their climate change awareness. The framework's segment on climate change risks and opportunities guided the identification of significant physical climate change events, biological impacts, and indirect economic consequences. The RTSAF outlines a four-phase process for climate change adaptation and mitigation: options identification, assessment, implementation, and evaluation (Figure 2.1).

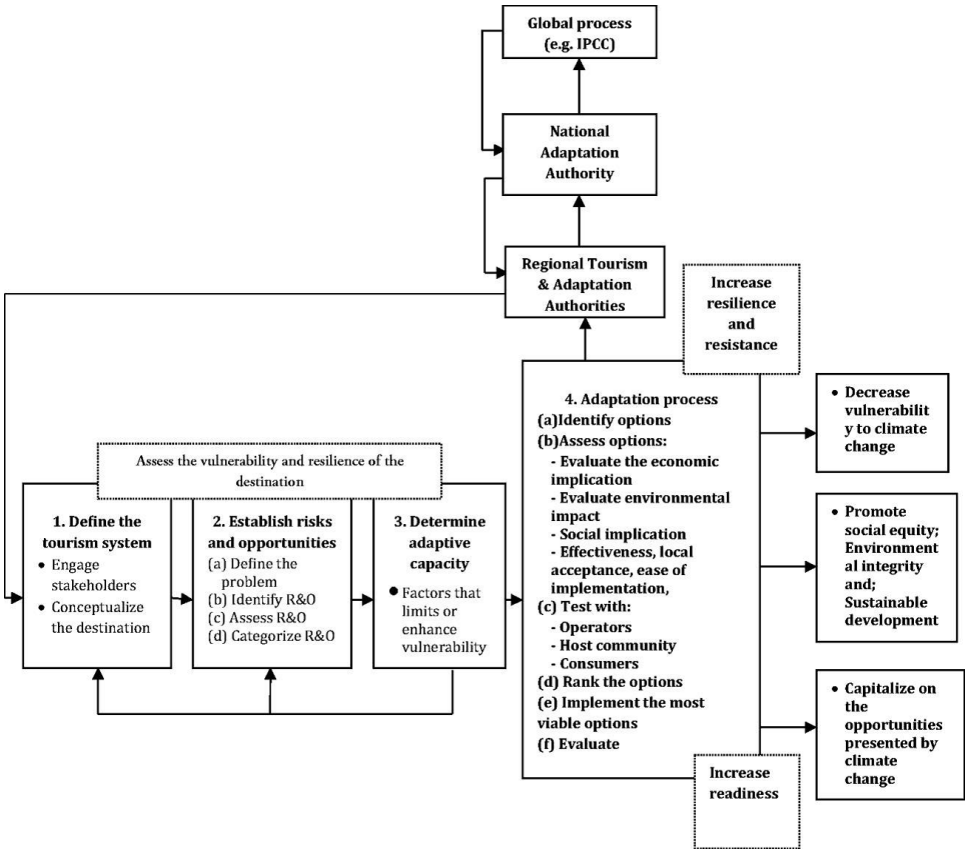

Figure 2.1: An enhanced Regional Tourism Sustainable Adaptation Framework (RTSAF)

Source: Adapted from Njoroge *et al.* (2020).

Using the RTSAF framework (Figure 2.1), the study identified and classified climate change response strategies by tourism enterprises and assessed their extent of implementation in Kenya. The study also drew from the RTSAF's guidelines on determining adaptive capacity to analyze the internal factors influencing tourism enterprises' adoption of climate resilience strategies.

2.1.2 The Triple Bottom Line Theory

The Triple Bottom Line (TBL) theory, initially proposed by Elkington (1998), broadens the concept of organizational performance beyond traditional financial metrics to include environmental and social justice. When applied to tourism enterprises, TBL serves as an organizational philosophy that urges enterprises to consider the impacts of their operations on both natural and human environments. It underscores the evaluation of economic, social, and environmental performance, majoring on «profit, people, and planet.»

In the economic dimension, TBL evaluates traditional financial performance indicators such as sales revenue, profit, and return on investment, with specific metrics for the tourism sector including bed occupancy rates and the number of visitors. The social dimension, or social capital, includes human capital and the social systems supporting the business. This was assessed using indicators like employee training, stakeholder feedback, community benefits, procurement practices, and corporate social responsibility. The environmental dimension, or natural capital, acknowledges tourism's reliance on ecosystems for services that sustain the industry. The theory proposes implementing metrics to measure interactions between the natural environment and tourism economic systems to mitigate adverse impacts. The study utilized TBL to establish environmental performance measures and identify environmental sustainability practices adopted by tourism enterprises.

2.1.3 Technological, Organizational, and Environmental (T-O-E) Factors Model

Tornatzky, Fleischer, and Chakrabarti (1990) proposed the T-O-E framework to analyze barriers and drivers in adopting sustainable tourism practices. Technological factors assess the availability and compatibility of green technologies. Organizational factors consider leadership support, employee skills, and organizational structure. Environmental factors evaluate external influences like regulatory policies and market demands for sustainable practices. By examining these dimensions, the framework provides insights into how technological advancements, organizational capabilities, and external environmental pressures influence the adoption and implementation of sustainable initiatives within tourism enterprises.

The study utilized the Technological, Organizational, and Environmental (T-O-E) factors proposed by Tornatzky, Fleischer, and Chakrabarti (1990) to categorize the barriers and drivers affecting the adoption of climate change action and sustainable tourism practices by tourism enterprises

2.1.4 UNEP Tools and Framework for Climate Change Adaptation and Mitigation for Tourism

Building on the results of the 2nd International Conference on Climate Change and Tourism, as well as the Davos Declaration, the United Nations Environmental Program (UNEP) established tools and framework for climate change adaptation and mitigation, (UNEP, 2008). The tools and framework describe a portfolio of climate change adaptation and mitigation strategies by tourism stakeholders. The UNEP tool identifies and classifies adaptation practices into Technical, Managerial, Policy, Research, Education, and Behavioural. The UNEP tool also identifies and classifies the climate change mitigation measures by tourism enterprises into those aimed at eliminating, reducing, substituting, and offsetting carbon dioxide emissions. These tools and frameworks provided global benchmarks against which climate change adaptation and mitigation practices currently implemented by the tourism enterprises were compared.

2.1.5 The GSTC Industry Criteria

The Global Sustainable Tourism Council (GSTC) criteria sets the minimum standards for tourism management organizations to ensure the sustainability of tourist attractions. This criterion promotes an interdisciplinary, holistic, and integrated approach to sustainable destination management, aiming to optimize economic benefits for host communities, enhance social impacts, and minimize environmental impacts. Applicable to all types and sizes of destinations and tourism sub-sectors, the GSTC standards align with established global standards such as UNWTO target indicators and GSTC hotel and tour operator standards (Anis et al., 2023).

The study utilized the globally accredited GSTC standards to benchmark sustainability practices adopted by tourism enterprises in Kenya, as they offer comprehensive, sector-specific criteria designed for tourism, unlike the more generalized ISO standards (ISO 14001 for environmental management, ISO 26000 for social responsibility, and ISO 50001 for energy management). The GSTC standards focus on environmental, socio-economic, and cultural impacts specifically tailored for the tourism industry, ensuring a holistic assessment. This makes them more relevant and practical for evaluating sustainable tourism practices, aligning with global best practices and fostering more effective and targeted sustainability measures within the sector.

The GSTC industry criteria focus on four major pillars: sustainable planning and management, managing socio-economic impacts, cultural impacts, and environmental impacts. This approach aimed to identify and evaluate the sustainability practices embraced by tourism enterprises in the country. These pillars have several criteria and indicators that map onto the 17 Sustainable Development Goals (SDGs) as illustrated in Table 2.1.

Table 2.1: GSTC Industry Criteria Mapped by the SDGs

GSTC Industry Criteria	SDGs
Sustainability Planning and Management	
• Long-term transformative leadership	SDG 12
• Legal compliance	SDG 16
• Reporting and communication	SDG 12, 17
• Staff engagement	SDG 4, 17
• Customer experience	SDG 12
• Promotion of sustainable tourism practices	SDG 12
• Impact of buildings and infrastructure	SDG 11, 15
• Compliance to land-use plans and climate regulations	SDG 11, 15
• Information and interpretation of natural and cultural heritage	SDG 11, 12
• Destination engagement in tourism planning and management	SDG 11, 17
Managing Socio-economic Impacts in Tourism	
• Building community support	SDG 3, 4, 9
• Local employment	SDG 8, 10
• Local Purchasing	SDG 2, 8, 12
• Local entrepreneurs	SDG 8, 12
• Addressing exploitation and harassment	SDG 5, 10, 16
• Providing equal opportunity	SDG 5, 10
• Decent work provision	SDG 1, 4, 8
• Provision of community services	SDG 6, 11, 12
• Improving local livelihoods	SDG 11, 12
Managing Cultural Heritage Impacts	
• Cultural interactions	SDG 4, 11, 12
• Protection of cultural heritage	SDG 11
• Promotion, preservation, and presentation of culture and heritage	SDG 11, 12
• Cultural artifacts	SDG 11
Managing Environmental Impacts	
• Conservation of resources	SDG 7, 12
GSTC Industry Criteria	
• Pollution reduction	SDG 13, 11, 3, 2
• Biodiversity conservation	SDG 14, 15
• Invasive species	SDG 14, 15
• Visits to natural areas	SDG 14, 15
• Animal welfare	SDG 14, 15
• Wildlife harvesting and trade prevention	SDG 14, 15

Source: Adapted from GSTC (2016)

The study relied on the GSTC industry criteria (Table 2.1) as a global benchmark against which sustainable practices by tourism enterprises in Kenya were compared.

2.1.6 System of Environmental-Economic Accounting Central Framework

The study relied on the System of Environmental-Economic Accounting Central Framework (SEEA-CF, 2012) (UN et al, 2014) to compile the energy, GHG, water, and solid waste accounts for Kenya's tourism sector. This statistical framework, consisting of comprehensive tables and accounts ensured the creation of consistent and comparable statistics and indicators for policy-making, analysis, and research. The SEEA Central Framework is built on established concepts, definitions, classifications, and accounting rules, which guide the compilation process. As an accounting system, it organizes information into integrated and conceptually coherent tables and accounts. The SEEA Central Framework also ensured that the environmental flow accounts (figure 2.2) are aligned with other international standards, recommendations, and classifications, such as the System of National Accounts 2008, the International Standard Industrial Classification of All Economic Activities (ISIC), and the Central Product Classification (CPC).

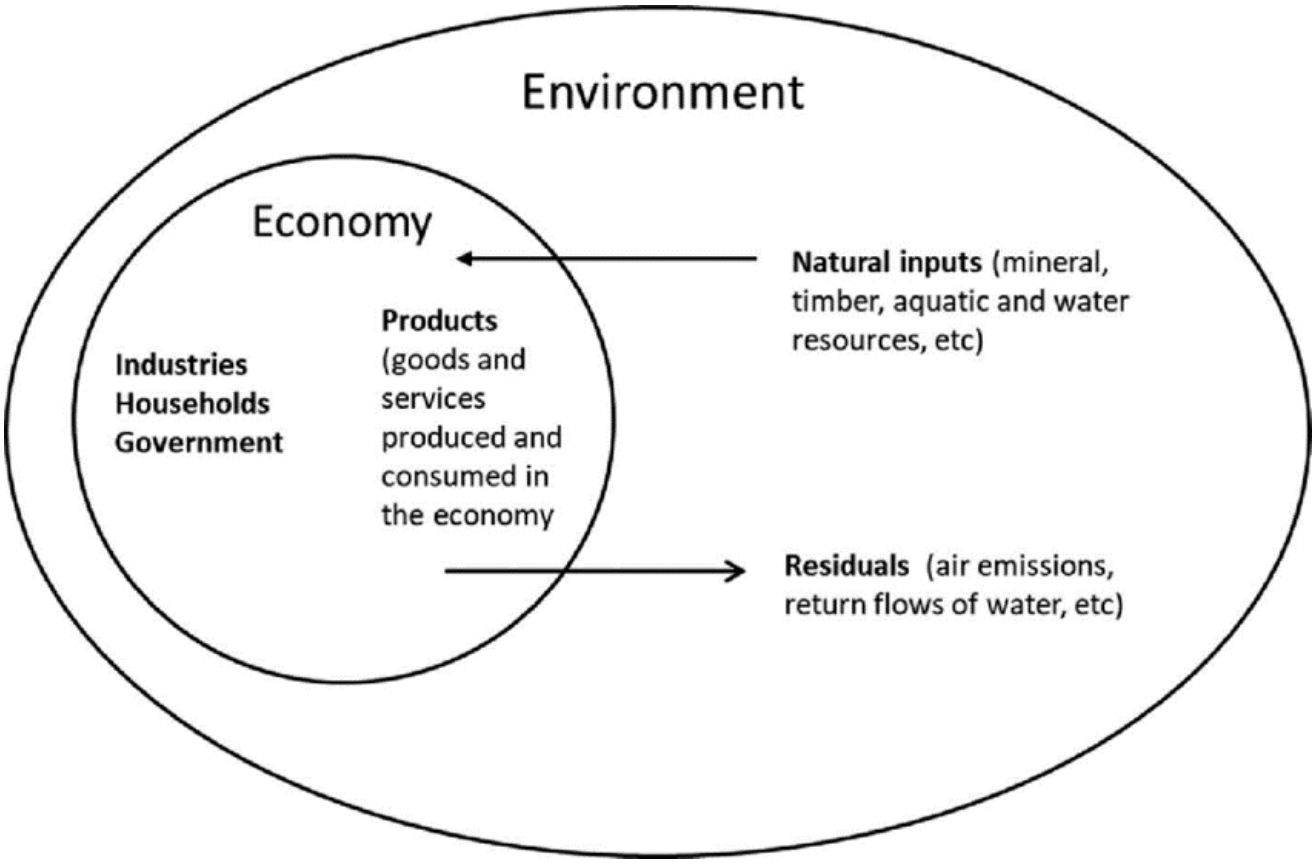

Figure 2.2: Environmental Flow between the Economy and the Environment

2.1.7 The UNWTO Tourism Satellite Accounts- Recommended Methodological Framework (TSA-RMF, 2008)

The compilation of SEEA for tourism relied on the Tourism Satellite Account Recommended Methodological Framework (TSA-RMF-2008) to classify tourism industries and activities (UNWTO & United Nations Statistics Division [UNSD], 2008). According to this framework, a tourism sector consists of establishments whose main activity is the same tourism characteristic activity (UNWTO & UNSD, 2008). The study defined tourism-characteristic industries as those activities that typically produce tourism-characteristic products (UNWTO & UNSD, 2008). These products were identified based on one or both of the following criteria: (a) tourism expenditure on the product represents a significant share of total tourism expenditure (share-of-expenditure/demand condition), or (b) tourism expenditure on the product represents a significant share of the supply of the product in the economy (share-of-supply condition) (UNWTO &UNSD, 2008).

Table 2.2 lists the categories of tourism-characteristic consumption products and tourism-characteristic activities (tourism industries) that formed the basis for classifying tourism industries in constructing the SEEA accounts.

Table 2.2: Tourism characteristic consumption products and tourism characteristic activities (tourism industries)

Products	Activities
1. Accommodation services for visitors	1. Accommodation for visitors
2. Food- and beverage-serving services	2. Food- and beverage-serving activities
3. Railway passenger transport services	3. Railway passenger transport
4. Road passenger transport services	4. Road passenger transport
5. Water passenger transport services	5. Water passenger transport
6. Air passenger transport services	6. Air passenger transport
7. Transport equipment rental services	7. Transport equipment rental
8. Travel agencies and other reservation services	8. Travel agencies and other reservation services activities
9. Cultural services	9. Cultural activities
10. Sports and recreational services	10. Sports and recreational activities
11. Country-specific tourism characteristic goods	11. Retail trade of country-specific tourism characteristic goods
12. Country-specific tourism characteristic services	12. Other country-specific tourism characteristic activities

Source: UNWTO 2008

The study adopted a consumption-side perspective (demand) to classify tourism industries. This approach aligns with the TSA-RMF-2008). Following the TSA-RMF, the classification focused on primary tourism activities, which are industries that directly provide goods and services that satisfy the specific needs of tourists. This differs from the supply-side perspective often adopted in national tourism legislation, such as Kenya's Tourism Act 2011 Schedule Nine.

By adopting the consumption-side perspective (Table 2.2), the study was able to gain a precise understanding of the core industries that directly generate economic activity from tourist spending. This aligns with the core principles of the TSA-RMF, which aims to measure the economic impact of tourism through the lens of tourist consumption.

2.1.8 Stakeholder Theory (Freeman,1984)

The stakeholder engagement for the current study was underpinned by Stakeholder Theory, initially proposed by R. Edward Freeman in 1984. This theory emphasizes the importance of recognizing and addressing the interests of all parties affected by or able to affect a project's activities. The core tenets of the theory include identifying stakeholders, understanding their interests, and ensuring their involvement throughout the project's lifecycle (Freeman, 1984).

The study relied on the theory's guidelines to identify primary and secondary project stakeholders, ensuring that all relevant parties, such as tourism enterprises, government agencies, and key informants, were considered. The theory provided a basis for defining stakeholder roles, clarifying their contributions and responsibilities in delivering the study's outputs and ensuring that stakeholder input was effectively integrated into the project (Freeman, 1984).

The stakeholder engagement process and activities were guided by the tenets of the theory to foster open and transparent communication, which was crucial for building trust and addressing stakeholder concerns throughout the study. Engaging stakeholders early and continuously allowed for the integration of their feedback, making the process more inclusive and reflective of diverse perspectives. The stakeholder engagement plan was informed by the theory in developing participatory methods, such as surveys, focus group discussions, key informant interviews, and stakeholder validation forums. These methods helped gather valuable insights and fostered a sense of ownership among stakeholders (Andriof et al., 2002). Based on the theory, the engagement plan was able to address stakeholder concerns and incorporate feedback to ensure that the study remained relevant and responsive to the needs of those affected.

The study also relied on Stakeholder Theory to develop a stakeholder engagement plan and to monitor and evaluate engagement processes, which were essential for maintaining an organized and effective approach to stakeholder involvement. This ensured that engagement activities were aligned with the study's objectives and provided a basis for assessing the effectiveness of stakeholder interactions and making necessary adjustments at every phase of the study and engagement process (Phillips, 2010).

2.1.9 Mendelow's Power-Interest Matrix (Mendelow, 1991)

Mendelow's Matrix, introduced in 1991, evaluates stakeholders by their levels of interest and power to determine their potential impact on a project. According to Mendelow, effective stakeholder identification and management are essential for project success. This approach recognizes the bidirectional influence between stakeholders and projects, underscoring the need for thorough stakeholder analysis and engagement. By categorizing stakeholders based on their power (ability to influence the project) and interest (concern for the project's success), the matrix creates a power-interest grid to guide strategic project management and stakeholder engagement efforts.

The power-interest grid provided a valuable tool for stakeholder analysis, crucial in engaging stakeholders effectively for the situational analysis on the adoption of sustainable best practices and assessing climate change impacts on Kenya's tourism sector. This approach categorized stakeholders based on their level of power (ability to influence outcomes) and their level of interest (in the study's outcomes). Stakeholders were classified into four quadrants: high power, high interest; high power, low interest; low power, high interest; and low power, low interest (Figure 2.3)

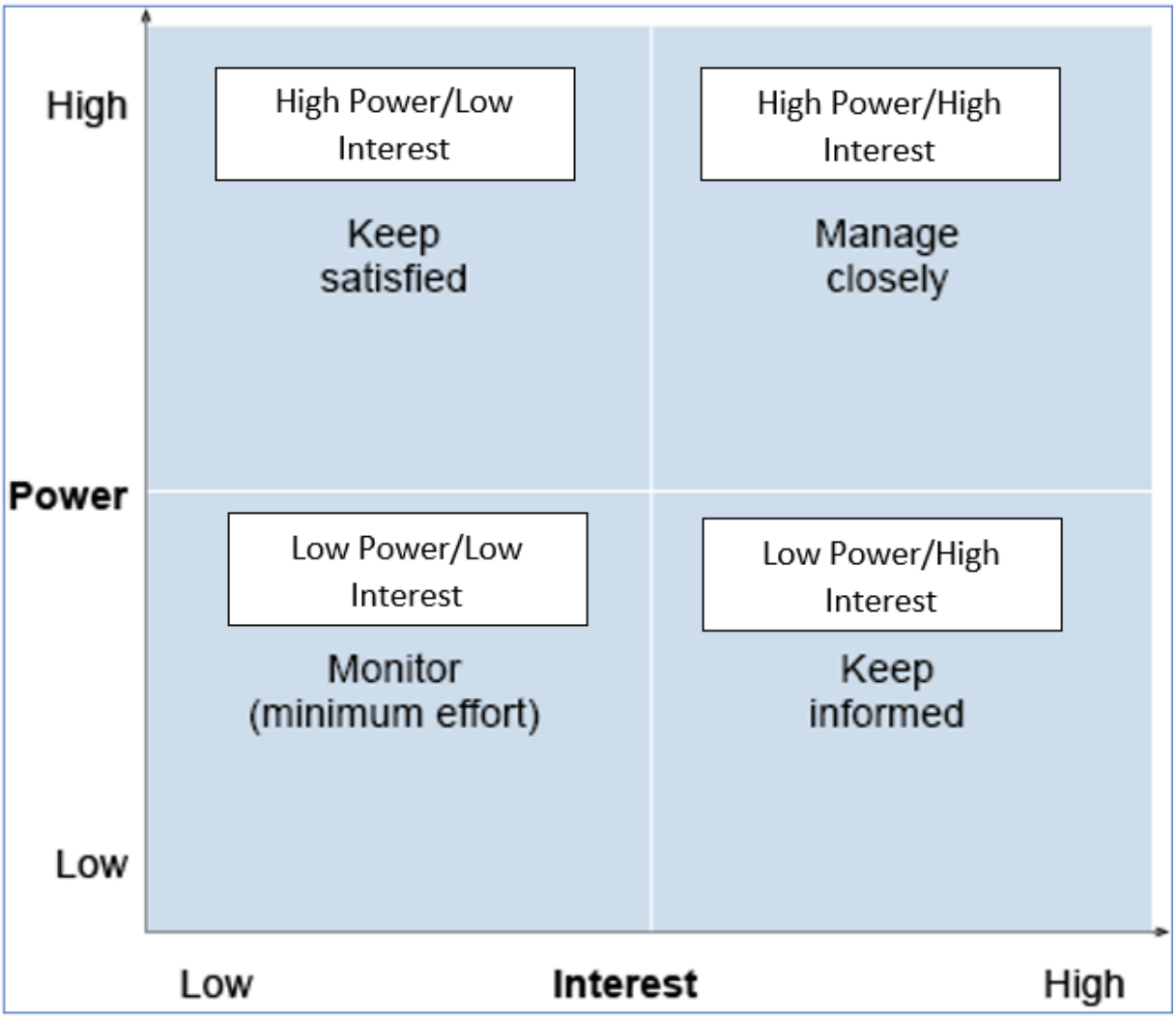

Figure 2.3: Mendelow Power- Interest Matrix

In Figure 2.3, stakeholders with high power and high interest included government bodies like the State Departments, influential NGOs focused on climate action and major tourism operators. Engaging these stakeholders was crucial, as they significantly influence policy decisions and industry practices. Stakeholders with high power but low interest included large corporations not directly involved in tourism but with significant environmental footprints, such as energy providers. Engaging them ensured broad support for sustainable initiatives beyond the tourism sector. Stakeholders with high interest but lower power included host communities dependent on tourism for their livelihoods; their engagement was vital for sustainable development initiatives. Finally, stakeholders with low power and low interest, such as small-scale local businesses outside the tourism sector, would not directly impact policy but could benefit from awareness and capacity-building efforts.

The stakeholder engagement plan considered the Power-Interest Matrix approach advantageous for prioritizing stakeholder engagement efforts by aiding in identifying key influencers and ensuring their concerns were addressed. By mapping stakeholders onto the grid, the study tailored communication strategies to effectively reach and mobilize each group. Moreover, the approach was instrumental in fostering a holistic understanding of stakeholder dynamics, facilitating collaborative decision-making and consensus-building across diverse interests. Ultimately, this approach enhanced the study's credibility and sustainability by ensuring that all relevant perspectives were considered, leading to more robust climate response strategies and sustainable best practices in Kenya's tourism sector.

2.2 Conceptual Approaches

2.2.1 Barriers and Drivers for Adoption of Sustainable Tourism Practices Conceptual Approach

The conceptual framework that guided the study in identifying the determinants influencing the adoption of sustainability practices by tourism enterprises is depicted in Figure 2.4. The schematic diagram outlines the barriers and drivers, including incentives and disincentives for adoption, conceptualizes the sustainable practices embraced by the enterprises, and elucidates the sustainability performance of tourism enterprises. This theoretical perspective offered a comprehensive framework that helped the study to comprehend the intricate interplay between external and internal factors influencing the adoption of sustainability practices in the tourism sector.

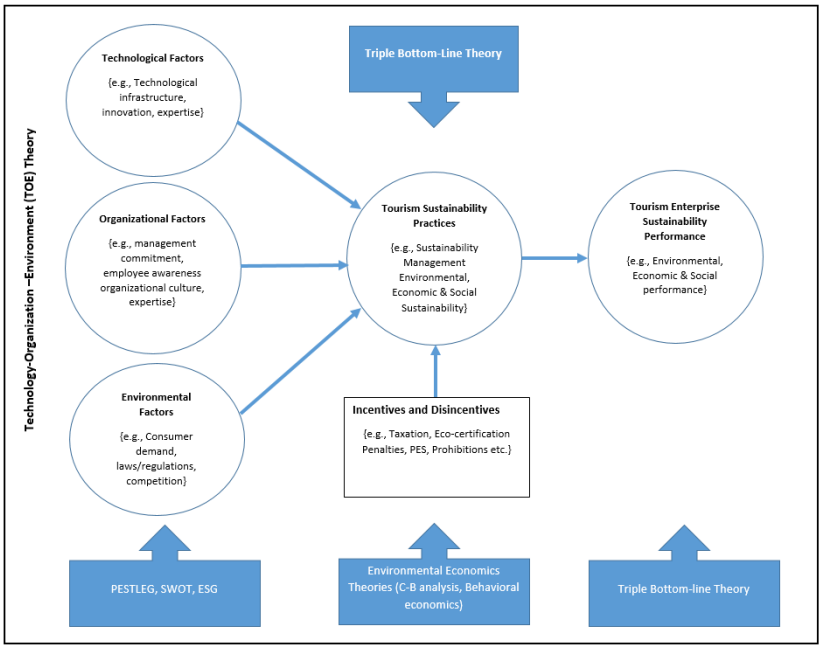

Figure 2.4: Conceptual Framework-Adoption of Sustainability Practices by Tourism Enterprises

2.2.2 Best Practices Conceptual Approach

The study relied on the conceptual approach depicted in Figure 2.4 to assess climate change adaptation, mitigation, and sustainability practices among tourism enterprises in Kenya. The study compared baseline practices against two global standards: the UNEP Framework for Climate Change Adaptation and Mitigation for Tourism (2008) and the Global Sustainable Tourism Council Industry criteria (GSTC, 2016). This comparison identified gaps in implementation across adaptation, mitigation, and sustainability goals. The identified gaps were then prioritized based on their contribution to achieving these goals. This prioritization informed the development of best practices, designed to guide tourism enterprises in Kenya towards effective climate change adaptation, mitigation, and sustainability practices. Figure 2.5 presents the conceptual framework adopted.

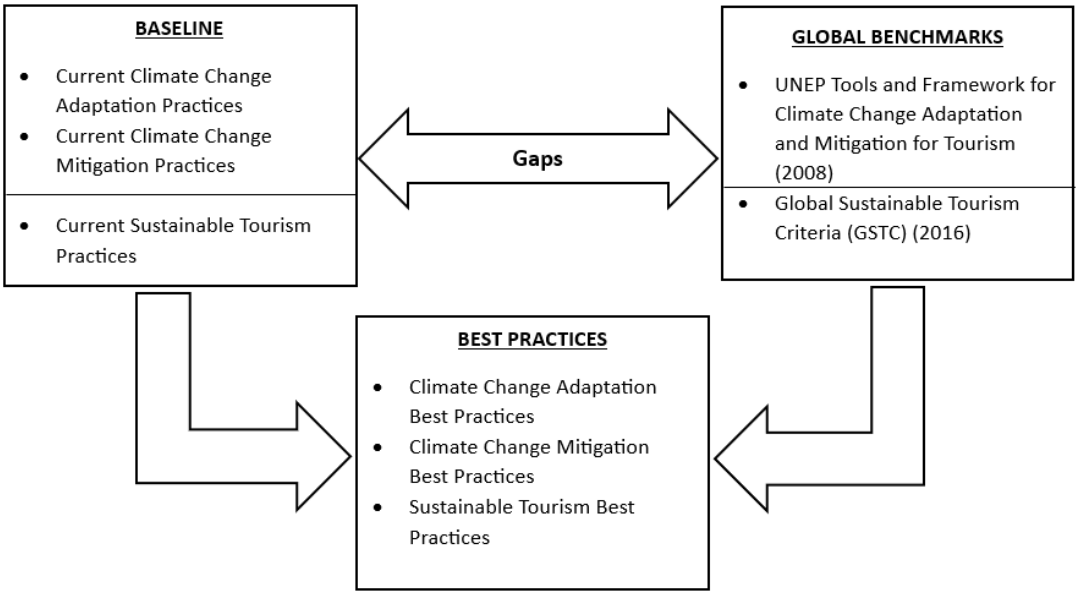

Figure 2.5: Conceptual Framework for the Best Practice Report

2.2.3 System For Environmental-Economic Accounting (SEEA) Conceptual Approach

The Generic Statistics Business Process Model (GSBPM) was used to compile the SEEA accounts for tourism. Recognized and employed by statistical organizations, the model promotes consistency and comparability of economic data for SEEA accounts. It emphasizes quality control at each stage of the statistical production process, enabling the identification and resolution of data inconsistencies, errors, or gaps. The GSBPM provided clear guidelines and workflows, streamlining the statistical processes involved in producing the SEEA accounts. Table 2.3 summarizes the steps adopted in producing the SEEA accounts in line with the GSBPM:

Table 2.3: Methodological Approach for Development of the SEEA-Accounts - the Generic Statistics Business Process Model (GSBPM)

Step	Activities
i. Specify Needs	• Specified the rationale and importance of elaborating the SEEA- accounts for tourism; • Determined concepts, definitions, classification and standards for the Accounts; and • Evaluated data availability and feasibility of developing the accounts.
ii. Design	• Designed the statistical outputs to be produced, including the systems and tools for dissemination of the outputs; • Defined the statistical variables to be collected in the data collection instrument, as well as any other variables that will be derived in the analysis process; • Determined appropriate data collection methods and instruments; • Identified and specified the population of interest, the sampling frame and sampling criteria and methodology; and • Determined the statistical processing methodology to be applied in the compilation of the accounts.
iii. Build	• Developed the data collection instruments; and • Tested the data collection instruments
iv. Collect	• Selected sample; • Set up and run data collection; and • Loaded the collected data and metadata into a suitable electronic environment for further processing.
v. Process	• Integrated data; • Classified and coded the data; • Imputed missing data; • Computed tourism shares; • Calculated aggregates; and • Finalized data files.
vi. Analyse	• Prepared draft outputs of the SEEA-Accounts; • Validated the accounts; • Scrutinized and explained the Accounts; • Finalized outputs
vii. Disseminate	• Release the statistical product and support users to access and use the output.

Source: Adapted from U. N. E. C. E. (2009)

2.2.4 Stakeholder Engagement Conceptual Approach

The stakeholder engagement process was implemented through four phases: stakeholder identification, sensitization, data collection, and stakeholder validation. Figure 2.6 presents a flow diagram detailing the approach used for stakeholder sensitization.

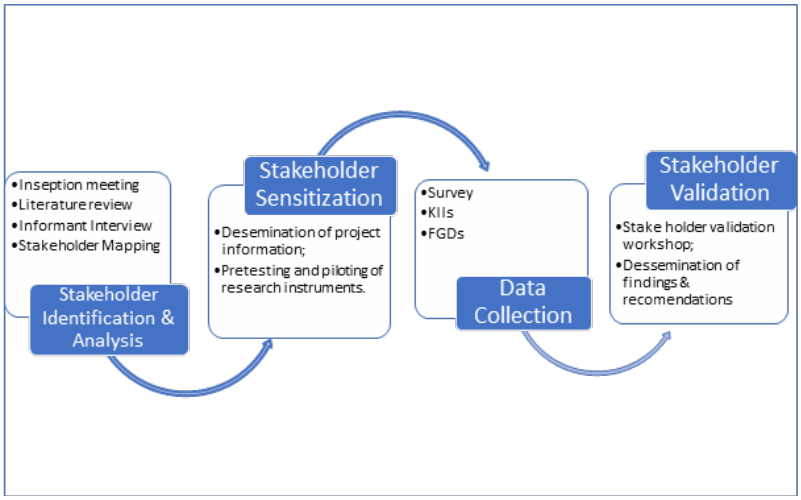

Figure 2.6: Five Phase Stakeholder Engagement Approach

The schematic diagram (Figure 2.6) outlines a four-phase process adopted for stakeholder engagement. The first phase, «Stakeholder Identification & Analysis,» involved scoping, literature review, and informant interviews to identify relevant stakeholders based on previous research, reports, publications, the Tourism Act 2011, and the project terms of reference (TORs). This phase included analysing and mapping stakeholders according to their roles, interests, and influence. The second phase, «Stakeholder Sensitization,» focused on disseminating information about the objectives, activities and the roles of the stakeholders to the identified and targeted stakeholders through telephone calls and in-person meetings. The third phase, «Data Collection,» included a baseline survey to collect primary quantitative data from the sampled 1,253 tourism enterprises across the eight regions, administrative data from key data-providing institutions, and qualitative feedback from KIIs with tourism industry experts and opinion leaders, as well as FGDs targeting industry practitioners nationwide. The «Stakeholder Validation» phase consisted of a validation workshop where the report's findings and recommendations were presented to stakeholders for feedback and adoption. The final engagement activity will involve disseminating the revised research findings and recommendations through an online popular version of the report on the TRI website.

2.2.5 Stakeholder Engagement Plan

To implement the four-phased stakeholder engagement process, the study developed a stakeholder implementation plan. This plan mapped the objectives of stakeholder engagement in the development of each of the project's deliverables against the stakeholder engagement activities and identified the expected outcomes of these activities. Table 2.4 presents the stakeholder engagement plan developed for the research project.

Table 2.4: Stakeholder Engagement Phases, Objectives, Key Activities and Outputs

PHASE AND OBJECTIVES	ACTIVITIES	OUTPUTS	OUTCOMES
Stakeholder Identification and analysis: i. To clarify the scope of the project; ii. To identify key stakeholders in the project; iii. To map stakeholder interests and roles in the project.	• Project inception meeting;	• Defined project scope	• Clear understanding of project goals and boundaries among stakeholders
	• Desk research;	• Database of potential stakeholders	• Comprehensive list of stakeholders with relevance to the project
	• Informant interview (TRA officers);	• Stakeholder profile	• Detailed mapping of stakeholder roles, interests, and influence
	• Stakeholder mapping	• Stakeholder map	• Identification of stakeholder relationships and potential areas of collaboration or conflict
Stakeholder Sensitization i. To communicate the project's objectives, activities and roles of the stakeholders; ii. To build collaboration and stakeholder buy-in to the project's activities; iii. To pilot and pretest data collection tools.	• Telephone calls	• Information packet distributed	• Stakeholders have a clear understanding of the project's objectives and their roles
	• In-person meeting;	• Meeting notes and summaries	• Increased stakeholder collaboration and support for project activities
	• E-mails;	• Information packets distributed	• Increased stakeholder collaboration and support for project activities
	• Pilot survey	• Tested data collection tools	• Validated and improved data collection tools for accurate data gathering
Data collection i. To recruit stakeholders to participate in data collection; ii. To collect quantitative primary, secondary and administrative data; iii. To obtain stakeholder perspectives on the research subject matter	• Baseline survey;	• No. of complete survey questionnaires;	• Representative stakeholder participation and comprehensive data set
	• Focus Group Discussion;	• No. of FGD transcripts and notes	• Rich qualitative data providing deeper and complementary insights
	• Key informant interviews;	• No. if KII transcripts and notes	• In-depth expert perspectives
	• Deliberative Mapping	• Geo-referenced maps of climate change impacts	• Enhanced understanding of spatial distribution and intensity of climate change impacts on tourism

PHASE AND OBJECTIVES	ACTIVITIES	OUTPUTS	OUTCOMES
	• In-person visit to key data providing institutions;	• No. of completed SEEA datasheets	• Accurate and up-to-date secondary data
	• Follow up emails. • Follow up telephone calls.	• No. of completed SEEA data sheets	• Enhance secondary data response rate, validity and reliability
Stakeholder Validation i. To obtain stakeholder validation and endorsement of the research findings & recommendations; ii. To build support for the implementation of the project's recommendations.	• Stakeholder validation workshop;	• Workshop report including stakeholder feedback	• Validation and endorsement of research findings by stakeholders
	• Publication of research findings and recommendation	• Published report	• Increased awareness and support for the project's recommendations among stakeholders
		• Dissemination materials (e.g., executive summaries)	• Broader stakeholder understanding and commitment to implementing the recommendations

2.3 Technical Approach

2.3.1 Research Design

The study employed an Explanatory Sequential Mixed Method Research (ESMMR) design, which integrated both quantitative and qualitative approaches to leverage the advantages of both methodologies. The quantitative aspect involved gathering numerical data and applying statistical techniques to unveil patterns among the study subjects. This approach was suitable for collecting standardized measures of socially derived constructs like attitudes and perceptions, employing standardized research instruments such as questionnaires. Furthermore, it facilitated the efficient and cost-effective collection of data from a large sample of study units spread across a broad geographical area. Moreover, this design was particularly suitable for obtaining cross-sectional baseline data on the characteristics of tourism enterprises at a single point in time.

The study incorporated a qualitative approach, which entailed collecting non-numerical data to attain a deeper understanding of climate change impacts and sustainability practices within the country's tourism industry. The qualitative approach enabled the study to capture first-hand experiences from knowledgeable informants within the tourism sector, offering in-depth insights into the study subject. Additionally, it aided in identifying emerging themes and patterns those quantitative methods alone might not have captured. The approach enabled the study to have a more comprehensive exploration of the complexities surrounding climate change impacts and sustainability practices within the country's tourism industry. The integration of both qualitative and quantitative methods enhanced the overall robustness of the study and provided a holistic perspective on the research questions.

2.3.2 Desk Research

The desk research involved a comprehensive review of existing literature and data sources to analyze the impacts of climate change and sustainable practices in the global tourism sector, focusing on their adoption by tourism enterprises. The desk research centered on recent literature addressing the effects of climate change on the economy, biodiversity, flora and fauna, and socio-economic activities of tourism enterprises. Keywords such as «impacts of climate change in the tourism sector,» «communication infrastructure,» «impacts of climate change on biodiversity,» and «vulnerability of tourism enterprises to climate change» guided this review. Sources included specialized climate change journals, grey literature, and Government of Kenya publications like the Updated NDCs, Climate Change Action Plan, and National Climate Change Response Strategy 2010.

The desk research involved an exhaustive examination of official reports by national and international organizations, national policy documents on climate change action and sustainability, existing legal and regulatory instruments, and literature on relevant theories and global best practices. This served as the foundation for the situational analysis and provided a benchmark for comparing the incentives and disincentives framework with global practices.

Additionally, the study reviewed literature related to the development of the System of Environmental-Economic Accounting (SEEA). This included global best practices, experiences,

and lessons from other jurisdictions that have implemented SEEA, as well as policy documents and official reports on SEEA's progress in Kenya. The review appraised materials on the development and implementation of economic and environmental accounting frameworks for the tourism sector, including conceptual definitions, standards, classifications, and other relevant documents. Table 2.5 lists the standards and guidelines identified in the literature on SEEA-Accounts implementation.

Table 2.5: Standards and Guideline for Development of the System of Environmental Accounting for the Tourism Sector in Kenya

Theme	Source
System of National Accounts (SNA)	• SNA 2008: System of National Accounts https://unstats.un.org/unsd/nationalaccount/sna2008.asp
System of Environmental-Economic Accounting Central Framework (SEEA-CF-2012_	• UN et al (2014) SEEA 2012 Central Framework (2012): http://unstats.un.org/unsd/envaccounting/seearev/ • UN et al. (2014) System of Environmental-Economic Accounting 2012 Applications and Extensions – White cover edition. • UN (2014) SEEA Implementation Guide – Draft for UNCEEA/9/6 - 2014. http://unstats.un.org/unsd/envaccounting/ceea/meetings/ninth_meeting/UNCEEA-9-6d.pdf
Tourism Satellite Accounts (TSA)	• UNWTO, UN (2010) International Recommendations for Tourism Statistics 2008 https://unstats.un.org/unsd/publication/Seriesm/SeriesM_83rev1e.pdf • UNWTO et al (2010) Tourism Satellite Account: Recommended Methodological Framework 2008 https://unstats.un.org/unsd/publication/Seriesf/SeriesF_80rev1e.pdf • UNWTO, UN (2016) International Recommendations for Tourism Statistics 2008 – Compilation guide https://unstats.un.org/wiki/display/IRTSCG
SEEA -Water	• UNSD (2016) SEEA Technical note: Water accounting, Draft to UNCEEA • UN (2012) System of Environmental-Economic Accounting for Water. UN. Series F No. 100 (ST/ESA/SER.F/100) • UN (2012) International Recommendations for Water Statistics. UN Series M No. 91 (ST/ESA/SER.M/91). http://unstats.un.org/unsd/envaccounting/irws/ • UNSD (2013) Draft Guidelines for the Compilation of Water Statistics and Accounts. http://unstats.un.org/unsd/envaccounting/WCG14.pdf
SEEA-Energy	• UNSD (2016) SEEA Technical note: Energy accounting, Draft for UN-CEEA Eurostat (2014) Physical Energy Flow Accounts Manual. IEA. • Eurostat (2013) Annual Energy Statistics Questionnaires & Explanatory notes http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/questionnaires OECD/IEA/

Theme	Source
	• Eurostat (2005) Energy Statistics Manual. IEA, Paris. http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/publication?p_product_c ode=NRG-2004 • Schenau, S. (2012) Compilation of physical energy flow accounts (PEFA) for the Netherlands. https://circabc.europa.eu/w/browse/ad2ff2b8-f9cc-4d3d-b76e499e09ed01b1 • UN et al (2013) SEEA Energy draft http://unstats.un.org/unsd/envaccounting/energy.asp
SEEA-GHG Emission	• UNSD (2016) SEEA Technical note: Air emissions accounting, Draft for UNCEEA. • Eurostat (2013) Compilation Guide (2013) for Eurostat's Air Emissions Accounts (AEA). http://ec.europa.eu/eurostat/documents/1798247/6191529/Manual-AEAPart-B-20130426.pdf/c242c290-0bf1-453e-b8d9-326869a50693 • Eurostat (2015) Manual for Air Emissions Accounts (AEA) 2015 edition. http://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-GQ-15- 009
SEEA-Solid Water	• Australian Bureau of Statistics (2013) Waste Account, Australia, Experimental Estimates, 2013, Catalogue number 4602.0.55.005, Canberra, Australia http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/ 4602.0.55.005 2013

Source: TRI situational analysis data, 2023

2.3.3 Quantitative Research

The study employed a cross-sectional survey design to collect data from a sample of research subjects at a specific point in time. A questionnaire was administered to a representative sample of tourism enterprises nationwide, enabling generalizations about the larger population. This method was ideal for efficiently gathering data from a large and geographically dispersed population, facilitating the simultaneous examination of multiple research variables. This approach provided a comprehensive baseline of the study population, depicting the status of climate change impacts, resilience strategies, and sustainability practices across various tourism regions. Additionally, it allowed for comparisons of research variables across different population subgroups.

2.3.3.1 Target and Study Population

The target population in the study encompassed all tourism enterprises registered under the Tourism Act 2011 that are functioning within the seven tourism regions in the country. The study population, consisting of 16,438 tourism enterprises categorized as Classes A to H (refer to Appendix A), was employed as the sampling frame for the baseline study.

2.3.3.2 Sample Size and Sampling Strategy

2.3.3.2.1 Sample Size Computation

The study calculated the sample size for the survey based on the study population (N=16,438) using the following formula for estimating sample size in a finite population with a known coefficient of variation:

$$n = \frac{4 \times N \times (CV)^2}{(EA^2 \times N) + 4 \times CV^2} \qquad \text{Eq.1.1}$$

Where:

n= Sample Size;

N= Study population (N=16,438);

CV = Coefficient of variation estimated at 95%;

EA = margin of error (5%);

4 = Constant based on the confidence interval
(commonly used for a 95% confidence level)

According to Equation 1.1, a sample of 1,327 tourism enterprises from categories A to H was selected to take part in the baseline survey. Within this sample, 88 were identified as tourism training institutions falling under Class H. This yielded to a robust response rate of 94% (n=1253) (Appendix B: Provides a Sampling frame for the baseline Study).

2.3.3.2.2 Sampling Strategy

The study utilized a multi-stage probability sampling approach to enlist tourism enterprises for participation in the research. The process began by purposively selecting all the regions outlined in the National Tourism Blueprint 2030, namely Central, Nairobi, Rift Valley, Western, Eastern, Coastal, and Maasai Mara and Amboseli, to ensure national representation of tourism enterprises. In the second stage, the study randomly selected counties within the seven tourism regions. Out of the 47 counties, the study included 29 in the sample. Proportionate random sampling was then applied to derive the sample from the identified counties. The sampling proportions were determined based on the number of tourism enterprises registered in each class (A-H).

2.3.4 Qualitative Approach

The study relied on Key Informant Interviews (KIIs) to collect non-numerical data. Informants were purposively selected to participate in the interviews based on their expertise, knowledge and experience in the Kenyan tourism industry. The study leveraged KIIs to obtain perspectives from informants with unique knowledge of the industry gained from their positions in the key organization and roles in the industry. Key Informant Interviews (KIIs) gathered views from twenty-six (26) experts from sustainability advocacy and research organizations, county government departments, tourism trade organizations, Ministries, Departments, and Government Agencies (MDAs) to further enrich the process. Appendix G summarizes the sample of Key informants targeted for qualitative data collection during the study.

The study collected qualitative data from participants drawn from the tourism sector across the country. twenty-four (24) FGDs were conducted during nationwide stakeholders' engagement (n = 467). The FGDs gathered feedback from various participants, including enterprise owners, government representatives, and conservation groups (Appendix H)

2.3.5 Pretesting and Piloting of Research Instruments

The consultancy refined the data collection instruments (questionnaire and semi-structured interview guide) through a two-stage process following the recommendations of Brancalion et al. (2014). In the first stage, a pre-test was conducted with a panel of 14 experts from the tourism industry and academia. The panel assessed the instruments for their relevance to the study objectives and the underlying study theories. The focus was on whether the instruments effectively operationalized the study variables.

The expert-driven pre-test also scrutinized the research instruments for clarity of language, organization, and the arrangement of items. Additionally, it assessed the appropriateness of the format used in the questions' design. The feedback received from the pre-test guided the revision of the study instruments that were used to collect data.

The second stage of refinement involved a respondent-driven pilot study conducted with a sub-sample characterized by demographic and psychographic profiles similar to the study's target population. A common practice in social science recommends using a sub-sample comprising around 10% of the study's total sample size for the pilot study. In this case, the pilot study was carried out in Mombasa County and involved a sample of 154 respondents representing a diverse range of tourism enterprises (classified from A to H) for the quantitative research component. Table 2.6 provides details on the subset of the population targeted in the respondent-driven pilot of the quantitative data collection tool.

Table 2.6: Pilot Study Sample Size

Enterprise Classification	Sample size (n)	Enterprise Classification	Sample size (n)
Class A	19	Class E	136
Class B	6	Class F	1
Class C	25	Class G	0
Class D	1	Class H	4

Source: TRI Situational Analysis Data, 2023

The pilot phase of the interview guide for qualitative data collection involved interviewing 20 participants from various sectors, including government departments, agencies, county governments, academia, tourism trade organizations, and community-based organizations (CBOs). The pilot surveys and interviews were conducted between September 11th and 22nd, 2023, achieving a 79% response rate for the questionnaire with 154 respondents and a 65% response rate for interviews involving 13 informants.

The results of the pilot study prompted revisions to the survey questionnaire and interview guides to enhance the operationalization of research constructs, such as removing ambiguous questions, improving categorical choices, and standardizing measurement units. Additionally, modifications were made to the online data collection platform to improve clarity and flow.

2.3.6 Data Collection Procedure

The study employed trained research assistants to collect quantitative data using a questionnaire on the KOBO-COLLECT application, an open-source survey platform on Android mobile devices. Research assistants visited sampled respondents at their premises, ensuring a high response rate and accurate questionnaire submissions within 30-40 minutes per questionnaire. KOBO-COLLECT facilitated the seamless submission of completed questionnaires to an online server, allowing real-time monitoring of response rates and questionnaire quality for timely corrective actions.

Qualitative data collection involved key experts conducting in-depth interviews using a semi-structured guide. Interviews, recorded with handheld voice recorders, were conducted during scheduled visits to selected informants, lasting an average of 25-30 minutes per interview. Similarly, qualitative data from nationwide focus group discussions (FGDs) was recorded using handheld recorders during the sessions. Participants in the FGDs were encouraged to record and present their discussions during plenary sessions. These recordings constituted qualitative data utilized in the study.

2.3.7 Data Analysis Protocols

2.3.7.1 Document Analysis

The document review aimed to assess the global to national landscape of climate change institutions, policies, laws, and regulations, and to examine best practices in climate change response and sustainable tourism. It sought to benchmark international case studies, identify knowledge gaps, and review debates on climate change resilience and sustainable tourism. Relevant documents were identified from government departments, international organizations, journals, and online databases using specific search criteria and keywords. Initial screening involved reviewing abstracts and summaries to ensure relevance. Analog materials were digitized, indexed, and stored in a digital database alongside digital sources.

Content analysis was employed to code and synthesize the literature, categorizing materials based on the study's objectives. This method facilitated the systematic extraction of data, such as government initiatives from reports, legal requirements from statutes, global trends from international reports, and new concepts from peer-reviewed journals. The analysis involved synthesizing codes to identify recurring patterns and themes, ensuring consistency and reliability through cross-verification of information. Discrepancies were resolved through further investigation, maintaining accurate citations for each document reviewed. The findings of the document review were synthesized and integrated into the study report, providing comprehensive insights into climate change and sustainable tourism practices.

2.3.8 Quantitative Data Analysis

2.3.8.1 Data Preparation

Quantitative data from the completed questionnaires were promptly captured in real time on the KOBO-COLLECT servers. To safeguard data integrity, the received data underwent continuous monitoring for accuracy, representativeness, and completeness. Periodic backups were generated to ensure the protection and security of the dataset. Following Neuman (2014), the initial phase of data preparation involved scrutinizing the Excel spreadsheets using a contingency cleaning method to identify coding inconsistencies, such as variables captured by both numeric and string values, missing data, and outliers. Missing values were coded and imputed where appropriate. Observations (questionnaires) with less than 60% completion of questionnaire items were excluded from further analysis. The contingency data cleaning method also encompassed cross-classifying variables and scrutinizing the results for illogical combinations. For instance, enterprises not categorized as Class A (hotels) but with entries for bed occupancy and star rating were identified and addressed. A refined dataset was generated for further quantitative analysis, utilizing SPSS version 20 for statistical analysis and QGIS (Ver. 3.10.2) for geospatial analysis.

2.3.8.2 Preliminary Data Analysis

The initial analysis computed questionnaire response rates and assessed completed and usable responses from the refined dataset. It also involved profiling respondents' demographics and tourism enterprises' firmographic attributes. Descriptive statistics such as mean, standard deviation, frequency counts, and percentages were used appropriately. Cross-tabulations compared firmographic attributes across the sample. Results were presented visually using tables, charts, and thematic maps to illustrate the spatial distribution of surveyed enterprises based on locational data re-projected into UTM coordinates.

2.3.8.3 Quantitative Data Analysis

This phase of the analysis involved querying the data in alignment with the consultancy objectives to address specific research questions associated with each objective. Univariate descriptive statistics, including means, standard deviation, frequency, and percentage frequency, as deemed appropriate depending on the variables' measurement scales to characterize the variables were computed. Where necessary, continuous variables were transformed to generate categorical variables, and categorical variables were converted into binary variables.

The Chi-square test was employed to examine associations between nominal variables, while correlation analysis-specifically, Pearson's product-moment correlation (r)-was utilized to explore associations between interval and ratio scale variables as appropriate. The study relied on the Student T-test, repeated-measures ANOVA, and one-way ANOVA to compare means for interval and ratio scale variables. In cases where ANOVA results indicated a significant difference between the means, appropriate post-hoc tests were conducted to identify the significant distinctions. Binary logistic regression (BLR) and ordinary least squares (OLS)

regression analysis were utilized by the study to examine predictive and causal relationships between variables. The necessary diagnostic tests were conducted to assess the assumptions of the BLR and OLS regression analysis.

Structural equation modeling was employed to investigate how barriers, drivers, incentives, and disincentives influence the adoption of climate change response and sustainable tourism practices. This involved constructing measurement models through confirmatory factor analysis and structural models using maximum likelihood estimation. Additionally, ordinary least squares (OLS) regression was utilized to assess the relative impacts of specific barriers, drivers, incentives, and disincentives on the extent to which climate change response and sustainable tourism practices are adopted.

For geospatial analysis, the study computed Shannon-Weiner indices of diversity and mapped the results to explore the spatial distribution of the phenomenon. The substantive quantitative analysis results were described and presented using tables, bar charts, and maps for enhanced visualization.

The analysis for compiling the accounts involved computing descriptive statistics, including means, standard deviations, frequencies, and percentage frequencies, to assess the flows of materials between the sampled tourism enterprises. These statistics were then used to generalize aggregate flows in the target population. Where appropriate, tourism shares were computed from the TSA Accounts (TRI, 2023) and applied to the tourism sector flows. Emission factors and Global Warming Potential (GWP) were applied to the intermediate energy use data to compute GHG flows in MtCO2e. The qualitative feedback from KIIs and FGDs was analysed using content analysis

2.3.9 Qualitative Data Analysis

The study utilized Thematic Analysis to analyze qualitative data. Following a method inspired by Braun and Clarke (2006), transcripts from Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) were systematically coded for thematic analysis. Initial codes were derived from significant ideas and organized into cohesive themes that aligned with the research objectives. These themes were further refined to capture nuanced insights across the research questions. The results emphasized detailed descriptions and direct quotes, enhancing clarity and depth. Visual representations such as tables, charts, and mind maps were used to illustrate key findings. Nvivo Version 12 facilitated qualitative analysis and visualization, ensuring methodological rigor and providing comprehensive insights into the study's qualitative component.

2.4 Ethical Considerations

The research was guided by the following ethical considerations.

i. Informed Consent: Each participant received detailed information outlining the purpose of the survey, the data collection procedures, the potential risks and benefits of participation, and their right to withdraw at any time. Verbal consent was obtained before starting the survey, ensuring voluntary participation and awareness of rights.

ii. Confidentiality and Anonymity: All data was anonymized, removing any personally identifiable information. Data was securely stored and accessed only by authorized personnel, ensuring participant confidentiality, and protecting their privacy.

iii. Minimizing Harm: Survey questions were carefully worded to avoid causing distress or discomfort. Participants could skip any questions they felt uncomfortable answering. Researchers were prepared to offer support or referral to appropriate resources if needed.

iv. Respect for Participants: All participants were treated with respect and courtesy. Their opinions and perspectives were valued and acknowledged. Researchers maintained a non-judgmental attitude and avoided imposing personal biases during data collection.

v. Transparency and Accountability: The study design, data collection procedures, and ethical considerations were documented and made available to participants and stakeholders upon request. Researchers were open to feedback and addressed any concerns about ethical conduct.

vi. Cultural Sensitivity: The survey was designed and implemented with sensitivity to the cultural context of the Kenyan tourism sector. Local research assistants were involved in development and administration to ensure cultural appropriateness and understanding. Researchers avoided imposing biases or assumptions on participants' experiences and perspectives.

By adhering to these ethical principles, the study collected valuable data while ensuring the well-being and privacy of all participants. This commitment to ethical research practices fostered trust and cooperation, contributing to the study's success and its potential to promote positive change within the Kenyan tourism sector.

Baseline Study

CHAPTER THREE

3. BASELINE STUDY FINDINGS AND DISCUSSIONS

3.1 Overview

The successful contribution of tourism to the attainment of socio-economic development objectives assigned to the industry depends on investing in the promotion of sustainable tourism practices (STPs) to achieve a balance among environmental, economic, and socio-cultural aspects. This is particularly crucial, as Kenya's tourism sector is 80% nature-based, incorporating wildlife safaris, beach activities, adventures, and cultural experiences. It heavily relies on the country's network of wildlife-protected areas, natural landscapes, and coastal resources as the main attractions (KTB, 2017; Akama et al., 2011). Consequently, reinvesting in the conservation and protection of natural resources in a sustainable manner becomes critical for the tourism sector's ability to contribute to the socio-economic development agenda of the country, ensuring its survival now and in the future.

Overall, sustainable tourism practices (STPs) aim to minimize negative impacts on the environment, society, and culture while promoting long-term positive outcomes. These practices strive to strike a balance between economic benefits, social responsibility, and environmental conservation, aligning with the principles of the Triple Bottom Line (TBL) theory. In this context, elements of sustainable tourism practices encompass a range of measures implemented by tourism enterprises, such as protecting and preserving natural resources, ecosystems, and biodiversity. Additionally, these practices involve activities that promote the respect and preservation of the cultural heritage of the destination, engaging in programs that contribute to the well-being of local communities by fostering economic development, respecting local cultures, and enhancing social welfare. Furthermore, sustainable tourism practices include participating in forms of tourism that generate economic benefits for shareholders and stakeholders, including local businesses and the community at large (Stange & Brown, 2014; Elkington, 1998).

Despite the positive highlights of the tourism sector, it faces numerous challenges at global, regional, national, and local levels. Some of these challenges include; the impacts of climate change on the tourism sector; the emergence of pandemics such as COVID-19; political instability within, between, and among countries; infrastructural problems; global economic recessions; high inflation and escalating oil prices resulting in increased transport and accommodation costs; financial limitations; and technical and human capacity issues (UNWTO, 2023). For example, the advent of the COVID-19 pandemic resulted in travel restrictions, leading to a decline in tourism's share of the global GDP to 5.3%, accompanied by a 19% decline in employment, equivalent to a loss of 62 million jobs (WTTC, 2022b).

Climate change continues to pose a formidable challenge to all sectors of social and economic development. Specifically, the rise of global temperatures is severely affecting climate-sensitive sectors such as tourism, which is largely dependent on natural resources (IPCC, 2022). It is in this context that the tourism sector declared a climate crisis in 2020 (Scott and Gossling

2022). This was aligned with the United Nations Framework Convention on Climate Change Conference of the Parties 25 (UNFCCC COP 25) projection that greenhouse gas emissions from tourism could surge by 25% by 2030 based on 2016 levels demanding for the sector to embrace low-carbon pathways (UNWTO 2019). The declaration was motivated by the fact that climate events that affect tourism range from heat waves to floods, which may result in damage to infrastructure, reduction of a destination's appeal, or increase in costs.

On the other hand, documented indirect impacts involve environmental changes straining social and economic systems, such as altered water availability, biodiversity loss, compromised landscape authenticity, reduced food production, increased natural hazards, coastal erosion, bleaching of coral reefs, and rising vector-borne diseases increasing vulnerability of tourism enterprises (Chemeli et al., 2020; Njoroge, 2020; Becken & Hay, 2007). This implies that for the survival of the tourism sector, appropriate climate change adaptation and mitigation measures or practices need to be in place and promoted for adoption by different tourism enterprises. The identification of such measures needs to include those that also entrench sustainable tourism practices.

At the same time, tourism may cause adverse impacts because the supply and demand of tourism commodities involve intricate exchanges encompassing natural resource usage, waste, and emissions generation, and the eventual return of the industry's byproducts to the natural environment. For example, studies reveal that the hotel industry, a significant sector in travel and tourism, collectively consumes substantial water and energy resource quantities and produces significant amounts of waste compared to residential households (Verma & Chandra, 2016). Also, the UNWTO estimates that the tourism sector contributes about 5% of global CO2 emissions (UNWTO, 2012). Universally, practitioners and experts acknowledge that managing these impacts effectively is imperative for ensuring the sustainability of tourism.

Against this background, TRI undertook a baseline study to ascertain the current status of climate change impacts on tourism enterprises, the adoption of climate change adaptation and mitigation measures, and the implementation of sustainable tourism practices by tourism enterprises. The specific objectives of the baseline study were:

i. To map and evaluate the impacts of climate change on the tourism sector;
ii. To evaluate the climate change response strategies adopted by tourism enterprises in the country;
iii. To determine the current level of adoption of sustainable best practices by tourism enterprises and compare it with global best practices to address climate change; and
iv. Assess the drivers and barriers to the adoption of climate change adaptation, mitigation and sustainability practices by the tourism sector.

Following the objectives, the study addressed the following research questions:

i. What is the level of stakeholder awareness of climate change impacts on tourism enterprises in Kenya?
ii. What are the stakeholders' perceptions of the effects and significance of climate change impacts on tourism enterprises in the country?

iii. What climate change adaptation and mitigation measures are adopted by tourism enterprises in the country?
iv. What are the predictors of the adoption of climate change resilience strategies by tourism enterprises in the country?
v. What is the level of stakeholder awareness of sustainable tourism and sustainability practices in the country?
vi. What sustainable tourism best practices are adopted by tourism enterprises in the country?
vii. What is the extent and variability of sustainable tourism best practice adoption by tourism enterprises in the country?
viii. What are the determinants of the adoption of sustainable tourism best practices by tourism in the country?

The following sections of this chapter present and discuss the results of the study on the above objectives and research questions.

3.2 Preliminary Qualitative and Quantitative Analysis

3.2.1 Tourism Enterprises Regional Distribution

The survey requested respondents to indicate the location of their enterprises in the seven (7) tourism regions- Nairobi, Rift Valley, Masai & Amboseli, Northern, Western, Coast, and Central regions. Results of frequency counts of the responses are presented in Figure 3.1

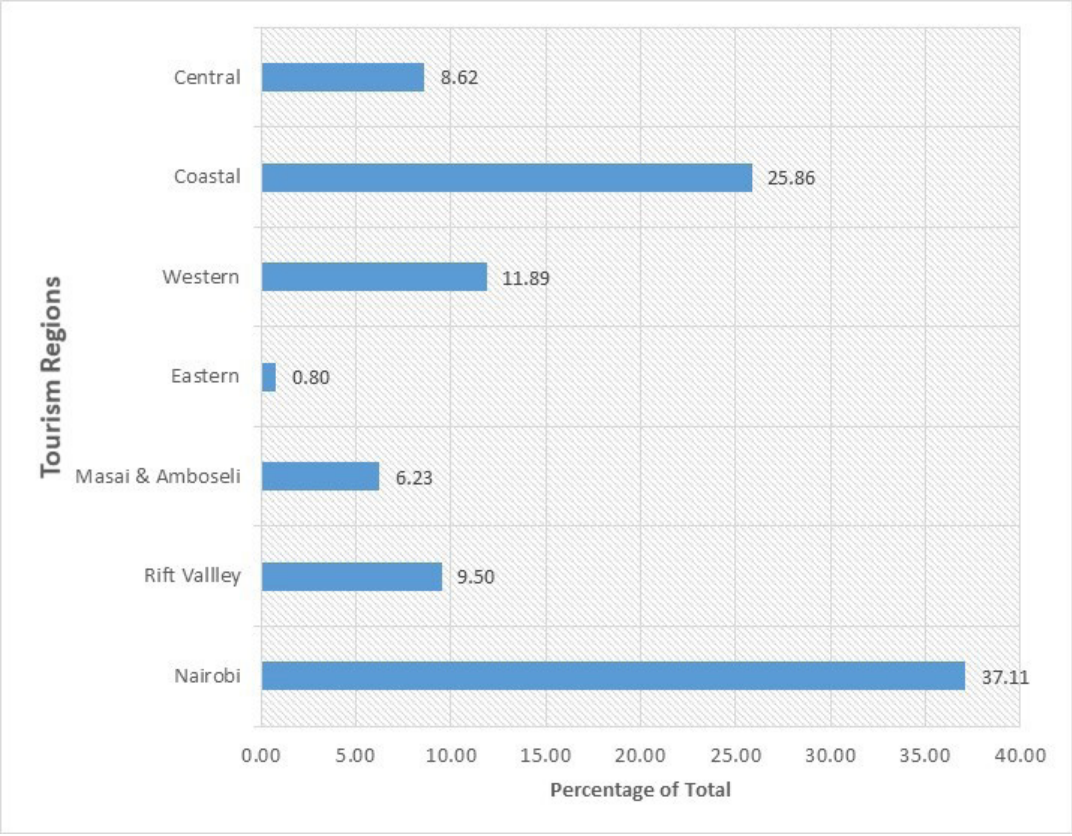

Figure 3.1: Distribution of tourism enterprises by region

Source: TRI Situational Analysis data, 2023.

The results in Figure 3.1 show that majority of the tourism enterprises were located Nairobi region (37%, n = 465) followed by the Coastal region (26%, n = 324). The western region was a distant third (12%, n = 149). The rest were less than 10% of which Rift Valley was at 10% (n =119) followed by Central (9%, n =108), Maasai and Amboseli (6%, n = 78) and Eastern (1%, n = 10) This was consistent with TRA database of registered tourism enterprises of which majority were in Nairobi and Coastal Kenya regions.

The study utilized geographical coordinates to map the surveyed enterprises. Figure 3.2 illustrates the spatial distribution of the tourism enterprises in the baseline survey.

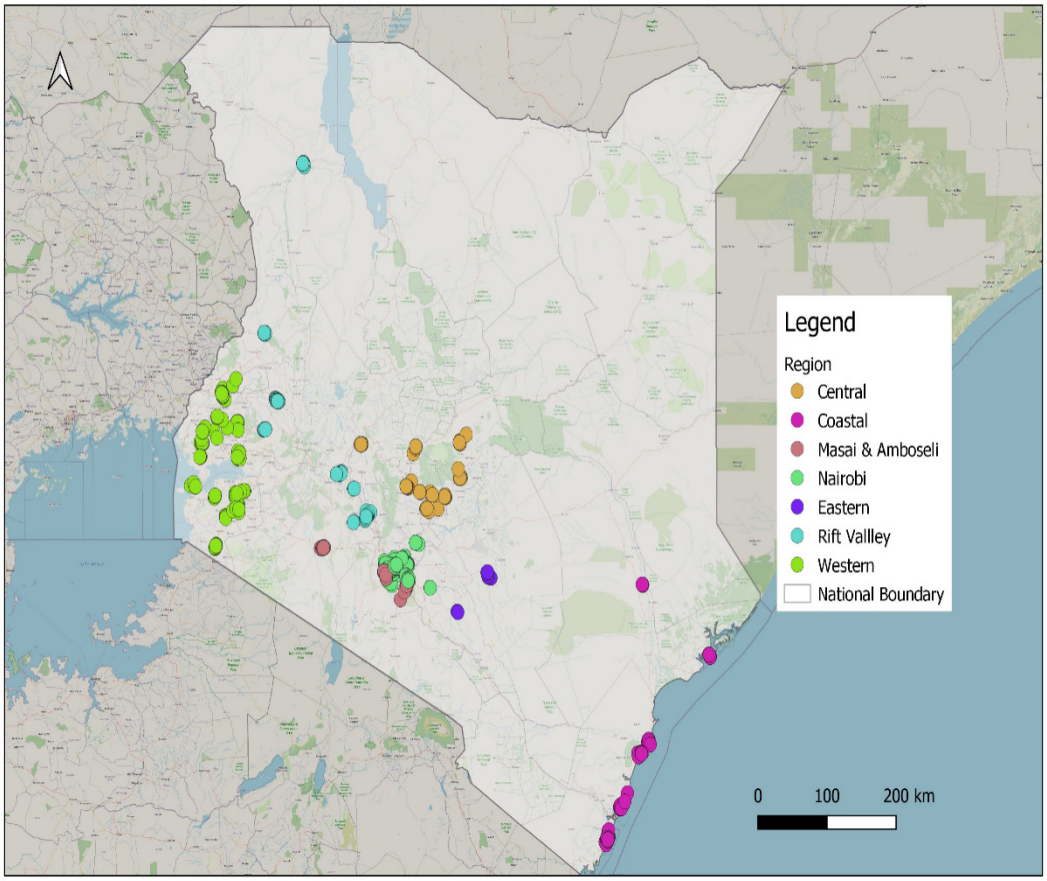

Figure 3.2: Spatial distribution of surveyed tourism enterprises by region.

Source: TRI Situational Analysis data, 2023.

Figure 3.2 confirms that the majority of tourism enterprises surveyed in the baseline study were concentrated in the country's primary tourism destinations, particularly in the Nairobi and Coastal regions (n = 789, 63%). Nairobi and Mombasa cities are home to Jomo Kenyatta International Airport and Moi International Airport, respectively, and serve as the country's main international entry points. The two cities boast significant tourism infrastructure development and are considered must-visit destinations for tourists upon arrival or departure. Additionally, a noteworthy proportion of enterprises were situated in the western tourism region, an emerging tourism circuit in the country followed by Rift Valley. Each of the remaining tourism regions was represented by less than 10% of the respondents.

3.2.2 Profile of the Survey Respondents

The study collected data on respondents' demographic attributes, including gender, the highest level of formal education completed, current role in their tourism enterprise, and years of experience in the tourism industry. These characteristics were assessed to measure the respondents' competence in providing insights into climate change impacts and sustainability practices within the local tourism industry. Frequency counts were utilized to profile the respondents based on their demographics. Table 3.1 summarizes the results of this profiling:

Table 3.1: Demographic profile of survey respondents

Demographic Attribute	Level	Frequency	% Frequency	Cumulative % Frequency
Gender	Male	883	70.50	70.50
	Female	370	29.50	100.00
Level of Education	No Formal Education	11	0.88	0.88
	Primary School Not Completed	9	0.72	1.60
	Primary School Certificate	75	5.99	7.59
	Secondary School Not Completed	8	0.64	8.23
	Secondary School Certificate	212	16.93	25.16
	Collage Cert	159	12.70	37.86
	College Diploma	423	33.79	71.65
	Bachelor's Degree	320	25.56	97.20
	Master's Degree	30	2.40	99.60
	Doctorate Degree	5	0.40	100.00
Level of Responsibility	Operational Responsibility	678	54.11	54.11
	Managerial Responsibility	397	31.68	85.79
	Executive Responsibility	178	14.21	100.00
Years of Experience	Less than 5 years	436	34.80	34.80
	6 to 10 years	405	32.32	67.12
	11 to 15 Years	205	16.36	83.48
	16 to 20 years	106	8.46	91.94
	More than 20 years	101	8.06	100.00

Source: TRI Situational Analysis data, 2023.

The study sample was predominantly composed of male respondents (n = 883, 71%), indicating a notable gender disparity within the tourism industry. As shown in Table 3.1, over 75% of respondents had at least a high school certificate, with the majority holding a college certificate (n = 423, 34%). A significant proportion of participants (n = 355, 28%) had achieved university-level education, ranging from bachelor's degrees to doctoral degrees. The result highlights a high literacy level among the baseline study participants, confirming their capability to provide valuable information on the study's subject matter.

Furthermore, the majority of respondents (54%) held operational positions within their current roles in the tourism industry, while the remaining respondents were in managerial or executive decision-making positions. This result implies that the study primarily captured insights from individuals engaged in day-to-day, hands-on activities within the sector. This perspective is valuable for understanding the practical aspects of sustainability and the challenges posed by climate change at the operational level.

It is worth noting that most respondents had less than five years of experience in the industry (35%), and the average years of experience within the sample were slightly below ten years ($\bar{x}$=9.72,SD=7.68). The finding indicates that the study sample comprised relatively newer entrants to the tourism sector. This brings fresh perspectives to the study, reflecting the views and experiences of individuals attuned to recent changes or emerging trends in the industry. However, more than 66% of the respondents had more than ten years of experience in the industry. Therefore, the sample was composed of a mix of both experienced and relatively less experienced individuals. The diversity in experience levels enriches the study by incorporating a range of perspectives, combining the insights of seasoned professionals with the fresh outlook of those newer to the industry.

3.2.3 Demographic Profile of Key Informants

The study obtained qualitative feedback from (n = 26) participants during the KIIs. Table 3.2 provides a summary of the profiles of the key informants who were interviewed.

Table 3.2: Demographic Profile of Key Informants in the Baseline Study

Gender	Level	Frequency	% Frequency
	Male	21	81%
	Female	5	19%
Year of Experience	< 5 years	1	4%
	5-10 years	6	23%
	11-15 years	5	19%
	>15 years	14	54%
Education	Diploma	5	19%
	Degree	4	15%
	Masters	15	58%
	PhD	2	8%
Responsibility	Operational	1	4%
	Director/Manager	12	46%
	Top Level Manager	13	50%

Source: TRI Situational Analysis data, 2023.

Table 3.2 shows that the majority of the informants were male (81%, n = 20), indicating that the baseline study predominantly gathered qualitative data from one gender. However, the informants' experience in the tourism industry varied widely, ranging from a minimum of 4 years to a maximum of 32 years (Table 3.1). On average, the interviewees had 18.15 years of experience in the tourism industry (SD = 9.91), highlighting the significant diversity in their professional backgrounds. The informants played various roles in the industry, encompassing managerial responsibilities in private organizations within hospitality, travel and tours, county government departments responsible for tourism, tourism training institutions, and advocacy groups. In terms of educational qualifications, 15% (n = 4) held bachelor's degrees, 58% (n = 15) possessed master's qualifications, and two informants held a doctoral degree. Conversely, five informants (19%) held Diplomas, certificates, or professional certifications in their respective trades. The demographic profile suggests a highly experienced and knowledgeable group, well-equipped to provide valuable insights into the subject matter of this study.

3.2.4 Tourism Enterprise Firmographics

3.2.4.1 Firm Ownership

The study profiled tourism enterprises by their legal ownership status. Respondents in the survey were required to indicate whether they operated as a sole proprietorship, limited liability company, partnership, cooperative, community enterprise, government-owned entity, or a non-governmental organization. The analysis summarised the ownership status of the sampled tourism enterprises using frequency counts. Figure 3.3 presents the results of this analysis.

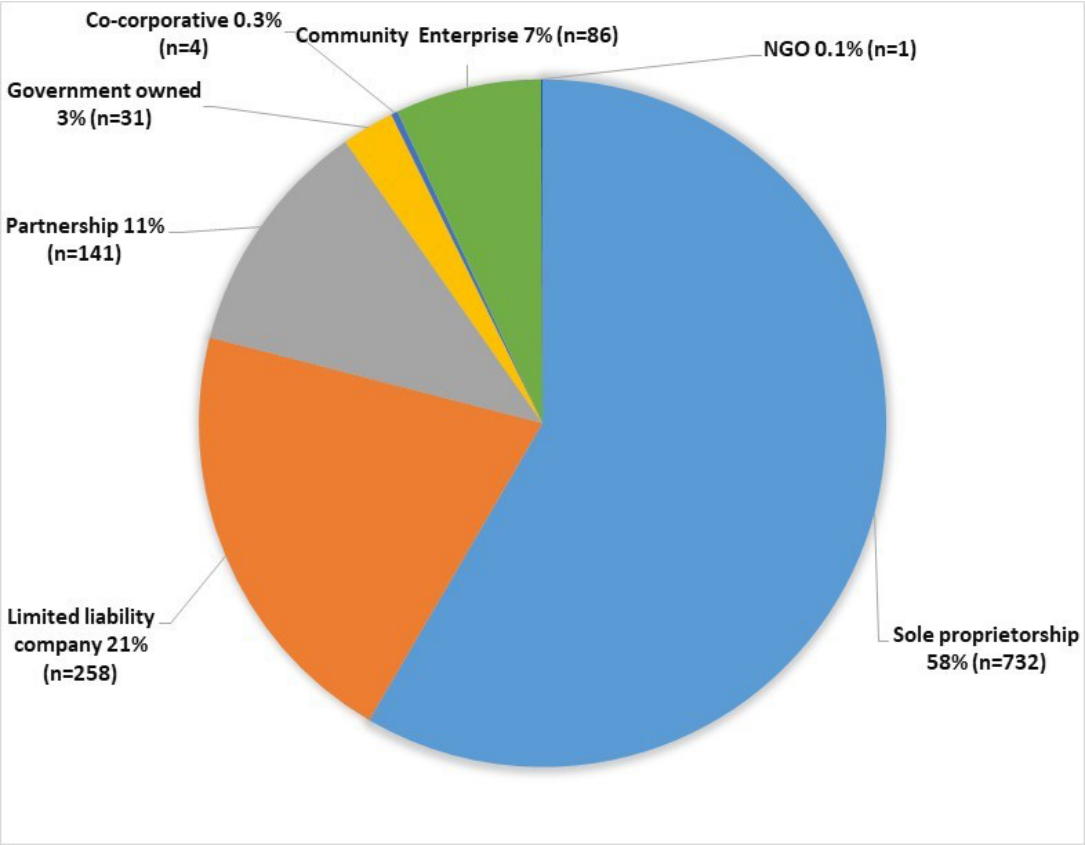

Figure 3.3: Tourism enterprises ownership status.

Source: TRI Situational Analysis data, 2023.

The results in Figure 3.3 confirm that the survey collected insights from privately owned tourism enterprises, with sole proprietorships (n = 732) making up the majority at 58% of the sample, and limited liability companies accounting for 21%. Partnerships constituted a notable 11%, totalling 141 enterprises. This indicates that the study primarily captured perspectives from tourism businesses motivated by private interests and entrepreneurship. Consequently, the study sheds light on the sustainability practices and climate change strategies implemented by these entities, which operate with distinct profit motivations and considerations compared to public or community-owned enterprises.

At the same time, 7% of the sample were community-owned enterprises, which underscores the importance of community engagement in the tourism sector. Understanding the sustainability practices of these enterprises is crucial, as they incorporate local perspectives, contribute to community development, and potentially adopt sustainable practices aligned with community needs.

Conversely, government-owned tourism enterprises, primarily class D enterprises, constituted 3% (n = 31). The relatively low representation of government-owned tourism enterprises (3%) suggests that the baseline study focused on private and community-driven initiatives rather than government-led efforts. Nevertheless, the diversity of ownership structure presented in the sample (Figure 3.3) highlights the heterogeneous nature of the tourism industry in Kenya. This diversity introduces a range of perspectives on sustainability and climate change responses, considering that different ownership models may adopt varied approaches and face unique challenges in implementing sustainable practices.

The survey further investigated the nationality of the beneficial owners of the tourism enterprises, differentiating between locally owned, foreign-owned, and enterprises with both local and foreign ownership. The results underscore that the survey predominantly captured perspectives from locally owned tourism enterprises, constituting 92% of the sample (n = 1,155). The high representation of locally owned tourism enterprises suggests a strong emphasis on indigenous perspectives and implies that the study provides insights primarily aligned with local interests, concerns, and approaches to sustainability and climate change within the Kenyan tourism industry.

3.2.4.2 Firm Size

The tourism literature suggests that the attributes of enterprises play a significant role in the adoption of new business practices, including sustainability measures. Additionally, these attributes precondition how businesses are affected by and respond to climate change Pandy (2017). Consequently, the survey required participating firms to outline their firmographic profiles, specifically focusing on the size of enterprises, measured by the number of employees directly employed.

The range of employees in the tourism firms surveyed varied widely, spanning from one to five hundred employees. On average, a typical firm had less than 20 employees($\bar{x}$=17.72,SD=38.12). Responses to this inquiry, treated as a continuous variable, was categorized into four groups: Microenterprises with 1-10 employees, small enterprises with 11-50 employees, Medium-sized enterprises with 51-250 employees, and large tourism businesses with 251-500 employees. Figure 3.4 illustrates a histogram, depicting the distribution of tourism firms based on the categories of the number of direct employees.

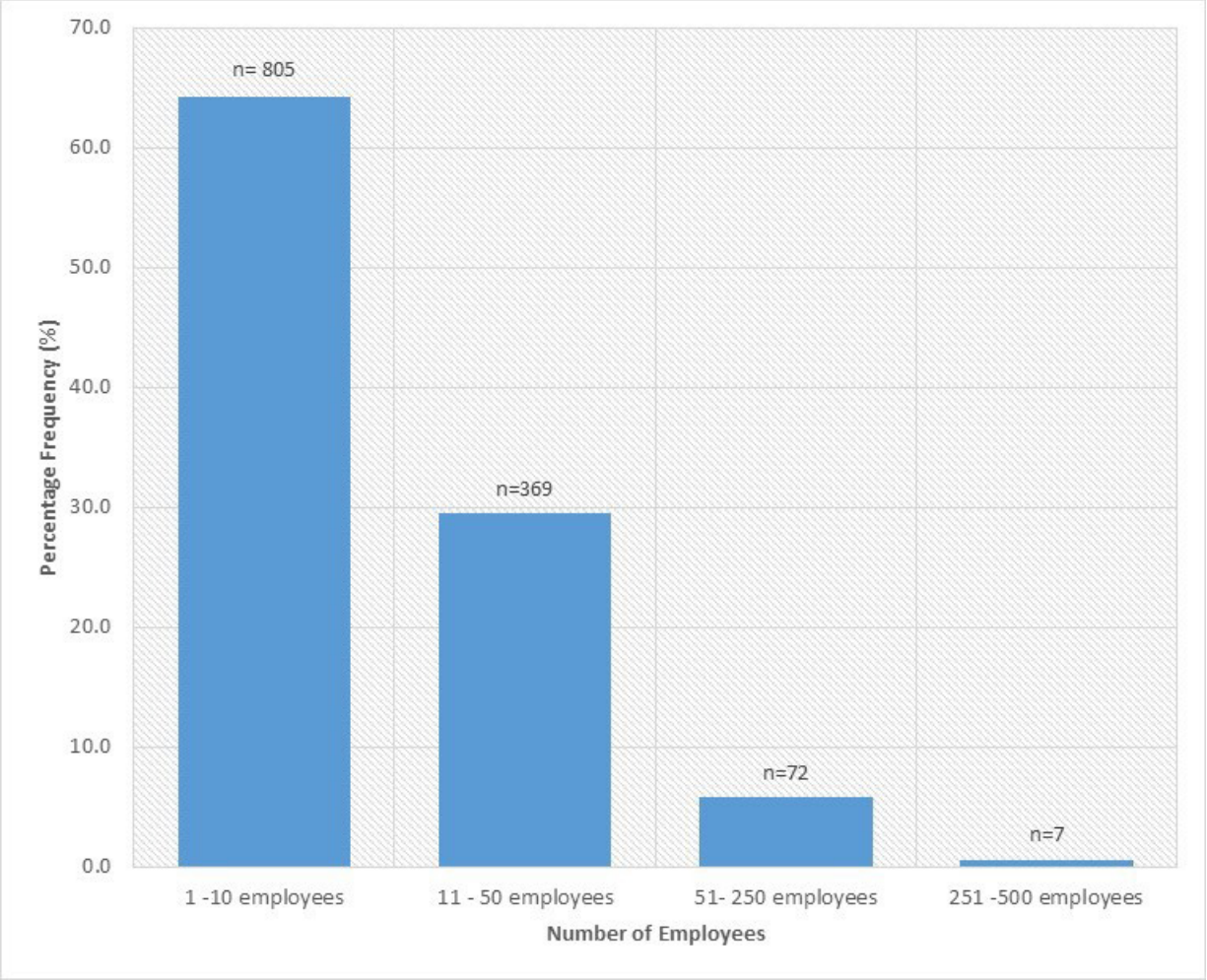

Figure 3.4: Size of surveyed tourism enterprises by number of employees

Source: TRI Situational Analysis data, 2023.

Figure 3.4 clarifies that the survey predominantly collected insights from micro-enterprises with 1-10 employees, constituting more than 64% of the study sample (n = 805). In contrast, small enterprises, categorized by their employee numbers, made up slightly less than 30% of the sample. Conversely, there was minimal representation of large tourism enterprises, accounting for less than 1% of the sample.

This outcome suggests a significant influence of the perspectives and practices of smaller entities within the tourism sector in Kenya. These micro-enterprises may encounter distinct challenges and opportunities compared to their larger counterparts. However, it is important to note that the distribution of enterprises in the sample by size mirrors the typical structural composition of the tourism sector. Mshenga and Owuor (2009) observed that the dominance of micro, small, and medium enterprises in the tourism sector is a result of the country's socio-economic development agenda, emphasizing these enterprises as sources of employment opportunities, contributors to national productivity, reducing of rural-urban migration, and suppliers of goods and services at reasonable prices.

Understanding the distribution, as depicted in Figure 3.4, is essential for tailoring sustainable practices to the specific challenges and opportunities faced by microenterprises, small enterprises, medium-sized enterprises, and large tourism businesses in mitigating and

adapting to climate change impacts. The study investigated the association between the enterprise classification by the Tourism Act, 2011 categorization and the size of the enterprise measured in terms of number of employees. Table 3.3 shows the results of a cross-tabulation of enterprise size by number of direct employees and enterprise classification.

Table 3.3: Size of enterprise by number of employees and enterprise classification

Proportion (%) of employees by tourism enterprise classification				
Enterprise Classification	**1 -10 employees**	**11 - 50 employees**	**51- 250 employees**	**251 -500 employees**
Class-A	19.71	12.93	2.08	0.00
Class-B	8.14	6.54	0.24	0.08
Class-C	13.89	3.99	0.32	0.16
Class-D	0.24	0.40	0.24	0.00
Class-E	20.59	2.79	1.68	0.00
Class-F	0.08	0.24	0.32	0.08
Class-G	0.16	0.16	0.00	0.00
Class-H	1.44	2.39	0.88	0.24

Source: TRI Situational Analysis data, 2023.

The results presented in Table 3.3 show that respondents representing micro-enterprises dominated the baseline survey sample among the tourism enterprise classification except for Class H enterprises (Tourism and hospitality training institutions) which had more small enterprises with between 11 - 50 employees. The study uncovered a significant association between enterprise classification and enterprise size, implying that the number of employees was dependent on the type of tourism enterprise in the sample (χ^2 (21) = 127.48, $p < .001$).

The findings in Table 3.3 imply that the size of enterprises, particularly in the context of employment figures, is not uniform across the tourism sector, with distinct variations based on the specific classification of the enterprise. Understanding the relationship can be pivotal for policymakers, industry stakeholders, and researchers aiming to tailor interventions support, and strategies that align with the unique characteristics of different tourism enterprise types, contributing to more effective and targeted industry development efforts.

3.3 The Impact of Climate Change on the Tourism Sector in Kenya

The study assessed the effects of climate change on Kenya's tourism sector. This section presents findings from quantitative and qualitative data analysis, including the level of awareness of climate change events among tourism stakeholders, identification of direct and indirect impacts, and the significance of impacts on tourism enterprises.

3.3.1 Level of Awareness of Climate Change Impacts on Tourism Enterprises

Tourism enterprises nationwide were surveyed on their awareness of climate change events on tourism. The questionnaire included a quantitative item measuring awareness levels using a five-point Likert scale, where 1 indicated «not at all aware» and 5 indicated «extremely aware.» Fourteen biophysical climate change events were assessed. The analysis used measures of central tendency to summarize the data and evaluate overall awareness. Table 3.4 provides a summary of the results.

Table 3.4: Summary statistics of the level of awareness of climate change events on tourism

Climate change impacts	Not aware at all (%)	Slightly aware (%)	Somewhat aware (%)	Moderately aware (%)	Extremely aware (%)	Mean	Std. Deviation	Overall level of awareness
Droughts	2.87	7.90	14.45	36.79	37.99	3.99	1.05	Moderately aware
Emergence of diseases	7.10	7.98	15.00	30.09	39.82	3.88	1.22	
Warmer temperatures	3.59	7.90	20.35	34.32	33.84	3.87	1.08	
Intensive rainfall	2.95	8.54	22.91	33.68	31.92	3.83	1.06	
Floods	5.80	8.50	18.80	32.00	34.90	3.82	1.17	
Loss of wildlife	8.78	7.26	17.96	31.13	34.88	3.76	1.25	
Emergence of new pests	11.33	11.97	24.02	29.45	23.22	3.41	1.28	Somewhat aware
Loss of tree species	13.57	13.41	22.11	26.82	24.10	3.34	1.33	
Rising water levels	14.37	11.73	22.43	29.21	22.27	3.33	1.33	
Landscape erosion	14.84	17.32	26.42	24.26	17.16	3.12	1.30	
Bleaching of coral reefs	32.08	18.83	21.47	18.91	8.70	2.53	1.34	
Melting of glaciers	40.70	20.35	17.24	13.41	8.30	2.28	1.34	Slightly aware

Source: TRI Situational Analysis data, 2023.

The results presented in Table 3.4 illustrate the varying levels of awareness among surveyed respondents regarding different biophysical climate change events. The highest level of awareness, falling into the category of moderately aware, was observed for phenomena such as droughts, the emergence of diseases, warmer temperatures, intensive rainfall, floods, and the loss of wildlife populations ($2.50 > \bar{x} < 4.00$). Majority (91% -97%) of the respondents indicate that they were at least aware of the six climate change events. On the other hand, few respondents (53%) indicate at least limited awareness of melting of glaciers as a climate change event and were only slightly aware of the event ($\bar{x} = 2.28, SD = 1.35$).

In practical terms, these results suggest that there is a varying degree of understanding among the surveyed respondents in the tourism sector concerning different aspects of climate change impacts. The identified areas of higher awareness may be subjects of greater public attention or education efforts, while the lower awareness regarding melting glaciers may indicate a potential area for targeted awareness campaigns and educational initiatives. Addressing these

awareness gaps is crucial for fostering informed public discourse and promoting actions that contribute to climate change mitigation and adaptation efforts.

Key informants from various segments of the tourism industry were also engaged to assess their awareness and understanding of the implications of climate change on the sector. An additional prompt focused on how their enterprises had been affected by climate change. The qualitative analysis relied on reflexive thematic coding to group responses to these questions. Table 3.5 shows the initial codes extracted on the impacts of climate change on tourism and tourism enterprises.

Table 3.5: Initial Codes- Impacts of Climate Change on the Tourism Industry and Tourism Enterprises

Climate Change Impact	Files	References	Climate Change Impact	Files	References
Bushfires	1	1	Impact on economic activities	5	8
Changes in tourist travel patterns	6	9	Increase in costs	4	4
Changes in weather patterns	3	5	Increase in costs of wildlife conservation	1	1
Closure of facilities	1	1	Loss of destination Attractiveness	9	12
Damage to property and infrastructure	4	4	Loss of jobs	3	3
Encroachment in Protected Areas	2	2	Loss of revenue opportunities	4	6
Extreme weather conditions	5	5	Loss of wildlife population	6	7
Flight cancellations	1	1	Prolonged Droughts	4	4
Floods	5	5	Rising ocean levels	2	2
Habitat Destruction	3	3	Unreliable rainfall patterns	6	7
Human Wildlife Conflicts	1	1			

Source: TRI Situational Analysis data, 2023.

The results of the KII presented in Table 3.5, corroborate the findings of the quantitative analysis on awareness of impacts. They highlight significant consequences of climate change on the tourism industry, as recognized by key informants and respondents from a cross-section of tourism enterprises in the country. The results in Table 3.5 confirm that extreme weather conditions, changes in weather patterns, floods, prolonged droughts, and unreliable rainfall patterns were frequently mentioned. The interview also identified other specific impacts, including an increase in cases of human-wildlife conflicts. An interviewee related these impacts

to resource competition induced by climate change, as can be seen from the excerpt.

"…The scarcity of resources often leads to conflicts between communities and wildlife, creating a human-wildlife conflict. For instance, animals may enter peoples' homes, damaging crops because they cannot find sufficient food within the confines of the parks". - P018.

Other informants highlighted the connection between climate change-induced pressures and the rise in cases of encroachment into wildlife-protected areas. They observed that the effects of climate change, which impacted the availability of water resources, prompted communities to encroach into forests in search of water and food. This, in turn, resulted in habitat destruction and degradation of major tourism attractions. Encroachment was also linked to persistent droughts caused by climate change, as illustrated in the following excerpt:

'...Then the other one is related to droughts, particularly in the northern side of Kenya, where we've seen communities who have been severely affected by drought and who have been looking for pasture for their livestock have invaded certain properties.' - P09

Table 3.5 also reveals that interviewees were keenly aware of the impacts of climate change on destination attractiveness. Informants emphasized the vulnerability of the country's tourism industry to the effects of climate change, attributing it to the industry's heavy reliance on nature-based tourism. For example, the following quote illustrates the case of Kakamega crying stone, whose water had dried up, presumably due to the impacts of climate change:

> *'So the attractions, in general, have reduced. We are seeing rivers drying up, and things like the Crying Rock of Kakamega are drying up. This affects the existing destinations in terms of their attractiveness, but also in terms of accessibility.' - P024*

3.3.1.1 Classification of Climate Change Impacts

Climate change impacts are categorized into biological and physical based on their nature or the aspect of the environment affected (Kapitza et al, 2021; Kilroy, 2015). Biological impacts affect living organisms and ecosystems, influencing distribution, behavior, and overall well-being. They are often linked to changes in temperature, precipitation, and other climate-influenced factors. In contrast, physical impacts involve observable changes in earth's systems and environmental conditions due to climate alterations. Direct consequences include variations in temperature, precipitation, sea levels, and other climatic factors. In light of this differentiation, the baseline study categorized climate change impacts into two groups and developed an index to gauge the level of climate change impact awareness for physical and biological impacts by summing individual respondents rating for impacts in each category and dividing by number of impacts in the category. Table 3.6 displays the classification of impacts into biological and physical categories and presents the computed index reflecting the level of awareness in the baseline sample.

Table 3.6: Classification of climate change impacts and index of awareness levels for each impact category

Biological Climate Change Impacts	Physical Climate Change Impacts
i. Emergence of diseases	i. Droughts
ii. Loss of wildlife	ii. Warmer temperatures
iii. Emergence of new pests	iii. Intensive rainfall
iv. Loss of tree species	iv. Floods
v. Bleaching of coral reefs	v. Rising water levels
	vi. Landscape erosion
	vii. Melting of glaciers
Index score: $\bar{x}$=3.39,SD= 0.99	**Index score:** $\bar{x}$=3.46,SD= 0.84

Source: TRI Situational Analysis data, 2023.

The findings in Table 3.6 confirm that survey respondents had a moderate level of awareness regarding impacts classified into biophysical categories. Notably, respondents demonstrated slightly greater familiarity with physical climate change impacts ($\bar{x}$ = 3.46, SD = 0.84) compared to biological impacts of climate change ($\bar{x}$ = 3.39, SD = 0.99). The results imply that while there is a generally moderate level of awareness across both categories, there is a marginal inclination towards recognizing the physical aspects of climate change over the biological aspects among the surveyed individuals. The findings suggest that targeted educational efforts may enhance awareness of the effects of climate change on ecosystems. Additionally, the finding underscores the need for communication strategies that effectively convey the diverse nature of climate change effects, ensuring a well-rounded understanding among the surveyed population.

The qualitative analysis reclassified the initial code for climate change impacts based on impact nature and/or environmental aspect affected. The procedure involved grouping the codes to reflect similar or related impacts. Figure 3.5 and 3.6 displays a hierarchy diagram of key themes from the analysis, classifying climate change impacts into biological and physical categories:

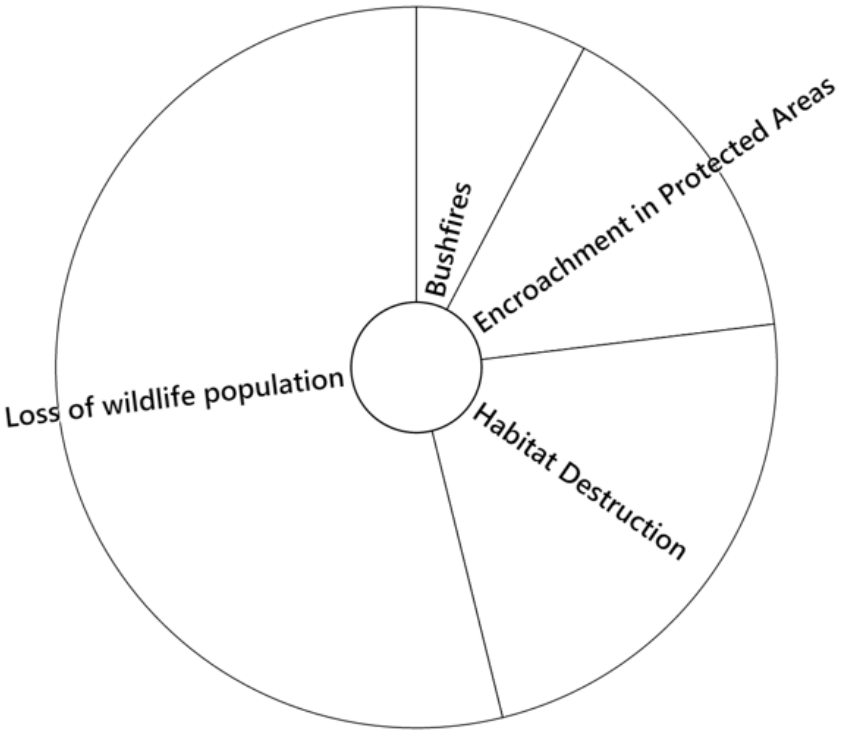

Figure 3.5: Hierarchy Chart-Impacts of Climate Change on the Earth's Life Forms

Source: TRI Situational Analysis data, 2023.

The analysis classified impacts that affect life forms in the natural environment under one category labelled "impact on life forms." This category corresponds to impacts on "Biological Climate Change Impacts" in the classification adopted in Table 3.6. The informants link impacts in this group to the severe drought's effect on wildlife populations across various regions of the country. Multiple references from the informants underscore the devastating consequences of prolonged droughts, with a particular emphasis on the significant loss of wildlife, including keystone species such as elephants. The interviewees emphasize that the tourism sector, heavily reliant on the country's diverse wildlife, is affected by these climatic events. The recurring mention of drought as a pivotal factor underscores the urgency and severity of the issue. Moreover, the informants note that the changes affect not only animal populations but also birdlife within national parks. For example, one informant noted:

"…And when you get these two extremes, there is no in-between. Therefore, you end up with the prolonged droughts that I can tell you have greatly affected the number of animals in nearly every park in this country, including birds. You go to a park-like Samburu that has wonderful birdlife, and you will notice that many birds are missing. It's not migration show because they are not; they're resident…" - P06

Figure 3.6 shows classification of climate change impacts that relate to the physical environment, i.e., changes in atmospheric weather conditions, landscapes and water bodies.

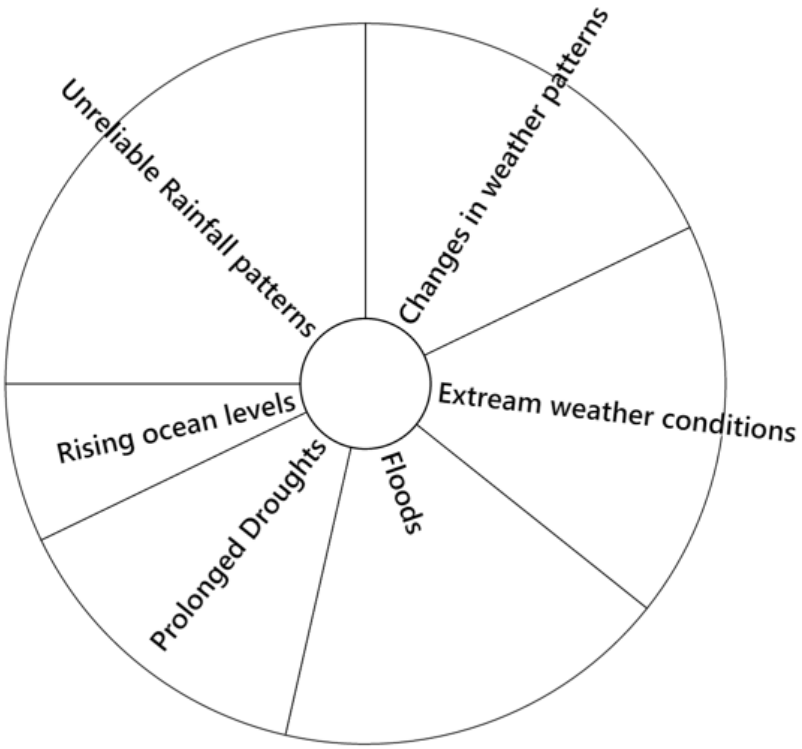

Figure 3.6: Hierarchy chart- impacts of climate change on the physical environment

Source: TRI Situational Analysis data, 2023.

In Figure 3.6, 28 references by 17 out of the 24 key informants were made to the impacts of climate change on the physical environment including changes in precipitation, seasonality, and rising water levels. Figure 3.6 shows that the climate change impacts mentioned by the key informants were grouped into the physical environment impacts. Excerpts from the interviews yielding Figure 3.6 reveal a pattern of unreliable rainfall patterns leading to severe drought conditions, affecting both wildlife and tourism. Other impacts on the physical environment include the disruption of facilities located near riverbeds. Additionally, extreme weather events, such as terrestrial rains and floods, were identified as having devastating consequences within the travel industry, causing flight cancellations. The irregularity of rainy seasons is also emphasized, making it challenging to predict weather patterns accurately. The absence of distinct peak and low seasons in tourism further underscores the changing climate's impact on the physical environment. For example, one informant noted,

«… When we have extreme weather, there is drought, there is terrestrial rains, we have devastating consequences and the impact is even within the travel industry. You get their flight cancellation, there are delays, and that is because there is climate» P010. «

In other examples of impacts on the abiotic environment, the informants noted the impacts of sea-level rise in the coastal region. The interviewee highlighted that the coastal region, particularly areas next to the ocean, had been affected by sea-level rise. Abandoned settlements, including cultural sites like Fort Jesus, Jumba la Mtwana, Gede Ruins, and Vasco da Gama

Pillars, were cited as examples. Another informant underscored the impact of sea-level rise on the coastal region, emphasizing the increased risk and danger posed by strong waves to cultural heritage sites along the coast. The abandonment of settlements and the potential threat to cultural sites highlight the tangible consequences of climate change, specifically sea-level rise, on the physical environment and cultural heritage in the coastal region.

Variations in Awareness of Biophysical Climate Change Impacts by Demographics

Previous studies have revealed variations in climate change awareness based on factors such as individuals' education, exposure, experience, and geographical location. For example, Ifegbesan, Azeez, and Mabekoje (2021) noted a significant difference in climate change awareness based on gender and the place of residence of respondents in a Nigerian study. The study thus proceeded to analyze the differences in the level of awareness of biological and physical climate change impacts by the respondents' demographic attributes including gender, level of qualification, experience in the industry and tourism region.

The study operationalized respondents' gender as a dichotomous categorical variable, with 1 representing male and 0 representing female. The analysis utilized the independent sample t-test to compare mean scores for the awareness index of biological and physical climate change impacts (dependent variables) between genders (independent variable). The results of the test uncovered evidence of significant differences in the scores for level of awareness of biological climate change impacts ($t(1251)=2.21, p<.05$) across genders, equal variance assumed. The males ($n=883, \bar{x}= 3.42$, SD = 0.99) were more aware of biological climate change impacts compared to females ($n=370, \bar{x}= 3.29$, SD = 1.01). The Magnitude of the difference in the means (mean difference = 0.135, 95% CI"0.015 to 0.260) was significant.

At the same time, the test showed evidence of significant differences in the scores for level of awareness of physical climate change impacts ($t(645.31)=2.61, p<.05$) between males and females, equal variances not assumed. The males ($n=883, \bar{x}= 3.50$, SD = 0.82) were more aware of physical climate change impacts compared to females ($n=370, \bar{x}= 3.36$, SD = 0.88). The Magnitude of the difference in the means (mean difference = 0.140, 95% CI"0.035 to 0.245) was also significant.

The results indicate that, on average, males demonstrate higher awareness of biological and physical climate change impacts than females. This suggests gender-based variations in awareness levels, vital for inclusive climate change strategies. Addressing this disparity is crucial for effective mitigation and adaptation. It underscores the need for gender-specific communication and education strategies to enhance awareness among diverse demographics. Tailored initiatives are necessary to bridge the awareness gap, ensuring both genders are equally informed and engaged in climate action.

Previous studies have revealed variations in climate change awareness based on factors such as individuals' education, exposure, experience, and geographical location. For example, Ifegbesan, Azeez, and Mabekoje (2021) noted a significant difference in climate change awareness based on gender and the place of residence of respondents in a Nigerian study.

The study thus proceeded to analyze the differences in the level of awareness of biological and physical climate change impacts across the demographic attributes of respondents including gender, level of qualification, and experience in the industry and tourism region.

The study investigated the differences in respondents' awareness of biophysical impacts, considering variations in their educational qualification, experience in the tourism industry, and the location of their enterprises in the country. The survey instructed respondents to specify their level of educational qualification by choosing from eight options, ranging from «no formal education» to «Doctorate Degree (Ph.D.).» The analysis then reclassified these responses into four categories: individuals with no formal education, those with basic education (i.e., primary and secondary school certificates), those with tertiary-level education (College certificates and diplomas), and respondents with higher education qualifications (Bachelor's, Master's, and Doctoral degree holders).

Simultaneously, the questionnaire responses regarding respondents' experience in tourism, expressed in the number of years, were reclassified into three groups. Individuals with less than 5 years of experience were labelled as novices in the industry, those with 6 to 15 years were labelled as having intermediate experience, and those with more than 16 years were categorized as having advanced experience. The survey recorded the location of the tourism enterprise using a seven-level categorical variable, offering options for Nairobi, Coastal, Western, Rift Valley, Central, Eastern, and Maasai Mara & Amboseli tourism regions. Table 3.7 provides the mean scores of the index rating respondents' levels of awareness of biophysical climate change impacts. These scores were compared across respondents' literacy levels, experience in the industry, and the location of the enterprise.

Table 3.7: Mean score of respondents' awareness of biophysical climate change impacts by the level of education, experience, and tourism region

					Awareness of Biological Climate Change Impacts	Awareness of Physical Climate Change Impacts
Independent Variable	**Group/Level**	**N**	**Mean**	**SD**	**Mean**	**SD**
Level of Education	No Formal Education	11	3.29	0.58	2.75	0.50
	Basic Education	304	3.24	0.96	3.18	0.77
	Tertiary Level Education	582	3.33	1.05	3.49	0.82
	Higher Level Education	355	3.61	0.89	3.68	0.87
Experience in Tourism	Novice	436	3.26	1.04	3.33	0.88
	Intermediate Experience	610	3.42	0.98	3.51	0.79
	Veteran	207	3.56	0.90	3.60	0.85
Region	Nairobi	465	3.36	1.04	3.50	0.82
	Rift Valley	119	3.46	0.85	3.54	0.81
	Maasai & Amboseli	78	3.43	1.05	3.62	0.75
	Eastern	10	3.74	1.00	4.19	0.83
	Western	149	3.36	1.05	3.70	0.96
	Coastal	324	3.33	0.96	3.21	0.76
	Central	108	3.58	0.90	3.45	0.89

Table 3.7 reveals a general increase in awareness of the biological and physical impacts of climate change with rising literacy levels. Respondents with no formal education to those with tertiary level education showed a certain level of awareness regarding these impacts, in comparison to respondents with higher education levels—bachelor's degrees, masters, and PhD—who demonstrated a moderate level of awareness of the biophysical impacts of climate change. Moreover, the ANOVA results suggest that level of awareness of biological climate change impacts differ significantly across respondents' level of education ($F_{(3,1248)}=8.98, p<.001$). Similarly, level of awareness of physical climate change impacts differs significantly by level of education ($.F_{(3,1248)}=23.52, p<.001$).

The correlation between rising literacy levels and increased awareness of both biological and physical impacts of climate change underscores the role of education in shaping environmental consciousness. The findings highlight the importance of educational initiatives in fostering a more informed and conscious society regarding climate change, emphasizing the need for targeted awareness campaigns at various educational levels.

At the same time, the results suggest that the level of awareness regarding the impacts of climate change increases with experience in the tourism industry. Respondents with less than six years of experience were found to be somewhat aware of these impacts, in contrast to those with more than 16 years of experience, who demonstrated a moderate awareness of both the biological and physical impacts of climate change. At the same time, ANOVA results suggest that level of awareness of biological climate change impacts differ significantly across respondents' experience in the tourism industry ($F_{(2,1250)}=6.78, p<.001$). Similarly, level of awareness of physical climate change impacts differs significantly by experience ($F_{(2,1250)}=10.05, p<.001$). The positive association between experience in the industry and heightened awareness of climate change impacts highlights the importance of practical exposure in fostering climate change awareness and underscores potential impact of on-the-job learning and the importance of incorporating environmental education within the tourism sector.

On the flip side, awareness levels of biological and physical climate change varied across different tourism regions. Examining Table 3.7, reveals that respondents from Nairobi, Rift Valley, and Maasai/Amboseli regions demonstrated a certain level of awareness regarding the biological impacts of climate change but exhibited a moderate awareness of the physical impacts. Conversely, in the central region, the awareness pattern was reversed, with respondents being moderately aware of the biological impacts and somewhat aware of the physical impacts. On the other hand, the ANOVA results reveal that the level of awareness of biological climate change impacts was not significantly different across tourism regions ($F_{(6,1246)}=1.28, p=.27ns$). However, the results suggest significant difference in levels of awareness of physical climate change impacts across tourism regions ($F_{(6,1246)}=9.09, p<.001$).

The regional disparities in awareness levels within the tourism industry point to the localized nature of climate change awareness. These findings underscore the necessity for tailored communication strategies that account for the specific environmental concerns of each region.

To examine individual differences between groups of the independent variables, post-hoc comparisons were assessed using Dunnett's T3 and Tukey's as appropriate depending on assumption on equality of variance. Table 3.8 shows the mean scores for levels of awareness of biological and physical climate change impacts that were significantly different across education levels, experience and tourism regions.

Table 3.8: Significant difference in levels of awareness of biophysical climate change impacts across regions, experience, and level of education

Awareness of Biological Climate Change Impacts					**95% Confidence Interval**	
Independent Variable			**Mean Difference**	**p-value**	**Lower Bound**	**Upper Bound**
Level of Education	Basic Education	Higher Level Education	-0.37*	>.001	-0.56	-0.17
	Tertiary Level Education	Higher Level Education	-0.28*	>.002	-0.45	-0.11
Level of Experience	Novice	Intermediate Experience	-0.15*	.050	-0.31	-0.00
	Novice	Veteran	-0.29*	>.001	-0.48	-0.10
Awareness of Physical Climate Change Impacts						
Independent Variable			**Mean Difference**	**p-value**	**Lower Bound**	**Upper Bound**
Level of Education	No Formal Education	Tertiary Level Education	-0.74*	<.050	-1.38	-0.10
	No Formal Education	Higher Level Education	-0.93*	<.001	-1.57	-0.28
	Basic Education	Tertiary Level Education	-0.31*	<.001	-0.46	-0.16
	Basic Education	Higher Level Education	-0.50*	<.001	-0.66	-0.34
	Higher Level Education	Tertiary Level Education	0.19*	<.050	0.05	0.33
Level of Experience	Novice	Intermediate Experience	-0.19*	<.050	-0.31	-0.06
	Novice	Veteran	-0.28*	<.001	-0.45	-0.11
Tourism Region	Nairobi	Coastal	0.29*	<.001	0.12	0.46
	Rift Valley	Coastal	0.33*	<.050	0.07	0.59
	Maasai & Amboseli	Coastal	0.40*	<.050	0.11	0.70
	Western	Coastal	0.48*	<.001	0.21	0.76

*. The mean difference is significant at the 0.05 level.

Source: TRI Situational Analysis data, 2023.

The post-hoc results presented in Table 3.8 indicate that the level of awareness of both biological and physical climate change impacts differs significantly based on respondents' experience in the tourism industry. This confirms that individuals with varying levels of experience in the industry may have different levels of awareness regarding the biological and physical consequences of climate change. Similarly, the results further show that the level of awareness of both biological and physical climate change impacts differs significantly across respondents' educational levels. This implies that individuals with different educational

backgrounds may exhibit varying levels of awareness regarding the biological and physical effects of climate change. In the context of climate change response and sustainable tourism practices, these results emphasize the importance of considering industry experience, educational backgrounds, and regional differences when designing awareness and education initiatives. Tailoring strategies to these factors can enhance the effectiveness of climate change communication and education within the tourism industry.

3.3.2 Perceptions of the Effects of Climate Change on Tourism Enterprises

The survey assessed respondents' perceptions of the effects of climate change impacts on tourism enterprises over the past five years. Respondents were required to rate the effects of thirteen (13) climate events on their enterprises relying on a five-point Likert scale where 1 = No effect, 2=Minor effect, 3= neutral, 4=moderate effect, and 5 = major effect. The events listed included warmer temperatures, extreme low temperatures, changes in rainfall seasonality, prolonged droughts, hailstorms, flush floods, wild fires, mudslides, air pollution, sea level rise, strong waves, melting ice and changes in inland water levels. The analysis then relied on descriptive statistics to summarize the respondents' perceptions of the effect of climate change on their enterprises. Table 3.9 presents descriptive statistics of effects of climate change events on the tourism enterprises.

Table 3.9: Descriptive Statistics of Effects of Climate Change Events on Tourism

Climate change event	No effect (%)	Minor effect (%)	Neutral (%)	Moderate effect (%)	Major effect (%)	Mean	Std. Deviation	Extent of Effect
Prolonged droughts	9.10	13.73	20.99	25.94	30.25	3.55	1.29	**Moderate effect**
Change in rainfall seasons	7.66	11.57	29.85	29.45	21.47	3.45	1.17	**Neutral**
Warmer temperature	14.76	12.93	23.62	29.93	18.75	3.25	1.31	
Extreme low temperature	25.30	18.83	24.10	18.28	13.49	2.76	1.37	
Air pollution	32.80	18.04	24.50	17.16	7.50	2.49	1.30	**Minor effect**
Change in inland water body levels	41.50	15.40	21.79	14.37	6.94	2.30	1.32	
Flush floods	45.73	18.68	17.16	12.13	6.30	2.15	1.29	
Sea level rise	50.52	14.29	16.12	13.01	6.07	2.10	1.31	
Strong waves	53.07	13.81	16.84	11.17	5.11	2.01	1.27	
Wildfires	60.10	11.41	9.58	9.18	9.74	1.97	1.39	
Hailstorms	52.43	20.59	13.81	8.86	4.31	1.92	1.18	
Mudslides	56.26	16.28	13.41	9.74	4.31	1.90	1.21	
Melting ice	69.99	12.29	9.10	5.91	2.71	1.59	1.05	

Source: TRI Situational Analysis data, 2023.

The results in Table 3.9 show the varying extent of the effect of climate change events on tourism enterprises over the last five years. The results suggest that on average, the enterprises in the baseline survey sample were moderately affected by prolonged droughts ($\bar{x}$=3.55,SD=1.29). However, the surveyed enterprises were indifferent about the extent of the effect of changes in rainfall seasonality and warmer temperatures and extremely low temperatures on their business (2.50> $\bar{x}$<3.5). On the other hand, the survey results show that air pollution, flashfloods,

wildfires, mudslides hailstorms, and other five climate change events had minor effects on the tourism enterprises surveyed (1.00> $\bar{x}$ <1.50).

Overall, the results in Table 3.9 suggest that prolonged droughts, changes in rainfall seasons, warm temperatures, and extreme low temperatures have at least a minor effect on the majority of tourism enterprises (75%-92%). On the other hand, climate change events like air pollution, changes in inland water levels, flash floods, and rising sea levels had at least a minor impact on most enterprises (50%-67%). However, strong waves, wildfires, hailstorms, mudslides, and melting ice had at least a minor impact on fewer enterprises (<50%).

The findings from Table 3.9 indicate varying degrees of impact on tourism enterprises due to climate change events over the last five years. Prolonged droughts moderately affected the surveyed enterprises, while changes in rainfall seasonality and temperature had mixed responses, ranging from indifference to moderate impact. Interestingly, air pollution, flash floods, wildfires, mudslides, hailstorms, and other climate change events were generally perceived to have minor effects on tourism enterprises. These results suggest a nuanced vulnerability landscape, emphasizing the need for targeted climate resilience strategies tailored to the specific impacts identified, ensuring the tourism sector's sustainable adaptation.

3.3.3 Significance of Climate Change Impacts on Tourism Enterprises Operations

3.3.3.1 Identification of Significant Climate Change Impacts on Tourism Enterprises

The study required key informants to give their perspectives on how their enterprises had been directly affected by climate change in the recent past. Twenty-one out of the 24 interviewees reacted to the questions and indicated ways in which their business had been affected by climate change (49 references). Figure 3.7 provides a mind map of the impacts of climate change on tourism enterprises identified in the KII.

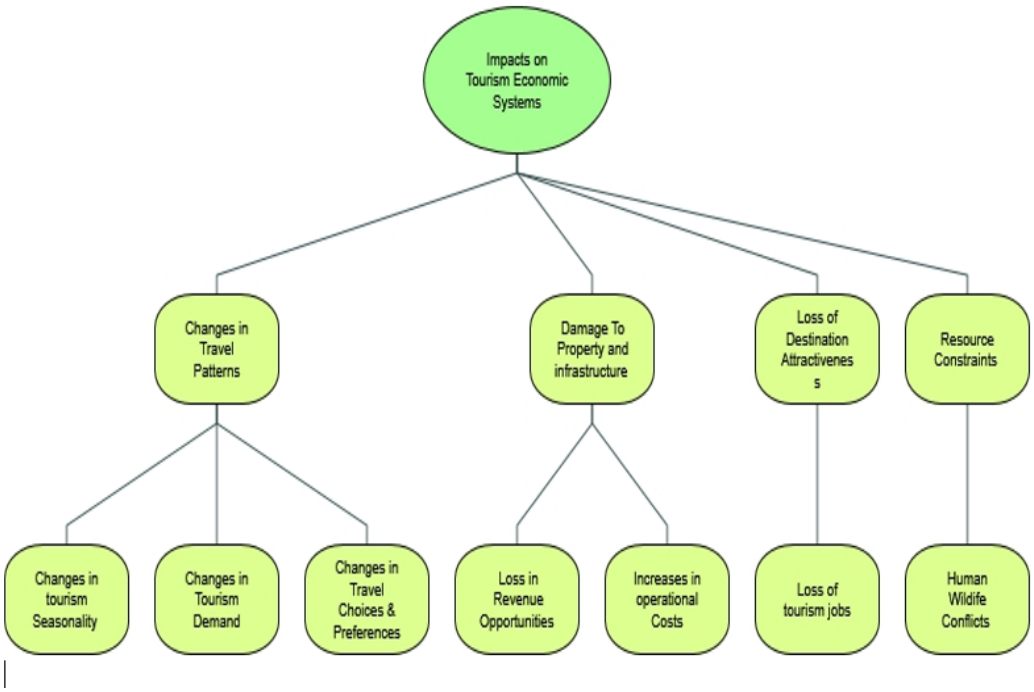

Figure 3.7: Mind map of climate change impacts on tourism economic systems

Source: TRI Situational Analysis data, 2023.

The classification of initial codes of the impacts of climate change on economic systems, particularly in relation to the tourism industry, yielded four broad sub-themes; changes in travel patterns, damages to property and infrastructure, loss of destination attractiveness and resource constraints (Figure 3.7). In the first sub-theme, key informants underscored that climate change has triggered shifts in travel patterns, influencing seasonality, visitation, and choices of tourist activities and destinations. Consequently, these changes have reverberated throughout the operational aspects of enterprises. An informant highlighted the disruptive consequences of extreme weather events, such as drought and terrestrial rains, leading to flight cancellations and delays. Another interviewee emphasized how prolonged drought has reshaped the pattern of tourism visits, prompting tourists to opt for alternative destinations and resulting in a decline in visitor numbers. Additionally, another informant observed significant shifts in tourism dynamics, noting the disappearance of distinct peak and low seasons, rendering it a non-seasonal phenomenon.

The second sub-theme captured tangible consequences of climate change on property and infrastructure. In this sub-theme, interviewees described the damages caused by heavy rainfall on historical walls that have been standing for over 400 years. The walls absorb water, become heavy, crumble, and even develop green mold due to excessive rain. The heat exacerbates the situation, leading to the cracking of walls.

"…Rainfall is substantial whenever it occurs, impacting these walls that have stood for over 400 years. When the walls absorb water, they become exceptionally heavy, leading some of them to crumble and fall due to the increased humidity. Additionally, the region experiences high temperatures, contributing to the formation of a green mold resembling algae when the rain is particularly heavy. This mold affects the walls of the structure. It's important to note that our fort is constructed from coral rocks, constituting a blend of coral rocks, lime, and clay. Excessive heat exacerbates the situation, causing the walls to crack" P016.

Under the sub-theme of property damage, informants observed the emergence of sudden winds in the last two years, impacting structures made of Makuti (palm fronds). Although the damages were not on a large scale, they signal a shift in climate patterns, requiring attention to the structural resilience of tourism-related infrastructure. Still, the impacts of climate change on infrastructure supporting tourism were noted with an interviewee observing incidences where bridges were washed away due to flash floods resulting in restricted access to attractive destinations, and disrupting safari experiences as animals become difficult to observe. The direct link between climate change-induced events and the impairment of crucial tourism infrastructure emphasized the practical challenges faced by enterprises in providing accessible and enjoyable experiences for visitors.

The informants' perspectives highlighted the multifaceted economic repercussions of climate change on revenue streams within the tourism industry, affecting both businesses and individuals. For instance, it was demonstrated that the closure of facilities in places like Samburu due to flash floods caused by excessive rain or drought, led to revenue loss as visitors perceive these calamities negatively. The informants also connected climate change impacts

to direct increases in operational costs for tourism enterprises. The interviewees mentioned the rise in operational costs attributed to increased energy expenses, particularly for uses like air-conditioning. This has necessitated adjustments in product pricing. Additionally, they highlighted changes in food prices resulting from climate-related factors such as drought, leading to unpredictable and fluctuating costs for food supplies. Moreover, the interviewees identified the challenge of unexpected costs incurred due to alterations in itineraries and bookings, necessitating quick thinking and flexibility in response to climate-related disruptions. For example, an informant from the travel and tours sub-sector noted that:

“We have the challenge that we have been seen is that a lot changes will incur cost. Which had not been factored earlier so you have to switch, maybe you pay for a hotel you had not paid for maybe you try transfer booking you don’t get your money back so the hardest part is very quick thinking in terms of changing the itinerary and you have a financial loss somewhere along the way” P04.

The third sub-theme captured the deterioration of the destination’s attractiveness and thus competitiveness due to climate change events. The interviewees linked adverse impacts on their operational profitability to deterioration in the destination’s attractiveness and reduction in visitation due to climate change effects. For instance, the interviewees note changes in animal migration patterns, disrupting the predictability of wildlife viewing experiences. Clients, accustomed to the reliability of seeing specific species in certain areas, now face uncertainties due to increased interchanges and altered migration routes. Other responses underscored the impact on Mombasa’s reputation as a sunny destination, with climate change leading to unexpected cold or rainy weather, contradicting tourists’ expectations for warm and sunny conditions. These examples collectively demonstrate how climate change-induced shifts in wildlife behavior and weather conditions can significantly impact destination attractiveness, challenging traditional expectations and potentially affecting tourist experiences.

The fourth sub-theme encompassed key informant perspectives on economic systems affected by resource constraints. One informant observed that climate change has led to the displacement of communities, particularly those that previously supported local tourism through activities like community tour guiding and providing food for facilities, including agricultural and farming practices. Another informant cited the example of communities around beach destinations who used to supply fish to tourist beach resorts. The informants highlighted that climate change has resulted in a reduction in fish harvests, leading to a situation where fisher folks are no longer able to supply hotels.

These results align consistently with the quantitative assessment, where increases in operational costs, loss of income opportunities, alterations in travel patterns, changes in seasonality, and business interruptions were rated as «very significant» impacts of climate change on tourism enterprises. Table 3.10 provides a summary of respondents’ ratings regarding the significance of climate change impacts on tourism enterprises.

Table 3.10: Rating on significance of climate change impacts on operations of tourism enterprises

Operational Impact	Rating on level of significance of impacts					Significance Rating		
	Not at all significant (%)	Slightly significant (%)	Somewhat significant (%)	Very significant (%)	Extremely significant (%)	Mean	Std. Deviation	Significance
Increase in operational costs	(%)	Mean	Std. Deviation	Significance	40.30	3.93	1.18	
Loss of income opportunities	9.02	8.06	16.84	33.36	32.72	3.73	1.25	
Changes in travel patterns	6.46	8.70	23.46	29.69	31.68	3.71	1.18	**Very significant**
Changes in seasonality	4.55	11.09	25.14	30.17	29.05	3.68	1.14	
Business interruptions	9.18	7.66	22.03	31.76	29.37	3.64	1.23	
Damages to infrastructure	18.83	16.36	21.15	26.90	16.76	3.06	1.36	
Increase of insurance premiums	22.03	16.92	20.75	24.74	15.56	2.95	1.39	
Damages to property	18.52	20.99	23.70	21.71	15.08	2.94	1.33	**Somewhat significant**
Loss of landscape attractiveness	23.78	15.80	21.79	23.94	14.68	2.90	1.39	
Wildlife migration	31.92	12.69	15.16	19.07	21.15	2.85	1.56	
Human-wildlife conflict	36.71	15.32	15.64	15.88	16.44	2.60	1.51	

Source: TRI Situational Analysis data, 2023.

The results presented in Table 3.10 highlight differences in respondents' perceptions regarding the significance of climate change impacts on various aspects of tourism business operations. The findings suggest that climate change had a very significant impact on four aspects directly related to the operational profitability of their enterprises, namely costs, income opportunities, seasonality, travel demand, and business interruptions ($3.50 > \bar{x} < 4.50$). In contrast, the impact of climate change on the enterprises' exogenous environment, such as damage to infrastructure, an increase in insurance premiums, damage to properties, loss of landscape attractiveness, wildlife migration, and human-wildlife conflict, was assessed as somewhat significant ($2.50 > \bar{x} < 3.50$).

Overall, direct impacts such as increased operational costs, loss of income opportunities, changes in travel patterns, changes in seasonality, and business interruptions were considered at least slightly significant by a majority of enterprises (91%-96%). On the other hand, damages to infrastructure, increased insurance premiums, property damage, loss of landscape attractiveness, wildlife migration, and human-wildlife conflict were seen as at least slightly significant by most enterprises (63%-81%).

The observed difference in perception regarding the direct and indirect impacts of climate change on tourism enterprises has significant implications for their response strategies and vulnerability. The recognition of very significant affects operational profitability aspects,

including costs, income opportunities, seasonality, travel demand, and business interruptions, emphasizes the immediate and tangible challenges that businesses face. On the other hand, the somewhat significant assessment of climate change impacts on the enterprises' exogenous environment, such as infrastructure damage and human-wildlife conflict, implies a less immediate but still noteworthy set of challenges. These findings underscore the need for tourism enterprises to develop comprehensive response strategies that address both the direct operational impacts and the longer-term environmental consequences of climate change, ensuring a holistic approach to vulnerability reduction and sustainable adaptation in the face of evolving climatic conditions.

3.4 Climate Change Response Strategies by the Tourism Sector in Kenya

The study then evaluated the climate change response strategies adopted by tourism enterprises in the country. The subsequent section presents the results of climate change adaptation and mitigation measures identified during the KIIs and FGDs, as well as quantitative results on the extent of adoption of these measures by the surveyed tourism enterprises.

3.4.1 Identified of Climate Change Adaptation Practices

The KII prompted informants to elaborate on the actions their tourism enterprises had taken to adapt to the impacts of climate change. Figure 3.8 illustrates the initial codes extracted through reflexive thematic coding, reflecting the informants' responses to climate change adaptation actions adopted.

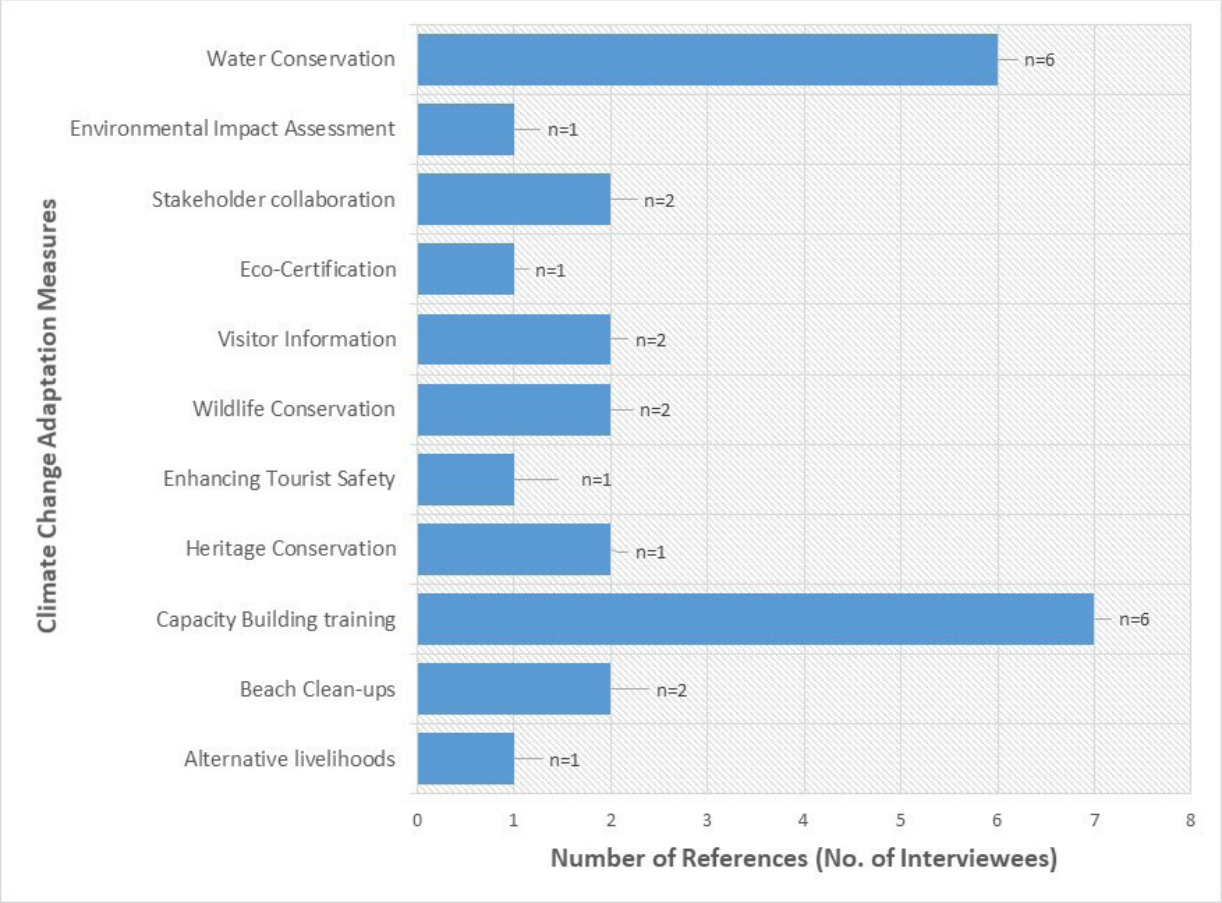

Figure 3.8: Climate change adaptation actions by key informants

Source: TRI Situational Analysis data, 2023.

The key informants emphasized a range of water conservation practices undertaken as part of climate change adaptation strategies. These measures encompass advising on minimizing water usage in facilities and implementing water harvesting during the rainy season to preserve water resources, collaborating on drilling boreholes and constructing dams to supply water to local communities and wildlife, installing reverse osmosis plants for groundwater extraction and implementing water recycling practices. These initiatives showcase the diverse and proactive approaches adopted by tourism enterprises to conserve water resources in response to climate change impacts.

However, comments from the FGDs also confirmed that water management technologies were not commonly adopted by tourism enterprises. There were few mentions of practices like the construction of water pans for storing rainwater for community use during drought periods, conservation of water towers and catchment areas, and the adoption of efficient water management technologies such as employing low-flow shower heads, recycling greywater, and using automatic shut-off mechanisms for water conservation.

Feedback from FGD suggests that the most commonly cited climate change adaptation intervention was the diversification of tourism products, aiming to reduce over-reliance on nature-based tourism products highly vulnerable to changes in climate patterns. For example, one informant advocated for product diversification as a response to climate change, stating that:

"One essential aspect is to prioritize diversification of your product offerings. Your portfolio should be highly diverse, ensuring that if one plan encounters difficulties, you have alternative options readily available. It's crucial not to rely solely on one strategy. Instead, understand and maintain multiple options, so you're well-prepared to adapt as needed. This knowledge and preparedness are especially important for tour operators in the current landscape" [P05].

FGD uncovered other managerial climate change adaptation practices adopted by the tourism industry practitioners. Participants from the accommodation sector highlighted successful linen-reuse programs in their hotels, lodges, and camps, encouraging guests to reuse towels and bed linens. However, some questioned their effectiveness, noting the need for guest sensitization to support behavior change. Additionally, participants discussed waste recycling and reduction programs, including initiatives such as reusing plastic bottles, and using refillable toiletries. They also mentioned solid waste collection activities involving the community, providing employment opportunities for youth and women who convert collected plastics and other materials into doors, boards, and other items. Some tourism enterprises conducted staff training on collective responsibility in waste management and implemented waste disaggregation and disposal, focusing on the 3Rs (reduce, reuse, recycle), with some wastes used as organic fertilizers for gardening.

Results from both FGDs and KIIs underscore the importance of training and capacity-building programs aimed at enhancing awareness of climate change impacts among guests and employees. Analysis of the qualitative feedback reveals that the most significant mentions by key informants and FGD participants were tourist education and awareness programs, as

well as employee sensitization activities aimed at attitude and behavior change. These results reflect the findings from the quantitative study, which also emphasized the importance of employee training, visitor sensitization, and tourist information. The educational practices aim not only to enhance the capacity of staff to deliver responsible tourism experiences but also to empower visitors to make informed choices and engage in sustainable behaviors during their travels.

Collaboration with local communities was also evident in training sessions covering climate change issues. Additionally, training and capacity-building efforts extended to school children, scouts involved in landscape management plans, and guides, with a specific emphasis on promoting environmental sensitivity and responsible tourism practices. These initiatives collectively reflect a comprehensive and multi-stakeholder approach to building resilience and fostering sustainable practices in the face of climate change. Commonly cited initiatives in the training initiative were:

1. Tourist education programs designed to educate tourists about responsible tourism practices and sustainable behaviors during their travels.
2. Employee sensitization activities aimed at changing attitudes and behaviors of employees towards sustainability, enabling them to deliver responsible tourism experiences.
3. Employee capacity development programs focused on equipping staff with the knowledge and skills to promote and implement sustainable tourism practices

Feedback from FGDs and KIIs indicated limited consideration of green building design as a technical climate change adaptation practice. However, a few new hotel establishments reported embracing green buildings as a means to adapt to climate change impacts. These facilities relied on eco-friendly construction materials such as Makuti thatch to regulate temperatures, reducing the need for air conditioning equipment. This practice is gaining momentum, especially in hotel establishments in wildlife-protected areas, where other materials like bamboo and wood are being utilized

However, FGD and KII feedback uncovered other technical climate change mitigation practices that focused on energy conservation and management. Discussions emphasized energy conservation and efficiency practices undertaken by tourism enterprises to enhance their climate change resilience. The qualitative findings indicated that tourism enterprises, especially classes A and B, were increasingly investing in energy-efficient technologies and building infrastructure for renewable energy, aiming to reduce operational costs, as one FGD participant noted.

"We've gone ahead now to put automatic switches where when there is no human activity, lights go off. Light sensors, yes. Like now, if you're walking in the corridor, the lights switch on as you move, and they switch off as you leave the area. So, we are saving on energy" [FGD02]

Frequently mentioned energy efficiency technologies included the use of improved cooking stoves, installation of automatic switches and light sensors, use of organic fuels (e.g., coconut briquettes), and use of green energy sources like solar and wind energy to a limited extent. Participants also cited employee sensitization and awareness creation as an approach to

encourage efficiency in energy utilization by their enterprises.

The difference in adoption between technical and managerial climate change adaptation practices can be attributed to several factors. Managerial practices, such as product diversification and employee training, are often easier and less costly to implement compared to technical practices. These managerial practices typically involve changes in procedures, policies, and human resource management, which can be integrated into existing operations without significant capital investment. For example, diversifying tourism products or conducting training sessions for employees requires fewer resources and can be done incrementally. This makes it more accessible for enterprises, particularly smaller ones with limited financial capacity.

On the other hand, technical practices, such as water desalination, recycling, rainwater harvesting, and structural modifications, often require substantial financial investment, specialized knowledge, and technology. The upfront costs and complexity associated with these technical solutions can be prohibitive, especially for smaller enterprises. Additionally, the perceived risk and uncertainty of returns on such investments can deter enterprises from adopting them. The findings imply that while managerial and educational practices are relatively well-adopted due to their lower cost and ease of implementation, there is a significant gap in the adoption of technical practices due to financial, technical, and resource constraints. This highlights the need for targeted support, such as financial incentives, subsidies, and technical assistance, to encourage the adoption of technical climate adaptation practices in the tourism sector

Feedback from KII and FGD cite other adaptation approaches including behavioural and policy adaptation practices. With regard to behavioural adaptation, few participants described interventions such as carpooling and encouraging staff to cycle to work, although evidence suggested that these practices had not yet gained wide traction among the enterprises.

Discussions on policy adaptation highlighted government regulations, incentives for climate action, and private sector compliance. Key components included ecosystem and heritage conservation. FGDs and KIIs noted public sector, tourism enterprises, and non-state agency efforts in ecosystem restoration and environmental conservation, aligning with baseline survey results. Efforts focused on rehabilitating degraded landscapes such as marine ecosystems, nature parks, game reserves, and settled areas. Activities included supporting community tree nurseries, tree planting, afforestation, reforestation, coral reef rehabilitation, mangrove restoration, seagrass planting, promoting smart agriculture, and landscape and resource planning.

On heritage conservation, reported efforts included gazettement or designation of nature and heritage sites, with the objective of establishing frameworks for their protection, conservation, and sustainable use in tourism activities by county governments as can be seen from the following excerpt:

"We have successfully gazetted several of our nature and heritage sites, designating them as County Heritage. The objective of this gazetting is to establish a framework for protecting, conserving, and promoting sustainable tourism use of these sites."[P04]

Compliance with government policies and regulations was identified as a crucial factor in enhancing adaptation to climate change. This includes adherence to regulations enforced by central government agencies such as the National Environment Management Authority (NEMA) and the Tourism Regulatory Authority (TRA), as well as regulations set by county governments. However, FGD participants highlighted challenges in compliance with these laws and regulations. These challenges include the multiplicity of licenses, complex licensing procedures, inadequate coordination between enforcing authorities, and a lack of incentives and disincentives for climate change adaptation

3.4.2 Identified Climate Change Mitigation Practices

Figure 3.9 shows initial codes extracted through reflexive thematic coding, reflecting the informants' responses to climate change mitigation measures adopted. The mitigation measures involve actions and strategies aimed at reducing or preventing the emission of greenhouse gases (GHGs) into the atmosphere to limit the extent of climate change. The primary goal of mitigation is to address the root causes of climate change by curbing the human activities that contribute to the accumulation of GHGs, such as carbon dioxide and methane. Mitigation measures focus on transitioning to a low-carbon or carbon-neutral economy to achieve a balance between emissions and their removal or offset.

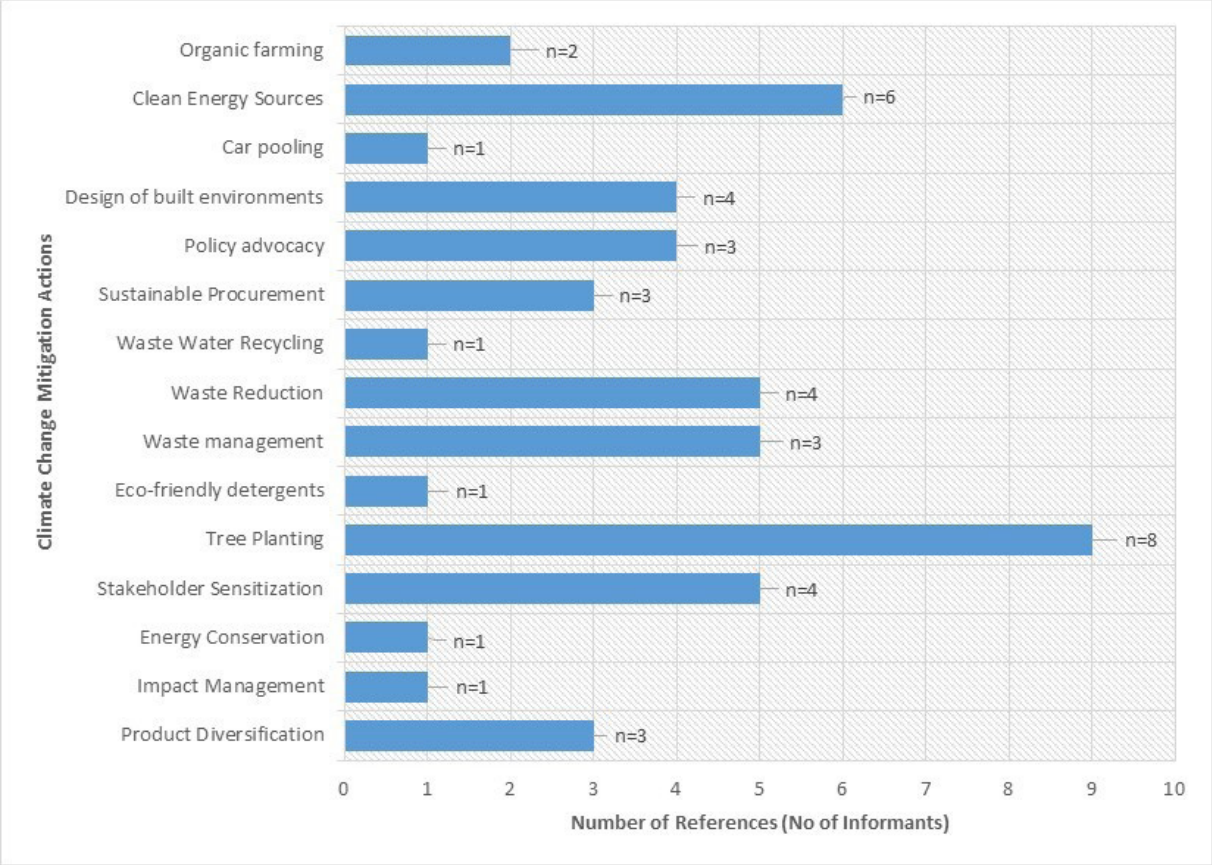

Figure 3.9: Climate change mitigation actions by key informants
Source: TRI Situational Analysis data, 2023.

Tree planting, the utilization of clean energy sources, waste reduction and management initiatives, stakeholder sensitization, and policy advocacy were among the most commonly cited mitigation measures. Eight (n = 8) key informants mentioned tree planting as a climate change mitigation practice. As evidenced by the following excerpt, tourism enterprises had aggressively embraced tree planting:

"We are currently implementing a plan across all hotels, coordinated through the Kenya Coastal Tourism Association (KCTA), in collaboration with our peers in the tourism industry. The initiative aims to introduce a program named 'One Guest, One Tree.' The concept is simple – each guest will be encouraged to plant a tree during their stay. By extending this effort to all coastal hotels, (we) envision the positive impact if every guest participates in planting a tree. Furthermore, we aim to involve both the staff and the local community in tree-planting activities wherever feasible." P023

Views from FGD participants indicated that enterprises engaged in tree planting primarily to sequester carbon. An example highlighting the benefits of mangrove planting illustrates this focus:

"We collaborate with the community in mangrove restoration because mangroves are known to absorb 10 times more greenhouse gases than terrestrial plants. This initiative serves as a mitigation measure, and our partnership with the community strengthens its effectiveness." [FGD07]

Other FGD participants said that they establish tree nurseries and distribute seedlings to communities as a means of empowering and encouraging local communities to engage in environmental conservation efforts and benefit from tree planting initiatives. Informants also suggested that tree planting aids in soil stabilization, flood prevention, and biodiversity conservation, thereby enhancing ecosystem resilience and promoting sustainable livelihoods for communities. The following excerpt serves as an illustration of this motivation:

"We establish nurseries for indigenous trees and distribute them to communities surrounding national parks, enabling them to access seedlings at no cost. Subsequently, we launch tree planting campaigns to further this cause." [FGD04]

Participants in the FGDs, emphasized that safeguarding fragile ecosystems in national parks, game reserves, wetlands, conservancies, and rangelands not only reduces emissions but also enhances biodiversity and ecosystem services, thereby bolstering resilience to climate change. There was consensus that protecting and restoring such sites could attract more tourist visits, potentially increasing sector revenue.

Evidence from qualitative feedback from FGDs also confirmed that communities were engaged in forest conservation activities supported by tourism enterprises as part of community extension or corporate social responsibility programs. For example, the Coastal Forest Conservation Unit, a global organization, was piloting an ecotourism project at Kaya-Kinondo-Mijikenda aimed at conserving the Kaya Forest for cultural and traditional rites. This project aims to develop an additional touristic destination for income generation and employment

creation for locals. Informants and participants highlighted additional activities undertaken by tourism enterprises to protect fragile ecosystems and watersheds. These include managing invasive species, controlling wildfires, regulating grazing in forest lands and conservancies, and engaging in apiculture and other non-timber income-generating activities.

Analysis of comments from FGDs and key informants underscored additional climate change mitigation practices implemented by the tourism sector in Kenya. Figure 3.10 summarizes commonly cited initiatives beyond tree planting and the protection/conservation of fragile ecosystems.

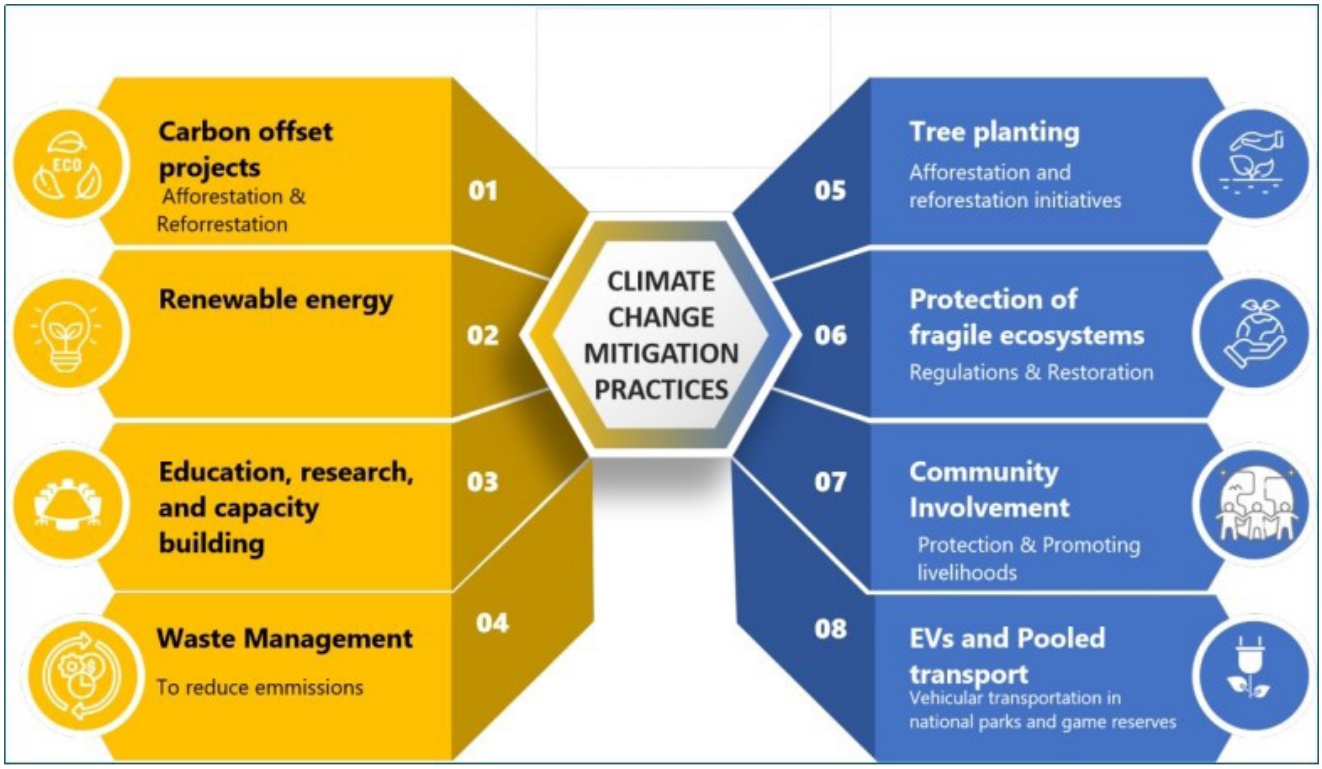

Figure 3.10: Current Climate Change Mitigation Practices

Source: TRI Situational Analysis data, 2023.

Figure 3.10 illustrates stakeholders' discussion on carbon offset projects that advance tourism's climate action. Two notable examples include: The Northern Rangeland Trust (NRT) carbon project spans counties in northern and Coastal Kenya, covering 45 community conservancies. It's the world's largest soil carbon removal project and the first to generate carbon credits from modified livestock grazing practices. FGD participants noted benefits such as sustainable tourism, job creation, economic diversification, support for education, and improved conservancy and rangeland management. Mikoko Pamoja (Mangrove Conservation for Community Benefit) is a blue carbon offset project in Kwale and Lamu Counties. It focuses on conserving and restoring mangrove ecosystems through community involvement, including policing illegal activities and planting seedlings to prevent deforestation. The Mikono Pamoja project promotes socio-economic development through sustainable activities like beekeeping and ecotourism.

Insights from KIIs and FGDs revealed that tourism enterprises are implementing emission reduction initiatives to mitigate climate change. Figure 3.10 highlights the use of renewable and alternative energy sources as a key practice for reducing emissions. Specific practices cited include solar energy and alternative fuels such as briquettes and LPG to minimize energy consumption. This is illustrated by the following quote from a participant: “We are using alternative sources of energy e.g., Briquettes made from Biomass and coconut husks…” [FGD07].

Discussion also cantered on restricting fossil fuel vehicular transportation within national parks and game reserves to curb greenhouse gas emissions. FGD participants indicated that some tourism enterprises are transitioning to non-fossil fuel-powered vehicles, albeit minimally. Others mentioned promoting shared transportation, biking, walking trails, and trekking safaris to lower their carbon footprints. These initiatives underscore tourism enterprises’ commitment to reducing emissions through transportation systems, as exemplified in the following excerpt:

“…. We have the Masai Wilderness Conservation Trust (MWCT) which is already using rechargeable electric vehicles covering 500 km per single full charge …” FGD01 and “…. We have electric vehicles and reducing on fuel consumption by cutting on fossil fuel …” [FGD01]

Informant interviews and FGDs captured views on practices implemented by tourism enterprises to reduce, reuse, and recycle their waste. Practices identified include the use of recyclable and reusable packaging material, treatment of solid and liquid waste, composting of biodegradable waste, incineration, reducing food waste, waste separation at the source, and training of staff on collective responsibility regarding waste management. The following quote illustrates a representative enterprise waste management cycle as captured in an FGD:

“… I take a scenario our property is actually placed near a conservancy or maybe lodges that are not connected actually to a Municipal or a County sewer system… for that case, we have the bio-digesters where wastes are processed. We then make organic fertilizers that we actually use in our farms. We are doing that actually in our lodges. So that we don’t discharge the waste that can destroying the ecosystem” [FGD12]

The discussions highlighted success stories regarding waste reduction by tourism enterprises. Mentions emphasized the sector’s efforts to reduce material use and solid waste generation, particularly by discouraging or discontinuing single-use plastic items, which emerged as the second most cited environmental management practice. A participant exemplified this with the quote:

“We have taken steps to mitigate environmental impact by discontinuing the use of single-use plastic bottles across all national parks, reserves, and hotels. Instead, we have implemented alternative methods for serving water.” [FGD02].

Key informants suggested that having knowledge and skills in climate change mitigation remains crucial for identifying suitable practices for emission reduction. The results of the qualitative study confirmed that most tourism enterprises had prioritized awareness creation, training, environmental education programs, continuous engagement with local communities,

and encouraging food suppliers to embrace green procurement. Specifically, some tourism enterprises held annual sensitization meetings with stakeholders to educate them about the impacts of climate change, the significance of tree planting, and the dangers of deforestation. This finding corroborates the baseline survey's indication of a moderate level of implementation of training and sensitization as mitigation and adaptation measures. The following excerpt demonstrates the motivation for awareness of climate mitigation:

"The main area where our department and school are looking at is through sensitization of students, because we all know that for example, tree cover is very important as an area of mitigating climate change issues. So, tree planting has been a major issue for our school where every activity that takes place, there is a tree planting exercise and also encouraging the students to plant trees in their homes." [P012]

The informant interviews highlighted tourism research conducted by public and private sector stakeholders on climate change for knowledge generation. This research provides empirical evidence to support policy formulation and guidelines for strengthening the tourism sector to mitigate against climate change. For example, ensuring the integration of climate change topics into Continuous Professional Development (CPD) sessions continues to enhance professionals' understanding of climate change impacts and fosters proactive measures within the tourism sector. As highlighted in a key informant interview, a participant stated:

"What we have managed to do so far, is we normally have a lot of CPD sessions, and during these CPD sessions, climate change is one of our agenda. For instance, I recall last year we were in our CPD session we took them through the climate change declaration and managed to break it down to what it should be for the tourism business. Because the people will see all this, but they are not able to see how directly they are affected or in any way how directly they contributed." [P024]

The findings indicate that many tourism enterprises are actively participating in conservation activities as part of their climate change mitigation strategy. This engagement not only helps reduce emissions but also enhances biodiversity and ecosystem services, thereby increasing resilience to climate change. Protecting and restoring fragile ecosystems also has the potential to attract more tourists, boosting sector revenue.

Tree planting is another mitigation measure being adopted, although to a lesser extent. Despite its limited adoption, notable initiatives demonstrate the tourism sector's potential for effective climate action through carbon sequestration and ecosystem stabilization. These efforts reflect the industry's commitment to environmental conservation and community empowerment.

3.4.3 Extent of Adoption of Climate Change Adaptation Practices by the Tourism Sector

The study relied on quantitative survey results to assess the extent of adoption of climate change adaptation practices by tourism enterprises in the country. Through a comprehensive review of the literature, the study identified a range of technical, managerial, policy, educational and behavioral climate change adaptation practices and tactical strategies of attaining carbon neutrality by the tourism enterprises recommended by experts and practitioners (see e.g.,

UNWTO-UNEP-WMO 2008). Following a pilot study, the list of practices was refined to 11 items, which include rainwater collection, sea-water desalination, water recycling, modification of built environments, protection against rising water levels, measures against extreme weather events, business diversification, specialized insurance, impact management planning, training, conservation efforts, guest information strategies, and visitor management initiatives.

The survey questionnaire tasked respondents with assessing the extent to which their tourism enterprises had implemented each of the 11 climate change actions, utilizing a Likert scale where 1 represented “to no extent,” 2 denoted “to a little extent,” 3 signified “to some extent,” 4 indicated “to a large extent,” and 5 represented “to a very large extent.” Table 3.11 summarizes the results in terms of computed measures of central tendency.

The state-of-the-art adaptation practices were evaluated for Class A hotels (n = 433), Class B restaurants (n = 183), Class C tour operators (n = 230), and Class E other small enterprises, including professional photographers and tour guides (n = 314), collectively representing 96% of the surveyed entities. Table 3.11 presents the mean extent of implementation for 11 climate change adaptation practices and the proportion of enterprises that implemented these practices to at least a limited extent, disaggregated by tourism enterprise classification.

Table 3.11: Mean rating of the extent of adoption of climate change adaptation practices by Class A, B, C & E Enterprises

	Class A (n =433			Class B (n =183)			Class C (n=230)			Class E (n= 314)		
Climate Change Adaptation and Mitigation Practices	**Mean**	**SD**	**%**	**Mean**	**SD**	**%**	**Mean**	**SD**	**%**	**Mean**	**SD**	**%**
Product and market diversification	2.82	1.22	82.4	2.82	1.11	85.80	3.06	1.24	82.60	3.14	1.17	87.60
Training and campaigns for employees and guests	3.09	1.33	82.9	2.96	1.30	80.90	3.00	1.43	77.40	2.96	1.22	87.60
Informing tourists of the weather conditions	2.61	1.45	67.00	2.08	1.30	50.30	3.89	1.09	95.20	3.51	1.27	91.40
Redirecting guests from ecologically sensitive areas	2.44	1.41	62.4	1.90	1.17	45.90	3.47	1.24	90.00	3.32	1.29	88.20
Developing impact management plans	2.56	1.29	72.1	2.40	1.26	67.80	2.68	1.32	71.30	2.48	1.16	75.80
Structural modification of built environments	2.64	1.33	74.1	2.43	1.34	65.00	1.68	1.05	34.30	2.06	1.19	53.50
Special insurance	2.08	1.3	51.7	2.11	1.22	56.80	2.61	1.32	72.20	2.34	1.25	63.70
Shielding against rising water levels	1.65	1.13	31.4	1.65	1.06	33.90	1.60	1.01	31.30	2.08	1.23	51.90
Rain Water Collection	2.09	1.44	42.5	1.80	1.31	33.90	1.27	0.71	16.10	1.39	0.97	17.80
Water Recycling	1.56	1.12	19.9	1.48	0.98	23.00	1.38	0.86	20.90	1.44	1.01	19.10
Removing Salt from water	1.32	0.88	15.5	1.28	0.79	14.20	1.17	0.55	10.40	1.25	0.65	15.30

Source: TRI Situational Analysis data, 2023.

3.4.3.1 Product and Market Diversification

The results in Table 3.11 show that overall, product and market diversification was adopted to a moderate extent ($2.50 < \bar{x} < 3.50$) by tourism enterprises across the four classes (Class A, B, C, and E). Figure 3.11 further confirms that the majority of enterprises across these classes had implemented the practice to at least a limited extent (82% - 88%). These findings suggest a broad recognition of the necessity to diversify products and markets to mitigate risks associated with climate change.

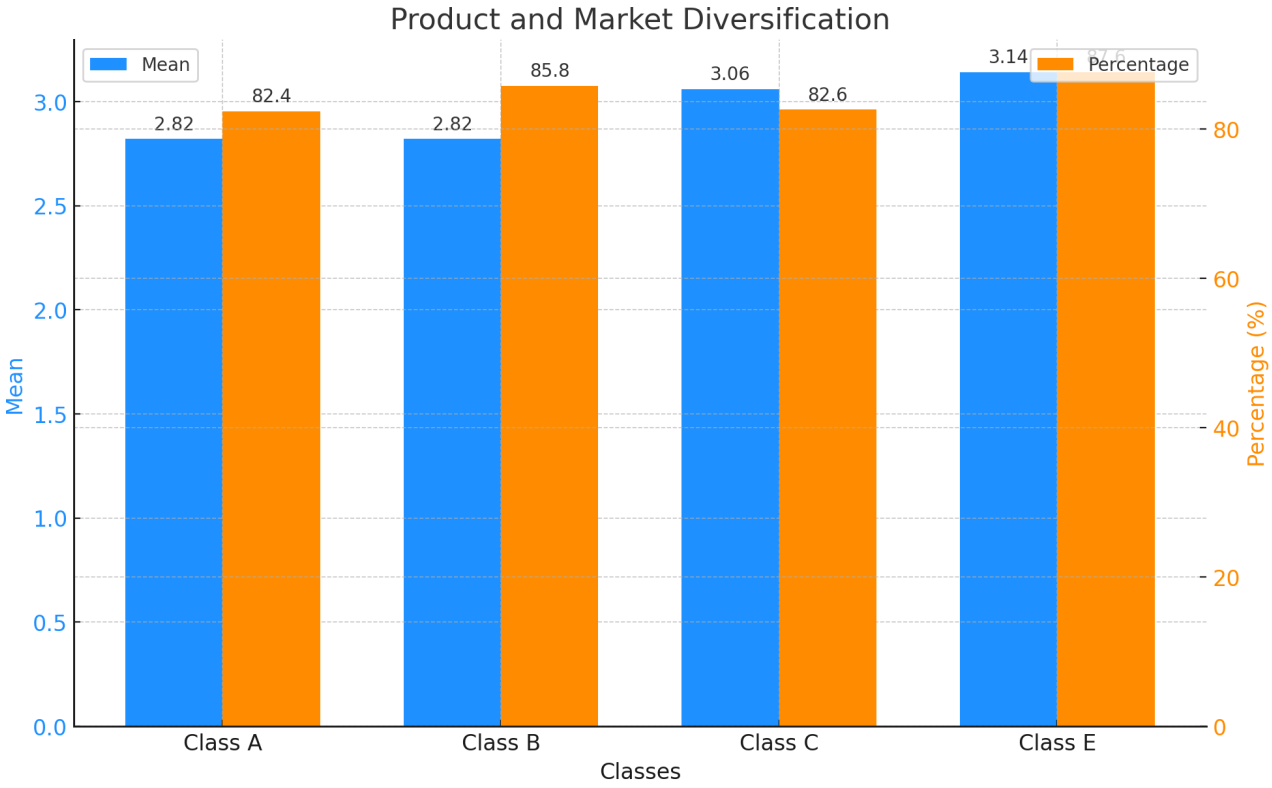

Figure 3.11: Product and Market Diversification

Source: TRI Situational Analysis data, 2023.

3.4.3.2 Training and Campaigns for Employees and Guests

The results in Table 3.11 show that overall, training and campaigns targeting employees and guests was adopted by all classes of tourism enterprises to a moderate extent ($2.50 < \bar{x} < 3.50$). Further, Figure 3.12 clarifies that the majority of enterprises across these classes had implemented the practice to at least a limited extent (77% - 88%). These findings suggest adoption of the practice by Kenya's tourism sector.

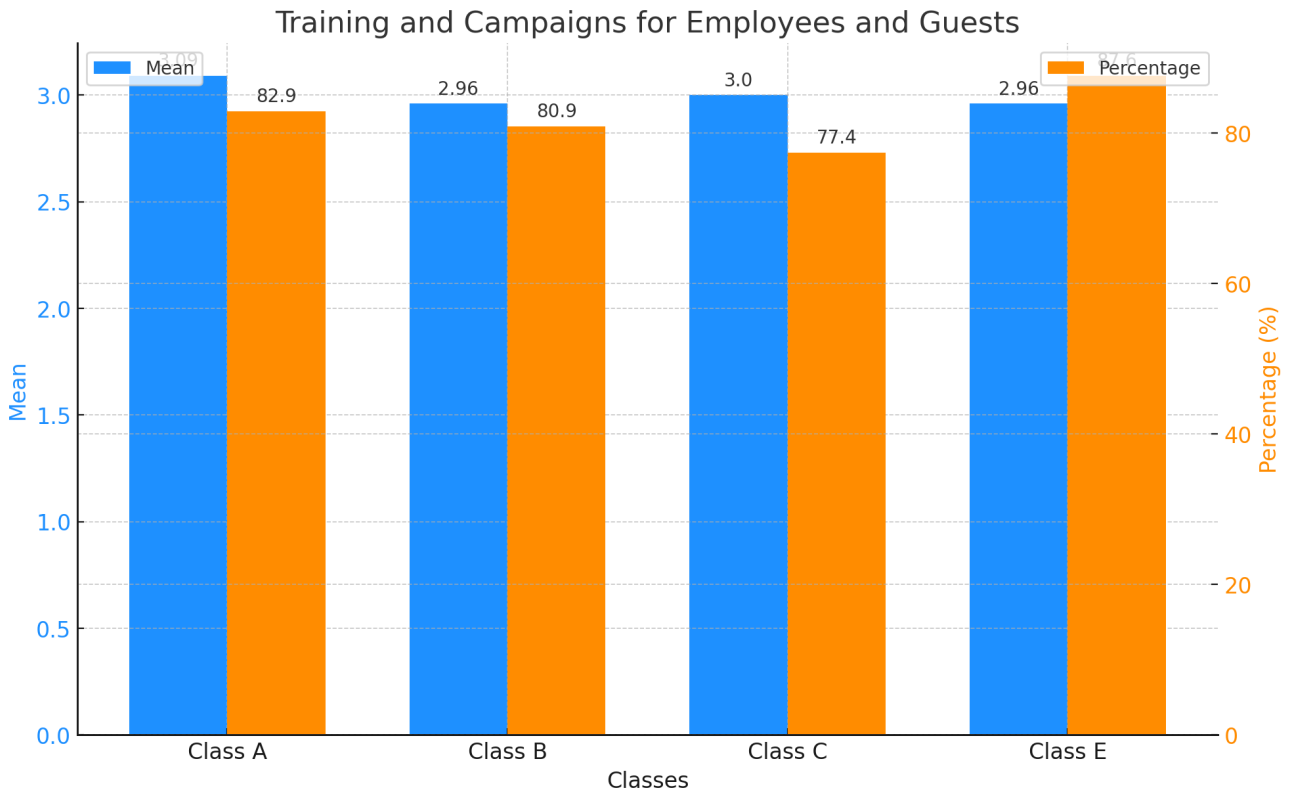

Figure 3.12: Training and Campaigns for Employees and Guests

Source: TRI Situational Analysis data, 2023.

3.4.3.3 Informing Tourists of the Weather Conditions

The results in Table 3.11 show variability in the extent of adoption of offering tourists weather information as an adaptation practice across different tourism enterprise categories. This practice was implemented to a considerable extent by Class C and E enterprises, which provide outdoor tourism experiences ($3.50 < \bar{x} < 4.50$). Figure 3.13 shows that the majority of Class C and E enterprises had implemented the practice to at least a limited extent (91%-94%). Conversely, Class B enterprises, primarily restaurants, implemented the practice to a limited extent ($\bar{x} = 2.08$, SD = 1.30). Slightly more than 50% of the restaurants had implemented the practice to at least a limited extent, while most hotels (67%) had done so to a limited extent.

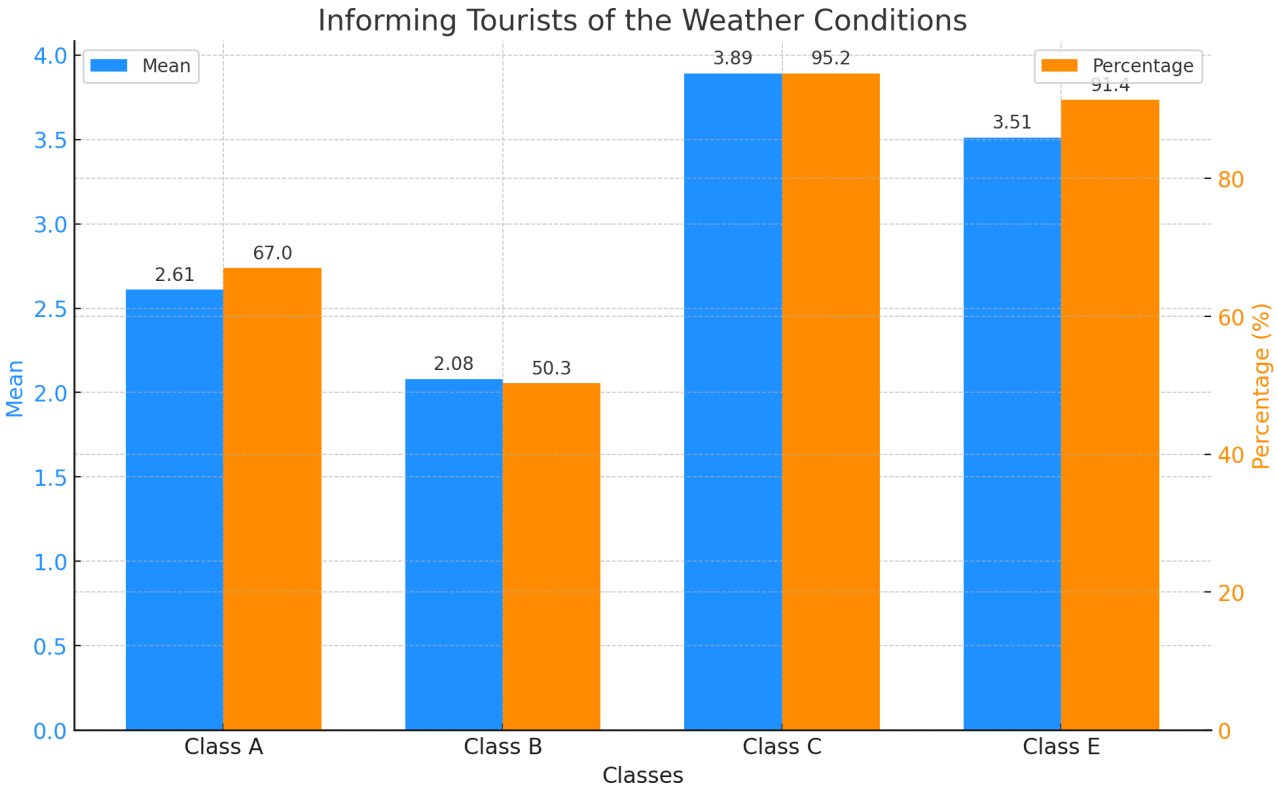

Figure 3.13: Informing Tourists of the Weather Conditions

Source: TRI Situational Analysis data, 2023.

3.4.3.4 Redirecting Guests from Ecologically Sensitive Areas

The results in Table 3.11 show variability in the extent of adoption of redirecting guests from ecologically sensitive areas an adaptation practice across different tourism enterprise categories. This practice was implemented to a moderate extent by Class C and E enterprises, which provide outdoor tourism experiences ($2.50 < \bar{x} < 3.50$). Figure 3.14 shows that the majority of Class C and E enterprises had implemented the practice to at least a limited extent (90% and 88% respectively). Conversely, Class B enterprises, primarily restaurants, implemented the practice to a limited extent ($\bar{x} = 1.90$, SD = 1.17). Slightly less than 50% of the restaurants had implemented the practice to at least a limited extent, while most hotels (62%) had done so to a limited extent.

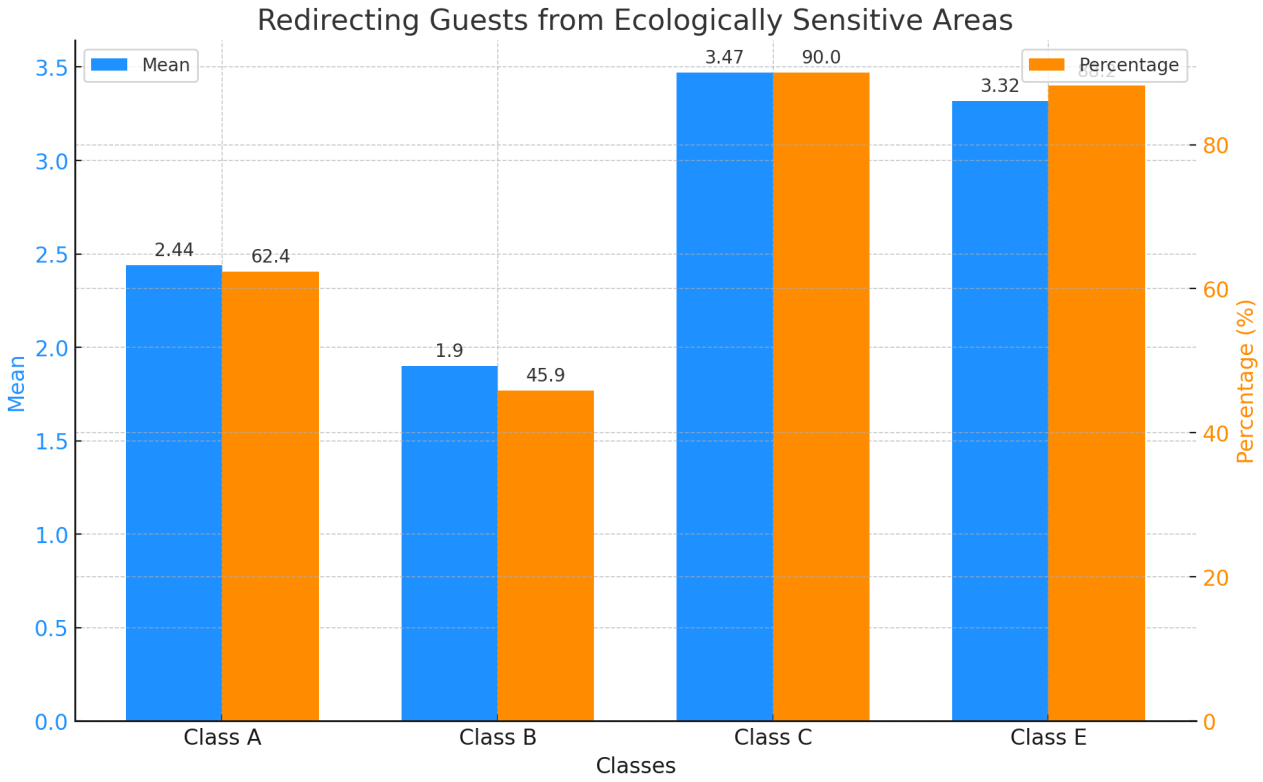

Figure 3.14: Redirecting Guests from Ecologically Sensitive Areas

Source: TRI Situational Analysis data, 2023.

3.4.3.5 Developing Impact Management Plans

The results in Table 3.11 reveal that developing impact management plans was implemented to a moderate extent by hotels and tour operators ($2.50 < \bar{x} < 3.50$). The majority of enterprises in these categories implemented the practice to at least a limited extent (72% and 71%, respectively). Additionally, Figure 3.15 shows that most enterprises across the four categories had implemented the practice to at least a limited extent (68%-72%).

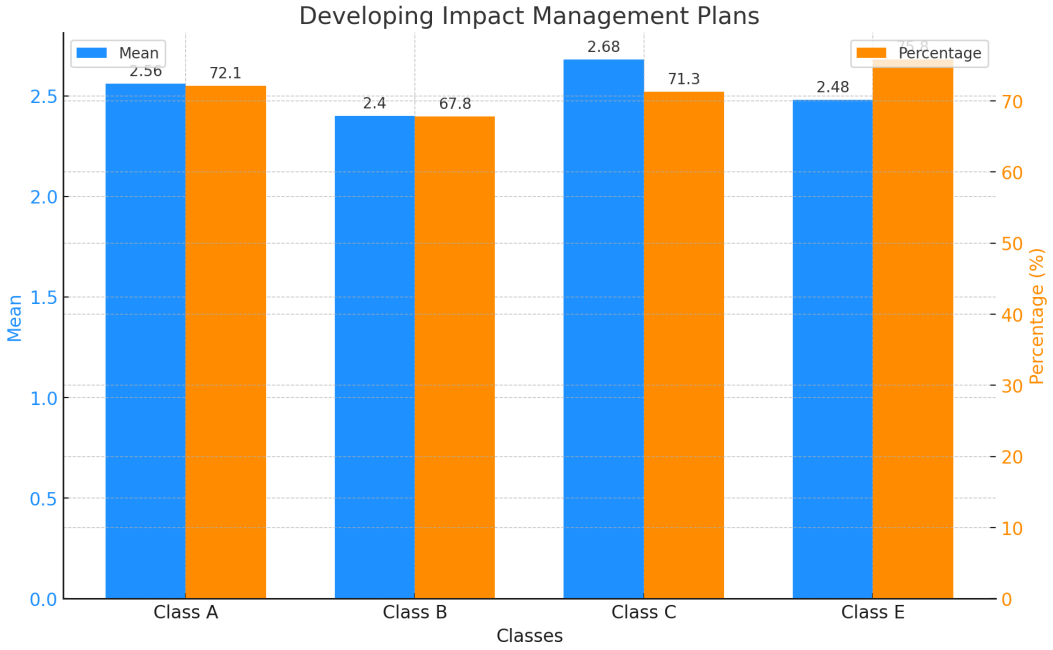

Figure 3.15: Developing Impact Management Plans

Source: TRI Situational Analysis data, 2023.

3.4.3.6 Structural Modification of Built Environments

The results in Table 3.11 confirm that modification of the built environment was implemented to a moderate extent by hotels ($\bar{x}$ = 2.65, SD = 1.33), with most hotels (74%) implementing the practice to at least a limited extent. Conversely, this practice was implemented to a limited extent by restaurants, tour operators, and other small enterprises (1.50 < $\bar{x}$ < 2.50), suggesting less emphasis on structural changes. Figure 3.16 shows lower engagement in Classes C and E, likely due to the nature of their operations, which may not involve significant built environments. Accommodation providers exhibited the highest engagement, likely driven by the need to protect infrastructure investments.

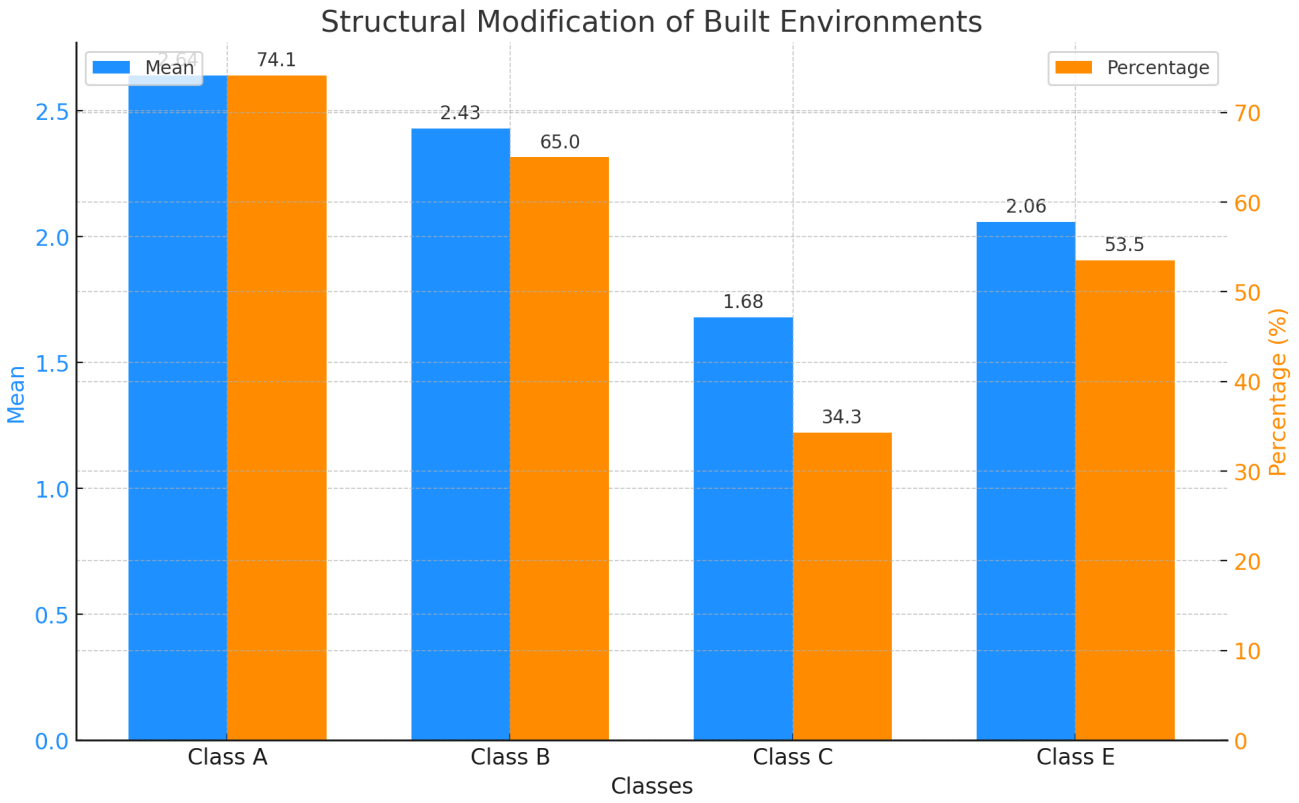

Figure 3.16: Structural Modification of Built Environments

Source: TRI Situational Analysis data, 2023.

3.4.3.7 Special Insurance

The results in Table 3.11 and Figure 3.17 confirm that the adoption of special insurance as a climate change adaptation strategy was limited among class A, B, and E enterprises (1.50 < $\bar{x}$ < 2.50), with less than a majority of enterprises in these categories adopting the practice (51-63%). However, most class C enterprises, specifically tour operators, embraced the practice (72%), implementing it to a moderate extent ($\bar{x}$ = 2.61, SD = 1.32). This moderate engagement, particularly among Class C enterprises, suggests their greater exposure to specific climate-related risks, necessitating insurance coverage.

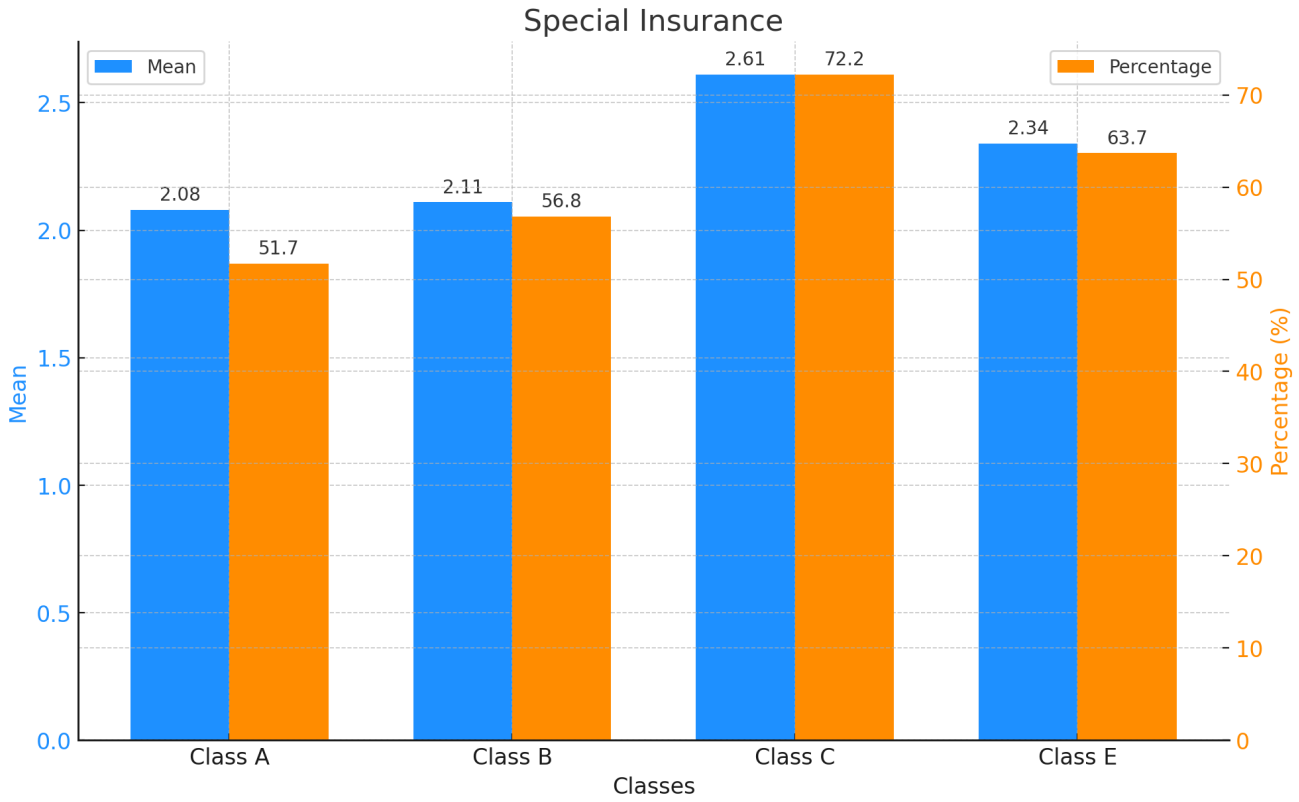

Figure 3.17: Special Insurance

Source: TRI Situational Analysis data, 2023.

3.4.3.8 Shielding Against Rising Water Levels

The results in Table 3.11 reveal that shielding against rising water levels as a climate change adaptation practice was implemented to a limited extent across the tourism sector ($1.50 < \bar{x} < 2.50$). Figure 3.18 confirms that few hotels (31%), restaurants (34%), tour operators (31%), and other small tourism enterprises, such as professional photographers (52%), had adopted this practice. This indicates a significant gap in the implementation of this practice, highlighting an opportunity for broader adoption across the industry.

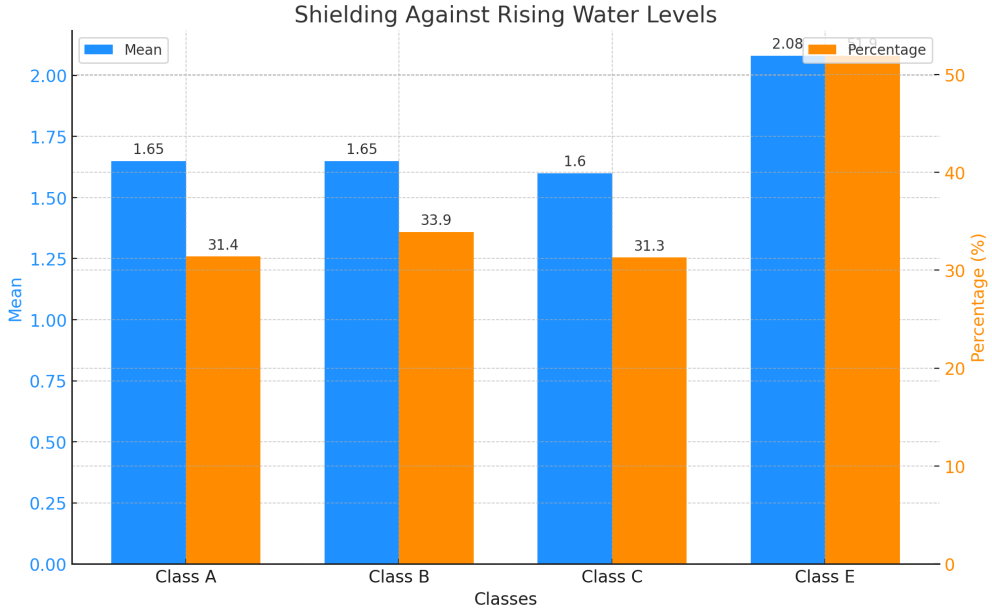

Figure 3.18: Shielding Against Rising Water Levels

Source: TRI Situational Analysis data, 2023.

3.4.3.9 Rainwater Collection

The results presented in Table 3.11 suggest a limited extent of rainwater collection adoption by tourism enterprises in classes A, B, C, and E ($1.50 < \bar{x} < 2.50$). Figure 3.19 further reveals the low prevalence of this practice across the sector, with only 34% implementation by restaurants, 43% by hotels, and less than 20% by tour operators and other small enterprises in these classes. The results indicate that rainwater collection is not widely adopted, with notably low engagement in Classes C and E. This practice may be perceived as less critical or too costly relative to its benefits.

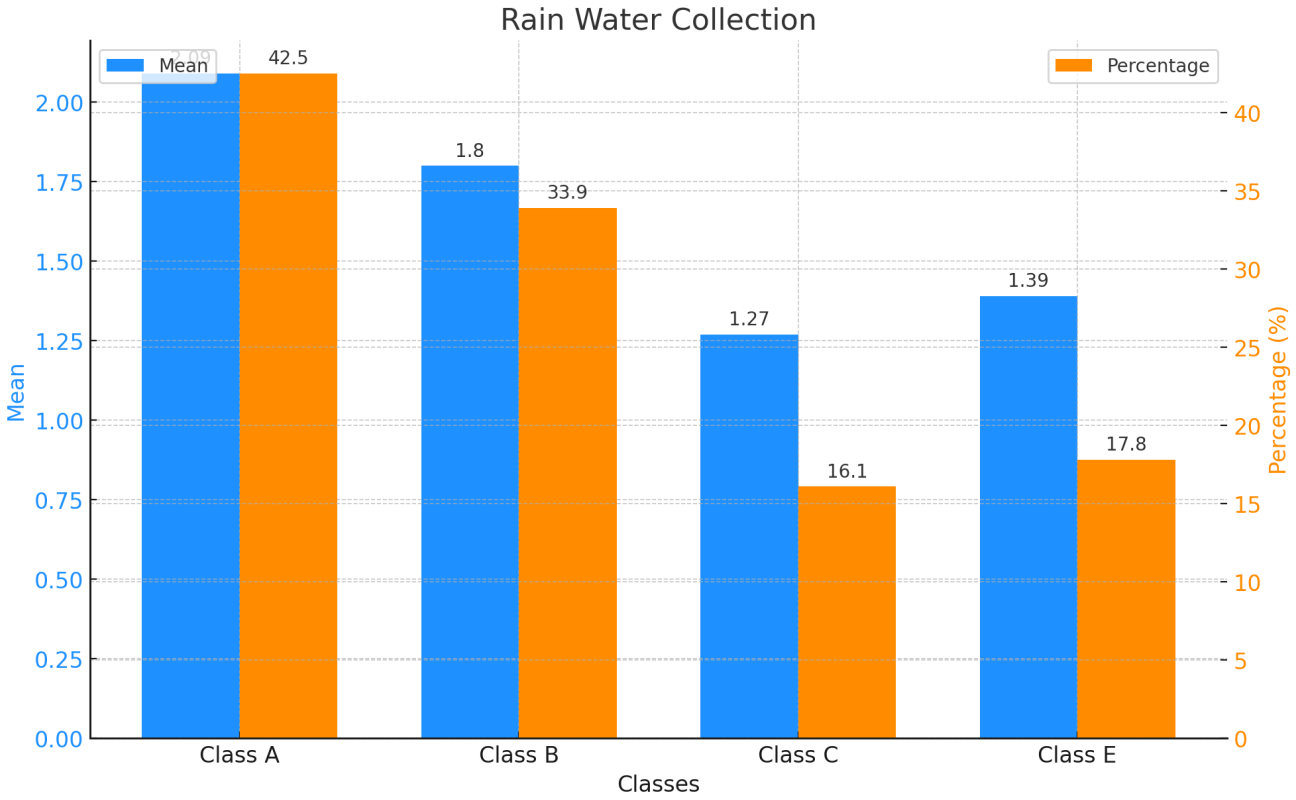

Figure 3.19: Rainwater Collection

Source: TRI Situational Analysis data, 2023.

3.4.3.10 Water Recycling

Similarly, the results show that the adoption of water recycling practices was consistently lacking in Class A, B, C, and E enterprises ($1.00 < \bar{x} < 1.50$), indicating that this practice was not implemented by tourism enterprises in these categories (Table 3.11). However, the results suggest that fewer than 20% of enterprises in all classes had at least included water recycling in their climate change adaptation strategies (Figure 3.20). This indicates minimal engagement in water recycling efforts, suggesting either a lack of awareness or perceived feasibility issues. Consequently, there is a significant gap in sustainable water management practices across all classes

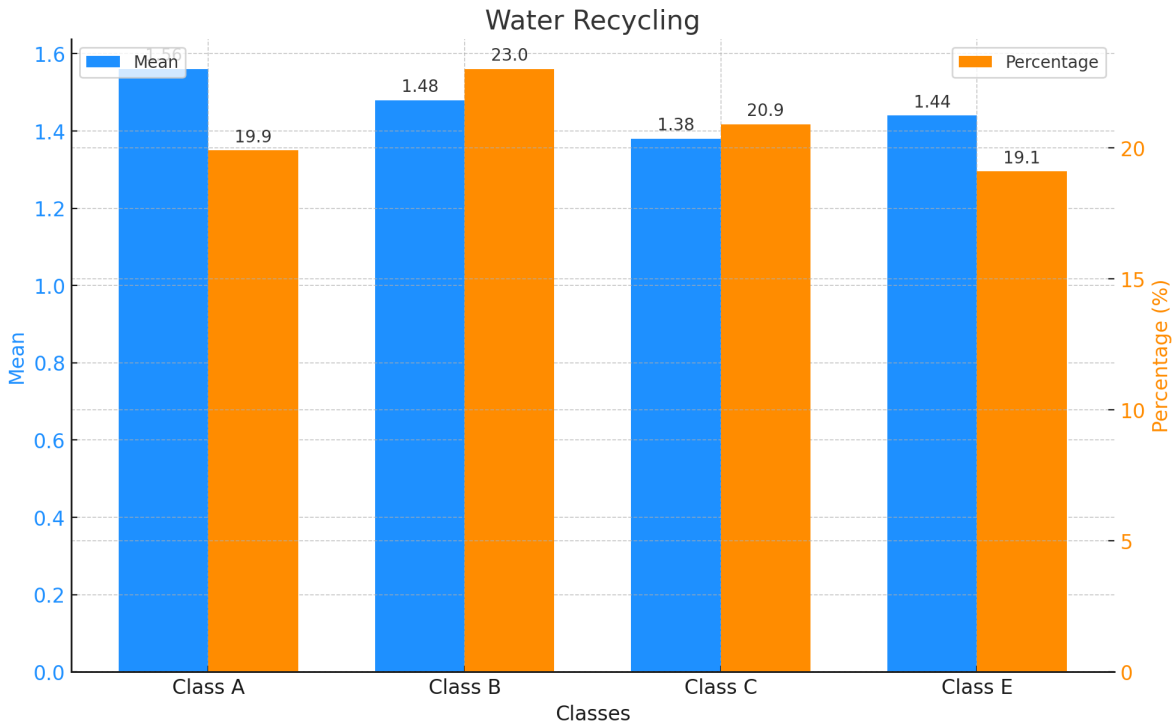

Figure 3.20: Water Recycling

Source: TRI Situational Analysis data, 2023.

3.4.3.11 Removing Salt from Water

Simultaneously, the results show that saltwater desalination was consistently lacking in Class A, B, C, and E enterprises ($1.00 < \bar{x} < 1.50$), indicating that this practice was not implemented by tourism enterprises in these categories (Table 3.11). Fewer than 20% of enterprises in all classes had included desalination in their climate change adaptation strategies (Figure 3.21). This suggests minimal engagement in water desalination efforts, likely due to a lack of awareness or perceived feasibility issues. Consequently, there is a significant gap in sustainable water management practices across all classes.

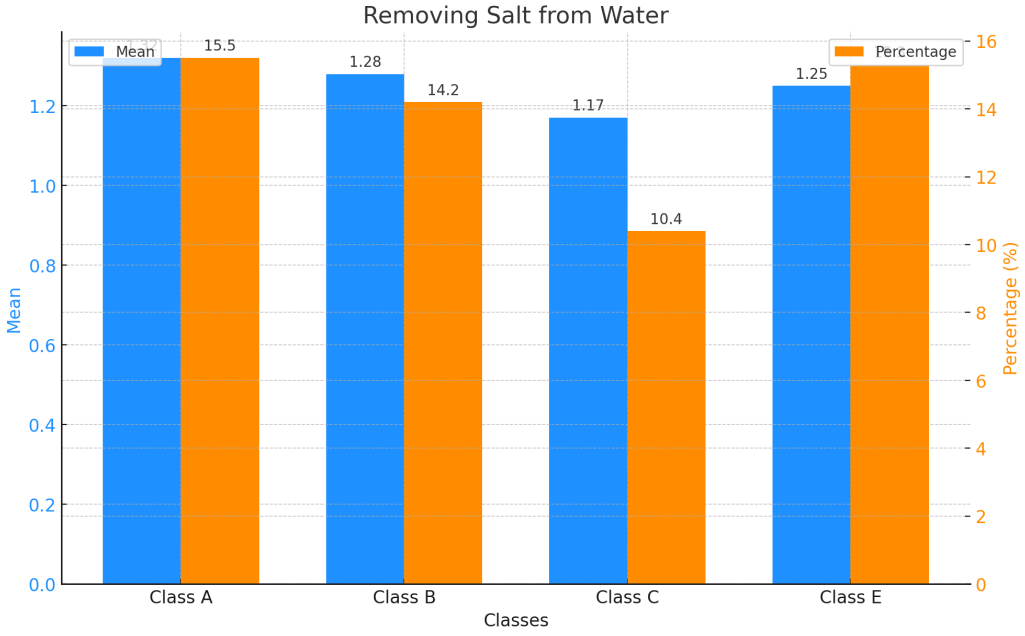

Figure 3.21: Removing Salt from Water

Source: TRI Situational Analysis data, 2023.

3.4.4 Extent of Adoption of Climate Change Mitigation Practices by the Tourism Sector

The study considered the extent of the adoption of tree planting and engagement in conservation activities as climate change mitigation practices. The survey questionnaire tasked respondents with assessing the extent to which their tourism enterprises had implemented the two climate change mitigation practices, utilizing a Likert scale where 1 represented “to no extent,” 2 denoted “to a little extent,” 3 signified “to some extent,” 4 indicated “to a large extent,” and 5 represented “to a very large extent.

The study considered the adoption of two climate change mitigation practices designed to offset carbon dioxide emissions from the atmosphere: tree planting and participation in conservation activities. Table 3.12 and Figure 3.20 show the results of descriptive statistics on the extent of adoption of these two practices and the proportion of enterprises that have adopted the practices to at least a limited extent.

Table 3.12: Mean rating of the extent of adoption of climate change adaptation practices by Class A, B, C & E Enterprises

Classification	Statistics	Tree planting	Engaging in conservation initiatives
Class A (n =433)	Mean	2.5	2.82
	SD	1.41	1.31
	%	64.4	78.8
Class B (n =183)	Mean	2.26	2.55
	SD	1.37	1.32
	% Of total	55.7	72.1
Class C (n=230)	Mean	1.91	2.92
	SD	1.23	2.92
	% Of total	41.7	77.4
Class E (n= 314)	Mean	2.16	3.29
	SD	1.22	3.29
	% of total	57.6	88.5

Source: TRI Situational Analysis data, 2023.

The findings in Table 3.12 and Figure 3.20 suggest that to a large extent ($2.5 > \bar{x} < 3.5$) tourism enterprise in class A, B, C and E were participating in conservation activities as part of their climate change mitigation strategy to offset CO2 emissions. The majority of the enterprises; hotels (79%), restaurants (72%), tour operators (77%), and other small-scale tourism enterprises like curio shops and professional safari photographers (88%) participated in conservation activities at least to a limited extent as shown in Figure 3.20.

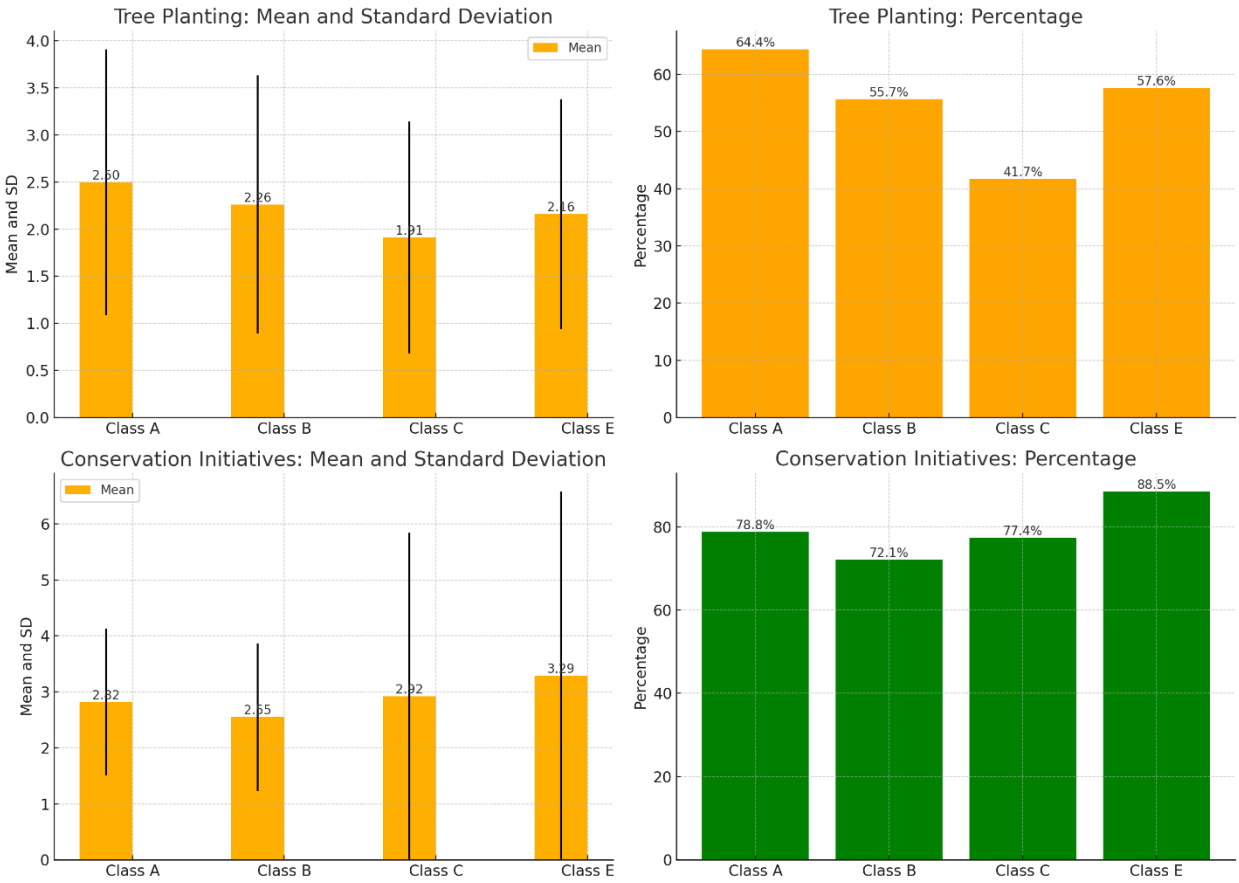

Figure 3.22: Climate Change Mitigation Practices Implemented by Tourism Enterprises in Kenya

Source: TRI Situational Analysis data, 2023.

On the other hand, results in Table 3.12 show that tree planting as a climate change mitigation measure was adopted only to a limited extent across the tourism enterprise categories ($1.5 < \bar{x} < 2.5$). However, a significant proportion of enterprises in the hotel category (64%), restaurants (56%), tour operators (42%), and other smaller enterprises (58%) had implemented the practice to at least a limited extent.

Although the survey results revealed a low extent of adoption of tree planting across the tourism industry, feedback from the FGDs and KIIs showcased some successful afforestation projects. For instance, SKAL International, a tourism association, exceeded its 10,000-mangrove planting target by planting 15,000. By surpassing its goal, SKAL International's tree-planting initiative demonstrates the potential of proactive climate change mitigation and effective collaboration in the tourism sector's environmental initiatives

3.5 Sustainable Tourism Practices in the Tourism Sector

The subsequent objective of the study was to determine the current level of adoption of sustainable best practices by tourism enterprises. The following section presents the results of an assessment of stakeholder awareness of sustainable tourism, followed by identification and mapping of the sustainable tourism practices (STPs) implemented by the tourism enterprises. The extent of adoption of these practices across the country is also presented.

3.5.1 Stakeholder Awareness of Sustainable Tourism

The KII prompted informants to explain their understanding of the concept of "Sustainable Tourism" and elaborate on how their respective organizations interpret this concept. The initial codes derived from the responses to this question revealed diverse interpretations, reflecting the complexity of the concept and the array of issues considered significant, dependent on differing contexts. Table 3.13 presents the issues discussed by the informants in conceptualizing sustainable tourism.

Table 3.13: Summary of key informant conceptualization of sustainable tourism practices

Sustainability Concept	Description	Cases	References
An organizational Philosophy	Practices supporting good governance, marketing practices, employee engagement, and fair engagement with clients; A systematic approach that considers all operations within an organization, aiming to ensure profitability and sustained success for the tourism department or the organization as a whole.	2	2
Community Benefits	Practices that focus on ensuring that communities around tourism areas benefit and rise simultaneously and align tourism practices with community development	1	2
Enduring	Focusing on continuity and ensuring the longevity of tourism operations	2	3
Green Tourism	Practices that are environmentally friendly, utilize natural local resources and are easily accessible within the operational area. The emphasis is on practices that have a minimal environmental impact	1	1
Impact optimization	Tourism practices aim to reduce the impact on the environment, local communities, culture, and heritage of the area where tourism activities are conducted.	3	3
Intergenerational Equity	Tourism practices aim to conserve and enhance experiences, ensuring that they can be sustained for future generations. This approach requires putting measures in place in the present to cater to the needs of the environment, economy, and communities for the benefit of future generations	8	8
Non-Consumptive use	Practices that utilize the environment without depleting its resources, ensuring that the actions contribute to maintaining or enhancing the current state of the environment	1	1
Resource Conservation	Practice where the welcoming and entertaining of guests should not occur at the expense of natural resources. It emphasizes maintaining resources from the current generation to the next without depletion.	3	5
Triple bottom baseline	Practices that protect the environment, preserve social systems, respect local cultural systems, and generate economic gains	2	2
Visitor Experience	Involves conserving and improving the overall tourism experience while ensuring sustainability for future generations. It extends beyond mere conservation efforts to actively contribute to the quality and safety of the visitor experience	2	2
Holistic Tourism Development	Sustainability ensures that we improve what exists to be able to develop every sector	1	1

Source: TRI Situational Analysis data, 2023

The perspectives of the informants on the concept of sustainability, as depicted in Table 3.13, encompass a wide range of views regarding the foundations of the concept. These views span from a relatively weak form of sustainability with a focus on human-centric or utilitarian considerations to a more robust form of sustainability that underscores bioethical and ecocentric perspectives. In the latter, the emphasis is placed on resource conservation.

Respondents subscribing to the "weak sustainability" perspective perceive sustainable tourism as an organizational philosophy geared towards achieving operational objectives, such as profitability, market share, corporate governance, and client satisfaction. This is evident in the statement:

"Perhaps these are the aspects that we could utilize to generate profits or returns and uphold the sustainability of the tourism department or the entire tourism organization" (P025).

A similar viewpoint was articulated by another informant who stated,

"It's a defined system or an approach where you look at all operations within an organization and you identify certain practices that will support either good governance, good marketing practices, good employee engagement and working condition practices, fair engagement with your clients and all that" (P09).

Conversely, those adhering to the very strong sustainability viewpoint underscore the significance of resource conservation, non-utilitarianism, impact mitigation, and inter-generational equity, encapsulated in the following statement:

*"Well, I can say the definition of sustainable tourism is basically where, as much as welcoming the guests and entertaining them, we should not do it at the cost of our resources. We should be doing it in a manner that the resources are maintained from this generation to the next generation without depleting them" (*P01)

However, the responses from the informants, as presented in Table 3.13, generally indicated an understanding of the goals associated with sustainable tourism objectives. These objectives encompass economic viability, local prosperity, high-quality employment, social equity, visitor satisfaction, community well-being, cultural richness, physical integrity, biological diversity, resource efficiency, and environmental purity, all of which are advocated by the UNWTO.

The findings in Table 3.13 underscore the necessity of formulating a unified understanding of the concept of sustainable tourism across the industry. This involves considering the diversity of perspectives and aligning with global sustainability objectives. Such an understanding is crucial for nurturing a resilient and responsible tourism sector that strikes a balance among economic, environmental, and social considerations.

3.5.2 Identified of Sustainable Tourism Practices by Tourism Enterprises in Kenya

The study identified and mapped STPs implemented by tourism enterprises in the seven tourism regions of the country. The study relied on qualitative data from KIIs and FGDs, as well as quantitative data from a survey of tourism enterprises, to identify and map these

practices. During the KIIs, informants were asked to elaborate on the STPs undertaken by their respective organizations and to highlight any successes in implementation. Interviewees made 38 references to various sustainable tourism practices during the KIIs. Figure 3.23 presents a bar chart showing the number of references to STPs during the KIIs, and Table 3.14 shows a frequency count of STPs embraced by the surveyed tourism enterprises.

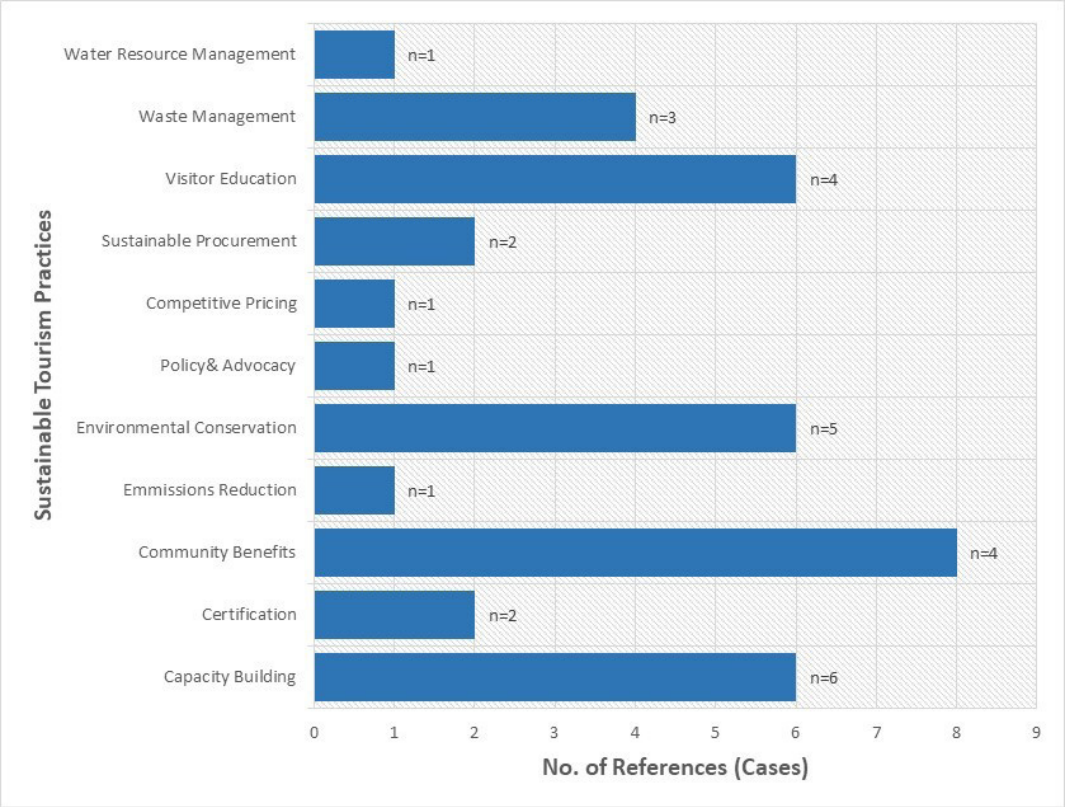

Figure 3.23: Sustainable tourism practices identified by key informants
Source: TRI Situational Analysis data, 2023.

Table 3.14: Counts of sustainable practices adopted by tourism enterprises

Sustainable Tourism Practice		Frequency	% of Total (n=1253)
1.	Legal Compliance	1109	89
2.	Anti-Sexual Harassment Policy	1025	82
3.	Employee Training & Development	870	69
4.	Stakeholder Feedback	859	69
5.	Sustainable Procurement	857	68
6.	Minimize Paper-Based Marketing	844	67
7.	Pollution Monitoring	824	66
8.	Energy Use Monitoring	816	65
9.	Water Management Systems	792	63
10.	Energy Saving Appliances	771	62
11.	Environmental Awareness Creation	710	57
12.	Eco-Building Designs	694	55
13.	CSR Budget	633	51
14.	Fleet Management	593	47
15.	Recycling Materials	455	36

Source: TRI Situational Analysis data, 2023.

Results in figure 3.23 and table 3.14 are described under the classification of environmental, economic and social sustainability practices following the TBL framework:

3.5.2.1 Identified Environmental Sustainability Practices

Figure 3.23 shows the popularity of environmental conservation activities, which were mentioned six times by five of the 26 informants interviewed. Interviewees mentioned landscape rehabilitation, tree planting, and beach clean-ups as practical ways for implementing environmental stewardship. An interviewee cited the requirement to conduct environmental impact assessments for new tourism infrastructure developments or before undertaking substantial improvements on existing infrastructure as a practice in environmental stewardship. On the other hand, FGDs results confirmed low levels of implementation of eco-building designs as an environmental sustainability practice among the tourism enterprises. Mentions of eco-building design adoption were low (43%), compared to other practices like energy and waste management, which received 53% and 52% of total mentions, respectively, in the focus group discussions. This result corroborates finding from the survey presented in table 3.14 suggesting low levels of adoption of eco-building designs (55%) as a sustainability practice.

Waste management is a key practice for both environmental and economic sustainability, with significant overlap between the two areas. The results in figure 3.23 suggest that environmental sustainability practices that require substantial resource investment and organizational commitment to sustainability like implementing waste management practices was less frequently mentioned.

However, the FGDs sought to identify specific waste management practices by tourism enterprises across the country. Feedback from FGDs revealed a variety of common waste management practices in tourism enterprises. Figure 3.24 depicts the prevalence of these practices in a tree map diagram:

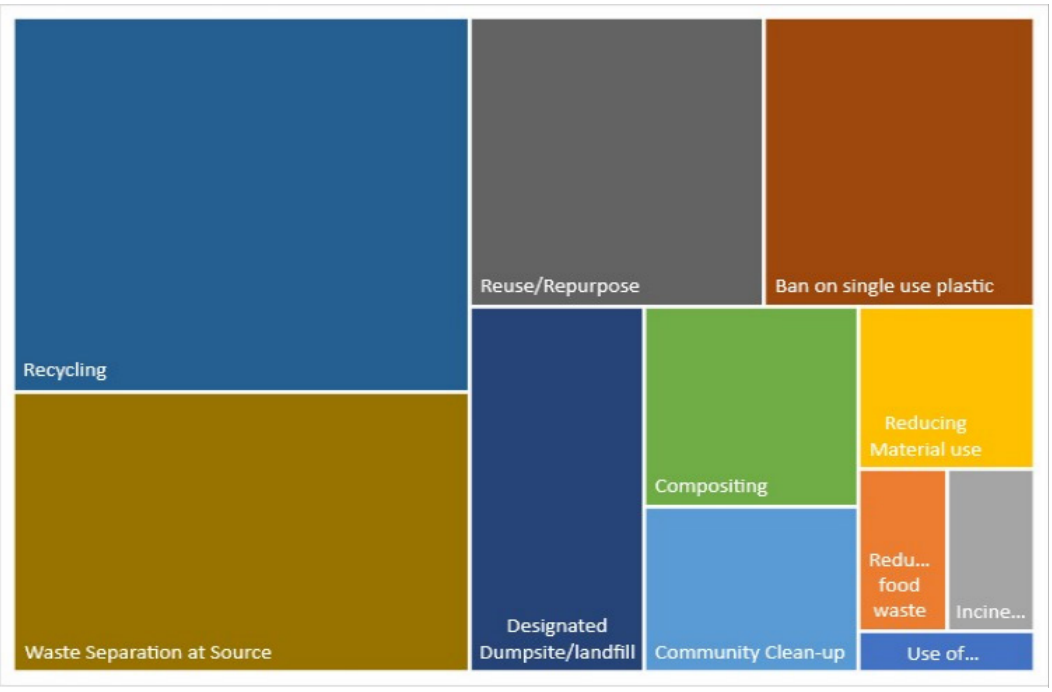

Figure 3.24: Tree-map Diagram Waste Management Practices Discussed in KIIs and FGDs
Source: TRI Situational Analysis data, 2023.

The FGDs emphasized waste reduction strategies, including banning single-use plastics, reducing material usage, and minimizing food waste. Participants highlighted the successful implementation of such strategies, citing the ban on single-use plastics and the promotion of recyclable bottles in wildlife-protected areas as best practices. The results confirmed that many enterprises, including hotels, lodges, and attractions, actively worked towards eliminating single-use plastics from their premises after the successful implementation of the plastic ban in parks. The enterprises have declared themselves as “no plastic areas” or “single-use plastic-free zones,” and encourage the use of reusable water bottles instead.

Under reuse strategies, discussions focused on the importance of waste separation at the source to encourage individuals and organizations to sort waste materials before disposal, enabling the recycling of waste into usable products. Specific practices mentioned included providing bins designated for various waste types, such as recyclables and organic waste. However, participants in the FGDs criticized poor waste handling at designated dumpsites/ landfills, which did not consider waste segregation practices, thus negating the benefits of waste separation. Although most participants and key informants agreed that the extent of waste recycling by tourism enterprises was still poor, initiatives for solid waste recycling were noted. Recycling practices included shredding plastics to reduce environmental impact, reusing plastic water bottles, and recycling soaps used in guest rooms. Some establishments offered training programs on recycling plastics, showcasing innovative approaches such as transforming plastics into ornaments. From the discussions, it emerged that most tourism enterprises relied upon designated public dumping sites/landfill for waste disposal. Other noted waste disposal practices include incineration, community clean-up exercises, and the use of exhauster services. The following excerpt captures the waste management cycle for a representative tourism enterprise, as gleaned from the FGDs:

“Now, turning to the issue of kitchen waste management, we have implemented measures to train our staff who handle waste. We ensure proper segregation, distinguishing between biodegradable and non-biodegradable waste, as well as assigning specific areas for disposal within our facility”

3.5.2.2 Identified Economic Sustainability Practices

Results in Figure 3.23 suggest that economic sustainability practices, such as resource (energy and water) management which require substantial resource investment and organizational commitment to sustainability, were less frequently mentioned in the key informant interviews. The quantitative results in Table 3.14 also confirm that economic practices focused on resource management were still not widespread. The results indicate moderate adoption of energy use monitoring (n=816, 65%), energy-saving appliances (62%), and water management systems (63%).

In Table 3.14, the results provide surprising insights into the adoption of economic sustainability practices by the surveyed enterprises. Unexpectedly, recycling of materials was the least adopted practice, adequately adopted by 36% (n=455) of the respondents, ranking below Environmental fleet management practices, which were adopted by 47% (n=593) of the

surveyed enterprises.

This finding signifies a low commitment to the circular economy approach of waste reduction and recycling in the industry. Additionally, fleet management practices are adopted by a moderate 47% of respondents, indicating a moderate commitment to the efficient and responsible management of transportation resources in the tourism sector in Kenya. This implies that the tourism sector in Kenya needs to focus on robust fleet management practices to contribute to reducing the environmental impact of transportation within the industry.

Further to results from the KIIs (Figure 3.23) and Survey (table 3.14), the FGD results highlight additional water management practices among tourism enterprises. Figure 3.25 shows counts of mentions of various water management practices cited in the FGDs:

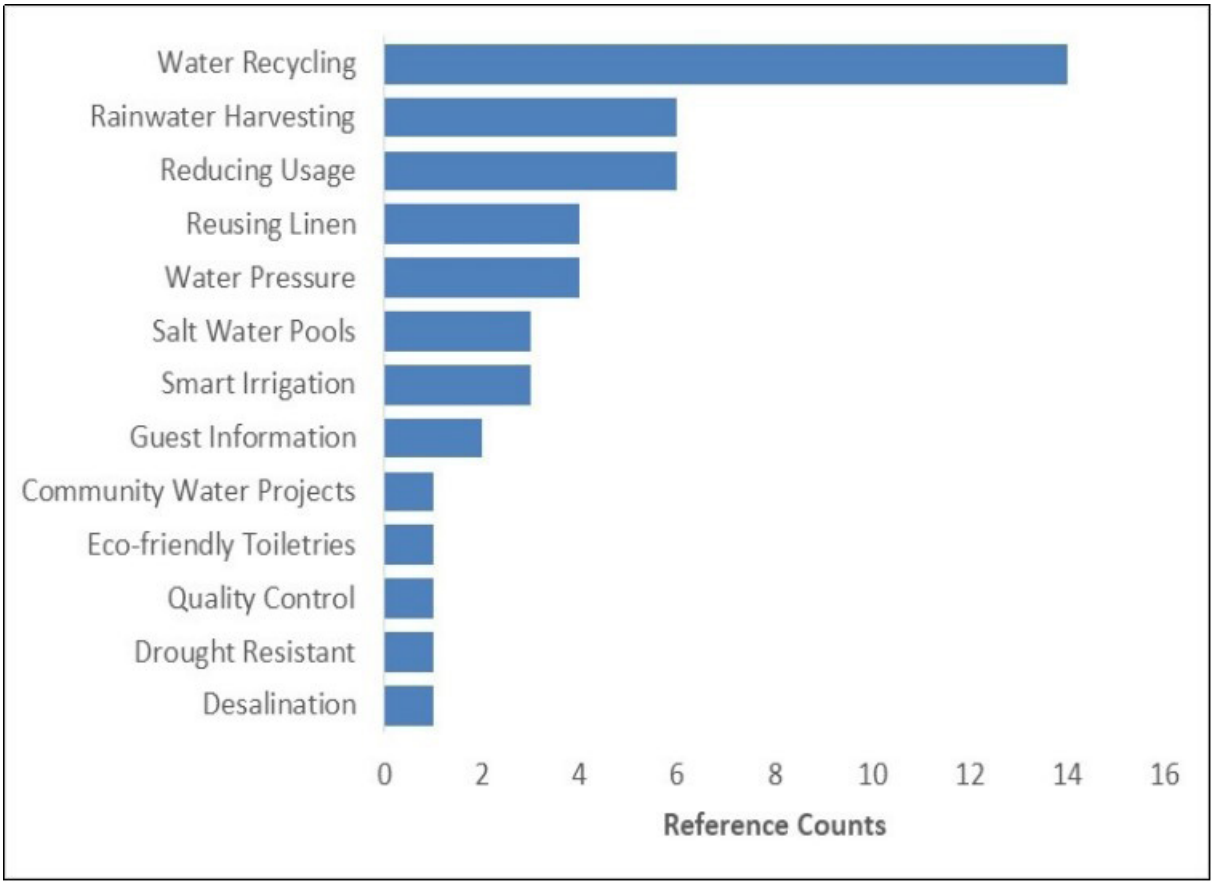

Figure 3.25: Water Management Practices Implemented by Tourism Enterprises in Kenya

Source: TRI Situational Analysis data, 2023.

The results in Figure 3.25 reveal the most popular water management practices adopted by hotels and restaurants, based on responses from key informant interviews (KIIs) and focus group discussions (FGDs). Notably, practices such as water conservation measures to reduce usage, linen reuse, reduction in water pressure, and the use of smart irrigation systems received significant mentions, confirming the survey results that highlighted the adoption of these practices by over 50% of the enterprises. This can be evidenced by the response of one hotelier interviewed:

“In our efforts for efficient water management in hotels, we focus on two key aspects. Firstly, we consider the frequency of changing linens. Secondly, we pay close attention to the type of

shower heads we utilize. It's essential that these shower heads are low-flow to minimize water usage. Additionally, we look at options like automatic shut-off mechanisms, where water stops flowing once hands are removed from the sensor" [FGD02].

FGD participants highlighted the use of water-saving cisterns, shower heads, and motion-sensing taps. Recycling and water-saving measures were also mentioned as can be evidenced in the following excerpt:

"We have employed the three R's - reduce, reuse, and recycle - in our water management approach. Firstly, we reduce the amount of water we use. Secondly, we reuse water that has been used, such as in the kitchen, redirecting it to washrooms. Similarly, water used in pools can also be repurposed for other purposes. Lastly, we recycle water to minimize waste. Moreover, we are initiating plans to address water obstruction, spillage, and overuse through automation." [FGD06_2]

The findings indicate a strong initial commitment to water conservation in hotels and restaurants, primarily through employee engagement and basic technologies. However, there's a notable deficiency in adopting more advanced and impactful water-saving practices. Rectifying these gaps demands a comprehensive, integrated approach to water conservation in the tourism sector, utilizing both human expertise and technological solutions to achieve sustainable water management.

The FGDs results provide additional insights into specific energy management practices. Figure 3.26 presents a tally of practices cited in the discussions:

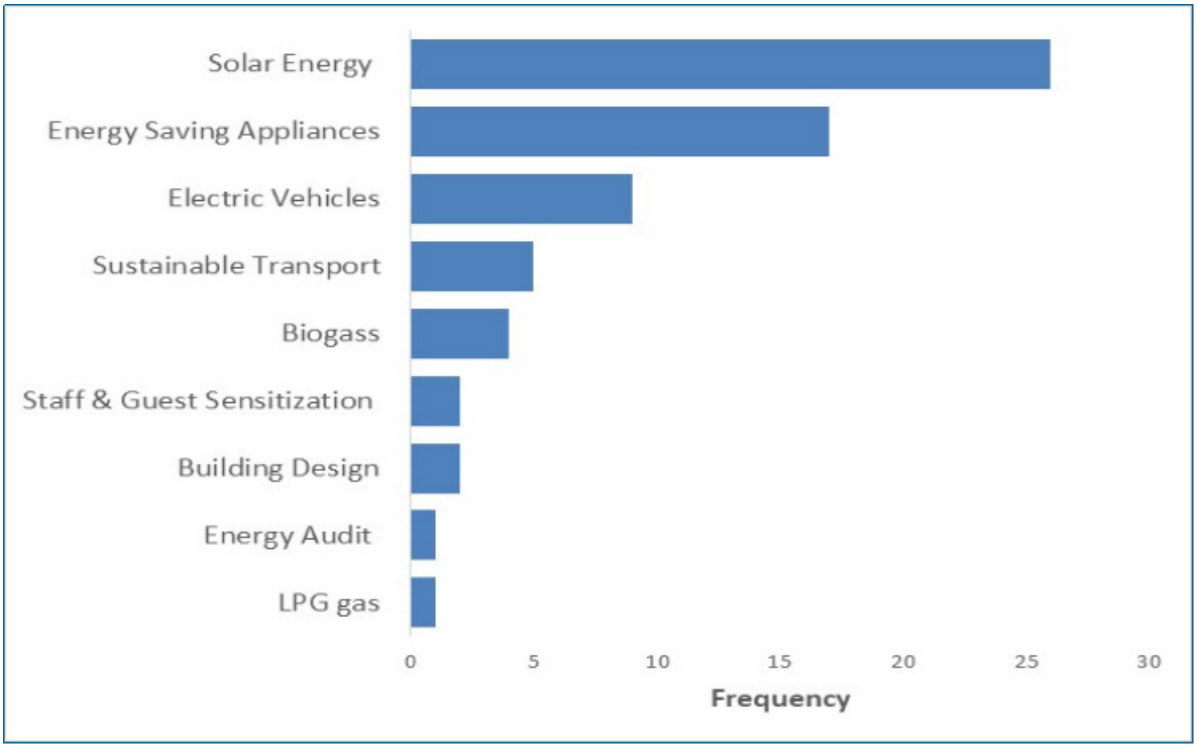

Figure 3.26: Water Management Practices Implemented by Tourism Enterprises in Kenya
Source: TRI Situational Analysis data, 2023.

Figure 3.26 suggests that, by proportion of mentions during the FGDs, most enterprises recognized the adoption of green energy solutions such as solar. For instance, a lodge in Masai Mara had its entire fleet of safari vehicles powered by solar energy, showcasing the adoption of renewable energy sources. Another facility mentioned efforts to transition from conventional electricity supply, as evidenced in the following quote:

"We have incorporated solar panels alongside our conventional electricity supply. Initially, our reliance on electricity outweighed our use of solar energy. However, we've shifted our focus towards greater utilization of solar power. Similarly, many establishments around us now prioritize solar energy over traditional fossil fuels. This transition reflects a broader trend towards embracing renewable energy sources, particularly solar power, for sustainable operations" [FGD03_2]

Furthermore, the results revealed efforts within the industry to promote sustainable transportation options, such as electric bikes and electric vehicles, aimed at minimizing emissions. There was specific mention of the adoption of electric vehicles (EVs) as a strategic approach to reduce reliance on fossil fuels and decrease fuel consumption. Additionally, steps are being taken to reduce dependence on fossil fuels by incorporating alternative energy sources such as LPG gas and briquettes derived from organic materials.

In terms of energy use, discussions during the FGDs focused on leveraging energy-efficient technologies to reduce consumption. Hotel and lodge operators specifically mentioned efforts to transition to energy-saving bulbs and the use of automatic switches and sensors to regulate lighting. Additionally, some enterprises had invested in upgrading to energy-efficient appliances and equipment, such as refrigerators, air conditioners, and water heaters, which they argued contribute to reducing energy consumption. Finally, several establishments emphasized the importance of educating both customers and employees on energy conservation practices, encouraging them to minimize energy usage during their stay or in their work activities.

3.5.2.3 Identified Social Sustainability Practices

The quantitative results from the survey (Table 3.14) suggest that social sustainability practices, such as compliance with relevant laws, were the most prevalent sustainability practices adopted by the surveyed enterprises, at 89%. This was followed by the implementation of anti-sexual harassment policies (82%, n=1025). The high level of legal compliance reflects a strong commitment to ethical and lawful business operations within the tourism sector in Kenya. The emphasis on anti-sexual harassment policies suggests a recognition of the importance of fostering safe and respectful environments within these enterprises.

At the same time, the qualitative results in Figure 3.23 reveal that low-investment STPs involving working with stakeholders were the most prevalent practices mentioned by the key informants. Initiatives to benefit the community through tourism were the most listed in eight references by four informants. This underscores a notable focus on community-oriented efforts within the context of tourism, indicating a recognition of the importance of fostering positive impacts on local communities through tourism-related activities. The consistent mention by multiple informants emphasizes the significance of community-centric initiatives. This finding

is adequately referenced by the following quote:
«We play a part in making sure that we create a platform for the local community to be part of sustainable tourism activities ... We support them; for example, every quarter of the year, we hold an exhibition where the community benefits from selling their merchandise to our visitors. In this way, they earn some income and can sustain themselves. We provide the platform for free, and they can bring their merchandise, we market for them, and we organize some tents so that there is a very well-laid area where visitors can come" (P016).

Further, the interview results show that training activities like capacity-building programs for practitioners in the tourism industry, community sensitization, and visitor education were prevalent amongst enterprises represented by the key informants. Visitor education programs focus on impact mitigation, behavior change, and safety. On the other hand, community and employee training involved impacting specific skills and awareness creation, as can be seen from the following excerpt:

"In the fact that we do some entrepreneurship training, we do some tour guiding training, we do some awareness in terms of environmental issues, on how to keep the environment clean, and we have also trained the local community in customer relations and skills on how they can handle tourists" (P016).

The qualitative feedback from FGDs aligns with survey findings, emphasizing the high adoption rate (71%) of Anti-Sexual Harassment Policies as a crucial social sustainability best practice. Additionally, Employees' Continuous Education and Professional Development showed a moderate adoption rate (57%), indicating a commitment to enhancing skills and knowledge vital for sector sustainability and innovation. However, the creation of environmental awareness had a lower adoption rate (43%), suggesting opportunities for improving educational initiatives. With only a minority (40%) allocating resources to corporate social responsibility initiatives, there's potential for enhancing contributions to local communities and environments.

Respondents' feedback from FGDs also emphasized the adoption of social sustainability measures by tourism enterprises, primarily centred on awareness creation and education initiatives. These efforts encompass environmental education programs targeting local communities and schools, annual sensitization meetings with tourism stakeholders, continuous engagement on sustainability issues with communities and stakeholders, and implementation of training programs and women empowerment initiatives.

The analysis of FGD feedback categorized social sustainability practices into three sub-themes: practices for tourists, the host community, and employees. Sustainability practices, including those targeting suppliers, formed another theme. Figure 3.27 depicts the frequency of mentions of these social sustainability practices from the KII and FGD data.

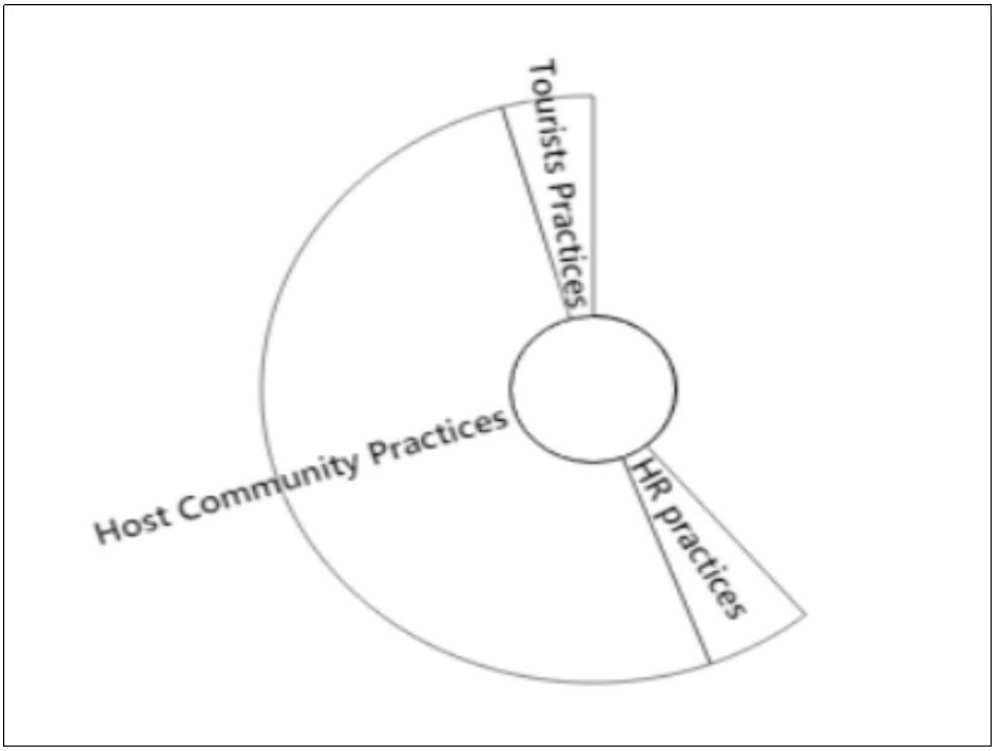

Figure 3.27: Hierarchy Diagram- Social Sustainability Practices implemented by the tourism enterprises
Source: TRI Situational Analysis data, 2023.

Social sustainability practices targeting host communities implemented by tourism enterprises reflect a multifaceted approach aimed at fostering community development, empowerment, and collaboration. Across various FGDs, several initiatives emerged, demonstrating efforts by tourism players to positively impact the lives of host communities.

One notable practice involves the provision of employment opportunities to local residents, thereby contributing to economic empowerment. It emerged from the interviews that tourism enterprises are not only creating jobs but also offering financial support through leases to local communities and direct financing of community projects. Additionally, corporate social responsibility (CSR) programs, including lunch programs, bursaries, and medical assistance, further demonstrate a commitment to addressing social needs within host communities, as highlighted in the following excerpt:

“Tourism players are significantly contributing to employment opportunities within local communities. Moreover, they provide direct financial support through leasing arrangements with local group ranches. Additionally, many hoteliers in the region offer CSR programs, including lunch initiatives. Furthermore, they provide bursaries and medical assistance to support the well-being of community members.” [FGD01_2]

Moreover, feedback from FGDs confirms that tourism enterprises actively support education and healthcare access for host communities. Initiatives include sponsoring vulnerable children, supporting local schools and dispensaries, and providing workshops on environmental conservation and permaculture farming. Investing in education and healthcare infrastructure contributes to long-term community development. Additionally, partnerships with local

communities involve projects like borehole construction and capacity-building, fostering ownership and empowerment among residents as evidenced in the following quote:

«We also dig boreholes to provide water for the community's animals. Additionally, during droughts, we implement a zero-grazing policy, allowing the community to bring their livestock to graze without conflict with landowners. This practice helps alleviate tensions and ensures access to grazing areas during dry seasons.»[FDG05_2]

Cultural preservation and support for traditional practices were prominent aspects of social sustainability efforts. Tourism enterprises were observed sponsoring cultural events and festivals, showcasing local talent, and promoting community-based tourism initiatives. These endeavors contribute to preserving cultural heritage, fostering community pride, and generating economic opportunities.

The FGD provided some evidence of social sustainability initiatives aimed at both tourists and employees, albeit limited. Regarding human resources practices, discussions highlighted training, employee welfare, and employment policies benefiting the host community. Firstly, emphasis was placed on staff training in sustainable practices, with a focus on continuous education and retraining to ensure effective implementation. Hotels were noted for prioritizing staff development to instill cultural changes and ensure smooth operations.

The study also noted a commitment to community engagement in employment opportunities. Some hotels, like in Diani, prioritize hiring from local communities, providing jobs, and contributing to local economic development. Additionally, there are capacity-building initiatives aimed at empowering local artisans, with hotels offering in-house training programs to enhance their skills and employability. A count of sustainability practices mentioned by the FGD participants demonstrated the importance of engaging with the guests in promoting sustainability.

Some sustainability practices aimed at tourists include using green blogs on websites to raise awareness about sustainability and climate change issues. These blogs educate visitors and promote environmentally friendly behaviors. Efforts are also made to educate clients about climate change impact through slogans and messages displayed at tourist sites, fostering immediate awareness. Moreover, resorts establish information centers to educate tourists about sustainability and local ecosystems. For instance, a marine information center was established along the south coast of Kenya to inform tourists about marine ecosystems. Similarly, in the Mara, an information center was created to educate visitors about the entire Mara Ecosystem. These centers serve as educational hubs, providing valuable insights into local biodiversity and conservation efforts.

Furthermore, there was a focus on creating awareness among tourists about responsible practices when visiting natural parks and reserves. This includes educating them on best practices to minimize their environmental impact, such as respecting wildlife and ecosystems. By promoting conscious and positive actions, these initiatives aim to encourage tourists to actively contribute to environmental conservation efforts during their visits.

3.5.3 Map of Sustainable Tourism Practices by Enterprises Across Regions

The study quantified and mapped the geographical variation in sustainability practices adopted by the tourism sector across the country. The survey covered enterprises from twenty-seven (27) counties and used the counties as the geographic unit for the subsequent spatial analysis. The analysis employed the Shannon–Weiner Diversity Index (H), a metric commonly used in biostatistics to assess community species diversity to quantify variability in the distribution of STPs. The Shannon diversity index, expressed through Equation 3.2, is a mathematical measure of diversity that takes into account both the range of available sustainability practices and the number of practices adopted within a specific geographical area. The index was computed to quantify the diversity of sustainability practices embraced by enterprises in each county.

$$H = -\sum_{i=1}^{S} pi * lnp_i$$

Where:

H= Shannon–Weiner Diversity Index

S= The range of tourism sustainability practices (s =15),

pi = A proportion representing the number of sustainable practices adopted by enterprises in a given county divided by the number of sustainable practices adopted by enterprises in that county;

ln= Natural Log.

The computed indices for the 27 counties were rendered in the form of a choropleth. Figure 3.28 presents the spatial variation in the diversity of tourism sustainability practices adopted by enterprises across the country.

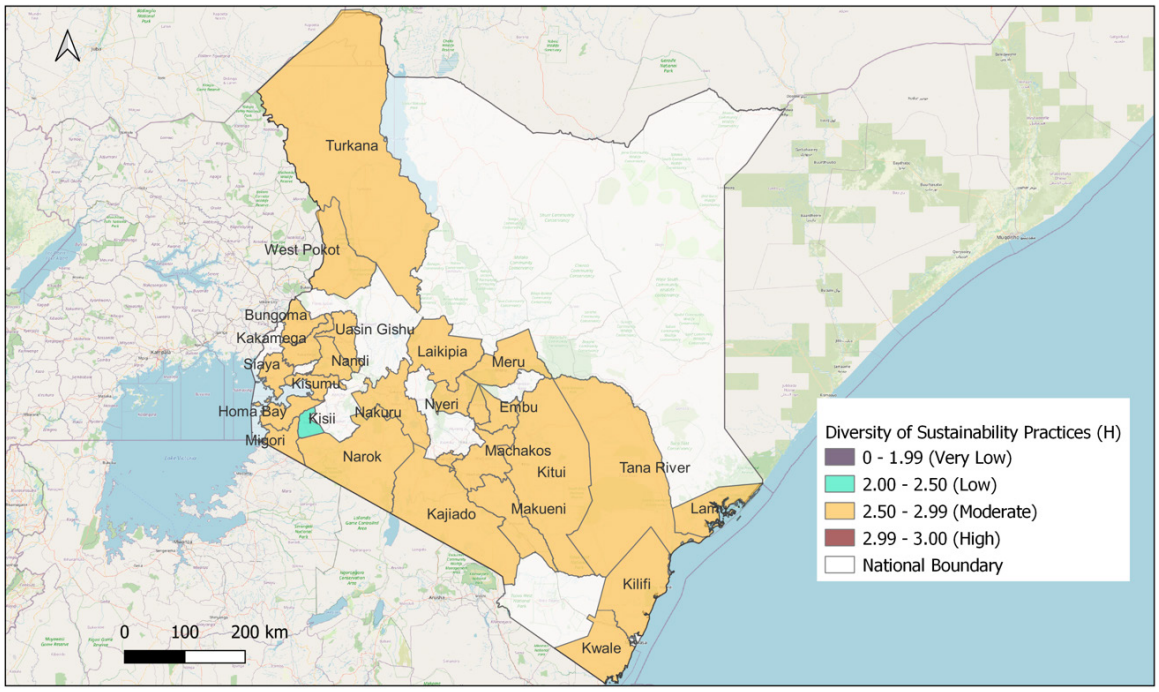

Figure 3.28: Diversity of the sustainability practices adopted by tourism enterprises in the country
Source: TRI Situational Analysis data, 2023.

In interpretation, a higher H value signifies greater diversity in sustainable practices within a specific county. Conversely, a lower H value indicates reduced diversity. However, in this current baseline study, we have utilized the classification system introduced by Baliton et al. (2020). According to this classification, an H value below or equal to 1.99 represents very low diversity, H in the range of 2 to 2.5 signifies low diversity, H ranging from 2.50 to 2.99 indicates moderate diversity and an H value of 2.99 or higher denotes high diversity. This classification system is employed to categorize the spatial diversity of sustainability practices adopted by the surveyed tourism enterprises.

The findings depicted in Figure 3.8 affirm that, with the exception of Kisii County, all other counties showcased a moderate diversity in the adoption of sustainability practices by tourism enterprises, falling within the H range of 2.50 to 2.70. In contrast, Kisii County exhibited a lower diversity of adopted practices, specifically with an H value of 2.14.

These results suggest that, overall, a diverse array of sustainability practices is implemented across all tourism regions, contributing to a well-rounded and varied approach to the implementation of sustainability measures. The isolated occurrence of a lower diversity value in Kisii County indicates an opportunity for the adoption of a broader spectrum of sustainable practices within the local tourism industry. This adjustment would enable Kisii County to align more closely with national practices and foster a more comprehensive and integrated approach to sustainability in the tourism sector.

3.5.3.1 Map of Sustainable Water Management Practices by Hotels, Restaurants and Tourism Training Institutions

To inventory specific sustainable water management practices implemented by Class A enterprises, encompassing hotels (n = 435), Class B enterprises, which include restaurants (n =188), and Class H enterprises, representing Tourism Training Institutions (n = 62), respondents from tourism enterprises in each category were tasked with indicating their adoption of water management practices from a checklist comprising 12 items.

The study quantified and mapped the geographical variation in the diversity of water management practices adopted by hotels, restaurants, and tourism training institutions across different counties. A choropleth map depicting the geographic distribution of the variety of water management strategies used by Class-A, B, and H businesses across the nation is shown in Figure 3.29.

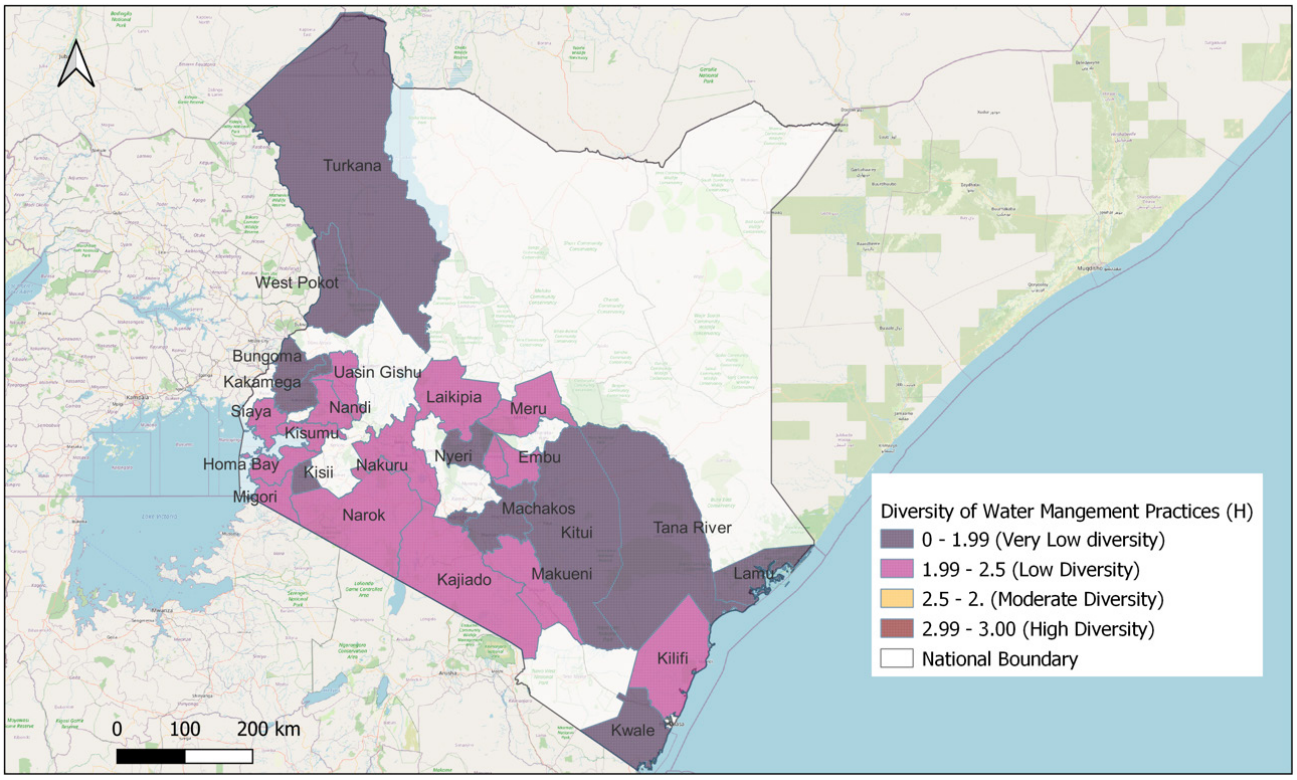

Figure 3.29: Diversity of water management practices adopted by tourism enterprises across counties in Kenya
Source: TRI Situational Analysis data, 2023.

The results depicted in Figure 3.29 reveal a range of diversity in water management practices from very low to low. Among the 27 counties, 12 counties, constituting 44%, recorded an H value of ≤ 2.00, indicating very low diversity in the adoption of water management practices. These counties encompass both rural and remote areas such as Turkana (H = 1.61), Tana River (H = 1.63), Lamu (H = 1.83), and West Pokot (H = 1.92). Notably, urban counties like Machakos (H = 1.74), Nyeri (H = 1.84), Nairobi City County (H = 1.88), and Kakamega County (H = 1.98) are also classified under this category of very low diversity in sustainable water management practices.

Conversely, counties exhibiting low diversity in water management practices range from Uasin Gishu with an H value of 2.00 to Kirinyaga with an H value of 2.41. This group comprises a combination of both urban and rural counties.

The results imply that that a significant portion of the assessed regions, encompassing both urban and rural settings, may have limited diversity in sustainable water management practices. This lack of diversity raises concerns about the adequacy and effectiveness of water management strategies in these areas. It suggests a potential need for targeted interventions and policy measures to enhance and diversify sustainable water management practices, addressing the specific challenges faced by each region. On the other hand, the low diversity in water management practices in the 56% of the surveyed counties present an opportunity for improvement, offering a more varied but still restricted range of approaches. This suggests that while there is some diversity in these regions, there is room for further enhancement and innovation in sustainable water management practices.

3.5.3.2 A Map of Sustainable Waste Management Practices across Counties

The study mapped waste management practices implemented by hotels, restaurants, and tourism training institutes across the country, using the Shannon–Weiner Diversity Index (H) (Equation 3.1) to quantify the diversity of measures implemented. A choropleth map in Figure 3.30 depicts the geographic distribution of the variety of waste management strategies used by Class-A, Class-B, and Class-H businesses nationwide.

Figure 3.30 reveals four counties characterized by very low diversity in waste management practices implemented by their respective tourism enterprises. These counties encompass Machakos, Narok, Kisumu, and Lamu, where the diversity of waste management practices ranges from H = 1.84 to H = 1.99. In contrast, the remaining counties, constituting 85% (n = 23), recorded low diversities in waste management practices.

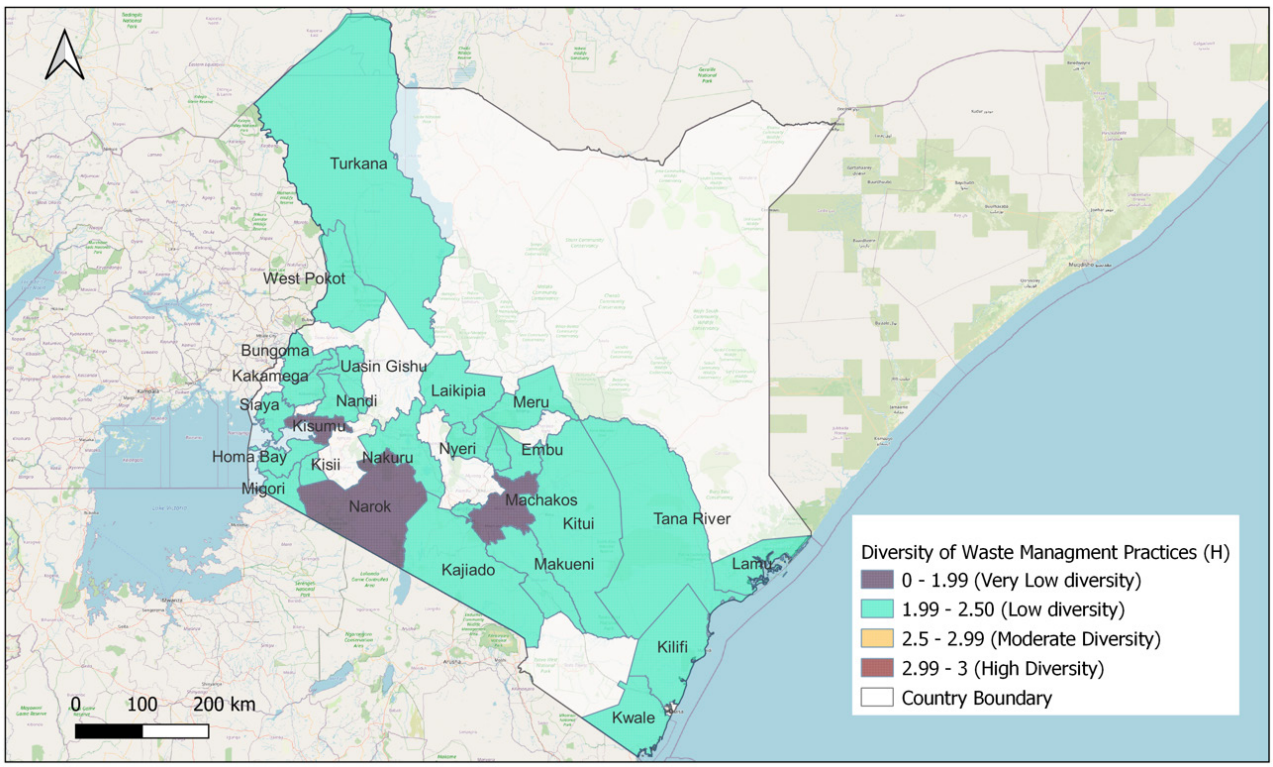

Figure 3.30: Diversity of Waste management practices adopted by Class A, B, & H enterprise across the country
Source: TRI Situational Analysis data, 2023.

The results depicted in Figure 3.30 indicate very low and low diversity in waste management practices across the assessed counties, highlighting both challenges and opportunities for enhancing sustainability efforts in the tourism sector. The observed limited diversity suggests a narrow range of waste management approaches, underscoring the necessity for counties to explore and embrace more comprehensive strategies to effectively address waste management issues. Furthermore, counties with low H values signal a reliance on conventional or less sustainable methods, potentially leading to inefficiencies and adverse environmental impacts. This underscores the urgency of adopting more innovative and eco-friendly approaches to waste management.

There are ample opportunities for counties nationwide to improve waste management practices by drawing inspiration from global best practices. For instance, implementing innovative waste sorting technologies at the source can enhance the efficiency of the recycling process. Technologies that convert waste into energy offer sustainable alternatives to traditional landfill disposal. Additionally, the integration of smart bin solutions has the potential to optimize waste collection routes, contributing to overall improvements in waste management efficiency

3.5.4 Extent of Adoption of Sustainable Tourism Practices by the Tourism Enterprises

The study evaluated baseline survey responses regarding the extent of implementation of 15 sustainable tourism practices. Respondents rated these practices on a five-point Likert scale, where (1 = Not at all, 2 = to a limited extent, 3 = to a moderate extent, 4 = to a considerable extent and 5 = to a great extent) across all 15 sustainable practices. The findings, represented by the mean ratings for the extent of implementation of these practices, were computed for Classes A, B, C, and E enterprises, which accounted for 96% of the surveyed enterprises. Table 3.15 presents the mean rating scores for the extent of adoption of sustainable tourism practices by the four classes of tourism enterprises in the country, and the proportion of implementation across the enterprises.

Table 3.15. Extent of Implementation of Sustainable Tourism Practices by Tourism Enterprises Categories (Class A, B, C and E)

Sustainable Tourism Practices	Classification	CLASS A (n=433)			CLASS B (n=183)			CLASS C (n=230)			CLASS E (n=314)		
		Mean	SD	%	Mean	SD	%	Mean	SD	%	Mean	SD	%
Compliance with laws	Social	4.24	0.93	98.60	3.95	1.22	93.40	3.92	1.28	92.20	3.93	1.15	94.60
Anti-sexual harassment policies	Social	3.78	1.2	92.80	3.67	1.23	92.30	3.41	1.39	84.80	3.59	1.32	87.90
Employees' continuous education and professional development	Social	3.35	1.28	88.20	3.25	1.2	89.10	3.13	1.33	82.20	2.79	1.32	79.90
Monitoring energy use	Economic	3.28	1.29	89.80	3.26	1.3	87.40	2.91	1.45	74.30	2.75	1.24	80.60
Minimizing paper-based marketing	Economic	3.24	1.22	91.00	3.16	1.31	88.50	3.11	1.34	81.30	2.88	1.33	79.30
Giving feedback to stakeholders	Social	3.26	1.33	86.10	2.97	1.26	83.60	2.77	1.13	82.20	3.22	1.24	86.00
Purchasing from sustainable suppliers	Economic	3.18	1.25	89.40	3.14	1.34	85.80	2.87	1.34	7 5.20	3.2	1.15	88.50
Implementing efficient water management system	Economic	3.29	1.23	91.20	3.29	1.2	89.60	2.43	1.37	62.20	2.55	1.24	72.60
Use of energy appliances	Economic	3.35	1.19	91.70	3.2	1.22	88.50	2.67	1.19	77.00	2.14	1.17	61.50
Monitoring of environmental pollution	Environmental	3.19	1.23	90.10	3.01	1.2	86.30	2.58	1.33	69.60	3.01	1.2	84.40
Environmental fleet management	Economic	1.93	1.28	41.30	2.1	1.25	52.50	3.17	1.21	84.80	2.69	1.33	73.20
Creation of environmental awareness	Environmental	2.66	1.26	75.10	2.52	1.21	73.80	2.49	1.35	63.90	2.9	1.2	83.40
Budgeting for CSR activities	Social	2.74	1.38	73.90	2.58	1.21	77.60	2.60	1.23	76.10	2.47	1.18	75.20
Eco-building designs	Environmental	3.02	1.27	84.80	2.71	1.26	77.60	2.27	1.43	52.20	2.43	1.22	69.10
Recycling materials	Economic	2.19	1.37	52.40	2.21	1.41	51.40	2.11	1.33	52.20	2.1	1.31	50.60

Source: TRI Situational Analysis data, 2023.

3.5.4.1 Environmental Sustainability Practices

The findings presented in Table 3.15 indicate that, on average, tourism enterprises have implemented environmentally sustainable practices to a considerable extent. The study focused on three areas of environmental sustainability: monitoring environmental pollution, creating environmental awareness, and adopting ecological building designs.

Results in Table 3.15 confirm that monitoring of environmental pollution as a sustainability practice was implemented to a moderate extent across all classes of tourism enterprises ($2.5 > \bar{x} < 3.5$), with Class C enterprises somewhat lagging behind in the extent of implementation ($\bar{x} = 2.58$, SD = 1.33). However, the majority of tourism enterprises had at least experimented with the practice to a limited extent (70% - 90%). The creation of environmental awareness was implemented to a moderate extent across the tourism enterprises. At least 75% of Class A, 74% of Class B, 64% of Class C, and 83% of Class E enterprises had implemented awareness creation among employees to a limited extent. On the other hand, the results show that hotels and restaurants had adopted eco-building design to a moderate extent, with more than 85% of hotels and 78% of restaurants reporting that they had implemented the practice at least to a limited extent.

3.5.4.2 Economic Sustainability Practices

The study considered practices adopted by tourism enterprises to promote efficient use of water and energy resources, as well as reduction in material use. The enterprises were required to indicate the extent of implementation of the following practices: monitoring energy use, minimizing paper-based marketing, implementing efficient water management systems, using energy-saving appliances, environmental fleet management, recycling materials, and purchasing from sustainable suppliers.

The results in Table 3.15 suggest that across class A, B, C, and E enterprises, monitoring of energy use, mainly for billing purposes, was implemented to a moderate extent ($2.5 < \bar{x} < 3.5$). The majority of hotels (90%), restaurants (87%), tour operators (74%), and other small enterprises (class E) (81%) had implemented the practice at least to a limited extent. Similarly, minimizing paper-based marketing was implemented to a moderate extent, and most of the enterprises (79% - 91%) had implemented the practice to a limited extent.

On the other hand, the results reveal that environmental fleet management practices aimed at reducing fuel use and CO2 emission were implemented to a limited extent by hotels ($\bar{x} = 1.93$, SD = 1.28) and restaurants ($\bar{x} = 2.10$, SD = 1.25), but adopted to a moderate extent by tour operators ($\bar{x} = 3.17$, SD = 1.21) and class E enterprises ($\bar{x} = 2.69$, SD = 1.33). The results show that the majority of tour operators (85%) and class E enterprises (75%) had implemented fleet management practices at least to a limited extent.

With regard to water management practices, results in table 3.15 suggest that efficient water management systems we implemented to a moderate extent by hotels ($\bar{x} = 3.29$, SD =1.23), restaurants ($\bar{x} = 3.29$, SD=1.20) and class E enterprises ($\bar{x} = 2.55$, SD =1.24). Majority of enterprises in the three classes had at least implemented the practice to a limited extent

(73% -91%). A further inquiry into the specific water management practices adopted by hotels and restaurants revealed disparities in adoption rates among various technologies/ interventions. Practices involving employee participation, such as minimizing water loss during duties, were most prevalent at 86% for restaurants and 85% for hotels. For hotels, employee-targeted practices were followed in prevalence by linen reuse programs that targeted guests at 77%. Water pressure reduction technologies were implemented by slightly more than half of the hotels (57%) and about half of the restaurants (50%). On the other hand, leak control measures were implemented in 49% of the hotels and 30% of the restaurants. However, the least adopted practices by hotels and restaurants included intelligent irrigation systems (4%) and greywater recycling for irrigation (7%).

According to the results in Table 3.15, recycling of materials was the least implemented economic practice across the four classes of tourism enterprises. It was implemented to a limited extent ($1.5 > \bar{x} < 2.5$) by slightly more than half of the enterprises (51%-52%) across all four classes. The studies queried the enterprises on the specific waste management practices they had adopted. The results indicate that hotels implement various waste management practices, with the most common being guest and staff education on waste prevention (15%), using local waste management services (16%), employing non-disposable crockery (13%), environmentally friendly detergents (13%), and reusable soap dispensers (10%). However, certain practices, such as food donation (5%), are less common. Notably, only a small percentage of enterprises use sewage plants (4%), while a significant portion resorts to landfills or dumping sites (4%). A minority have invested in advanced waste management technologies like biogas plants (1%).

For restaurants, the most prevalent practices included engaging local waste management service providers (17%), followed by the use of non-disposable crockery (16%), environmentally friendly detergents (16%), and educating guests and staff on waste prevention (15%). However, recycling waste and using biogas were less common, implemented by less than 1% and 3% of the restaurants respectively.

For tour operators, the most prevalent practices included educating guests and staff on waste prevention (35%) and utilizing local waste management service providers (28%). However, there was a notable absence of certain practices, such as using biogas plants, sewage plants, or donating leftover foods, all of which were reported at less than 1% frequency.

3.5.4.3 Social Sustainability Practices

The findings in Table 3.15 show differences in the adoption of social sustainability practices among tourism enterprises. The study considered the social sustainability practices adopted by tourism enterprises. The enterprises were required to indicate the extent of implementation of the following practices: compliance with laws, anti-sexual harassment policies, employee continuous education and professional development, giving feedback to stakeholders, and budgeting for corporate social responsibility initiatives. Among these practices, compliance with laws was the most widely adopted, implemented to a considerable extent by enterprises across all four classes ($3.5 > \bar{x} < 4.5$). The majority of hotels (99%), restaurants (93%), tour

operators (92%), and Class E enterprises (95%) reported compliance with applicable laws. Anti-sexual harassment policies were also implemented to a considerable extent by hotels ($\bar{x}$ = 3.89, SD = 1.20), restaurants ($\bar{x}$ = 3.67, SD = 1.23), and Class E enterprises ($\bar{x}$ = 3.59, SD = 1.30). However, tour operators reported implementing this practice to a moderate extent ($\bar{x}$ = 3.41, SD = 1.39). Despite this, most enterprises had implemented the practice at least to a limited extent (84% - 93%) (Table 3.15).

Third in importance in terms of extent of adoption was employees' continuous education and professional development, which was implemented to a moderate extent across all classes of enterprises ($2.5 < \bar{x} < 3.5$). However, a significant majority reported having adopted the practice at least to a limited extent (80% - 89%). On the other hand, budgeting for CSR programs was the least adopted, with enterprises in classes A, B, and C reporting adoption to a moderate extent, and between 74% - 76% stating that they had implemented the practice at least to a limited extent. Class E enterprises adopted the practice to a limited extent ($\bar{x}$ = 2.47, SD = 1.18), with 75% of Class E enterprises reporting providing a budget for CSR to a limited extent.

The findings revealed significant variations in the adoption of social sustainability practices among different classes of tourism enterprises in Kenya. These variations in the adoption of social sustainability practices indicated that while there was a strong commitment to legal and ethical standards, and employee development across the tourism sector in Kenya, there were notable gaps in environmental practices such as recycling and environmental fleet management. Addressing these gaps could lead to more comprehensive social sustainability, benefiting not only the enterprises but also the wider community and environment. Enhanced training programs, increased investment in sustainable technologies, and stronger community engagement in environmental initiatives could help bridge these gaps, promoting a more holistic approach to sustainability in Kenya's tourism sector.

3.6 Barriers/Drivers to Adoption of Climate Change Adaptation, Mitigation and Sustainable Tourism Practices

The study was to assessed the barriers and drivers to the adoption of climate change adaptation, mitigation, and sustainable tourism practices using quantitative data obtained from the national survey of tourism enterprises. The following section presents the results of the binary logistic regression model (BLR) used to study the predictor of adopting climate change response strategies, as well as the structural equation model (SEM) used to study the barriers and drivers to the implementation of STPs.

3.6.1 Predictors of Adoption of Climate Change Mitigation and Adaptation Practices by Tourism Enterprises

The literature suggests that climate change adaptation can be pursued by societies, institutions, governments, and individual enterprises, driven by various economic, social, and environmental factors through diverse mechanisms (Simpson, Gössling, Scott, Hall & Gladin, 2008).

Following Simpson *et al.,* (2008), the survey defined the adaptive capacity of an organization or enterprise as its potential or ability to successfully respond to climate variability. This includes the capacity to adjust behavior, utilize resources, and employ technology to mitigate

the impacts of climate change. The analysis then aimed to assess the predictors of climate change adaptation and mitigation to describe the current adaptive capacity of the tourism industry. Binary logistic regression was employed in the analysis to estimate the likelihood of adoption of a climate change mitigation or adaptation practice by a representative enterprise.

The analysis defined the BLR model with a dichotomous outcome variable, where 1 represented the adoption of an adaptation or mitigation measure, and 0 indicated otherwise. Adoption by the enterprise was considered if the respondents' rating of the extent of adoption was equal to or greater than three (≥3). The analysis took into account the firmographics of tourism enterprises, including legal status, nationality of ownership, size (number of direct employees), and classification, as predictors of the likelihood of adopting climate change mitigation and adaptation practices. Dummy variables were created for categorical variables with more than two groups. The models included, as predictors, respondents' perceptions of climate change impacts awareness, the effect of climate change, and the significance of climate change impacts on their enterprises, as captured by their indices. Table 3.16 presents descriptive statistics for the variables included in the binary logistic models.

Table 3.16: Descriptive Statistics of Input Variables for Predicting Climate Change Mitigation and Adaptation Practices Adoption

Dependent Variables (Dichotomous)	**Frequency**	
	Yes (1)	**No (0)**
Rain Water Harvesting	293	960
Desalination	95	1158
Water Recycling	192	1061
Structural modification	526	727
Shielding against raising water	309	944
Tree Planting	518	735
Product & Market Diversification	828	425
Special Insurance	491	762
Impact management Planning	630	623
Training employees & Guests	813	440
Conservation Activities	789	464
Redirecting guests	700	553
Informing tourists about weather	769	484
Independent Variables (Dichotomous)		
Private	1,135	118
Public	1,222	31
Mixed	1,196	57
	Frequency	

Dependent Variables (Dichotomous)	Yes (1)	No (0)
Foreign	1,212	41
Small	884	369
Medium	1,181	72
Large	1,246	7
Class A	818	345
Class B	1,065	188
Class C	1,023	230
Class D	1,242	11
Class E	939	314
Class F	1,244	9
Class G	1,249	4
Independent Variables (Continuous)	**Mean**	**SD**
Awareness of Biological Impact	3.39	0.99
Extent of Changes in PPT	2.77	0.92
Extent of Changes in Temp	3.00	1.11
Extent of Changes in Landscapes	1.82	1.06
Extent of Changes on W/bodies	2.14	1.13
Sign. of Impact to operation	3.76	0.92

Source: TRI Situational Analysis data, 2023.

The analysis proceeded to specify and estimate binary logistic regression models using the forward likelihood ratio method (Equation 3.2).

$$\log\left(\frac{p}{1-p}\right) = \beta 0 + \boldsymbol{\beta}_i \boldsymbol{X}_i + \boldsymbol{\beta}_j \boldsymbol{X}_j$$

Where:

p = Probability of adoption a climate change mitigation/adaptation practice;

log = natural logarithm;

$\boldsymbol{X}_i$ = A vector of Firmographics attributes;

$\boldsymbol{X}_j$ = A vector of Perceptions on climate change;

$\beta 0, \boldsymbol{\beta i}, \boldsymbol{\beta j}$ = coefficients to be estimated.

The coefficients represent the contribution of each predictor to the log odds of adopting a climate change mitigation practice. Tables 3.17 present the results of the estimated BLR models for climate change adaptation practices:

Table 3.17: Predictors of adoption of climate change adaptation measures by tourism enterprises

Adaptation Measures		Legal Status			Ownership		Size		Classification				
		C	Private	Public	Mixed	Foreign	Small	Medium	Class A	Class B	Class C	Class E	Class F
1	Shielding against raising water	-2.26	70.32 (0.07) **	10.95 (0.16) **					9.97 (1.81) **	11.11 (2.22) **			11.63 (13.90) **
2	Product & Market Diversification	-2.33					8.42 (1.51) **						
3	Special Insurance	-4.56	8.26 (2.05) **		13.39 (3.55) **		28.67 (2.16) **	11.74 (2.59)**	11.15 (0.62) **				
4	Impact Mngt. Planning	-4.45	5.18 (1.75) *		5.44 (2.31) *		24.28 (2.05) **	21.78 (4.17)**				8.50 (0.62) **	
5	Training employees & Guests	-4.27	3.95 (1.64) *		11.69 (13.2) **	6.04 (0.41) *	30.76 (2.52) **	13.86 (3.54) **			13.96 (0.48) **	18.63 (0.45) **	
6	Redirecting guests	-4.19			4.96 (2.73) *		9.88 (1.64) **	8.14 (2.45) **		8.41 (0.55) **	51.72 (4.55) **	29.17 (2.73) **	3.92 (9.13) *
7	Informing tourists about weather	-5.01					16.86 (1.98) **	4.93 (2.04) *		5.03 (0.64) *	85.93 (12.87)**	34.24 (3.14) **	4.88 (14.38) *

Continued:

Perceptions on Climate Change impacts									Model Fit	Exp. Power	Prediction
Adaptation Measures		C	Awareness of Biological Impact (VR47a)	Extent of Changes in PPT (VR48a)	Extent of Changes in Temp (VR48b)	Extent of Changes in Landscapes (VR48c)	Extent of Changes on W/ bodies (VR48d)	Sign. of Impact to operation (VR49)	LR Chi-Square (p <.001)	Nagelkerke R2	PAC (%)
1	Shielding against raising water	-2.26	18.48 (1.47) **		5.65 (1.19) *		50.78 (1.72) **		287.21	0.30	81.30
2	Product & Market Diversification	-2.33	22.41 (1.38) **				23.18	19.82	121.78	0.13	70.50
3	Special Insurance	-4.56	4.88 (1.18) *		4.54 (1.15) *		7.48 (1.24) *	27.40 (1.51) **	205.93	0.21	69.70
4	Impact Mngt. Planning	-4.45	7.88 (1.22) **		10.15 (1.23) **	4.53 (1.20) *	9.80 (1.28) **	30.91 (1.53) **	233.50	0.23	66.40
5	Training employees & Guests	-4.27	17.02 (1.37) **	15.29 (1.47) **	7.78 (1.23) *		18.73 (1.43) **	12.66 (1.33) **	287.17	0.28	73.30
6	Redirecting guests	-4.19					56.79 (1.70) **	83.23 (2.05) **	399.49	0.37	74.70
7	Informing tourists about weather	-5.01	6.72 (1.22) *				42.98 (1.66) **	87.55 (2.26) **	469.44	0.21	75.90

**P<.001, *p<.05

Source: TRI Situational Analysis Data, 2023

Predictors of Adoption of Climate Change Adaptation Practices

The results of the estimated BLR models, as indicated by the likelihood ratio chi-square statistics presented in Table 3.17, reveal that tourism enterprises' firmographics and respondents' perceptions of the impact of climate change significantly predicted the adoption of climate change adaptation practices by the enterprises(x^2=121.78-469.44,p<.001). The combined accuracy, sensitivity, and specificity results indicate correct predictions of the likelihood of adoption of adaptation practices ranging from 66% to 81%. The Nagelkerke R^2, suggests moderate proportion of variability explained (R^2 = 0.13-0.30), affirms the models' satisfactory explanatory power.

The odds ratios in the «Legal Status» column of Table 3.17 suggest that privately owned enterprises were 2.05 times more likely to secure special insurance, 1.75 times more likely to implement impact management plans, and 1.64 times more likely to train employees and guests on environmental issues compared to public or community-owned tourism enterprises. However, the results indicate that private firms were less likely to engage in shielding against raising water levels (Exp(B) = 0.07) than public and community enterprises.

These results imply that while privately owned enterprises show a higher inclination towards actions such as securing special insurance, implementing impact management plans, and providing environmental training, they are notably less likely to engage in measures to shield against rising water levels. This suggests a potential gap in private firms' environmental sustainability efforts, compared to their public or community-owned counterparts.

Regarding size measured by the number of employees, the results of the BLR models in Table 3.17 confirm that smaller and medium-sized firms, with between 11 to 250 employees, were more likely to adopt various climate change adaptation practices. These practices include taking up special insurance, implementing impact management plans, training employees and guests, and redirecting guests away from ecologically sensitive places, in comparison to micro enterprises with less than ten employees and large enterprises with more than 250 employees.

The results imply that smaller and medium-sized tourism enterprises exhibit a higher propensity to adopt a comprehensive set of climate change adaptation practices. This includes activities such as securing special insurance, implementing impact management plans, providing training to employees and guests, and redirecting guests away from ecologically sensitive areas. This suggests that, in the context of climate change resilience, smaller and medium-sized enterprises may demonstrate a more proactive and versatile approach compared to micro and larger counterparts within the tourism industry.

In terms of enterprise categories, the odds ratios in Table 3.17, specifically under the column «classification,» support the claim that different classes exhibit distinct tendencies. Class-A enterprises, focusing on visitor accommodation, Class-B encompassing restaurants, Class-C comprising tour operators, Class-E consisting of individual businesses offering tourism services like boat operators and curio dealers, and Class-F, which includes entertainment providers, were found to be less inclined to train their employees and guests compared to

Class D enterprises. Class D primarily includes publicly owned nature parks, reserves, and community-owned enterprises offering camping services. Conversely, the results suggest a higher likelihood for Class C, E, and F enterprises to redirect guests from sensitive areas and inform them of weather conditions than their counterparts in other categories.

The results indicate that an elevated level of awareness about climate change enhances the likelihood of adopting measures to mitigate rising water levels (Exp(B) = 1.47), engage in product and market diversification (Exp(B) = 1.38), take up special insurance, and train employees (Exp(B) = 1.18). Similarly, recognizing the impact of climate change on water bodies increases the likelihood of adopting these adaptation measures. Furthermore, the findings in Table 3.16 confirm that an increased perception of the importance of climate change impacts on enterprise operations, including effects on costs, income loss, business disruption, and changes in travel patterns, significantly stimulates the firms' adoption of climate change adaptation practices.

The results thus highlight the importance of fostering awareness and understanding of climate change among enterprises. Policymakers should consider initiatives aimed at increasing awareness levels within the business community. Additionally, efforts to emphasize the impact of climate change on water bodies could further incentivize the adoption of adaptation measures. Policymakers may want to develop targeted programs and campaigns that underscore the significance of climate change impacts on enterprise operations, emphasizing potential costs, income loss, business disruptions, and changes in travel patterns. These initiatives can contribute to a more proactive and widespread adoption of climate change adaptation practices among surveyed enterprises. Table 3.18 present the results of the estimated BLR models for climate change mitigation practices

Table 3.18: Predictors of adoption of climate change mitigation measures by tourism enterprises

			Legal Status		Ownership		Size			Classification			
	Mitigation Measures	**C**	**Private**	**Public**	**Mixed**	**Foreign**	**Small**	**Medium**	**Large**	**Class B**	**Class C**	**Class D**	**Class E**
1	Tree Planting	-3.34		12.4 (5.06) **	14.81 (3.39) **	8.56 (3.02) **		3.80 (1.74) *			35.86 (0.32) **		34.07 (0.37) **
2	Conservation Activities	-2.48	4.38 (0.46) *		7.36 (3.53) *	4.62 (2.65) *	6.55 (1.49) *	7.57 (3.09) *	16.48 (0.23)**	21.96 (0.17) **	21.84 (0.16) **	9.00 (0.30) **	
			Perceptions on Climate Change impacts						**Model Fit**	**Exp. Power**	**Predic-tion**		
	Mitigation Measures	**C**	**Awareness of Biological Impact (VR47a)**	**Extent of Changes in PPT (VR48a)**	**Extent of Changes in Temp (VR48b)**	**Extent of Changes in L/Landscape (VR48c)**	**Extent of Changes on W/ bodies (VR48d)**	**Sign. of Impact to operation (VR49)**	**LR Chi-Square (p<.001)**	**Nagelkerke R^2**	**PAC (%)**		
1	Tree Planting	-3.34	15.72 (1.34) **		9.22 (1.22) **	7.19 (0.82) *	37.32 (1.59) **	13.40 (1.33) **	204.00	0.20	65.80		
2	Conservation Activities	-2.48	20.98 (1.14) **				33.11 (1.55) **	92.11 (2.21) **	359.72	0.34	73.40		

**P<.001, *p<.05

Source: TRI Situational Analysis Data, 2023

Predictors of Adoption of Climate Change Mitigation Measures

The results in Table 3.18 reveal that, in comparison to locally owned enterprises, foreign-owned enterprises (Exp(B) = 3.02) and enterprises with both local and foreign ownership (Exp(B) = 3.39) demonstrated a higher likelihood of adopting tree planting.

The odds ratios in the «Legal Status» column of Table 3.18 suggest that private firms were less likely to engage in conservation activities (Exp(B) = 0.46) than public and community enterprises. This suggests a potential gap in private firms' environmental sustainability efforts, particularly in aspects related to conservation compared to their public or community-owned counterparts.

Regarding size measured by the number of employees, the results of the BLR models in Table 3.18 confirm that smaller and medium-sized firms, with between 11 to 250 employees, were more likely to adopt engaging in conservation activities in comparison to micro-enterprises with less than ten employees and large enterprises with more than 250 employees. The results suggest that, in the context of climate change resilience, smaller and medium-sized enterprises may demonstrate a more proactive and versatile approach compared to micro and larger counterparts within the tourism industry

The study assessed the influence of climate change awareness on the propensity to adopt tree planting. The results in Table 3.18 show that awareness of biophysical climate change impacts significantly increases the odds of adopting tree planting (Exp(B) = 1.34). Elevated awareness also enhances the likelihood of participating in conservation activities (Exp(B) = 1.14). Recognizing climate change impacts on water bodies similarly increases the likelihood of adopting adaptation measures. These findings highlight the crucial role of awareness in driving climate change mitigation within the tourism sector. Specifically, higher awareness of biophysical impacts motivates tourism enterprises to engage in practices like tree planting. Policymakers should consider implementing awareness programs targeting tourism enterprises to educate them about climate change impacts and the benefits of specific mitigation measures

The results suggest that an increase in the extent of change in water bodies due to climate change (Exp(B) = 1.59) and the significance of climate change impacts on business operations (Exp(B) = 1.33) encourages enterprises to plant trees as a climate change intervention measure. An important implication emerges the crucial need to enhance awareness about changes in water bodies due to climate change. For the summary of key informant conceptualization of sustainable tourism practices, a strong awareness culture within tourism enterprises can catalyze the implementation of environmentally conscious measures, contributing to the industry's overall sustainability and resilience in the face of climate change. Moreover, implementing incentive programs to reward tourism enterprises that actively promote and engage in initiatives related to climate change mitigation, especially those concerning water bodies, is significant. Financial incentives or recognition could effectively motivate businesses to prioritize sustainability measures.

3.6.2 Barriers and Divers to Implementation of Sustainable Tourism Practices

The study utilized the Technological, Organizational, and Environmental (T-O-E) factors proposed by Tornatzky et al. (1990) to categorize the barriers and drivers affecting the adoption of climate change action and sustainable tourism practices by tourism enterprises. Additionally, the study employed structural equation modeling (SEM) to evaluate the impact of these barriers and drivers on the adoption of climate change action and sustainable tourism practices within the tourism sector.

Results of the Confirmatory Factor Analysis (CFA) used to assess the unidimensionality and reliability of the measurement model in the SEM confirmed that eleven (11) items in the T-O-E framework loaded significantly on the latent variable - barrier/drivers of adoption of climate change mitigation, adaptation actions and tourism sustainability practices. The results in Table 3.19 show the resultant barriers and drivers in the measurement model.

Table 3.19: Measurement Model of Barriers and Divers for the adoption of Climate Change mitigation, adaptation and Tourism Sustainability Practices

	Latent Variable/ Indicators	**Factor Loading (λ)**	**t-value**	**p-value**	**Cronbach's alpha (α)**	**Composite Reliability (CR)**
	Drivers and Barriers (TOE)				**0.94**	**0.94**
1	Competitors' priorities	0.67	20.98	<0.001		
2	Level of habitat degradation	0.66	20.92	<0.001		
3	Policies on technology	0.90	26.61	<0.001		
4	Technological adaptability	0.85	25.78	<0.001		
5	Technological innovation	0.82	25.10	<0.001		
6	Technological capacity	0.82	25.12	<0.001		
7	Digital technology payment access	0.71	22.18	<0.001		
8	Managerial support for technology	0.86	25.90	<0.001		
9	Energy use efficiency	0.65	**			
10	Organizational sustainability targets	0.68	21.43	<0.001		
11	Performance measurement	0.66	21.73	<0.001		

Source: TRI Situational Analysis Data, 2023

The results presented in Table 3.19 confirm that all TOE indicators included in the measurement model demonstrated significant relationships with the latent variable - barriers and drivers ($t = 20.92 – 25.90$, $p < 0.001$). The factor loading coefficients of the indicators ranged from $\lambda = 0.65$ to 0.90, indicating a strong association between the TOE factors and the latent variable. These findings underscore the one-dimensionality (reliability) of the constructs, as indicated by Cronbach's alpha coefficients ($\alpha > 0.70$). Additionally, the composite reliability (CR) for all constructs was CR = 0.94, suggesting a satisfactory level of internal consistency (Hair et al., 1998).

The results confirm that competitors' priorities, the level of habitat degradation, policies on technology, technological adaptability, technological innovation, technological capacity, digital technology payment access, managerial support for technology, energy use efficiency, organizational sustainability targets, and performance measurement are reliable and critical factors that explain the propensity for the adoption of climate change adaptation, mitigation actions, and sustainable tourism practices by tourism enterprises in the country. These findings imply that policies and measures aimed at modifying or leveraging these eleven factors are likely to influence the extent of adoption of climate change actions and implementation of sustainable tourism practices in the tourism sector.

To evaluate the marginal and relative influence of the TOE factors (barriers and drivers) on the extent of adoption of climate change adaptation and mitigation measures and the extent of implementation of sustainability practices, the analysis estimated a full structural equation model. This model examined both the unstandardized and standardized path coefficients for the relationship between TOE factors and the extent of implementation of climate change and sustainability practices.

An examination of the model fit indices confirmed that the TOE factors effectively accounted for the differences in the extent of adoption of climate change actions and sustainable tourism practices. Six model fit indices for the structural model exceeded the conventional thresholds for acceptability (Normed Chi-Square ($\chi 2/df$) = 4.61, Goodness of Fit Index (GFI) = 0.88, Comparative Fit Index (CFI) = 0.93, Tucker-Lewis Index (TLI) = 0.93, Normed Fit Index (NFI) = 0.91, Root Mean Square Error of Approximation (RMSEA) = 0.05). These results suggest that the structural model fitted the data well and could be relied upon to explain the influence of barriers and drivers on the extent of implementation of climate change action and sustainable tourism practices by tourism enterprises.»

Table 3.20 displays the path coefficients or unstandardized regression weights (B) depicting the relationship between TOE factors (barriers/drivers) and the extent of implementation of climate change actions and sustainable tourism practices, emphasizing the marginal influence of these barriers/drivers on implementation extent.

Table 3.20: Result of the SEM- Drivers/Barriers, Incentives and Disincentives to Adoption of STP

Relationship	Path	Unstandardized Regression Weights (B)	T	P - Value	Conclusion
TOE => STPs	**Path_J**	**0.54**	**12.18**	**< 0.001**	**Supported**
Awareness => STPs	Path_H	0.09	3.65	< 0.001	Supported
Significance => STPs	Path_F	0.16	6.42	< 0.001	Supported
Incentives => STPs	Path_B	0.03	1.37	0.17	Fail to support
Disincentives => STPs	Path_D	0.03	1.35	0.18	Fail to support

Source: Survey Data, 2024

The highlighted results in Table 3.20 show that the path coefficient between TOE factors (barriers/drivers) and the extent of implementation of climate action and STPs was positive and statistically significant (BTOE = 0.54, t = 12.18, p <.001). These findings confirm that the eleven factors—competitors' priorities, the level of habitat degradation, policies on technology, technological adaptability, technological innovation, technological capacity, digital technology payment access, managerial support for technology, energy use efficiency, organizational sustainability targets, and performance measurement—were important in determining the extent of implementation of STPs and climate change action. The positive sign on the factors implies that these factors were drivers that promoted the implementation of these practices. The results further confirm that policy interventions geared to enhancing the TOE factors collectively would promote the adoption of climate change adaptation and mitigation practices and implementation of STPs amongst enterprises in the tourism sector.

Results from KIIs and FGDs participants underscored technological challenges, notably limited access to expertise and information, especially regarding measuring carbon footprints and implementing emission reduction strategies. Moreover, there was reluctance to embrace new sustainable technologies, like e-ticketing. According to the informants, this technological inertia poses a significant hurdle to advancing sustainability in the tourism sector. Additionally, the scarcity of expertise in areas like wastewater management and the high costs of importing foreign technologies exacerbate the situation. Slow uptake of new technologies such as electric vehicles due to financial constraints and unclear climate change compliance among tour operators further compound the challenges.

FGDs and KIIs findings highlight organizational barriers impeding STPs in Kenya's tourism. These encompass regulatory complexities, notably licensing requirements requiring streamlining. Moreover, there's a lack of information and awareness about sustainability practices, along with employment limitations due to insufficient education, training, and financial constraints hindering investment in sustainability. Affordability issues, resistance to change, and the need for governmental support are also noted, alongside a lack of expertise, institutional collaboration, and clear regulatory frameworks exacerbating effective implementation of sustainable measures.

To compare the relative influence of the barriers and drivers on the extent of tourism enterprises' adoption of climate change adaptation and mitigation actions and STPs, the analysis estimated ordinary least squares regression models and compared the standardized regression coefficients for the individual indicators of the barriers/drivers (βi). Table 3.21 shows the relative influence of T-O-E factors on the extent of implementation of social, environmental, and economic sustainability practices.

Table 3.21 Influence of T-O-E factors on the extent of implementation of social, environmental, and economic sustainability practices.

Technological, organizational & environmental Factors	Social Sustainability Practices		Environmental Sustainability Practices		Economic Sustainability Practices	
	β	*p*-value	β	*p*-value	β	*p*-value
Policies on technology	0.19	< 0.001	0.18	< 0.001	0.14	< 0.001
Performance measure	0.13	< 0.001	-	-	0.12	< 0.001
Digital technology and payment accelerators	0.13	< 0.001	0.14	< 0.001	0.14	< 0.001
Sustainability targets	0.08	0.01	0.08	0.01	0.12	< 0.001
Energy usage and efficiency	0.07	0.03	0.10	< 0.001	0.23	< 0.001
Technological innovativeness			0.09	0.02	0.08	0.04
Level of habitat degradation			0.09	< 0.001		
Model Fit Statistics						
R	0.47		0.54		0.57	
Adj R^2	0.22		0.29		0.32	
F	72.09		86.23		116.60	
p-value	< 0.001		< 0.001		< 0.001	

β = Standardized regression weight

Source: Survey Data, 2024 |

The results in Table 3.21 confirm that out of the 11 barriers/drivers, five (government policies on sustainability technology, enterprise use of performance measures, use of digital payment technology, presence of sustainability targets, and use of energy-efficient technologies) significantly explained 47% of the differences in the implementation of social sustainability practices ( ). Additionally, technological innovativeness and perceptions of habitat degradation, along with the initial five barriers/drivers, explained 54% of the differences in the implementation of environmental sustainability practices ( ). Furthermore, the results reveal that, out of seven barriers/drivers, six (excluding perceptions of habitat degradation) explained 57% of the variability in the implementation of economic sustainability practices (R = 0.57; F=116.60; p <.05).

Overall, the results in Table 3.21 support the notion that technological factors, including government policies on technology adoption, use of digital payment technologies, availability of energy-efficient technologies, and enterprise innovativeness; organizational factors such as performance measurements and sustainability targets; and perceptions of habitat degradation

are important drivers for the adoption of STPs by tourism enterprises. The results suggest that a holistic approach targeting improvements in technology, organizational culture, and awareness of environmental damage could significantly promote the implementation of social, economic, and environmental STPs in the tourism sector, accounting for 47% to 57% of the variability.

Moreover, the results confirm that, in relative terms, government policies promoting sustainable technologies were the most significant drivers for implementing social and environmental sustainability practices, accounting for a 19% and 18% improvement, respectively. Importantly, digital payment technologies were the second most significant drivers for social, environmental, and economic STPs, with improvements in technology promoting STPs adoption across all three dimensions by 13% to 14%. As expected, the availability of energy-efficient technologies was the most significant driver for the adoption of economic sustainability practices, suggesting that the cost-reduction gains from these technologies are important to tourism enterprises in the country.

The results imply that prioritizing policies to enhance access to sustainability technologies, such as tax incentives for investing in sustainable energy appliances and the enhancement of digital payment infrastructure, would significantly promote the adoption of economic and social sustainability practices. While promoting environmental awareness improves the adoption of economic sustainability practices, it would drive the implementation of environmental sustainability practices to a greater extent.

Based on their relative importance in influencing the implementation of STPs across the three dimensions of sustainable practices (Table 3.21), the barriers and drivers were ranked by their relative impact on the extent of implementation of STPs. Table 3.22 presents this ranking by their importance across social, environmental, and economic sustainability dimensions.

Table 3.22: Ranking of Barriers and Drivers for Implementation of STPs and Climate Change Action

Position	Barriers/Drivers
1	Policies on technology
2	Digital technology and payment accelerators
3	Energy usage and efficiency
4	Performance measure
5	Sustainability targets
6	Technological innovativeness
7	Level of habitat degradation

Source: TRI Situational Analysis Data, 2023

The ranking in Table 3.22 confirms the importance of technological factors—policies on technology, access to digital technology, payment accelerators, and energy use efficiency—as top drivers for implementing sustainable practices across the social, environmental, and economic dimensions. On the other hand, although stakeholders' perception of the level of habitat degradation was a significant driver for the implementation of environmental sustainability practices, this factor was ranked least impactful across the three sustainability dimensions. Organizational factors, including performance measurement and adoption of sustainability targets, occupied the middle positions in the importance ranking across the three sustainability dimensions. These results underscore the critical role of technology in promoting sustainability, suggesting that policy and investment should prioritize technological advancements to achieve comprehensive sustainable practices.

Best Practices

CHAPTER FOUR

4 BEST PRACTICES FINDINGS AND DISCUSSION

4.1 Overview

Tourism depends on a healthy environment but also contributes to adverse environmental impacts including climate change through emissions from the travel and accommodation sectors. Adapting to and mitigating climate change is vital for the industry's survival, while sustainable tourism practices reduce its environmental impact and enhance its socio-economic benefits. This interdependence requires a dual strategy: protecting environments to sustain tourism and adopting sustainable practices to secure the industry's future viability (Becken, 2013).

Recognizing the threat climate change poses to tourism, global best practices have emerged to foster adaptation. One strategy involves infrastructure improvements. For instance, the Netherlands invests in coastal defenses like dikes and seawalls to protect its beach-reliant tourism industry (Jones et al., 2018). Similarly, the Maldives constructs seawalls and elevates infrastructure to counter rising sea levels (Becken, 2012). Another approach is diversification. Japan, prone to natural disasters, promotes multi-seasonal tourism, balancing winter sports, spring festivals, and summer beach vacations to spread tourist flow and reduce climate sensitivity (Abe, 2019).

To mitigate climate change, best practices aim to reduce the tourism industry's greenhouse gas emissions. One effective strategy promotes sustainable transportation, with airlines offering carbon offset programs for passengers to invest in emission-reducing projects (Becken, 2012). Destinations are also enhancing public transportation infrastructure to encourage low-emission travel options (Gössling & Möller, 2019). Additionally, global hotel chains are adopting renewable energy sources like solar panels and wind turbines (Mowforth & Munt, 2014). Implementing water conservation measures and eco-friendly amenities further reduces the environmental impact of tourism accommodations (Becken, 2012).

The United Nations Environmental Program (UNEP) Tools and Framework for Climate Change Adaptation and Mitigation for Tourism offer a comprehensive approach to managing climate risks in the tourism sector. These tools emphasize enhancing awareness, fostering capacity-building, and promoting best practices for sustainability. They provide self-guidance on mitigation and adaptation strategies, incorporating methods and techniques for effective climate change management in tourism destinations. This framework serves as a global standard, supporting tourism professionals to implement climate response strategies and reduce greenhouse gas emissions, thereby promoting sustainable tourism practices (United Nations Environment Programme [UNEP], 2008).

Costa Rica and the Maldives have utilized the UNEP's 2008 framework to promote climate change responses. Costa Rica has integrated the framework into its national tourism strategy, emphasizing eco-friendly practices and biodiversity conservation. The Maldives has adopted the guidelines to enhance resilience against sea-level rise, focusing on sustainable resort

operations and community-based adaptation measures (UNEP, 2008).

For sustainable tourism, international best practices are exemplified by the Global Sustainable Tourism Council (GSTC). The Global Sustainable Tourism Council (GSTC) has developed comprehensive standards for tourism known as the GSTC Criteria, covering socio-economic, cultural, and environmental impacts (GSTC, 2016). Three prominent tourism destinations provide examples of successful implementation of the GSTC standards for the tourism sector: Slovenia is recognized for its comprehensive national tourism strategy that integrates sustainable practices across various sectors. Bhutan prioritizes environmental conservation and cultural preservation through its «high value, low impact» tourism policy, ensuring minimal negative impacts from tourism activities. The Azores, an archipelago in Portugal, focuses on protecting its rich biodiversity and unique landscapes by promoting eco-friendly tourism initiatives and engaging local communities in sustainable practices. These destinations exemplify the effective implementation of GSTC standards, enhancing their sustainability and appeal (GSTC, 2024; Dodds & Butler, 2019).

In the regional context, African nations are increasingly developing strategies to tackle climate change challenges in tourism. For example, South Africa's Responsible Tourism Guidelines encourage sustainable practices among tourism businesses, and Rwanda's ecotourism projects emphasize conservation and community development, supporting both adaptation and mitigation (Goodwin, 2017). Due to Africa's unique socio-economic conditions and high vulnerability to climate change, implementing best practices and standards is vital for an effective climate response. Standardization helps ensure a coordinated approach and prevents greenwashing. Africa's tourism industry can draw from international frameworks and tailor them to their specific contexts to achieve sustainability (Becken, 2012).

Kenya's tourism sector is making efforts to actively responds to climate change. For instance, the Maasai Mara conservancies, managed by communities, showcase adaptation efforts by promoting responsible tourism practices that balance conservation and local economic benefits (Lelei, 2018). Similarly, eco-lodges like Emboo in the Maasai Mara prioritize renewable energy and water conservation, showcasing mitigation strategies (Akama et al., 2018). However, existing sustainability standards, such as those by Ecotourism Kenya (EK), face criticism for weak enforcement mechanisms (Okumu, 2017). Clearer best practices and stricter standards are essential for an effective climate response. Becken (2012) recommends adopting and customizing international frameworks to Kenya's context to ensure a more sustainable future for the tourism sector.

The current study assessed the state-of-the-art in climate response and sustainable tourism practices in Kenya. The study found that tourism enterprises had generally low adoption of climate change adaptations. Measures requiring significant investment, such as rainwater collection, protection against rising water levels, special insurance, structural modifications, and tree planting, were adopted to a limited extent, while water recycling and desalination were seldom practiced. Employee training was the most widely implemented adaptation measure.

Regarding climate change mitigation, tree planting was adopted to a limited extent, and conservation activities were engaged in to some extent. A majority of hotels, restaurants, tour operators, and small-scale tourism enterprises like curio shops and safari photographers participated in conservation activities at least to a limited extent.

The study also found that environmentally sustainable practices like pollution monitoring, environmental awareness, and eco-building designs were implemented. Eco-building designs were adopted to a limited extent by most hotels and restaurants. Energy use monitoring was implemented to a moderate extent, while material recycling was the least implemented, practiced to a limited extent by slightly more than half. Compliance with laws was the most widely adopted social sustainability practice, followed by anti-sexual harassment policies. Budgeting for CSR programs was the least adopted.

By examining the industry's response to climate change and sustainability measures, current practices can be benchmarked against global standards. This comparison allows the industry to customize best practices for the local context, thereby ensuring a tourism sector that is more sustainable and resilient to climate change in the future.

Following the situational analysis of the adoption of climate change adaptation, mitigation and sustainable practices by Kenya's tourism enterprises, the study undertook to identify and prioritize climate change adaptation, mitigation, and sustainable best practices for the tourism sector in Kenya in line with global benchmarks. Specific objectives of the study were:

i. To assess the extent of implementation of climate change adaptation and mitigation practices by tourism enterprises in Kenya;

ii. To assess the extent of implementation of sustainable practices by tourism enterprises in Kenya;

iii. To compare the extent of implementation of climate change adaptation and mitigation practices against global benchmarks;

iv. To compare the extent of implementation of sustainable practices against global benchmarks; and

v. To recommend (identify and prioritize) climate change adaptation, mitigation and sustainable tourism best practices for the tourism sector in Kenya.

Following the baseline assessment of the extent of climate change adaptation, mitigation and sustainable tourism practices, this chapter presents the results of the comparison of the implemented climate change adaptation, mitigation, and sustainable practices in Kenya's tourism sector against global benchmarks. It also includes findings on the identification and prioritization of these practices and recommends best practices for the tourism industry in Kenya.

4.2 A Comparison of Climate Change Adaptation and Mitigation Practices Against Global Benchmarks

The study compared the extent of climate change adaptation and mitigation practices adopted by tourism enterprises, against global benchmarks to identify gaps in implementation. Baseline climate change mitigation and adaptation practices were benchmarked against the UNEP tools and framework for climate change adaptation and mitigation for tourism (UNEP, 2008), which outline minimum adaptation and mitigation standards for the tourism industry.

4.2.1 Comparison of Climate Change Adaptation Practices Against Global Benchmarks

Table 4.1 provides a comparison of baseline climate change adaptation practices against a global standard (UNEP, 2008). The comparison utilizes the UNEP (2008) criteria to categorize the baseline adaptation practices into six categories: technical, managerial, policy, research, tourism education, and behavioral adaptation. This classification aided in mapping the current practices against the global benchmark for easy comparison and identification of implementation gaps.

Table 4.1: Comparison of the extent of implementation of climate change adaptation practices against global benchmarks

Adaptation Practices	Global Benchmarks	Sources for the Benchmarks	Current Gaps in Kenya
Rainwater collection	High efficiency in water use	UNEP: Water Conservation, GSTC: Section D6, UN TOURISM: Water Management	Limited adoption, with only 32% implementing at least to a limited extent.
Removing salt from water	Advanced water treatment technologies	UNEP: Water Management, GSTC: Section D6, IFC: Water Treatment Standards	Rarely used, with 15% implementing at least to limited extent
Water recycling	Comprehensive recycling systems	UNEP: Waste Management, GSTC: Section D8, UN TOURISM: Recycling Initiatives	Limited use, with 23% implementing at least to limited extent
Structural modification of built environments	Use of green building standards	UNEP: Sustainable Building, GSTC: Section D7, IFC: Green Building Codes	Moderate adoption, 60% implementing at least to limited extent
Shielding against rising water levels	Flood defense and resilience infrastructure	UNEP: Climate Resilience, GSTC: Section D5, UN TOURISM: Disaster Preparedness	Limited adoption, with 37% implementing at least to limited extent
Tree planting	Reforestation and afforestation projects	UNEP: Ecosystem Restoration, GSTC: Section D1, UN TOURISM: Forestry Programs	Moderate adoption, with 58% implementing at least to limited extent.

Adaptation Practices	Global Benchmarks	Sources for the Benchmarks	Current Gaps in Kenya
Product and market diversification	Diversification strategies for sustainability	UNEP: Sustainable Business Practices, GSTC: Section A1, IFC: Market Strategy	Adopted to a great extent with 84% implementing at least to limited extent
Taking special insurance	Climate risk insurance and disaster resilience	UNEP: Insurance Solutions (PSI), GSTC: Section A3, UN TOURISM: Risk Management	Moderately implemented with 60% implementing at least to limited extent.
Developing impact management plans	Strategic environmental and social impact planning	UNEP: Impact Assessment, GSTC: Section B2, IFC: Environmental Planning	Implemented to a great extent with 73% implementing at least to limited extent
Training and campaigns for employees and guests	Regular training programs for sustainability	UNEP: Capacity Building, GSTC: Section B1, UN TOURISM: Training Programs	Implemented to a great extent with 83% implementing at least to limited extent.
Engaging in conservation initiatives	Active participation in conservation programs	UNEP: Conservation Initiatives, GSTC: Section D1, UN TOURISM: Conservation Programs	Implemented to a great extent with 81% implementing at least to limited extent.
Redirecting guests from ecologically sensitive areas	Sustainable tourism and conservation planning	UNEP: Sustainable Tourism, GSTC: Section A1, UN TOURISM: Visitor Management	Implemented to moderate extent with 71% implementing at least to limited extent.
Informing tourists of the weather conditions	Real-time weather updates and safety information	UNEP: Climate Information, GSTC: Section D4, UN TOURISM: Weather Safety	Implemented to moderate extent with 75% implementing at least to limited extent.

Source: TRI Situational Analysis Data, 2023

Table 4.1 highlights gaps in the extent of implementation of climate change adaptation practices observed from a comparison of currently implemented practices against global best practices as outlined by UNEP (2008).

With regard to technical climate change adaptation practices, the results in Table 4.1 highlight a moderate extent of use of energy efficiency technologies such as motion sensor active lights, clean energy sources (e.g., solar and wind), higher capacity vehicles, and efficient water technologies (e.g., dual-flush toilets). Although these practices are implemented by the majority of tourism enterprises, their extent of implementation is moderate and presents an opportunity for enhancement to improve adaptation by the tourism sector.

Table 4.1 also highlights gaps in the implementation of water management practices such as recycling, rainwater harvesting, and water conservation measures. The table reveals limited adoption of green buildings, ergonomic architectural design and décor, and the shift to open-

air spaces. The comparison uncovered gaps in the implementation of measures to protect against beach erosion and rising sea levels, including shielding against rising water by tree planting. The limited adoption of these practices presents gaps that can be ameliorated by incentivizing adoption by tourism enterprises.

The comparison suggests that managerial climate adaptation practices, including product and market diversification, impact management planning, and waste management (recycling, reusing, repurposing, and reducing), aligned well with global standards. These practices were moderately implemented by the enterprises, presenting opportunities for enhancement. However, there were gaps in the implementation of Awareness and Preparedness for Emergencies at the Local Level (APELL) protocols, indicating a need for new climate change adaptation practices. Although there was extensive use of waste reduction practices, such as refillable toiletries, other waste management practices, like promoting community participation in waste management, were not widely embraced by tourism enterprises.

With regard to policy adaptation measures, the comparison in Table 4.1 highlights gaps in the implementation of CSR programs by the enterprises, resulting from low budget allocation and a low level of designation of protected areas due to community resistance. These areas represent gaps that could be incentivized for adoption. On the other hand, there were no gaps in compliance with legal, regulatory, and licensing requirements, representing practices where non-compliance should be strongly disincentivized to maintain a high level of implementation.

The comparison suggests that educational and research practices such as employee sensitization, capacity building, visitor education, and information are well aligned with the UNEP (2008) guidelines. The results show that these practices are extensively implemented and could be maintained by incorporating them into the standards for certification. On the other hand, the comparison reveals a gap in research activity, with impact monitoring being implemented to a limited extent, presenting an opportunity for enhancement through a targeted incentive regime.

The comparison in Table 4.1 reveals that certain behavioural practices, such as linen reuse and visitor management practices like redirecting visitors from sensitive areas, are extensively adopted by tourism enterprises. These practices should be incorporated into the certification criteria as minimum requirements, for example, in the classification of hotels and restaurants and the licensing of tour operators. On the other hand, the gap revealed by the limited adoption of behavioural practices like cycling to work and carpooling suggests that these practices should be promoted through awareness campaigns and fostering a positive attitude among service providers, as prescribed in the UNEP (2008) benchmark.

4.2.2 Comparison of Climate Change Mitigation Practices Against Global Benchmarks

The study compared the extent of climate change mitigation practices by tourism enterprises against the global benchmark (UNEP, 2008). The comparison categorized mitigation practices, derived from the qualitative and quantitative results of the baseline survey, into four groups: Offsetting, Elimination, Reduction, and Substitution. This categorization followed the UNEP

(2008) criteria to facilitate analysis and gap identification. Table 4.2 presents a tabulation of the identified gaps in climate change mitigation practices.

Table 4.2: Comparison of the extent of implementation of climate change mitigation practices against global benchmarks

Theme	Current Practices	Global Benchmarks	Best Practice /Gaps
Eliminating (Completely removing practices that result in GHG emissions)	Avoid non-essential flights	• Travel less and stay longer	• Low adoption
	Waste recycling	• Reducing dumping at landfills	• Low adoption rate of waste recycling
	Ban of single-use plastics	• Ban on single-use plastics	• Moderate level of adoption of a ban on single-use plastic
	Waste reduction practices	• Reduce the use of materials	• Low extent of adoption
	Phasing out fossil fuel consumption	• Low carbon emission fleet	• Low extent of adoption
	Use of renewable energy sources	• Use of renewable energy e.g., solar, wind	• Moderate extent adoption
	Use of electric vehicle	• Low carbon emission fleet	• Limited extent of implementation
	Shifting to open-air spaces	• No air conditioning zone; • Ergonomic architectural design; • Green offices	• Low extent of adoption
Reducing (Minimizing emissions produced)	Waste management through recycling and composting	• Recycle waste	• Low level of adoption
	Tourists travelling through Air	• Minimize air trave	• Low adoption of minimization of Air travel
	Embracing energy-efficient technologies and practices	• Enhance efficiency in energy use	• Moderate extent of implementation
	Implementing energy-efficient technologies	• Energy-Efficient Technologies	• Moderate extent of adoption
	Optimize vehicular transportation	• Maintain a young transportation fleet	• Low level of adoption
	Use of high-capacity vehicles for staff transportation	• Optimizing transportation (high load factor, high passenger capacity, chose more efficient routes)	• Moderate extent of adoption
Substituting (Replacing high-emission activities/ materials with lower-emission alternatives)	Use of solar energy instead of fossil fuels	• Use of renewable energy sources	• Moderate level of adoption
	Alternative Transportation Methods	• Provide low-carbon public transport	• Low level of adoption
	Use of local materials in construction	• Uses of sustainable, low-emission building materials like bamboo, recycled steel, or rammed earth	• Moderate level of adoption

Theme	Current Practices	Global Benchmarks	Best Practice /Gaps
Offsetting (Compensating for emissions by investing in projects that reduce or remove an equivalent number of emissions elsewhere)	Planting of trees, afforestation and reforestation	• Afforestation and reforestation • Tree planting campaigns • Establishing and distributing tree nurseries	• Low extent of implementation of tree planting
	Investment in carbon offset programs	• Investment in carbon offsets programs	• Low level of adoption
	Ecosystem conservation and restoration	• Mangrove restoration • Participating in environmental conservation	• Moderate level of participation in conservation activities

Source: TRI Situational Analysis Data, 2023

The comparison in Table 4.2 reveals gaps in climate change mitigation practices within Kenya's tourism industry, focusing on eliminating GHG-emitting activities. The ban on single-use plastics and the use of renewable energy sources shows moderate adoption. The results suggest an opportunity to enhance these practices by implementing stronger disincentives for non-compliance, supporting comprehensive plastic-free policies, encouraging participation in global plastic reduction initiatives, and offering economic incentives to promote the use of renewable energy sources.

On the other hand, several gaps remain in implementing climate mitigation practices aimed at eliminating GHG emissions. Low adoption of non-essential flights suggests a need for awareness campaigns about the environmental benefits of extended stays. Waste recycling's low rate indicates the necessity for subsidies, rewards, and local partnerships. Waste reduction practices need training and incentives like certifications. Minimal adoption of low-carbon emission fleets requires subsidies or financial assistance for electric or hybrid vehicles and charging infrastructure. Limited use of electric vehicles can be improved through government incentives and infrastructure development. Promoting green building certifications, offering grants for sustainable designs, and educating stakeholders on ergonomic and green office benefits can enhance the adoption of open-air spaces.

The results in Table 4.2 suggest opportunities for enhancing emission reduction by the tourism industry. Embracing energy-efficient technologies and practices shows moderate implementation; therefore, offering financial incentives and training can boost adoption. Optimizing vehicular transportation and using high-capacity vehicles for staff can reduce emissions, requiring targeted subsidies and infrastructure improvements. Addressing these gaps can significantly reduce emissions and foster sustainable tourism practices.

The gaps in compensating for emissions within Kenya's tourism industry highlight key opportunities for improvement (Table 4.2). The low extent of tree planting, afforestation, and reforestation calls for increased investment and awareness campaigns to boost participation. The low level of adoption of carbon offset programs suggests the need for more attractive incentives, such as tax benefits or certification recognitions, to encourage tourism enterprises to invest in these programs. Moderate participation in ecosystem conservation and restoration indicates potential for enhanced engagement through partnerships with environmental

organizations and community-driven conservation initiatives. Addressing these gaps can significantly enhance the industry's overall climate mitigation efforts.

Tables 4.1 and 4.2 reveal significant gaps in Kenya's adaptation practices compared to global benchmarks. Rainwater collection, removing salt from water, and water recycling are notably underutilized. Despite high global efficiency standards, only 6.6% of Kenyan enterprises widely adopt rainwater collection, and 84.9% rarely use desalination methods. Comprehensive water recycling systems are almost non-existent, with a mere 3.2% adoption rate. Structural modifications and shielding against rising water levels also show substantial gaps, with moderate adoption rates and 62.7% of enterprises not implementing flood defense strategies. These deficiencies highlight the urgent need for improved water management technologies and resilience infrastructure to align with global best practices.

Conversely, Kenya shows better performance in areas like training and campaigns for employees and guests, which has the highest adoption rate, and developing impact management plans. However, tree planting and product and market diversification are still underdeveloped, with significant percentages indicating little to no extent of adoption. The limited use of special insurance for climate risk and low participation in conservation initiatives further underscore the need for comprehensive strategies to enhance sustainability. Addressing these gaps involves not only adopting advanced technologies and infrastructure but also fostering a culture of environmental responsibility and strategic planning to achieve global sustainability standards

4.3 Comparison of Sustainable Tourism Practices Against Global Benchmark

The study compared the extent of implementation of sustainable tourism practices by tourism enterprises, against global benchmarks to identify gaps in implementation. The extent of implementation of the practices was benchmarked against the GSTC criteria which outlines the minimum standards for the tourism industry

Table 4.3 compares baseline sustainable tourism practices with a global standard (GSTC, 2016). The comparison uses GSTC industry criteria, which categorizes sustainable tourism practices into four pillars: sustainable planning and management, socio-economic impacts, cultural impacts, and environmental impacts. These criteria outline minimum practices for tourism enterprises to achieve sustainability, aligning with global sustainable development goals. Utilizing the GSTC standard to classify sustainable tourism practices into these pillars facilitated mapping current practices against the global benchmark for ease of comparison and identification of implementation gaps.

Table 4.3: Comparison of the extent of implementation of Sustainable Tourism Practices Against Global Benchmark

Adaptation Practices	Global Benchmarks	Sources for the Benchmarks	Current Gaps in Kenya
Giving feedback to stakeholders	Regular stakeholder engagement	UNEP: Stakeholder Engagement and Participation, GSTC: Section A1	Moderate implementation, 85% at least to a limited extent
Budgeting for CSR activities	Significant budget allocation for CSR	UNEP: Corporate Social Responsibility, GSTC: Section C1	Moderate implementation, 76% at least to a limited extent
Employees' continuous education	Comprehensive training and professional development	UNEP: Capacity Building and Training, GSTC: Section B1	Moderate implementation, 85% at least to a limited extent
Monitoring environmental pollution	Continuous and thorough monitoring	UNEP: Environmental Monitoring and Reporting, GSTC: Section D2	Moderate implementation, 84% at least to a limited extent
Use of energy-efficient appliances	High adoption of energy-efficient technologies	UNEP: Energy Efficiency, GSTC: Section A5	Moderate implementation, 81% at least to a limited extent
Creating environmental awareness	Broad and impactful awareness campaigns	UNEP: Environmental Education, GSTC: Section B4	Moderate implementation, 75% at least to a limited extent
Anti-sexual harassment policies	Strict and comprehensive policies	ILO: Workplace Standards, GSTC: Section A9	Considerable implementation, 90% at least to a limited extent
Recycling materials	Comprehensive recycling programs	UNEP: Waste Management, GSTC: Section D8	Limited implementation, 53% at least to a limited extent
Environmental fleet management	Green fleet management practices	UNEP: Sustainable Transport, GSTC: Section A6	Limited implementation, 60% at least to a limited extent
Compliance with laws	Full compliance with environmental regulations	UNEP: Legal Compliance, GSTC: Section A2	Considerable implementation, 95% at least to a limited extent
Minimizing paper-based marketing	Extensive use of digital marketing	UNEP: Sustainable Marketing, GSTC: Section C3	Moderate implementation, 86% at least to a limited extent
Purchasing from sustainable suppliers	Prioritizing sustainable sourcing	UNEP: Sustainable Procurement, GSTC: Section A4	Moderate implementation, 86% at least to a limited extent
Efficient water management system	Advanced water management systems	UNEP: Water Conservation, GSTC: Section D6	Moderate implementation, 81% at least to a limited extent
Eco-building designs	Implementation of green building standards	UNEP: Sustainable Building, GSTC: Section D7	Moderate implementation, 73% at least to a limited extent
Monitoring energy use	Regular and detailed energy monitoring	UNEP: Energy Monitoring, GSTC: Section D4	Moderate implementation, 81% at least to a limited extent

Source: TRI Situational Analysis Data, 2023

The comparison of the extent of sustainable tourism practices implemented against the GSTC criteria reveals significant gaps (Table 4.3). The proportion of goods and services purchased locally is not measured, and a documented environmental purchasing policy is absent. Additionally, regular reports on sustainability policy, actions, and performance are lacking, and the proportion of locals employed in the tourism sector is not monitored. To enhance implementation, incentives such as financial rewards for local purchasing and employment, grants for developing environmental policies, and recognition for sustainability reporting can be offered. Disincentives could include penalties for non-compliance, while support could involve providing training and resources for sustainable practices.

Moreover, the comparison reveals significant gaps in managing socio-economic impacts within tourism. These include a lack of finances for CSR, inadequate monitoring of CSR program impacts, and insufficient collaboration between tourism enterprises and local communities, NGOs, and government bodies. Additionally, there is inadequate access to livelihoods through eco-tourism ventures and a lack of financial support for local tourism entrepreneurs. Opportunities for enhancement include offering tax incentives and grants for CSR activities, establishing monitoring frameworks, and fostering partnerships through collaborative platforms. Disincentives could include penalties for non-compliance with CSR commitments, while support can involve providing micro-financing, training, and resources to local entrepreneurs.

The comparison reveals significant gaps in managing environmental impacts within tourism operations. These include a lack of awareness regarding natural/cultural protected areas and areas of high biodiversity value, inadequate use of energy-efficient appliances, and insufficient measurement, monitoring, and reporting of solid waste generation. Additionally, the sources of pollution are not adequately monitored, documented, or reported. To enhance implementation, incentives such as tax breaks for adopting energy-efficient appliances, grants for waste management infrastructure, and recognition for sustainable practices can be offered. Disincentives could include fines for non-compliance with environmental regulations. Support mechanisms may involve providing training on environmental conservation practices, establishing monitoring and reporting frameworks, and facilitating partnerships with local conservation organizations.

The data underscores notable gaps in Kenya's adaptation practices compared to global benchmarks, particularly in areas requiring significant investment and systematic implementation. For instance, budgeting for CSR activities and employees' continuous education reveal inconsistencies and limited financial commitment, suggesting a need for more robust and consistent investment in these areas. Similarly, the implementation of comprehensive recycling programs and environmental fleet management is relatively uncommon, with high variability, indicating substantial room for improvement in waste management and sustainable transportation practices. These gaps point to the necessity for more strategic and financially backed efforts to align with global sustainability standards.

Moreover, while some practices such as anti-sexual harassment policies, compliance with laws, and monitoring energy use are more prevalent, they are not universally adopted. This partial adherence highlights the need for broader and more consistent application of these policies and practices. The moderate variability in creating environmental awareness, minimizing paper-based marketing, and purchasing from sustainable suppliers further suggests that while efforts are being made, they are not yet widespread or uniform. Addressing these gaps will require a concerted effort to enhance stakeholder engagement, implement comprehensive training programs, and adopt advanced technologies and systems for energy and water management to meet global benchmarks effectively.

4.4 Prioritization of Climate Change Adaptation, Mitigation and Sustainable Tourism Best Practices

4.4.1 Identification of Best Practices for Climate Change Adaptation,Mitigation and Sustainable Tourism in Kenya

Following comparisons of baseline climate change adaptation, mitigation, and sustainable tourism practices by tourism enterprises against global benchmarks, implementation gaps were highlighted. Based on these gaps, the study prioritized climate adaptation, mitigation and sustainability practices for tourism enterprises, considering their effectiveness in promoting sustainability and achieving climate change adaptation and mitigation objectives. Figure 4.1 illustrates this relationship through a Venn diagram, identifying priority practices in the intersection.

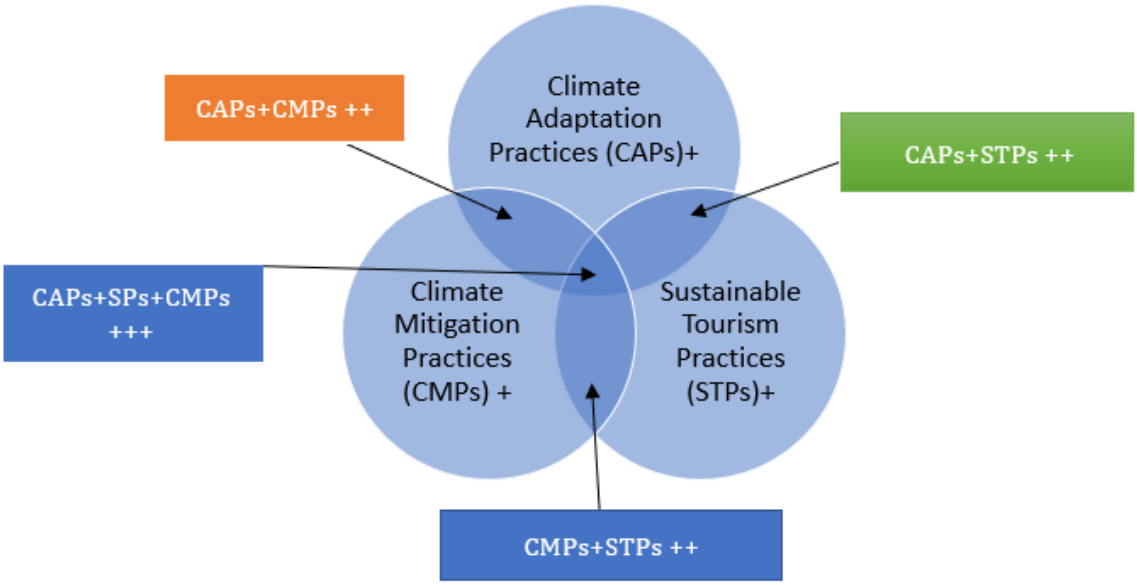

Figure 4.1: Venn diagram showing conceptual flow and nexus for identification and prioritization of climate adaptation, mitigation, and sustainable tourism practices

KEY

CAPs + CMPs (++): These are the practices that have climate change adaptation and mitigation benefits denoted as ++

CAPs + STPs (++): These are the practices that have climate adaptation and sustainable tourism benefits denoted as (++).

CMPs + STPs (++): These are the practices that have climate mitigation and sustainable tourism benefits denoted as ++

CAPs + STPs + CMPs (+++): These are the practices that have climate adaptation, sustainable

Table 4.4 further provides the prioritized practices after a careful examination of emerging gaps in climate change adaptation, mitigation, and sustainable tourism practices. The identification and prioritization of the best practices are based on the double and triple benefits in regard to enhancing the resilience of the tourism enterprises, contributing to emission reduction and sustainable tourism to position Kenya as a competitive and sustainable tourist destination.

Table 4.4: Identification of Best Practices for Climate Change Adaptation, Mitigation and Sustainable Tourism Practices

Priority Practices	Climate Adaptation and Climate Mitigation Practices (CAPs+CMPs)	Climate Adaptation and Sustainable Tourism Practices (ADPs+STPs)	Climate Adaptation, Climate Mitigation, and Sustainable Tourism Practices (CAPs+CMPs+STPs)
Water conservation	++	++	+++
Energy Conservation and Efficiency	++	++	+++
Ecosystem Restoration and Environmental Conservation	++	++	+++
Product Market Diversification	++	++	+++
Change on Product Use and Shifting to Open Air Spaces	++	++	+++
Waste Management	++	++	+++
Shift to Green Buildings	++	++	+++
Capacity Building, Training and Research	++	++	+++
Compliance to Government Policies and Regulations	++	++	+++
Protection of Fragile Ecosystems and Watersheds	++	++	+++
Investment in Carbon Offset Projects	++	++	+++
Use of Vehicular Transportation System	++	++	+++

4.4.2 Priority Best Practices for Climate Change Adaptation, Mitigation and Sustainable Tourism in Kenya

The identification of priority best practices for climate change adaptation, emission reduction, and enhancing resilience in sustainable tourism led to the development of key strategic climate actions aimed at positioning Kenya as a competitive and sustainable tourist destination. Implementing these climate actions in each priority area will not only bolster the resilience of the tourism sector but also contribute to overall emission reduction and economic growth in the country.

Table 4.5 outlines climate change response actions and sustainable tourism practices identified for implementation in each priority area by order of importance, forming the best practices for Kenya's tourism industry. These actions require investment in support programs, incentives, and disincentive mechanisms for their implementation.

Table 4.5: Priority Practices and Key Strategic Action for Climate Change Resilience and Sustainable Tourism

Priority Area	Prioritized Best Practices in line with Global Benchmarks	Responsible Organization/Partner
Water conservation practices	• Water conservation and efficiency use practices • Water harvesting	• Association of Tourism Enterprises • Ministry of Tourism and Wildlife and its State Agencies (SAGAs) • Ministry of Water, Sanitation and Irrigation (SAGAs)
Energy conservation and efficiency	• Procurement and installation of energy-efficient technologies	• Ministry of Energy and Petroleum • Tourism Enterprises • Association of Tourism Enterprises • Ministry of Tourism and Wildlife and its State Agencies (SAGAs) • Ministry of Environment, Climate Change and Forestry and its State Agencies • (SAGAs).
Ecosystem restoration and environmental conservation	• Tree planting and reforestation projects to restore natural habitats and biodiversity • Participate in environmental conservation activities	• Tourism Enterprises • Association of Tourism Enterprises • Ministry of Tourism and Wildlife and its State Agencies (SAGAs) • Ministry of Environment, Climate Change and Forestry and its Semi-Autonomous Government Agencies (SAGAs)
Product market diversification	• Develop new green tourism products that highlight local culture, nature, and sustainable practices • Expanding to new niche markets e.g., eco-tourism, adventure tourism, or cultural heritage tourism • Continuous market research	• Tourism Enterprises • Association of Tourism Enterprises • Ministry of Tourism and Wildlife and its State Agencies
Change in product use and shifting to open-air spaces	• Adopting eco-friendly building materials and designs; • Adopting environmentally friendly architectural design; • Creating open-air, nature-integrated spaces	• Tourism Enterprises • Association of Tourism Enterprises • Ministry of Tourism and Wildlife and its State Agencies

Priority Area	Prioritized Best Practices in line with Global Benchmarks	Responsible Organization/Partner
Waste reduction and management	• Waste reduction and management practices	• Ministry of Environment, Climate Change and Forestry and its State Agencies (SAGAs) • Ministry of Tourism and Wildlife and its State Agencies (SAGAs) • Tourism Enterprises • Association of Tourism Enterprises • NEMA
Capacity building, training, and research	• Conducting frequent workshops and seminars on sustainability practices, climate change adaptation, and mitigation strategies • Enrolling employees in certification programs • Implementing continuous on-the-job training programs	• Tourism Enterprises • Association of Tourism Enterprises • Ministry of Tourism and Wildlife and its State Agencies • Kenya Institute of Curriculum Development (KICD)
Compliance with government policies and regulations	• Compliance with licensing requirements • Conducting EIA for new projects, annual environmental audits and compliance with EMP recommendations • Continuous staff training on legal and regulatory requirements	• Tourism Enterprises • National Environment Management Authority (NEMA) • Association of Tourism Enterprises • Ministry of Tourism and Wildlife and its State Agencies (SAGAs) • Ministry of Environment, Climate Change and Forestry and its State Agencies (SAGAs)
Protection of fragile ecosystems and watersheds	• Guidelines and designated trails to minimize human impact on fragile ecosystems • Compliance with regulations on riparian ecosystem protection	• Tourism Enterprises • Association of Tourism Enterprises • Ministry of Tourism and Wildlife and its State Agencies (SAGAs) • Ministry of Environment, Climate Change and Forestry and its State Agencies (SAGAs)
Investment in carbon offset projects	• Collaborating with local conservation groups for reforestation or renewable energy projects to offset carbon emissions from tourism activities	• Tourism Enterprises • Association of Tourism Enterprises • Ministry of Tourism and Wildlife and its State Agencies • Ministry of Environment, Climate Change and Forestry and its State Agencies (SAGAs)
Carbon dioxide emission Reduction	• Use of electric vehicular transportation	• Ministry of Environment, Climate Change and Forestry and its State Agencies (SAGAs) • Ministry of Tourism and Wildlife and its State Agencies (SAGAs) • Ministry of Energy and Petroleum

Source: TRI Situational Analysis Data, 2023

The outlined priority areas and their associated practices reveal several critical implications for Kenya's tourism sector. Climate-smart and sustainable energy practices and technologies, for instance, highlight the need for the procurement and installation of energy-efficient technologies. This requires coordinated efforts among various stakeholders, including the Ministry of Energy and Petroleum, tourism enterprises, and relevant associations. The moderate adoption levels indicate an opportunity for enhanced implementation and investment in these technologies to reduce environmental impact and promote sustainable tourism. Water resource management and conservation efforts, which focus on water conservation, efficient use practices, and harvesting, involve multiple ministries and associations, suggesting a need for integrated and widespread adoption of advanced water management practices to address the current gaps and improve resource sustainability.

The data also highlights the importance of waste reduction and management practices, which necessitate a collaborative approach involving the Ministry of Environment, Climate Change and Forestry, NEMA, and tourism enterprises. Addressing the current gaps in waste management practices could significantly reduce the environmental footprint of the tourism sector. Similarly, reducing carbon dioxide emissions through the use of electric vehicular transportation involves coordinated actions from several ministries and state agencies. The low adoption rates indicate a significant opportunity for policy development and incentives to encourage the transition to electric vehicles. Additionally, ecosystem restoration and conservation efforts, including tree planting and reforestation projects, require active participation from tourism enterprises and various state agencies to restore natural habitats and biodiversity. The emphasis on protection of fragile ecosystems, carbon offsetting, product and market diversification, and compliance with legal and regulatory requirements further underscores the necessity for comprehensive strategies and active involvement from all stakeholders to achieve sustainable development goals in Kenya's tourism sector.

Environmental Economic Accounting

CHAPTER FIVE

5 SYSTEM OF ENVIRONMENTAL AND ECONOMIC ACCOUNTING (SEEA) FOR THE TOURISM SECTOR

5.1 Overview

Globally, ecosystem accounting, as supported by the UN (2014; 2021), recognizes the environment's integral role in society and the economy. This aligns with SDG Indicator 15.9.1, integrating biodiversity values into national policies and economic accounting to support SDG 15. This includes aligning with Aichi Biodiversity Target 2 and implementing the Systems of Economic and Environmental Accounting (SEEA) for systematic biodiversity measurement and monitoring. Embedding SEEA into national accounting frameworks aids in sustainable ecosystem use, forest management, desertification combat, and reversing land degradation. This ensures environmental considerations are integral to economic decisions, supporting ecosystem protection, restoration, sustainable forest management, desertification prevention, and halting biodiversity loss.

SDG Indicator 15.9.1, as outlined by the United Nations Statistics Division (UNSD, 2023), monitors progress in integrating biodiversity values into national policies and economic accounting through two components. Component (a) tracks countries aligning their national targets with Aichi Biodiversity Target 2 within their development and poverty reduction strategies (UN Biodiversity Convention, 2020). Component (b) focuses on integrating biodiversity into national accounting via the System of Environmental-Economic Accounting (SEEA) (UN Statistics Division [UNSD], 2021). SEEA provides a framework for systematically measuring and reporting on economic-environmental interactions (UNSD, 2021). The 2023 Global Assessment on Environmental-Economic Accounting and Supporting Statistics reports that 90 countries are implementing SEEA, although to varying extents (UNSD, 2023). SEEA integration ensures consistent inclusion of environmental data in economic decision-making (UNSD, 2021). This fosters sustainable development and facilitates the achievement of SDG 15.9.1 by structuring the accounting of natural assets and ecosystem services (UNSD, 2021).

The Global Assessment of Environmental-Economic Accounting and Supporting Statistics, administered by the United Nations Committee of Experts on Environmental-Economic Accounting (UNCEEA) (UNSD, 2023), aimed at evaluating the progress of SEEA implementation worldwide and providing data for Sustainable Development Goal (SDG) indicator 15.9.1 (UNSD, 2023). The assessment categorized global SEEA implementation into three stages: pilot or initial compilation, compilation and dissemination, and regular compilation and dissemination (UNSD, 2023). Figure 5.1 shows the status of the implementation of SEEA accounting globally:

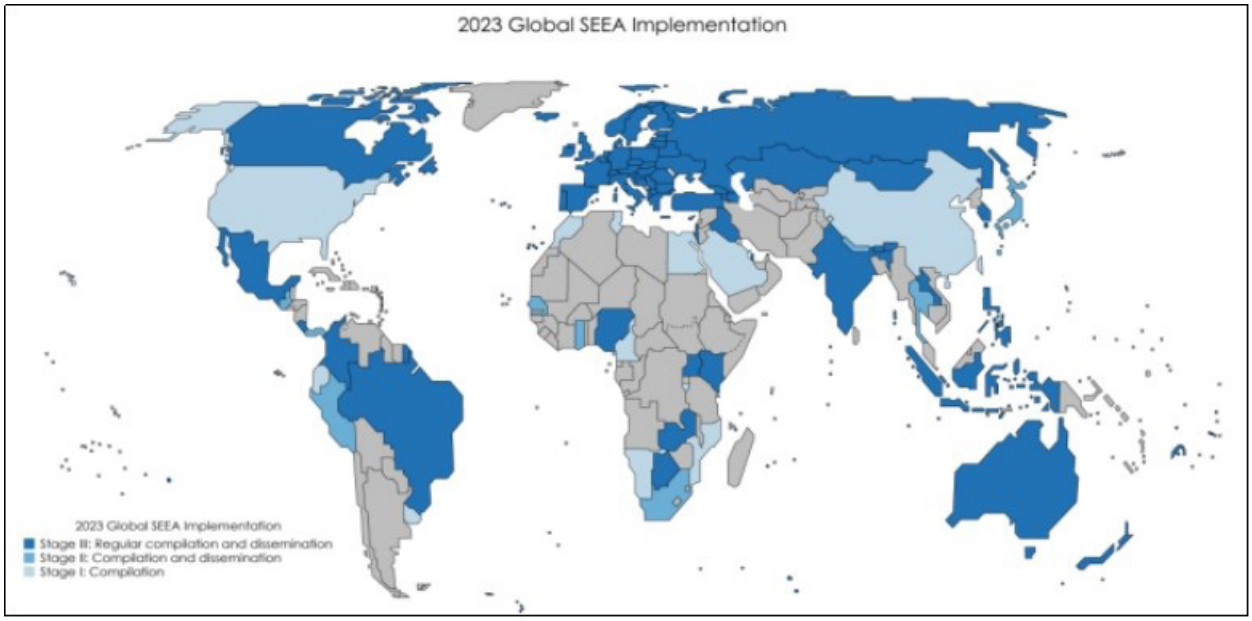

Figure 5.1: Status of Implementation of SEEA

Source: UNCEEA (2023)

The 2023 UNCEEA benchmark assessment, conducted in milestone years (2014, 2017, 2020, and 2023) as depicted in Figure 5.1, revealed that by 2023, 90 countries had implemented SEEA. Among these, 74% regularly published accounts, 11% did so on an ad-hoc basis, and 14% compiled accounts but did not publish them (UN). Almost all countries (89 out of 90) compiled SEEA Central Framework (SEEA CF) accounts, while nearly half also compiled SEEA Ecosystem Accounting (SEEA EA) or thematic accounts. This demonstrates a significant global commitment to integrating environmental-economic accounting into policy and decision-making (UNCEEA, 2023).

The Gaborone Declaration for Sustainability in Africa, issued in May 2012, initiated progress towards quantifying and integrating natural capital into development planning across the continent (RoB, 2021; UNEP-WCMC, 2016). In response, the adoption of the System of Environmental-Economic Accounting (SEEA) framework emerged as a pivotal tool for measuring sustainable development, underscoring the increasing recognition of the necessity for policy integration and change in Africa. Alfieri (2023) highlighted the insufficiency of GDP as a sole metric for fostering efficient, inclusive, and environmentally conscious economies in Africa, advocating instead for an integrated framework capable of monitoring progress toward sustainable and equitable development goals.

However, the adoption of SEEA in Africa faces notable challenges, leading to relatively low adoption rates of SEEA accounts across the region (United Nations Environment Programme [UNEP], 2023). These challenges include limited technical capacities within statistical agencies, inadequate guidance documentation tailored to the African context, and a lack of knowledge platforms for facilitating SEEA implementation and sharing best practices (UNEP, 2023). Despite these hurdles, some countries have demonstrated significant progress in SEEA adoption. South Africa, for example, has developed advanced ecological indicators and accounts specifically for its national river ecosystems (Department of Environmental

Affairs, Republic of South Africa, 2019). Similarly, Uganda has embraced SEEA by using it to develop species accounts for the Shea tree, integrating valuable biodiversity data with land-use information (Nsubuga, 2017). These examples showcase the potential of SEEA for African nations. However, a recent mapping of adoption rates in Africa reveals that SEEA has only marginally mainstreamed into sectoral planning and management processes across the continent (UNEP, 2023). Overcoming these challenges requires ongoing efforts from governments, regional organizations, and international partners to enhance technical capacity building, improve guidance documentation that reflects African needs, and facilitate knowledge exchange through dedicated platforms. By addressing these critical areas, Africa can accelerate the adoption and integration of SEEA into sustainable development initiatives, fostering a data-driven approach to environmental management and economic decision-making.

In Kenya, environmental economic accounting initiatives began in 2017 with technical assistance from the United Nations Statistics Division (UNSD). A national stakeholders' workshop convened in May 2017 endorsed three pivotal accounts: energy, water, and forests, with energy emerging as the primary account for production. In April 2018, Kenya, through the Kenya National Bureau of Statistics (KNBS), successfully produced and released its first set of pilot physical energy supply and use tables. Since then, KNBS has been producing physical supply and use tables for energy accounts, with the latest release in May 2024 (Economic Survey, 2024). The KNBS is currently in the advanced stages of preparing a National Plan for Advancing Environmental Economic Accounting 2023-2028 (NP-AEEA), which prioritizes the development of water, forest ecosystem, energy, and mineral accounts. The Kenya Tourism Board (KTB) has taken positive steps by incorporating an "Environmental and Sustainability Reporting" section in its annual reports (KTB, 2023). However, the scope and depth of this reporting may vary from year to year. The absence of standardized environmental accounting practices across the broader tourism sector complicates the assessment of the overall environmental impact (UNEP, 2023). This underscores the necessity for a more comprehensive framework for tourism enterprises in Kenya to monitor and report on their environmental impact

From this background, the TRI undertook to develop a System of Environmental-Economic Accounting (SEEA) for tourism sector activities in Kenya, in line with the System of Environmental-Economic Accounting-Central Framework (SEEA-CF) 2012 and the United Nations World Tourism Organization Tourism Satellite Account: Recommended Methodological Framework (UNWTO TSA-RMF) 2008. The specific objectives of this undertaking were:

i. To undertake a situational analysis of environmental-economic accounting practices in Kenya’s tourism sector.
ii. To compile pilot SEEA-Energy Accounts for Kenya’s tourism sector in line with the SEEA-CF 2012 and UNWTO TSA-RMF 2008.
iii. To compile pilot SEEA-Water Accounts for Kenya’s tourism sector in line with the SEEA-CF 2012 and UNWTO TSA-RMF 2008.

iv. To compile pilot SEEA-Greenhouse Gas Emissions Accounts for Kenya's tourism sector in line with the SEEA-CF 2012 and UNWTO TSA-RMF 2008.
v. To compile pilot SEEA-Solid Waste Accounts for Kenya's tourism sector in line with the SEEA-CF 2012 and UNWTO TSA-RMF 2008.

This chapter reports the results of the situational analysis of environmental-economic accounting (EEA) practices in Kenya, covering the legal, regulatory, and institutional framework, current EEA practices in the country's tourism industry, and presents compiled core SEEA accounts for energy, GHG, water, and solid waste for the tourism industry for the year 2022.

5.2 Legal and Regulatory Framework for Environmental-Economic Accounting in Kenya

The study reviewed literature and conducted interviews with key informants to examine the existing legal and regulatory framework for environmental-economic accounting (EEA) in Kenya. The review revealed no specific laws or regulations for environmental-economic accounting in tourism enterprises. However, several existing laws, regulations, policies, and strategies were identified as relevant to this area in Kenya. Table 5.1 summarizes the legal and regulatory landscape for environmental-economic accounting in Kenya's tourism sector.

Table 5.1: Legal and Regulatory Landscape for Environmental-Economic Accounting in Kenya's

Category	Details	Relevance/Implications to SEEA	Year
Policies			
Kenya Vision 2030	Aims for a globally competitive and prosperous Kenya with a high quality of life by 2030, emphasizing sustainable development.	Provides a long-term framework that integrates environmental sustainability into economic planning.	2008
National Environment Policy (NEP)	Provides a framework for an integrated approach to environmental management, emphasizing sustainable use of resources.	Supports comprehensive data collection on natural resources for informed policy-making.	2013
National Climate Change Action Plan	Focuses on mitigating climate change impacts and promoting low carbon development.	Facilitates the inclusion of climate data into national accounts, essential for SEEA.	2018
National Energy Policy	Promotes sustainable energy production and consumption, energy efficiency, and the use of renewable energy sources.	Encourages the inclusion of energy data in national accounts, crucial for SEEA energy accounts.	2018
National Solid Waste Management Strategy	Provides a comprehensive approach to managing solid waste, promoting recycling, and reducing waste generation.	Supports data collection on waste management, essential for SEEA material flow accounts.	2015
Strategies			
National Strategy for the Development of Statistics (NSDS)	Enhances the capacity of the national statistical system to produce reliable, accurate, and timely data, including environmental statistics.	Strengthens the statistical foundation necessary for SEEA implementation.	2019-2023

Category	Details	Relevance/Implications to SEEA	Year
Green Economy Strategy and Implementation Plan (GESIP)	Promotes sustainable development through green economy initiatives, integrating environmental considerations into economic planning.	Encourages the integration of environmental and economic data, aligning with SEEA principles.	2016
Natural Capital Accounting (NCA) Program	Integrates environmental data into national accounts, supporting better decision-making and policy formulation.	Directly aligns with SEEA by promoting the valuation and accounting of natural capital.	2016
Legal Instruments			
Environmental Management and Coordination Act (EMCA), 1999	Provides the legal framework for environmental management, conservation, and sustainable use of resources.	Establishes a legal mandate for environmental data collection and management, crucial for SEEA.	1999
Statistics Act, 2006	Establishes the legal basis for collecting, analysing, and disseminating statistical information, including environmental data.	Ensures legal support for the collection of environmental statistics required by SEEA.	2006
Climate Change Act, 2016	Provides a regulatory framework for enhancing climate resilience and low-carbon development.	Supports the integration of climate change metrics into economic accounting.	2016
Energy Act, 2019	Regulates energy production, distribution, and consumption, promoting renewable energy and energy efficiency.	Facilitates the integration of energy data into national accounts, supporting SEEA energy modules.	2019
Water Act, 2016	Regulates the management, conservation, use, and control of water resources in Kenya.	Provides essential data on water resources, a critical component of SEEA.	2016
Wildlife Conservation and Management Act, 2013	Provides for the protection, conservation, sustainable use, and management of wildlife in Kenya.	Supports the collection of data on biodiversity, contributing to SEEA ecosystem accounts.	2013
Sustainable Waste Management Act, 2022	Provides for the establishment of legal and institutional framework for the sustainable management of waste; ensure the realization of the constitutional provision on the right to a clean and healthy environment and for connected purposes	Supports data collection on waste generation and environmental management, crucial for SEEA Solid Waste accounts	2022
Regulatory Instruments			
Environmental (Impact Assessment and Audit) Regulations, 2003	*Sets requirements for conducting environmental impact assessments and audits for projects.*	*Ensures consistent data on environmental impacts, valuable for SEEA environmental accounts.*	*2003*

Category	Details	Relevance/Implications to SEEA	Year
Renewable Energy Regulations	*Promotes the use of renewable energy sources and sets standards for their production and distribution.*	*Encourages the integration of renewable energy data into SEEA energy accounts.*	*2012*
Greenhouse Gas Inventory System	*Establishes a system for tracking and reporting greenhouse gas emissions.*	*Provides essential data on greenhouse gas emissions, necessary for SEEA air emission accounts.*	*2016*
Water Resource Management Rules, 2007	*Provides regulations for the sustainable management and use of water resources.*	*Supports detailed water resource accounting, crucial for SEEA water accounts.*	*2007*
Waste Management Regulations, 2006	*Provides guidelines for the management, handling, and disposal of various types of waste.*	*Supports data collection on waste generation and management, crucial for SEEA material flow accounts.*	*2006*
Climate Change (Carbon Markets) Regulations, 2024	*Provides regulations for the carbon project development and management processes, an institutional framework, benefit sharing and direction on Kenya's engagement in Article 6 of the Paris Agreement.*	*Supports essential data collection on greenhouse gas emissions, necessary for SEEA air emission accounts.*	*2024*

Source: TRI Situational Analysis Data, 2023

5.3 Institutional Framework for Environmental-Economic Accounting in Kenya

Table 5.2 outlines the institutional framework for EEA in Kenya's tourism sector, detailing the roles of various public and private institutions. These entities can collaborate to collect, manage, and utilize environmental data specific to tourism, integrating it into national accounts to support sustainable tourism development and informed policy-making.

Table 5.2: Institutional Framework for Environmental-Economic Accounting

Type of Institution	Institution	Role
Public Institutions		
Government of Kenya	Ministry of Environment, Climate Change and Forestry	Oversees environmental policies, ensures implementation of SEEA, and coordinates data collection and management.
	Ministry of Energy and Petroleum	Provides data on energy production, consumption, and renewable energy sources for SEEA energy accounts.
	Ministry of Water, Sanitation and Irrigation	Supplies data on water resources, management, and usage, supporting SEEA water accounts.
	Ministry of Finance and National Planning	Integrate SEEA into national development plans and economic policies, ensuring resource allocation for SEEA activities.

Type of Institution	Institution	Role
	Kenya National Bureau of Statistics (KNBS)	Leads the compilation and dissemination of environmental-economic accounts, and ensures data quality and consistency.
	National Environment Management Authority (NEMA)	Collects environmental data, enforces regulations, and supports the development of SEEA frameworks.
	Kenya Forestry Service (KFS)	Provide data on forestry resources, contributing to SEEA land and ecosystem accounts.
	Kenya Wildlife Service (KWS)	Supply data on biodiversity and wildlife, supporting SEEA ecosystem and biodiversity accounts.
	Water Resources Authority (WRA)	Manage water resource data, crucial for SEEA water accounts.
	Ministry of Tourism and Wildlife	Provide data on tourism activities, impacts on natural resources, and supports SEEA tourism satellite accounts.
	Kenya Tourism Board (KTB)	Collect and provide data on tourism statistics, economic contributions, and environmental impacts, supporting SEEA tourism satellite accounts.
	Tourism Regulatory Authority (TRA)	Regulate and oversee standards in the tourism sector, collects data on compliance and performance for SEEA tourism accounts.
	Tourism Research Institute (TRI)	Conduct research and provides data on tourism trends, impacts, and sustainability, contributing to SEEA tourism accounts.
	Tourism Fund (TF)	Manage tourism revenues and funds projects, provides financial data relevant for SEEA tourism accounts.
Private Institutions		
Research Institutions	International Livestock Research Institute (ILRI)	Conduct research and provides data on agricultural and land use, contributing to SEEA land and ecosystem accounts.
	African Centre for Technology Studies (ACTS)	Research and provide data on sustainable development and environmental management for SEEA.
	Strathmore University's Energy Research Centre	Provide research and data on renewable energy and energy efficiency for SEEA energy accounts.

Type of Institution	Institution	Role
Non-Governmental Organizations (NGOs)	World Wide Fund for Nature (WWF) Kenya	Supply data on conservation efforts, biodiversity, and ecosystem services, supporting SEEA ecosystem accounts.
	Green Belt Movement	Provide data on reforestation, land restoration, and climate action, contributing to SEEA land accounts.
Private Sector	Kenya Association of Manufacturers (KAM)	Offer data on industrial production, waste management, and resource use, relevant for SEEA material flow accounts.
	Kenya Private Sector Alliance (KEPSA)	Advocate for sustainable business practices, promotes SEEA adoption among private sector entities.
	Kenya Renewable Energy Association (KEREA)	Provide data on renewable energy projects, supporting SEEA energy accounts.
	Eco-tourism Kenya	Promote sustainable tourism practices, collects data on eco-tourism activities, and supports SEEA tourism accounts.
	Kenya Association of Hotelkeepers and Caterers (KAHC)	Provide data on hotel and catering industry performance, resource use, and waste management, supporting SEEA material flow accounts.
	Kenya Association of Tour Operators (KATO)	Supply data on tour operations, resource use, and environmental impacts, relevant for SEEA tourism accounts.
	Kenya Association of Travel Agents (KATA)	Provide data on travel trends and agency operations, supporting SEEA tourism satellite accounts.
	Kenya Tourism Federation (KTF)	Coordinate efforts among tourism stakeholders, collects sector-wide data for SEEA tourism accounts.
	Kenya Coast Tourism Association (KCTA)	Provide data on coastal tourism activities, impacts on marine resources, and supports SEEA coastal and marine accounts.

Source: TRI Situational Analysis Data, 2023

5.4 Status of Tourism Environmental Reporting

To assess the status of environmental reporting by tourism enterprises, the study interviewed key informants from the tourism sector and conducted FGDs across the country. The following section presents the results of the qualitative data analysis on the status of environmental-economic accounting by tourism enterprises:

5.4.1 Tourism Enterprises Environmental Reporting on Energy

Results from FGDs and KIIs revealed that tourism enterprises primarily rely on billing services from energy suppliers like Kenya Power for energy use documentation, which aids in financial

audits and comparisons. Internal reporting, especially for solar power, was common but lacked formal systems or mandatory requirements, leading to regulatory gaps and hindering comprehensive energy management. As one participant noted:
"You cannot maybe record in terms of output, but you can record in terms of the amount you are using from the billing services (Kenya Power), because this one is good for auditing. It will help you by the end of the year, you are supposed to know whether the amount you used in terms of energy for the previous year is going down vis-a-vis the amount you are using for this year" [FGD003].

5.4.2 Tourism Enterprises Environmental Reporting on GHG Emissions

The findings from KIIs and FGDs revealed a lack of documentation and reporting on greenhouse gases among tourism enterprises in Kenya. Most respondents from both focus group discussions and key informant interviews noted the absence of such practices, with many simply stating "No documentation" or "We don't do that." Overall, the tourism sector lacks systematic approaches to measuring and reporting greenhouse gas emissions, highlighting the need for more structured and consistent efforts to enhance environmental accountability and sustainability practices. Participants attributed the absence of these practices to a lack of knowledge, tools, and the perception that it is expensive, as highlighted in the excerpt:

"We have not yet……. So expensive……We don't know how to measure……We do not have the tools," noted participants [FGD002].

Nevertheless, there are instances of awareness and application in sectors like travel and hospitality, indicating potential for broader implementation. A notable example is an organization actively engaged in carbon accounting. One participant affirmed, *"We are a big fan of carbon accounting. So, we measure our footprint and we do this based on data*" [FGD011].

5.4.3 Tourism Enterprises Environmental Reporting on Solid Waste

The findings from the FGDs and KIIs indicate a diverse approach to waste management documentation and reporting among tourism enterprises in Kenya. Some enterprises engage in systematic tracking of waste using spreadsheets, report books, and kitchen stock forms, with detailed segregation and weighing of different waste types. Regular meetings are held to review waste reduction strategies, as noted by one participant:

"Any kind of waste is recorded... Now, solid waste, will include organic waste, recyclable... it's weighed and known this is waste that has been generated from either kitchen, workshop, construction, and all that" [FGD008].

In contrast, other enterprises show sporadic or absent documentation practices, often conducting internal reporting without informing external stakeholders, highlighting the lack of comprehensive monitoring and standardized reporting requirements across the sector.

The findings also reveal inconsistencies in waste measurement practices among tourism enterprises. Some organizations measure waste in kilograms and maintain daily records, while others lack measurement practices entirely, focusing on basic segregation or facing capacity

issues. Despite ambitions for accurate waste measurement, skepticism about its practicality and reliability persists. As one participant mentioned,

"They do not measure the amount of solid waste that they produce... most hotels do not measure because of lack of mechanisms or capacity to measure. No waste is documented" [FGD006].

Additionally, some enterprises rely on alternative waste management methods like biogas instead of precise measurement. These findings underscore the need for improved measurement skills, capacity building, and consistent policies to enhance waste management practices in Kenya's tourism sector.

5.4.4 Tourism Enterprises Environmental Reporting on Water Use

Findings on water use documentation by tourism enterprises in Kenya reveal varied practices. Some enterprises track water usage daily, weekly, and monthly through record books and metering in guest rooms, aiding in accounting and consumption decisions. As one respondent noted, "We document that on a daily basis. There is a record book and there are employees in the repairs and maintenance department who do that" [FGD002]. Certain businesses employ metering systems to monitor water usage in specific areas such as laundry, kitchens, and guest rooms, measuring consumption in litres or cubic meters. Enterprises with boreholes are required to measure monthly water extraction as part of permit compliance, with one participant stating, "If you have a borehole, there is that permit that allows you to every month measure how much water you extract from the ground" [FGD005]. Additionally, some tourism businesses record daily water levels for accountability and rely on monthly readings from external water suppliers.

However, the sector faces significant challenges in water use documentation and reporting. Standardized reporting is often lacking, with many enterprises not documenting borehole or municipal water. Reporting usually occurs only for billing purposes, as noted by one respondent: "Then in reporting, this is documented because every month you receive your bills in your various sectors, then you document on what you've used, how much you've paid for it" [FGD006]. Many establishments lack formal measurement systems, with some only reporting issues when there is a disruption in the water supply, as highlighted by a participant: "The only time you're going to report about water is maybe if you don't have a connection, you've not received water" [FGD006]. This inconsistency in documentation practices underscores the need for clearer guidelines, improved measurement skills, and robust reporting mechanisms to ensure sustainable water management in Kenya's tourism sector.

5.5 Core Accounts for Tourism Industries

5.5.1 Classification Tourism Enterprises by the Tourism Satellite Account Recommended Methodological Framework -2008

The study utilized the TSA-RMF 2008 to classify tourism enterprises. This standardized methodology, developed by the United Nations Statistics Division (UNSD) and endorsed by the UNWTO, facilitates the systematic measurement and analysis of the economic impact

of tourism. Aligned with the System of National Accounts (SNA), the framework categorizes tourism industries into eleven groups, including accommodation services, food and beverage serving services, various passenger transport services, transport equipment rental services, travel agencies, cultural services, sports and recreational services, and retail trade of country-specific tourism characteristic goods. This classification ensures consistency in measuring value added and GDP from a national accounting perspective (Recchini, 2023). Table 5.3 displays the classification of tourism industries surveyed by the TSA-RMF 2008 across the seven regions. For brevity, passenger transport services are aggregated into one category.

Table 5.3: Frequency of tourism enterprises surveyed by TSA-RMF classification and regions

	Proportion (%) by TSA RMF and tourism region								
TSA RMF classification	**Nairobi**	**Rift Valley**	**Maasai & Amboseli**	**Eastern**	**Western**	**Coastal**	**Central**	**Total (n)**	**% Frequency by TSA-RMF**
Accommodation Services	2.76	3.43	2.01	0.33	8.54	13.05	4.52	414	34.64
Food & Beverage Services	5.02	3.85	1.42	0.17	2.51	1.67	2.18	201	16.82
Passenger Transport	0.08	0.08	0.00	0.00	0.00	4.10	0.00	51	4.27
Transport Equip. Hire	5.27	0.00	0.33	0.00	0.00	0.08	0.00	68	5.69
Travel Agency & Reservations	19.58	0.84	1.42	0.00	0.08	2.93	1.59	316	26.44
Cultural Services	0.00	0.00	0.00	0.00	0.00	0.08	0.08	2	0.17
Sports and Recreation	0.75	0.42	0.17	0.00	0.00	2.34	0.17	46	3.85
Retail of tourism commodities	3.10	0.00	1.00	0.00	0.08	2.51	0.00	80	6.69
Other Tourism Services	1.17	0.00	0.08	0.00	0.00	0.08	0.08	17	1.42

Source: TRI Situational Analysis Data, 2023

Table 5.3 unveils the classification of 1,195 enterprises based on the TSA-RMF 2008 criteria. Notably, Class H enterprises under the Tourism Act 2011 categorization (n = 56) were omitted from the TSA-RMF classification. This exclusion is attributed to the fact that Class H enterprises, which are institutions offering tourism training, deviate from the criteria outlined in TSA-RMF 2008, owing to differences in operational characteristics.

The results presented in Table 5.3 affirm that enterprises specializing in tourism hospitality services constitute the majority, comprising over half of the sample (n = 615, 52%). This underscores the economic significance of the hospitality sector within the country's tourism industry. Following closely is travel agency and reservation services, accounting for 26% (n = 316), indicating a noteworthy presence and importance of these services in Kenya's tourism sector.

The remaining 22% of the sample were other tourism enterprises. This highlights the diversity and representativeness of the study sample, reinforcing the claim that the baseline study adequately provides insights into climate change impacts and sustainability practices across various sectors of the tourism industry in the country.

For purposed of constructing the core accounts, the tourism industry activities in table 5.3 were aggregated into five (5) key tourism industries as defined by the TSA (UNWTO & UNSD, 2008):

i. Accommodation for visitors' services
ii. Food and beverage serving services
iii. Passenger transport (encompassing railway, air, road, water transport, and transport equipment hire)
iv. Travel agencies and reservation services
v. Cultural services, sports, and recreation services, country-specific tourism goods and services (aggregated as others)

5.6 Energy Accounts

The study collected primary survey, administrative, and secondary data to compile initial energy physical flow accounts for tourism sector activities in Kenya. These accounts record energy flows in physical units (i.e., joules) from the initial extraction from the environment into the economy, the flows within the economy in the form of supply and use of energy products by industries, including tourism industries and households, and finally, the flows of energy back to the environment (as energy residuals). The accounts are based on the Kenya National Bureau of Statistics (KNBS) SEEA-Energy accounts for 2022. The most recent SEEA energy account and energy balances for 2022, published by the KNBS in 2023, served as a primary source of secondary data for constructing the country’s initial SEEA-energy account for the tourism sector in this study.

The following section describes the compilation of the physical supply and use tables (PSUT) for tourism industries. The industries are aggregated into categories including accommodation for visitors, food and beverage services for visitors, passenger transport (road, railway, air, and water), travel agencies and reservation services, and other tourism industries.

5.6.1 Physical Supply Tables -Energy

The PST records the physical flows of energy from natural inputs, including renewable energy sources like solar, wind, hydro, geothermal, and biomass wood, from the environment into the economy, including tourism industries. The rows of the table also capture imports of energy products into the economy from the rest of the world and the production of energy products by the Electricity, Gas, Steam, and Air Conditioning Supply Industries.

The International Recommendations for Energy Statistics (IRES) describes energy products as those exclusively or mainly used as a source of energy directly (e.g., electricity) and products that release energy during some chemical or other processes, such as combustion. Peat, biomass, and waste are conventionally regarded as energy products when used for energy purposes. Additionally, the table records energy residuals generated by industries, including waste converted into energy. Energy residuals may also include other energy by-products, particularly heat generated when end users (either households or enterprises) use energy products for energy purposes (e.g., household lighting) (SEEA, 2016).

5.6.1.1 Energy Flows from Natural Inputs -2022

The study captured secondary data on energy flows from natural inputs, including hydro, solar, wind, geothermal, and biomass, during the year 2022 as recorded in the KNBS Economic Survey, 2023 (KNBS, 2023). Table 5.4 aggregates the flow of natural energy inputs from the environment in 2022 and highlights the natural energy mix (%) for the country during the period under focus.

Table 5.4: Natural Energy Inputs Flows -2022

Natural Energy Inputs	Flow from the Environment (TJ)	Percentage of Total (%)
Solar	1,381.40	0.00
Wind	7,714.91	0.01
Hydro	10,943.55	0.02
Thermal	19,863.18	0.03
Biomass	562,954.40	0.93
Total	**602,857.44**	**1.00**

Source: KNBS, 2023

Table 5.4 illustrates that in 2022, Kenya extracted 602,857.44 terajoules (TJ) of energy from the environment. Biomass dominated the energy mix, constituting a substantial 93%. Households extracted approximately 99% of biomass wood energy (559,477.3 TJ), with the remaining portion extracted by manufacturing industries. Thermal and hydro energies accounted for 3% and 2% respectively, while wind and solar energies combined made up less than 2% of the total natural energy flows from the environment. Results in Table 5.4 provide input for the flows of energy from natural inputs from the environment in the energy PST

5.6.1.2 Energy Products Imports in 2022

In the same year, the economy imported energy products from the rest of the world. Table 5.5 records the flow of energy products from other economies into the Kenyan economy, measured in kilojoules.

Table 5.5: Energy Products Imports in 2022

Energy Products Supply	Imports from Rest of the World (TJ)	Percentage of Total Imports (%)
Electricity	1,137.61	4.38
Coal and Coke	4,888.06	18.83
Motor Spirit Petroleum (petrol)	5,528.91	21.29
Aviation gasoline	5.78	0.02
Jet fuel	2,760.93	10.63
Kerosene	15.98	0.06
Light Diesel	8,380.31	32.28
Fuel oils n.e.c.	1,847.49	7.12
Lubricating oils	25.01	0.10
Lubricating greases	11.50	0.04
Liquefied Petroleum Gas (LPG)	1,354.43	5.22
Others	7.52	0.03
Total	**25,963.53**	**100.00**

Source: KNBS, 2023

Table 5.5 indicates that in 2022, the primary energy product imports were motor spirit petroleum (petrol) and light diesel, utilized in manufacturing, transportation, and thermal energy generation industries, collectively constituting 54% of the total imports. Coal and coke comprised a significant 19% of the imports, while approximately 2,761 TJ of jet fuel, representing 11% of the energy product imports, were brought into the economy in 2022. Results in table 5.5 provide input on the flow of energy products from the rest of the world (ROW) in the PST.

5.6.1.3 Generation of Energy Products by Industries and Households in 2022

The SEEA-Energy PST records energy products produced by industries classified under International Standard Industrial Classification (ISIC) division D, involved in the generation, distribution, or sale of electricity, gas, steam, and air conditioning, as well as households. Table 5.6 presents excerpts from Kenya's SEEA Energy account (KNBS, 2023), illustrating the supply of energy products by industries and households in 2022.

Table 5.6: Generation of Energy Products by Industries and Households in 2022

Energy Product	Electricity, Gas, Steam and Air Conditioning Supply Industries (TJ)	Accommodation for visitors & Food & Beverage Serving Services	Households (TJ)	Total
1. Electricity	45,609.70		-	**45,609.70**
2. Charcoal	111.46	237.9	43,008.66	**43,358.02**
3. Firewood	2,723.78	402.9	498,490.26	**501,616.94**
4. Others	-		17,978.40	**17,978.40**
Total	**48,444.94**	**640.8**	**559,477.32**	**608,563.06**

Source: KNBS, 2023 and TRI situational analysis data, 2023

Table 5.6 illustrates that in 2022, industries (Electricity, Gas, Steam, and Air Conditioning Supply Industries, Accommodation, and Food and Beverage serving services) and households added together transformed 501,616.94 TJ of biomass wood into firewood and 43,385.02 TJ into charcoal. The supply of firewood from biomass by households and industries constituted 41% of the total energy supply in the economy for the year, highlighting the country's dependence on biomass wood. Meanwhile, industries such as Kengen, Independent Power Producers (IPPs), REREC, and off-grid generation transformed a total of 45,609.70 TJ of energy into electricity, representing 4% of the energy available in the country in 2022.

The SEEA-Energy account anticipates the conversion of natural energy inputs by industries into electricity for own consumption. According to the KNBS (2023) energy account for Kenya, in 2022, an insignificant 265.2 TJ of electricity (0.02%) was generated from natural energy sources (solar, wind, and hydro) by industries. Similarly, a national baseline survey of tourism enterprises (n = 1253) conducted for the current study revealed that only 5% (n = 69) of the tourism enterprises generated their own electricity off-grid. The enterprises that generated their own electricity were mainly those offering accommodation to visitors and food and beverage service providers (n = 52).

Table 5.6 provides input on generation of energy by Electricity, Gas, Steam, and Air Conditioning Supply Industries and households in the PST.

5.6.2 Physical Use Tables -Energy

The Physical Use Tables (PUT) are structured similarly to the SEEA-CF 2008, presenting energy usage within the economy by economic agents; industries, households, accumulations, and flows into the rest of the world and environment in a particular year, captured in physical quantities (Terra Joules).

These tables are divided into rows that document the extraction and utilization of energy from natural inputs, primarily by electricity, gas, steam, and air conditioning supply industries, other industries (e.g., manufacturing), and households. In the case of Kenya, natural energy products encompass renewable resources extracted from the environment—such as solar,

wind, hydro, geothermal, and biomass wood. The rows also encompass the use of energy products disaggregated by the Standard for International Energy Classification (SIEC) and the flow of energy residuals from extraction, transformation, and losses due to transmission.

The columns of the table record intermediate energy consumption by tourism industries classified according to the TSA-RMF, 2008, into Accommodation, Food and Beverage, Passenger transport, Travel agencies and reservations, and others. They also capture intermediate energy consumption by other industries in the economy and final consumption by households. Additionally, other columns in the table document flows of energy products to the rest of the world as exports, accumulation/stock, and flows to the environment.

5.6.2.1 Natural Energy Inputs Usage in Kenya, 2022

The study acquired secondary data on the usage of natural energy inputs in the Country in 2022. This encompassed the consumption of natural energy inputs by the electricity and gas industries for energy production and distribution, the consumption of natural energy inputs by other industries (e.g., manufacturing), as well as household final consumption of natural energy inputs. The data was sourced from the SEEA-Energy Account for Kenya, in 2022 (KNBS, 2023). Table 5.7 presents a summary of the results of natural energy input usage in the country for the year 2022.

Table 5.7: Natural Energy Inputs Usage in Kenya, 2022

Natural Energy Inputs	Electricity, Gas, Steam and Air Conditioning Supply (TJ)	Manufacturing (TJ)	Accommodation for visitors & Food & Beverage Serving Services	Households (TJ)
1. Solar	1,381.40			-
2. Wind	7,714.91			-
3. Hydro	10,943.55			-
4. Geothermal	19,863.18			-
5. Co-Generation	0.97			-
6. Biomass Wood		2,835.30	640.80	559,477.30
Total	**39,904.01**	**2,835.30**	**640.80**	**559,477.30**

Source: KNBS, 2023 and TRI situational analysis data, 2023

The results in Table 5.7 reveal that 93% of this energy was consumed by households, mainly as energy from biomass used for the production of domestic firewood and charcoal, highlighting the economy's excessive reliance on this energy source. A significant 2,835.30 TJ of biomass wood was also utilized in production processes by manufacturing industries and 640.80 TJ of biomass wood was used for accommodation, food, and beverage services for visitors. Additionally, 39,904.01 TJ of wind, solar, hydro, and geothermal energy was consumed by the energy generation industry for electricity production and distribution.

Table 5.7 provides input on natural energy usage by electricity, gas, steam and air-conditioning supply industries, other industries – manufacturing, tourism industries, and households in the energy PUT

5.6.2.2 Intermediate, Final Consumption and Export of Energy Products in Kenya, 2022

The study obtained data on intermediate and final consumption of energy products from the Kenya SEEA-Energy Account for the year 2022. The data collection focused on key energy products, including petrol, diesel, electricity, kerosene, LPG, firewood and charcoal, jet fuel & aviation gas, fuel oils n.e.c, and lubricants. Intermediate consumption by industries was categorized into consumption by tourism sector activities and consumption by all other industries in the economy. Table 6.8 provides a detailed breakdown of intermediate energy product usage by both the tourism sector and other industries within the economy for the year 2022. Tourism sector energy uses are explicitly captured in the “Accommodation and Food Service activities” and include activities in the “transport and storage” industries as well as energy uses in the activities of “other commercial sectors”.

However, the results in 5.7 lack adequate detail on intermediate consumption by tourism sector activities. This limitation arises from the aggregation approach employed in constructing the SEEA-Energy Account. In this structure, consumption by the tourism sector is encompassed within the accommodation, food and beverage service activities. Additionally, tourism transport activities—encompassing road, rail, air, and water passenger transport—are consolidated under the broader category of transport and storage, and some tourism activities are implicit in the “other commercial sectors”.

5.6.2.3 Energy Products Usage by Tourism Enterprises in 2022

The study relied on primary data from a survey of tourism enterprises across the country to gain insight into the pattern of energy consumption by tourism enterprises across the TSA five classes. Table 5.8 summarizes the results of average monthly energy consumption by enterprises in the five categories.

Table 5.8: Intermediate and Final Energy Products Consumption -2022

Energy Product Consumption (TJ)												
Economic Sector	**Electricity**	**Coal and Coke**	**Motor Spirit Petroleum (petrol)**	**Aviation gas**	**Jet fuel**	**Kerosene**	**Light Diesel**	**Fuel oils n.e.c.**	**Lubricating oils & greases**	**Liquefied Petroleum Gas (LPG)**	**Charcoal & Wood fuel**	**Others**
Accom. for visitors	771.51	0.00	92.71	0.00	0.00	10.35	128.35	0.27	0.96	25.79	402.86	0.00
F&B Serving Services	455.54	0.00	54.74	0.00	0.00	1.12	75.79	0.16	0.57	15.23	237.87	0.00
Passenger Transport	3,451.10	0.00	414.71	0.14	87.15	0.04	574.14	47.85	4.29	10.80	0.00	0.00
Travel Ag. & Res.	211.17	0.00	25.38	0.00	0.00	0.92	35.13	9.13	0.26	2.34	0.00	0.00
Others Tsm. Industries	161.29	0.00	19.38	0.00	0.00	0.00	26.83	0.00	0.20	1.79	0.00	0.00
Total Tsm. Industries	5,050.60	0.00	606.92	0.14	87.15	12.43	840.24	57.41	6.28	55.95	640.73	0.00
Elec. and Gas Supply	153.98	0.00	0.00	0.00	0.00	0.00	-8.52	738.80	4.19	0.00	0.00	0.00
Other industries	19,151.28	4,858.99	4,264.25	3.78	2,354.03	49.76	6,529.92	613.31	35.42	176.13	2,835.35	0.00
Households	11,674.19	0.00	0.00	0.00	0.00	310.00	0.00	0.00	0.00	1,164.63	541,498.92	0.00
Accumulation	0.00	0.00	657.73	1.55	318.54	-356.19	979.11	350.40	-114.08	-43.54	0.00	7.16
ROW	76.84	29.11	0.00	0.33	1.18	0.00	39.55	87.28	104.68	1.23	0.00	0.71
Environment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**36,106.90**	**4,888.10**	**5,528.90**	**5.80**	**2,760.90**	**16.00**	**8,380.30**	**1,847.20**	**36.50**	**1,354.40**	**544,975.00**	**7.87**

Table 5.8 depicts the intermediate and final uses of energy products in the year 2022. Table 6.8 shows that in 2022, the tourism sector was a significant energy consumer, using 14% of the electricity supplied by the Electricity, Gas, Steam, and Air Conditioning sector (5,050.60 TJ) and substantial amounts of motor spirit petroleum (11%) and light diesel (10%). Other notable energy sources included LPG and lubricating oils and greases, primarily for passenger transport. Despite this high consumption, only 5% of tourism enterprises produced energy from biomass, generating 640.73 TJ, a small fraction compared to the 544,334.27 TJ used by other industries and households, highlighting the sector's reliance on conventional energy sources.

Figure 5.2: shows the use of energy products by the tourism sector.

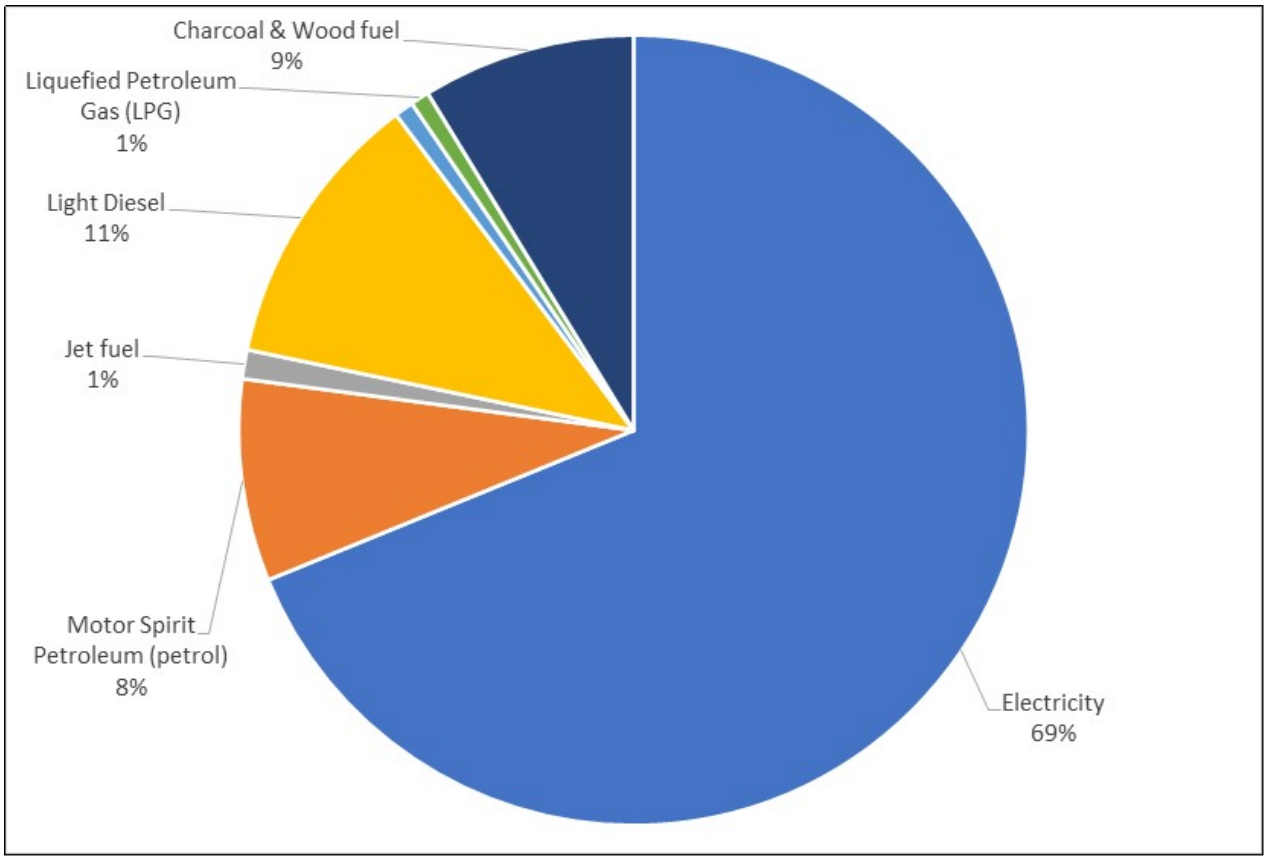

Figure 5.2: Intermediate Use of Energy Products by Tourism Industries in The Year 2022

Source: TRI situational analysis data, 2023, KNBS, 2023

Figure 5.2 shows the energy product mix as a percentage of total energy product intermediate consumption by tourism enterprises in Kenya (7,357.85TJ). The figure shows that electricity makes up 69% (5,050.60TJ), Other significant energy products consumed by tourism enterprises include light diesel 11% (840.24 TJ), charcoal and wood fuel 9% (640.73TJ) and petroleum 8% (606.92TJ).

5.6.2.4 Tourism Share of Intermediate Energy Products Consumption -2022

In terms of energy product utilization within production processes, it's noteworthy that these products may be acquired for various purposes, including those related to tourism, thus contributing to environmental flows associated with tourism demand (Costantino, 2017). This observation applies to both tourism-related and other industries' outputs. In practical terms,

expenditures in tourism represent a substantial portion of the supply within tourism industries, while the majority of outputs from other industries are intended for non-tourism purposes (UNWTO, Glossary of Tourism terms). Consequently, the proportion of tourism-related acquisitions of products may significantly differ between tourism-specific activities and those of other industries. For instance, the share of tourism-related expenditure in accommodation services is likely to be considerably higher compared to that in transport and storage industries (Costantino, 2017)

Based on Costantino (2017), the study calculated tourism's share of intermediate energy consumption using output share ratios derived from the Kenya Tourism Satellite Account (TSA)-2019 (TRI, 2020). Due to the absence of direct data, these ratios were utilized to estimate the proportion of environmental flows (including water, energy, GHG emissions, solid waste, etc.) associated with visitor activities and thus attributable to tourism within each tourism industry. The TRI data from TSA-2019 provided the most recent output ratios available, and the study assumed stability in these ratios from 2019 to 2022 when computing the proportion of environmental flows attributable to tourism in 2022. Table 5.9 presents the computed tourism output ratios.

Table 5.9: Tourism Output Ratios

Tourism Sector	Output	Tourism share	Tourism Ratio (%)
Accommodation for visitors' service	130,245	116,092	0.89
Food and beverage serving services	76,904	61,287	0.80
Railway passenger transport	2,966	2,465	0.83
Road passenger transport	436,320	165,248	0.38
Water passenger transport	2,140	218	0.10
Air passenger transport	141,182	78,658	0.56
Transport and equipment rental	5,590	5,524	0.99
Travel agencies and the reservation industry	30,059	28,216	0.94
Cultural services	15,918	4,635	0.29
Sports and recreation services	11,310	11,273	1.00
Total	**852,634**	**473,616**	**0.56**

Source: Tourism Research Institute, 2020

To determine the share of energy usage in various sectors attributable to tourism, tourism ratios were aggregated from Table 5.9 as follows: accommodation services for visitors (89%), food and beverage serving services (80%), passenger transport (including railway, road, water, and air transport) (42%), travel agencies and reservation services (including car hire) (95%), and other tourism industries such as cultural services, sports, and recreation services (58%). These ratios were then applied to the energy consumption data for relevant tourism industries by multiplying the energy consumption of each sector by its corresponding tourism ratio. This calculation provided the share of energy usage by tourists, reflecting tourism's impact

on energy consumption for the year under consideration. Table 5.10 presents the energy consumption by tourism-specific industries attributable to tourism expenditure in the country. Table 5.10 suggests that 58% (4,281.83 TJ) of the tourism industries' total intermediate energy consumption (7,357.9 TJ) was attributable to expenditures by tourists on tourism goods and services.

Table 5.10: Tourism Share of Intermediate Energy Products Consumption by Tourism Industries in 2022

Energy Products	Accommodation for Visitors		Food & Beverage Serving Services		Passenger Transport		Travel Agencies and Reservation Services		Other tourism industries		Tourism Industries	
	Tourism Share	Total	Tourism Share	Total	Tourism Share	Total	Tourism Share	Total	Tourism Share	Total	Tourism Share	Total
Electricity	687.65	771.51	363.02	455.54	1,460.85	3,451.10	199.87	211.17	94.24	161.29	2,805.63	5,050.60
Coal and Coke	-	-	-	-	-	-	-	-	-	-	-	-
Motor Spirit Petroleum (petrol)	82.63	92.71	43.62	54.74	175.55	414.71	24.02	25.38	11.32	19.38	337.15	606.92
Aviation gasoline	-	-	-	-	0.06	0.14	-	-	-	-	0.06	0.14
Jet fuel	-	-	-	-	36.89	87.15	-	-	-	-	36.89	87.15
Kerosene	9.22	10.35	0.89	1.12	0.02	0.04	0.87	0.92	-	-	11.01	12.43
Light Diesel	114.40	128.35	60.39	75.79	243.03	574.14	33.25	35.13	15.68	26.83	466.76	840.24
Fuel oils n.e.c.	0.24	0.27	0.13	0.16	20.26	47.85	8.64	9.13	-	-	29.26	57.41
Lubricating oils &greases	0.86	0.96	0.45	0.57	1.82	4.29	0.25	0.26	0.12	0.20	3.49	6.28
Liquefied Petroleum Gas (LPG)	22.99	25.79	12.14	15.23	4.57	10.80	2.21	2.34	1.04	1.79	42.96	55.95
Charcoal & Wood fuel	359.07	402.86	189.56	237.87	-	-	-	-	-	-	548.63	640.73
Others	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL USE	**1,277.06**	**1,432.81**	**670.21**	**841.02**	**1,943.04**	**4,590.22**	**269.12**	**284.33**	**122.40**	**209.49**	**4,281.83**	**7,357.86**

Source: KNBS, 2023

5.6.2.5 Balanced Energy Account for Tourism Enterprise

Tables 5.11 and 5.12 present the balanced energy physical supply and use tables for the tourism industries in Kenya for 2022. Table 5.11 (PST) highlights the flow of energy from the natural environment, the import of energy products from the rest of the world (ROW), the conversion of renewable energy sources into electricity by the Electricity, Gas, Steam, and Air Conditioning Supply industries, and the conversion of biomass into wood fuels and charcoal by households, tourism industries, and other sectors. Table 5.12 (PUT) details the intermediate consumption of energy products by tourism industries and other sectors, the final energy consumption by households, accumulation, exports of energy products, and the flow of energy residuals into the environment.

Table 5.11: Physical Supply Table for Kenya's Tourism Sector - Energy Account - 2022

PHYSICAL ENERGY SUPPLY TABLES																			
	Tourism Industries												Other Industries						
	Accommodation for Visitors		Food and Beverage Serving Services		Passenger Transport		Travel Agencies & Reservations		Others Tourism Industries		Total Tourism industries		Gas, Steam, and Air Conditioning Supply	Other Industries	H/holds	Accum.	ROW	Environment	Total
	TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total							
Energy from Natural Inputs																			
Solar																		1,381.40	1,381.40
Wind																		7,714.91	7,714.91
Hydro																		10,943.55	10,943.55
Thermal																		19,863.18	19,863.18
Biomass																		562,954.40	562,954.40
Energy Products																			
Electricity													45,609.70				1,137.61		46,747.31
Coal and Coke																	4,888.06		4,888.06
Motor Spirit Petroleum (petrol)																	5,528.91		5,528.91
Aviation gasoline																	5.78		5.78
Jet fuel																	2,760.93		2,760.93
Kerosene																	15.98		15.98
Light Diesel																	8,380.31		8,380.31
Fuel oils n.e.c.																	1,847.16		1,847.16
Lubricating oils																	25.01		25.01
Lubricating greases																	11.50		11.50
Liquefied Petroleum Gas (LPG)																	1,354.43		1,354.43
Firewood	359.07	402.9	189.56	237.9							548.63	640.73		2,835.30	541,498.92		-		544,974.95
Others															17,978.40		7.83		17,986.23
Energy Residuals															-	-	-	-	-
Energy from Solid Waste)															-	-	-	-	-
TOTAL SUPPLY	**359.069**	**402.860**	**189.559**	**237.870**							**548.628**	**640.73**	**45,609.70**	**2,835.30**	**559,477.32**	-	**25,963.51**	**602,857.44**	**1,237,384.00**

Source: KNBS, 2023. TRI situational analysis data, 2023

Table 5.12: Physical Use Table for Kenya's Tourism Sector - Energy Account – 2022

PHYSICAL USE TABLES																			
	Intermediate Consumption; Use of Energy preoducts and Receipt of Energy Losses														Final Consumption				
	Tourism Industries												Other Industries						
	Accommodation for visitors		Food and Beverage Serving Services		Passenger Transport		Travel Agencies & Reservations		Others Tourism Industries		Total Tourism industries		Electricity and Gas Supply	Other Industries	H/holds	Accumulation.	ROW	Envi	Total
									Tourism Industries										
	TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total							
Energy from Natural Inputs																			
Solar													1,381.40						1,381.40
Wind													7,714.91						7,714.91
Hydro													10,943.55						10,943.55
Thermal													19,863.18						19,863.18
Biomass														3,476.00	559,477.30				562,953.30
Co-generation													0.97						0.97
Energy Products																			
Electricity	687.6	771.51	363.02	455.54	1,460.85	3,451.10	199.87	211.17	94.24	161.29	2,805.63	5,050.60	153.98	19,151.28	11,674.19		76.84		36,106.90
Coal and Coke	-	-	-	-	-	-	-	-	-	-	-	-		4,858.99			29.11		4,888.10
Motor Spirit Petroleum(petro	82.6	92.71	43.62	54.74	175.55	414.71	24.02	25.38	11.32	19.38	337.15	606.92		4,264.25		657.73	-		5,528.90
Aviation gasoline	-	-	-	-	0.06	0.14	-	-	-	-	0.06	0.14		3.78		1.55	0.33		5.80
Jet fuel	-	-	-	-	36.89	87.15	-	-	-	-	36.89	87.15		2,354.03		318.54	1.18		2,760.90
Kerosene	9.2	10.35	0.89	1.12	0.02	0.04	0.87	0.92	-	-	11.01	12.43		49.76	310.00	- 356.19	-		16.00
Light Diesel	114.4	128.35	60.39	75.79	243.03	574.14	33.25	35.13	15.68	26.83	466.76	840.24	- 8.52	6,529.92		979.11	39.55		8,380.30
Fuel oils n.e.c.	0.2	0.27	0.13	0.16	20.26	47.85	8.64	9.13	-	-	29.26	57.41	738.80	613.31		350.40	87.28		1,847.20
Lubricating oils &greases	0.9	0.96	0.45	0.57	1.82	4.29	0.25	0.26	0.12	0.20	3.49	6.28	4.19	35.42		- 114.08	104.68		36.50
Liquefied Petroleum Gas (LP(	23.0	25.79	12.14	15.23	4.57	10.80	2.21	2.34	1.04	1.79	42.96	55.95		176.13	1,164.63	- 43.54	1.23		1,354.40
Charcoal & Woodfuel	359.1	402.86	189.56	237.87	-	-	-	-	-	-	548.63	640.73	-	2,835.35	541,498.92	-	-		544,975.00
Others	-	-	-	-	-	-	-	-	-	-	-	-			-	7.16	0.71		7.87
Energy Residuals	-		-		-		-		-		-								
Extraction	-		-		-		-		-		-							17,978.40	17,978.40
Transformation	-		-		-		-		-		-								-
Losses	-		-		-		-		-		-							10,640.39	10,640.39
TOTAL USE	**1,277.1**	**1,432.81**	**670.21**	**841.02**	**1,943.04**	**4,590.22**	**269.12**	**284.33**	**122.40**	**209.49**	**4,281.83**	**7,357.86**	**40,792.47**	**44,348.22**	**1,114,125.04**	**1,800.68**	**340.91**	**28,618.79**	**1,237,383.97**

Source: KNBS, 2023. TRI situational analysis data, 2023

The Tourism sector PSUT (Tables 5.11 and 5.12) confirms that tourism and other industries produce a minimal amount of energy products, such as wood fuel and firewood for their own consumption, accounting for less than 1% of total biomass energy products, compared to households, which produce 99%. Additionally, although 5% of surveyed tourism enterprises reported generating their own electricity from renewable energy sources like solar and wind, the overall electricity production by tourism industries is negligible. The tables support the notion that tourism is a significant consumer of electricity, accounting for 14% of total energy product consumption (5,050.6 TJ), as well as fossil fuel products, including motor spirit petroleum (11%, 606.92 TJ) and light diesel (10%, 840.24 TJ).

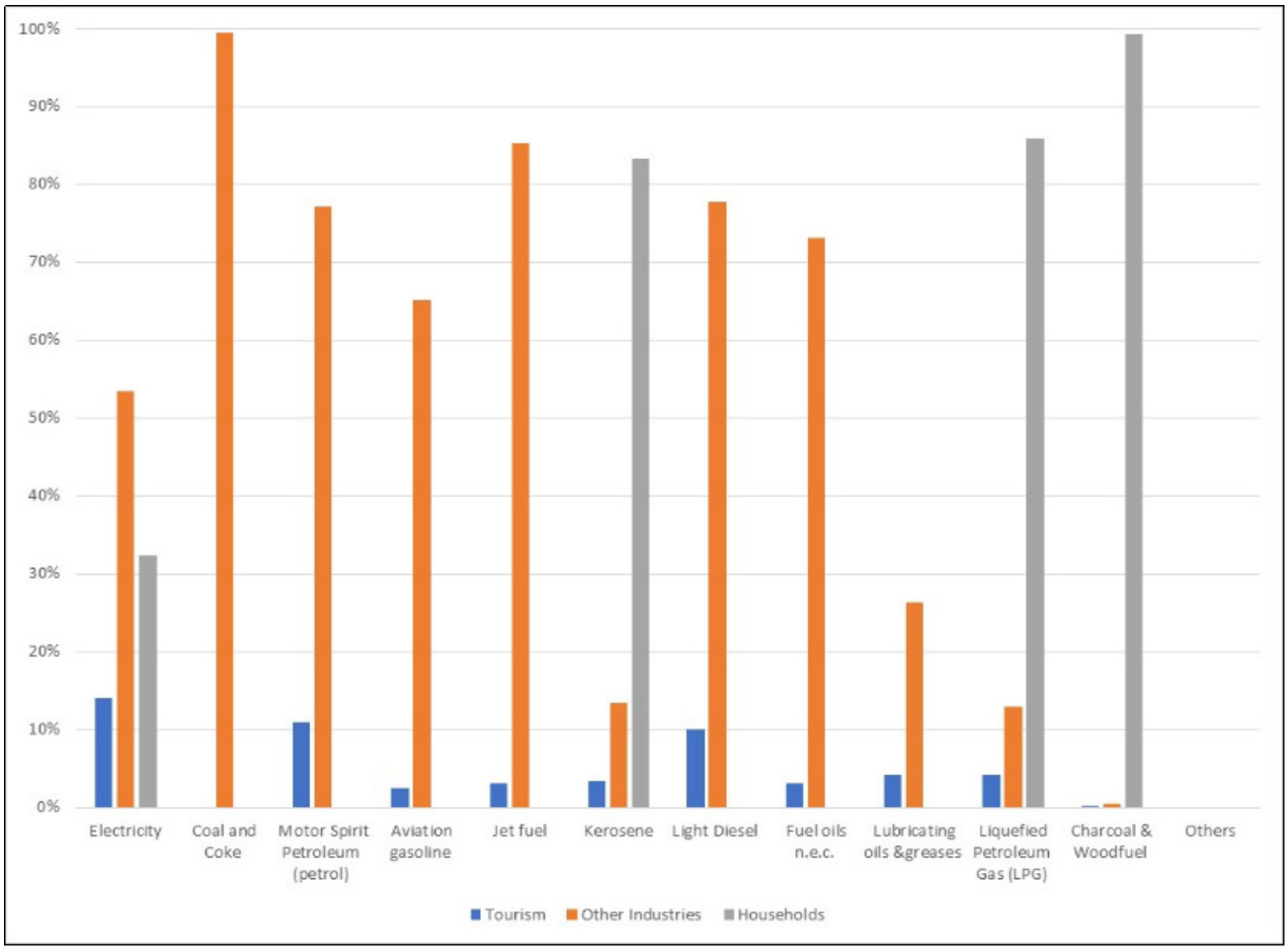

Figure 5.3: Proportion of Energy Product Use by Tourism Industries, Other Industries, and Households

Source: TRI situational analysis data, 2023

The high levels of energy consumption highlight the need for the tourism industry to adopt more sustainable energy practices (Green energy). By transitioning to renewable energy sources and improving energy efficiency, the tourism sector can reduce its carbon footprint and align with global sustainability goals, ensuring long-term viability and resilience in an increasingly eco-conscious market.

5.7 Green House Gases Account

The air emissions account captures data on gaseous and particulate substances released into the atmosphere by economic agents due to production, consumption, and accumulation activities. It aligns with the System of National Accounts (SNA) and records emissions generated

by resident economic units categorized by substance (United Nations et al., 2009). In the context of tourism, the SEEA-UNWTO framework, adapted from the air emissions account in the SEEA Central Framework (SEEA-CF), focuses on greenhouse gas (GHG) emissions generated by tourism industries. These emissions are categorized by GHG type and the flow of the emissions into the atmosphere (United Nations et al., 2010; UNWTO, 2019).

The study utilized both primary and secondary data to compile greenhouse gas flow accounts from production and consumption activities across various sectors, including tourism industries, other industries, household consumption, accumulation, and the environment. Adopting an "energy first approach," the analysis focused on anthropogenically generated greenhouse gases, drawing upon energy consumption data from economic sectors as the primary source (Smith et al., 2021). The SEEA-Energy Account for Kenya, published by the KNBS (KNBS, 2023), provided a useful basis for constructing the emission accounts. Subsequently, examining energy consumption patterns within tourism industries (including accommodation, food & beverage, passenger transport, travel agencies and reservations, and other tourism sectors) offered a valuable method for estimating the associated greenhouse gas emissions in tourism (Jones & Brown, 2020).

The emissions account captures the flow of Carbon Dioxide (CO2), Methane (CH4) Nitrous oxide (N2O), and nitrogen dioxide (NO2). These were converted into CO2 equivalents (CO2e) by applying the global warming potential (GWP) established by the Intergovernmental Panel on Climate Change (IPCC).

Complementary data on the country's total GHG emissions was obtained from the World Bank database, covering CO2 equivalent emissions (kt) from 1990 to 2019 (World Bank, 2023). This includes CO2 emissions (excluding short-cycle biomass burning), other biomass burning, all anthropogenic CH4 sources, N2O sources, and F-gases (HFCs, PFCs, and SF6). Emission factors were sourced from the International Energy Agency (IEA), whose reports provide valuable information for estimating GHG emissions from industries' energy use (IEA, 2022). Inputs to compute tourism's share of GHG emissions, as a proportion of total sector emissions, were sourced from the current TSA for the country (TSA-2019) published by TRI (2020).

The subsequent sections describe the construction of physical supply and use tables for GHG emission for Kenya’s tourism industries -2022 and the structure of the accounts.

5.7.1 Physical Supply Tables -GHG

The foundational framework of the emissions account is built upon the physical supply table (PST), as outlined in the System of Environmental-Economic Accounting Central Framework (SEEA-CF) 2012. The PST provides a comprehensive view of GHG emissions generated by various industries and households. These emissions, categorized by type—such as CO□, CH□, N□O, and NO□—are quantified in CO□ equivalent tonnes (United Nations et al., 2014).

On the horizontal axis, columns of the PST represent the origin of emissions, distinguishing between economic units—industries and households—as their sources. Specifically, for creating a GHG-Emissions Account for the tourism sector in Kenya, the PST categorizes industries

according to the Tourism Satellite Account: Recommended Methodological Framework (TSA-RMF) 2008. For brevity, these are aggregated into five tourism-specific industries: accommodation for visitors, food and beverage serving services, passenger transport, travel agencies and reservation services, and other tourism industries. All other industries in the economy are grouped together.

The column on households captured GHG emissions by households and was broken down by purpose (i.e., transport, heating, cooking, and other) based on information available from the Kenya Integrated Household Budget Survey 2015-2016 (KIHBS) (KNBS, 2018). The column for accumulation shows the release of air emissions to the atmosphere from controlled landfill sites, reflecting emissions from production, consumption, and accumulation activities in earlier periods. These emissions were attributed to the waste management units that operate the landfill sites (UNFCCC, 2020)

5.7.1.1 National GHG Emissions

Although Kenya accounts for less than 0.1% of global GHG emissions, the country's total GHG emissions increased from 56.8 MtCO2e in 1995 to 93.7 MtCO2e in 2015 (Government of Kenya [GoK], 2018). GHG emissions are projected to rise to 143 MtCO2e by 2030 as the country implements its Vision 2030 development agenda (GoK, 2018). The leading source of emissions in Kenya is agriculture, contributing 40% of total national emissions, primarily due to livestock enteric fermentation and manure management. This is followed by land use, land-use change, and forestry (LULUCF) at 38%, mainly due to deforestation, and energy use, including transport, at 18%. Industrial processes and product use (IPPU) account for 3%, and waste management contributes 1% (GoK, 2018). As the economy grows towards the 2030 targets, projections indicate that energy will become the leading contributor to emissions due to increased consumption of fossil fuels for electricity generation, transportation, and industrial, domestic, and commercial heating needs (GoK, 2018).

Carbon dioxide emissions account for the largest share of greenhouse gases associated with climate change and global warming in Kenya (World Bank, 2023). Data for carbon dioxide emissions include gases from the burning of fossil fuels and cement manufacture, but exclude emissions from land use such as deforestation. From 1960 to 2021, CO2 emissions in Kenya averaged 7.99Mt, reaching an all-time high of 22.98Mt in 2019 and a record low of 2.4Mt in 1961 (World Bank, 2023). In 2021, CO2 emissions in Kenya increased to 22.43 Mt from 21.11 Mt in 2020. The Global Carbon Budget (2023) reports that by 2022, Kenya's CO2 emission was at 24.85Mt. Figure 5.3 shows the International Energy Agency (IEA) estimates of emissions of CO2 in Kenya in the period between 2000 and 2021 (IEA, 2022).

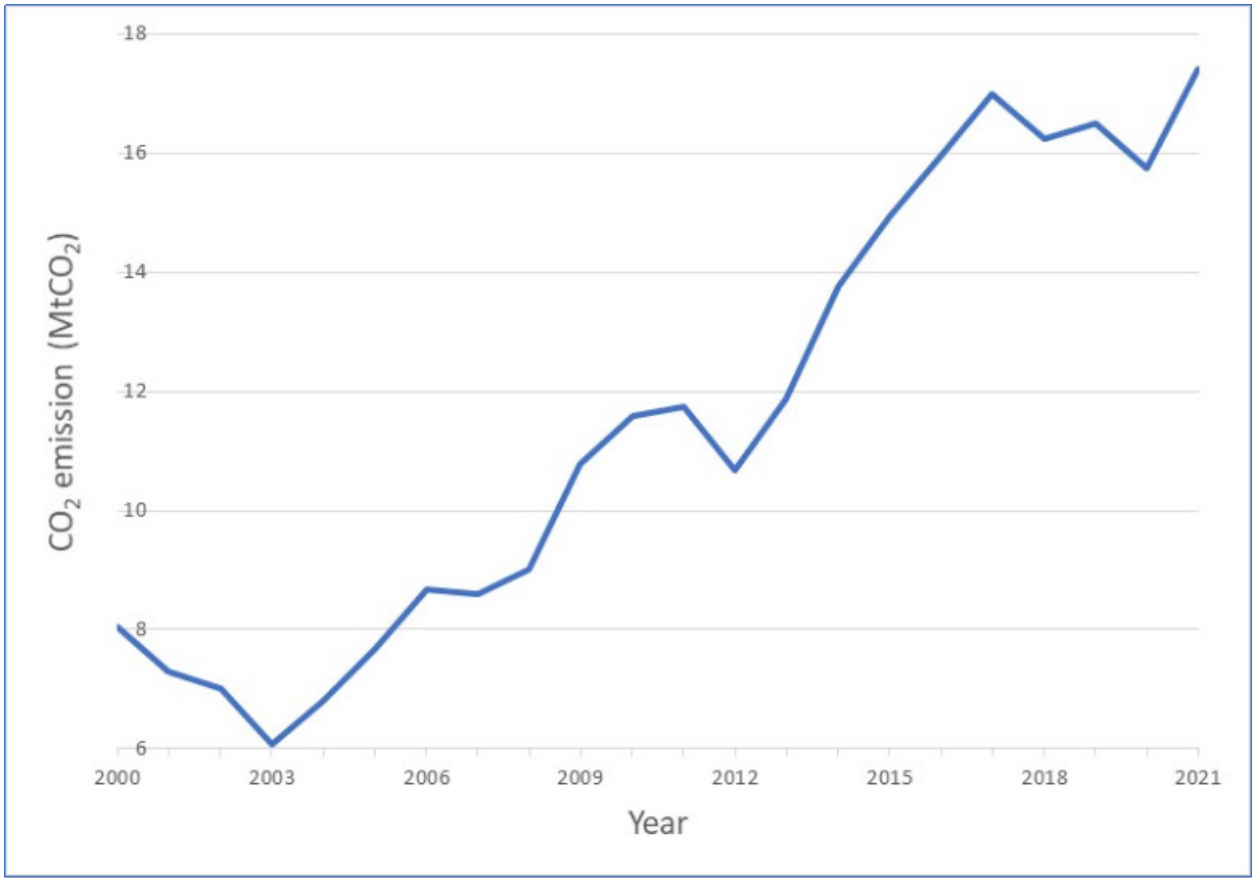

Figure 5.4: CO2 Emission from Fuel Combustion in Kenya – 2000 -2021
Source: IEA, 2023

Figure 5.3 depicts an increasing trend in CO2 emissions from fuel combustion, with an average increase of 4% from 2000 to 2021. This trend is expected to contribute to the overall rise in GHG emissions, which are projected to reach 143 MtCO2e by 2030 (GoK, 2018). The increasing trend in CO2 emissions from fuel combustion underscores the urgent need for robust monitoring and accounting mechanisms. Accurate tracking of emissions is crucial for assessing progress towards climate goals, formulating effective policies, and implementing mitigation strategies. It also highlights the necessity for transitioning to cleaner energy sources to curb emissions growth, ensuring sustainable development, and meeting international commitments such as those outlined in the Paris Agreement.

5.7.1.2 GHG Emissions by Industries

Based on intermediate energy production data (KNBS, 2023), the study estimated GHG emissions from energy consumption by non-tourism industries in the economy. The estimation was computed by applying emission factors to the sector's intermediate energy consumption across various energy products. Table 5.13 summarizes the emission factors for stationary combustion used in the computation (IEA, 2022).

Table 5.13: Emission Factors for Stationary Combustion

	Emission Factor			
Fuel Type	**CO_2 (kg/TJ)**	**CH_4 (kg/TJ)**	**N_2O (kg/TJ)**	**NO_2 (kg/TJ)**
Coal and Coke	95,000	10	2.5	10
Motor Spirit Petroleum (petrol)	73,300	5	2	1
Aviation gasoline	70,000	5	2	1
Jet fuel	70,000	3	0.5	1
Kerosene	72,600	3	0.5	1
Light Diesel	74,100	1	0.5	1
Fuel oils n.e.c.	81,300	2	0.5	2
Liquefied Petroleum Gas (LPG)	56,100	5	0.5	1
Wood fuel & Charcoal	112,000	200	4.0	

Source: Adapted from IEA (2022)

Table 5.14: Electricity Usage Emission Factors

	Emission Factors		
Usage	**CO_2 (kg CO_2 per kWh)**	**CH_4 (g CH_4 per kWh)**	**N_2O (g N_2O per kWh)**
Industrial Electricity	0.40 - 0.60	0.01 - 0.03	0.01 - 0.02
Domestic Electricity	0.30	0.02	0.02

Source: Adopted from IEA, 2022

Table 5.15: Electricity Usage Emission Factors

Gas	100-year –GWP
1. Carbon Dioxide $(CO_2)_2$	1
2. Methane $(CH_4)_2$	25
3. Nitrogen Oxide (N_2O)	298

Source: Intergovernmental Panel on Climate Change (IPCC), Fourth Assessment Report (AR4), 2007.

Table 5.16 presents the results of the estimation of GHG emission in MtCO2e from the combustion of fuel products by other industries except for tourism industries in 2022

Table 5.16: GHG emission by Industries due to intermediate Energy Products consumption -2022

Fuel Type	Energy Consumption (TJ)	CO_2 emission (Mt CO_2)	CH_4 ($MtCO_2$ e) *	N_2O ($MtCO_2$ e) **	NO_2 ($MtCO_2$ e) ***
Electricity	19,305.27	0.02	0.00	0.00	0.00
Coal and Coke	4,858.99	0.46	0.00	0.00	0.01
Motor Spirit Petroleum (petrol)	4,264.25	0.31	0.00	0.00	0.00
Aviation gasoline	3.78	0.00	0.00	0.00	0.00
Jet fuel	2,354.03	0.16	0.00	0.00	0.00
Kerosene	49.76	0.00	0.00	0.00	0.00
Light Diesel	6,521.40	0.48	0.00	0.00	0.00
Fuel oils n.e.c.	1,352.11	0.11	0.00	0.00	0.00
Liquefied Petroleum Gas (LPG)	176.13	0.01	0.00	0.00	0.00
Wood fuel & Charcoal	2,835.35	0.32	0.01	0.00	0.00
Total	**41,721.07**	**1.87**	**0.01**	**0.00**	**0.01**

Source: Research Data, KNBS, 2023

From the results in Table 5.16 for 2022, industries emitted a total of 1.87 million metric tons (Mt) of carbon dioxide (CO2) due to the intermediate consumption of various energy products. Light diesel with 0.48 Mt accounted for the highest CO2 emissions, followed by Coal and coke at 0.46 Mt. Additionally, industries emitted a total of 0.01 Mt of methane (CH4) and 0.01 Mt of nitrous oxide (NO2) equivalents. Notably, wood fuel and charcoal contributed significantly to CH4 emissions, totalling 0.01 Mt. Nitrogen dioxide (NO2) emissions were relatively minor compared to CO2 emissions. In total, 1.89MtCO2e GHG was supplied by industries' intermediate use of energy products with fossil fuels contributing 81% of the emissions.

5.7.1.3 GHG Emissions by Households

The analysis considered heating and lighting activities by households as sources of GHG emissions. It computed emissions from the use of kerosene, LPG gas, firewood, and charcoal by households for heating and lighting as sources of GHG from combustion. Table 5.17 presents the results of the calculation of GHG emissions from household final consumption of electricity, fossil fuel products (LPG and kerosene), and biomass (wood fuels and charcoal).

Table 5.17: GHG Emission by Households Due to Final Consumption of Energy Products -2022

Fuel Type	Energy Consumption (TJ)	CO_2 emission (Mt CO_2)	CH_4 ($MtCO_2$ e) *	N_2O ($MtCO_2$ e) **
Electricity	11,674.19	0.97	0.00	0.02
Kerosine	310.00	0.02	0.00	0.00
Liquid Petroleum Gas	1,164.63	0.07	0.00	0.00
Wood fuel & Charcoal	541,498.92	60.65	2.71	0.65
Total	**554,647.74**	**61.71**	**2.71**	**0.67**

Source: TRI situational analysis data, 2023, KNBS, 2023

In 2022, households in Kenya made significant contributions to greenhouse gas (GHG) emissions through their final consumption of energy products. Electricity, wood fuel and charcoal were the primary contributors, with an energy consumption of 554,647.74 TJ, resulting in CO2 emissions of 61.71 Mt. Additionally, the combustion of wood fuel and charcoal produced methane (CH4) emissions equivalent to 2.71 MtCO2e and nitrous oxide (N2O) emissions equivalent to 0.67 MtCO2e. Liquid petroleum gas (LPG) and kerosene, though consumed in smaller quantities, also contributed to GHG emissions, with 0.07 Mt and 0.02 Mt of CO2, respectively. Despite their lower emissions compared to wood fuel and charcoal, these findings underscore the need for sustainable energy practices and the promotion of cleaner energy sources to mitigate household GHG emissions in Kenya.

5.7.1.4 GHG Emissions by Tourism Enterprises -2022

The analysis computed greenhouse gas (GHG) emissions in MtCO2e resulting from the use of various energy products by tourism industries, aggregated into accommodation for visitors, food and beverage services, passenger transport, travel agency and reservations, and other industries, by applying relevant emission factors. Table 5.18 summarizes the results of the computation.

Table 5.18: GHG Emission by Tourism Industries Due to Final Consumption of Energy Products -2022

	Emissions in $MtCO_2e$			
Tourism Sector	**CO_2**	**CH_4**	**N_2O**	**NO_2**
Accommodation for visitors	0.15	0.00	0.00	0.00
Food & Beverage Serving Services	0.09	0.00	0.00	0.00
Passenger Transport	0.46	0.00	0.00	0.01
Travel Agencies & Reservations	0.03	0.00	0.00	0.00
Other Tourism Industries	0.02	0.00	0.00	0.00
Total	**0.75**	**0.00**	**0.00**	**0.01**

Source: TRI situational analysis data, 2023, KNBS, 2023

The results in Table 5.18 suggest that in 2022, Kenya's tourism sector contributed relatively low GHG emissions. The largest contributor was passenger transport, accounting for 0.46 MtCO2e, followed by accommodation for visitors with 0.15 MtCO2e. Food and beverage serving services emitted 0.09 MtCO2e, while travel agencies and reservations contributed the least at 0.03 MtCO2e. Other tourism industries had negligible emissions. Notably, methane (CH4), nitrous oxide (N2O), and nitrogen dioxide (NO2) emissions were negligible in all sub-sectors except in the passenger transport sub-sector. Overall, the total GHG emissions from the tourism sector in Kenya amounted to 0.75 MtCO2e.

5.7.1.5 GHG Emission by Tourism

The study calculated tourism's portion of GHG emissions from tourism industries by applying respective output ratios (see Table 5.9) to the sector emissions. Table 5.19 displays the outcomes of this computation.

Table 5.19: Tourism Share of GHG Emission by Tourism Industries Due to Final Consumption of Energy Products -2022

	Emissions in $MtCO_2e$			
Tourism Sector	**CO_2**	**CH_4**	**N_2O**	**NO_2**
Accommodation for visitors	0.13	0.00	0.00	0.00
Food & Beverage Serving Services	0.07	0.00	0.00	0.00
Passenger Transport	0.19	0.00	0.00	0.00
Travel Agencies & Reservations	0.03	0.00	0.00	0.00
Other Tourism Industries	0.01	0.00	0.00	0.00
Total	**0.44**	**0.00**	**0.00**	**0.00**

Source: TRI situational analysis data, 2023, KNBS, 2023

The analysis reveals that in 2022, tourism's share of tourism industries' GHG emissions due to the final consumption of energy products totaled 0.44 MtCO2e (Table 5.19). Among the tourism industries, tourism share in the passenger transport sub-sector was the highest contribution, at 0.19 MtCO2e, followed by the share in the accommodation sub-sector at 0.13 MtCO2e, and food and beverage serving services with 0.07 MtCO2e. Travel agencies and other tourism industries showed negligible emissions (0.03-0.01 MtCO2e).

5.7.2 Physical Use Tables -GHG

5.7.2.1 Emissions released to the environment - Total use of Emission

The physical use table displays the GHG emissions directly released into the atmosphere. Table 5.20 presents the total emissions from the use of energy resources and products by industries, including tourism, in their production activities, and by households in their consumption and subsistence production activities in 2022. It is noteworthy that due to incomplete data, emissions from accumulation, which represent air emissions released from controlled landfill

sites and reflect emissions from earlier periods of production, consumption, and accumulation (SEEA-CF accounts – Air Emissions, 2016), were not included in the accounts.

Table 5.20: Use of GHG Emissions -2022

Tourism Sector	Emissions in $MtCO_2e$			
	CO_2	CH_4	N_2O	NO_2
Tourism Industries	0.75	0.00	0.00	0.01
Other Industries	1.87	0.01	0.00	0.01
Households	61.71	2.71	0.67	0.00
Total	**64.33**	**2.72**	**0.67**	**0.02**

Source: TRI situational analysis data, 2023

In 2022, the use of various energy resources and products resulted in significant greenhouse gas (GHG) emissions from industries, including tourism, and households. Tourism industries contributed 0.75 MtCO2e of CO2 emissions, with no notable emissions of CH4, N2O, or NO2. Other industries emitted a more substantial amount, with 1.87 MtCO2e of CO2, 0.01 MtCO2e of CH4, 0.01 MtCO2e of NO2. Households were the largest emitters, releasing 61.71 MtCO2e of CO2, 2.71 MtCO2e of CH4, and 0.67 MtCO2e of N2O. Overall, the total GHG emissions into the environment amounted to 64.33 MtCO2e of CO2, 2.72 MtCO2e of CH4, 0.67 MtCO2e of N2O, and 0.02 MtCO2e of NO2. These figures highlight the substantial impact of household energy use on GHG emissions compared to industrial activities. In total, 67.74 MtCO2e was emitted into the environment. This quantity compares with the 2015 emissions declared in the Nationally Determined Contribution by Kenya (93.7 MtCO2e) (GOK, 2018). The current total excludes emissions from major sources such as agriculture (due to livestock enteric fermentation and manure management) and land-use change and forestry (LULUCF), capturing only emissions from energy use.

The tourism sector should be concerned about these findings for several reasons; Reducing CO2 emissions will promote climate change mitigation and preserve the natural environments that attract tourists. As today's travellers are increasingly environmentally conscious, adopting and showcasing sustainable tourism practices will enhance the sector's reputation and competitiveness, eventually attracting eco-friendlier tourists.

With the Kenyan government steadily tightening regulations on emissions and the environment, tourism enterprises can stay ahead of regulatory changes and avoid potential fines or restrictions by proactively reducing CO2 emissions. In terms of economic efficiency, increasing the implementation of energy-efficient practices and reducing reliance on fossil fuels will lead to long-term cost savings, improving the sector's economic resilience. Since tourism activities heavily depend on natural resources, continued implementation of sustainable practices will ensure the long-term viability of these resources, maintaining the sector's foundation for future growth and stability.

5.7.3 Balanced GHG Account for Tourism Enterprises

Table 5.21: Physical Supply and Use Tables for GHG Emissions - Kenya's Tourism Sector (2022)

Physical Supply Table for GHG emissions (Mt)																	
	Generation of GHG emission														Accumulations	Flow from the environment	Total Supply of emissions
	Tourism Industries												Other Ind.	H/ holds	Emission from landfills		
	Accommodation for visitors		Food & beverage Serving visitors		Passenger Transport		Travel Agencie & Reservations		Other Tourism Industries		Total Tourism Industries						
	TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total	Total		Total		
Type of emissions																	
Carbon dioxide (CO2)	0.13	0.15	0.07	0.09	0.19	0.46	0.03	0.03	0.01	0.02	0.44	0.75	1.87	61.71			64.33
Methane (CH4)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	2.71			2.72
Nitrous Oxide (N2O)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67			0.67
Nitorgen dioxide (NO2)	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00			0.02
Total CO_2 equivalent	0.13	0.15	0.07	0.09	0.20	0.47	0.03	0.03	0.01	0.02	0.44	0.76	1.89	65.09			67.74
Physical Use Table for GHG emission																	
																Flow to the environment	Total use of emissions
Emissions released to the environment																67.74	67.74

5.8 Water Account

The System of Environmental-Economic Accounting for Water (SEEA-Water) is a framework that organizes hydrological and economic information using the System of National Accounts (SNA) and the SEEA 2012 Central Framework as its foundation. The study developed SEEA-Water Accounts for the Tourism Sector in Kenya, aligning with the SEEA-UNWTO framework that integrates SNA, TSA- RMF 2008, and SEEA 2012 Central Frameworks.

The SEEA-Water Account for the tourism sector includes physical supply and use tables that track the flow of water between the environment and the economy. The breakdown of economic activities in the SEEA-Water Account for tourism identifies water flows in the 11 tourism industries classified in the TSA-RMF 2008 grouped into five categories that distinguish the main tourism sectors as well as those associated with water supply—water service providers, water usage, and consumption. The account captures the generation and distribution of water by the water service providers, along with wastewater treatment.

To construct the SEEA-Water Accounts, various data sources were utilized. This included primary data on water supply by tourism sector activities, water usage by the industries, and the physical flows of water back to the environment. Additionally, secondary and administrative data on water generation, supply, and usage in the economy obtained from various agencies in the water and sanitation sector were incorporated. The following sections report the SEEA-Water Physical Supply and Use Tables (PSUT).

5.8.1 Physical Supply Tables - Water

The structure of the Physical Water Supply Table (PWST) comprises columns representing different economic units: main tourism industries, industries involved in water collection, treatment, and supply, other aggregated industries, and households. Additionally, the table incorporates a column for documenting water flows from the environment. On the other

hand, it contains five rows to document various aspects: sources of abstracted water, water distribution, self-use of abstracted water, wastewater and reused water, return flows of water, and water losses through evaporation, transpiration, and incorporation into products.

The survey instrument was used to gather data on water management practices. The instrument required tourism enterprises to indicate their main water sources including utilities, self-abstracted groundwater/surface water, rainwater, bottled water and also inquired about wastewater treatment either by external facilities or using -house practices. Additional questions explored specific water and wastewater management strategies employed by the tourism enterprises. This data provided insights into water consumption patterns and wastewater management approaches within the tourism sector

5.8.1.1 Sources of Abstracted Water in Kenya -2022

Data on water produced in the country was obtained from the Kenya National Bureau of Statistics (KNBS, 2023). Figure 5.5, plots the quantity of surface water and total water abstracted in the country in year 2018 to 2022 as reported by KNBS (KNBS, 2023).

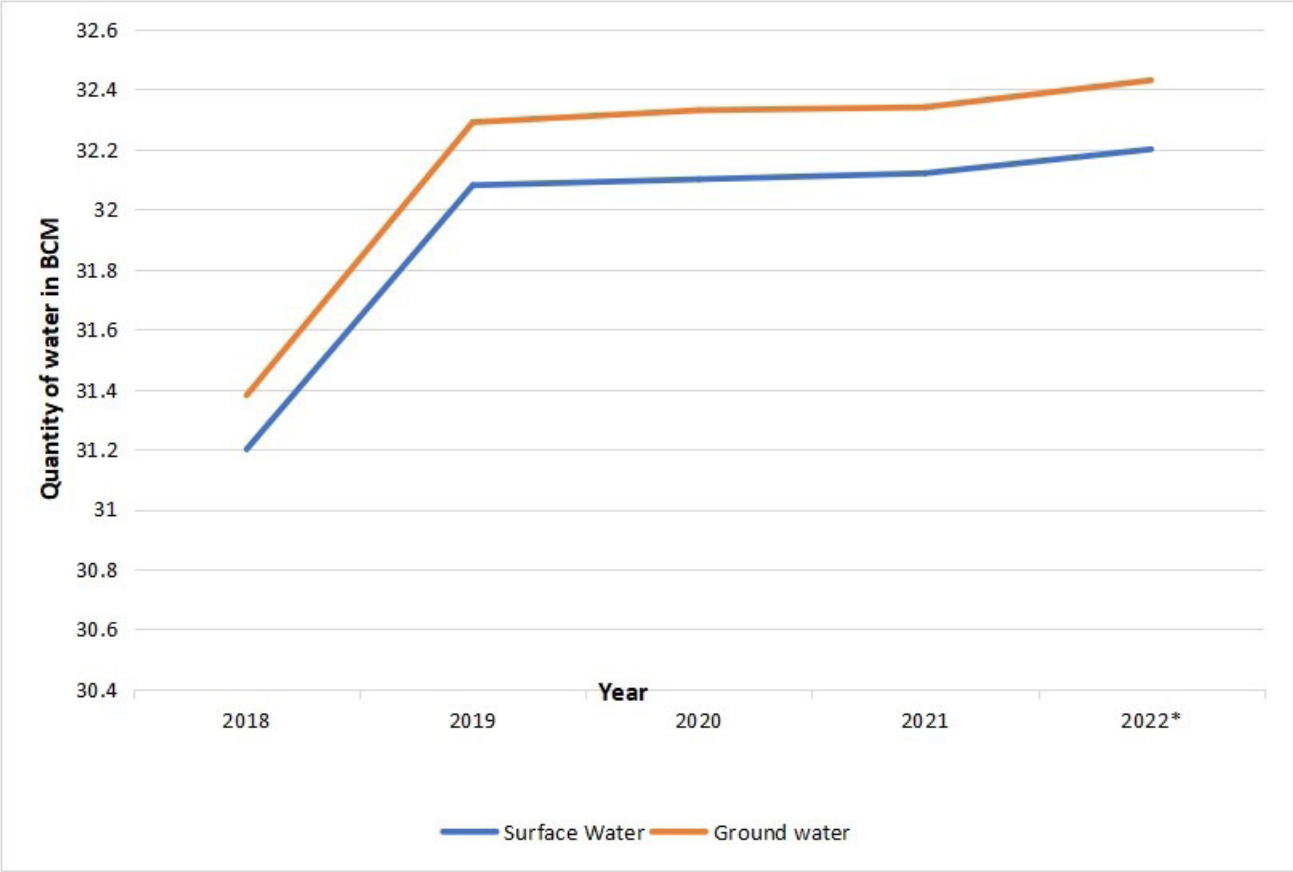

Figure 5.5: Quantity of Ground and Total Water Abstracted from the Environment (2018-2022).
Source: KNBS (2023)

The figure reveals that on average about 31,840 million cubic meters (MCM) of water was abstracted annually between 2018 and 2022. The total water abstracted is the sum of the volume of surface water abstracted and groundwater abstracted (figure 5.4) and Table 5.22

Table 5.22: Summary of Water Abstraction in Kenya- 2017 -2022

	Quantity of Water Abstracted per year (MCM)					
Source	**2017**	**2018**	**2019**	**2020**	**2021**	**2022***
Surface Water	30,740.00	31,200.00	32,080.00	32,100.00	32,120.00	32,100.00
Groundwater	140.00	180.00	210.00	230.00	220.00	220.00
Total Abstracted	**30,880.00**	**31,370.00**	**32,290.00**	**32,320.00**	**32,340.00**	**32,320.00**

Results in Table 5.22 provide information on the sources and volume of abstracted water – The total supply of abstracted water from the environment. The table reveals that in 2022, households for domestic consumption, water service providers for distribution, and industries for production activities collectively abstracted 32,320.00 million cubic meters (MCM) of water from the environment. The results in Table 6.22 differ from the latest data provided by the Food and Agriculture Organization (FAO) (FAO, 2023) on water sources for Kenya in 2020. The FAO data reports that in 2020, a total of 23,700 MCM was abstracted from the environment as surface and groundwater.

5.8.1.2 Distribution of Abstracted Water by Water Collection,Treatment and Supply Industries

The PWST records the total use of abstracted water by ISIC division 36, which includes industries involved in water collection, treatment, and supply. In Kenya, private firms in this sector are registered by the Water Services Regulatory Board (WASREB). Secondary data on the amounts of water produced by regulated water service providers in Kenya from 2019 to 2022 were obtained from the latest WASREB impact report – Issue No. 15 (WASREB, 2023). Figure 5.5 presents the quantity of water produced by regulated water service providers and billed for the financial years 2019/2020 to 2021/2022 (WASREB, 2023).

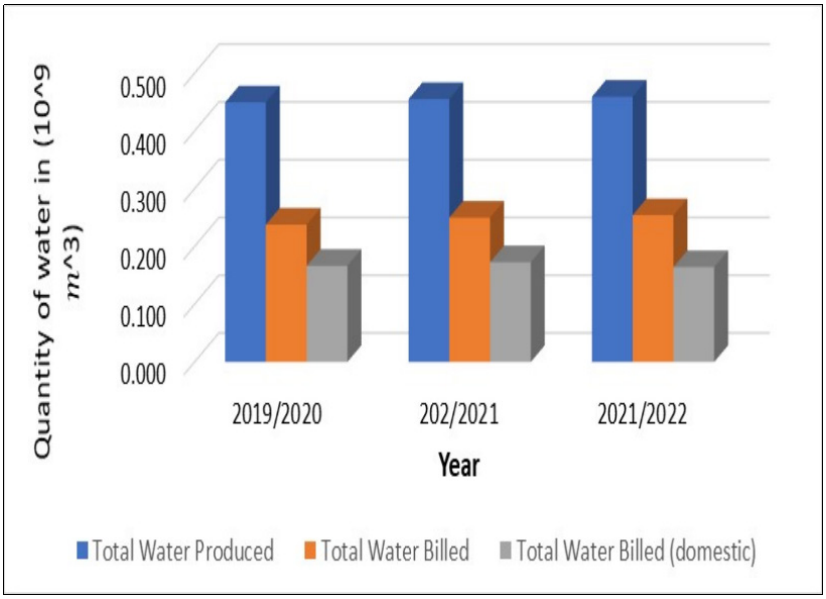

Figure 5.6: Quantity of Water Produced and Billed by Water Services Providers 2019- 2022.
Source: WASREB, 2023

Figure 5.5 illustrates that, on average, 450 million cubic meters (MCM) of water were produced by regulated water service providers and distributed for domestic and industrial use each year between 2019 and 2022. Of the produced water, 55% was billed to households for domestic use annually, equating to an average of 167.81 MCM. The figure also indicates that industrial water usage from regulated water service providers remained slightly below 80 MCM yearly. Notably, approximately 45% of the produced water, amounting to about 207.4 MCM per year, was not billed. This can be attributed to low nationwide water coverage by regulated water service providers, which stood at 62% in 2022. Table 5.23 provides a summary of distributed abstracted water by water collection, treatment, and supply companies between 2019 and 2022

Table 5.23: Distributed Abstracted Water by Water Collection, Treatment and Supply Industries 2019 -2022

Parameter (MCM) per Year	2019/2020	202/2021	2021/2022
Total Water Produced	450	460	460
Total Water Billed	240	250	250
Total Water Billed (domestic)	170	170	160

The results in Table 5.23 show that 54% of the water produced by water collection, treatment, and supply industries (i.e., WSPs) was supplied to industries and households in 2022. Of the water billed, 64% was supplied to households for domestic use, and approximately 90 MCM was supplied to industries, including the tourism industry, for commercial use. An estimated 46% (210 MCM) of the produced water was not billed, representing the volume of non-revenue water (NRW) in 2022. The Water Services Regulatory Board (WASREB) estimates the NRW for 2022 at 45% a loss of Ksh. 11.2 billion (WASREB, 2023). The data in Table 5.23 provides input on the distribution of abstracted water by water collection, treatment, and supply industries in the PWST.

5.8.1.3 Ground and Surface Water Abstracted by Tourism Sector Enterprises -2022

The data on the quantity of ground and surface water abstracted was aggregated for each tourism industry activity classification. The data from the baseline survey served as the basis for estimating the sources of abstracted water by tourism industry activities throughout the year. Table 5.24 presents the aggregated results, displaying the average quantity of water abstracted by each tourism industry activity for their own daily use, measured in MCM, in 2022.

Table 5.24: Quantity of Ground and Surface Water Abstracted by Tourism Industry Enterprises

	Quantity of Water Abstracted in 2022 (MCM)		
Tourism Industry Activities	**Ground Water**	**Surface Water**	**Total**
Accommodation for visitors	16.10	0.60	16.70
Food & Beverage Serving activities	3.40	0.20	3.60
Passenger transport	0.80	-	0.80
Travel agency services	0.10	-	0.10
Other services	0.10	-	0.10
Total	**20.50**	**0.80**	**21.30**

Source: TRI situational analysis data, 2023

Table 5.24 illustrates that visitor accommodation enterprises abstracted 16.70 million cubic meters (MCM) of water in 2022 from both ground and surface sources for their own consumption. Similarly, travel agencies and other reservation services abstracted approximately 0.1 MCM in the same year. Additionally, the data reveals that Food & Beverage Serving enterprises relied on their own water sources, abstracting approximately 3.60 MCM, compared to passenger transport enterprises, which abstracted 0.8 MCM in 2022. Travel agencies and other tourism industries abstracted 0.20 MCM of water from ground and surface water sources for their own consumption. Results in Table 5.24 provided input for the PWST for its use of abstracted water by tourism industries. Data on own use of abstracted water by households and other industries was unavailable.

5.8.1.4 Sewerage Treated for Own Use by Tourism Industry Activities in 2022

The PWST in the SEEA-Water account captures the quantity of wastewater recycled by economic entities during the accounting period. This is broken down into the quantity of wastewater sent to treatment plants and the quantity of wastewater treated for own use.

The survey required respondents to indicate whether they treated their own sewage for reuse. Most of the enterprises (97%, n = 1,253) indicated that they did not treat their sewage for their own use. However, 35 enterprises provided monthly estimates of volumes of sewage treated for reuse in litres. On average, these enterprises treated 36,190.57 litres, with significant variation among the enterprises (SD = 81,958.28), and the data was significantly positively skewed (skewness index = 3.35, SE = 0.40). These results show that the sample mean volume was a biased estimator of the population mean and therefore could not be used to estimate the total volume of sewage treated for the tourism sector. Consequently, there were no estimates for the volume of treated sewage reused by the enterprises in the PSUT.

5.8.2 Physical Use Tables - Water

The structure of the Physical Water Use Table (PUT) comprises columns representing different economic units: main tourism industries, industries involved in water collection, treatment, and supply, other aggregated industries, and households. Additionally, the table incorporates a column for documenting water flows from the environment. On the other hand, it contains five

rows to document various aspects: sources of abstracted water, water distribution, self-use of abstracted water, wastewater and reused water, return flows of water, and water losses through evaporation, transpiration, and incorporation into products.

In the 'Water Uses' row, the PWUT captures the usage of distributed water from ISIC division 36 industries by tourism sector activities. This is differentiated from the intermediate use by industries in other sectors of the economy. The row underwater uses records of the self-use of abstracted water, primarily by tourism enterprises that provide accommodation to visitors.

5.8.2.1 Use of Distributed Water by Tourism Sector Activities in 2022

The study surveyed tourism enterprises for the volume of water used. The questionnaire required the enterprises to indicate the average monthly bill incurred for water consumption from water service providers and water bottling companies in the year 2022. The average monthly water consumption by the tourism sector activities was aggregated to compute the total monthly expenditure on water—both bottled and supplied by water companies. Table 5.25 presents the results of this aggregation:

Table 5.25: Aggregate Tourism Sector Activities Average Monthly Water Usage in 2022

Tourism Sector Activity	n	Total Monthly WSP Bill/Ksh ('000)	n	Total Monthly Bottled Water Exp./Ksh ('000
1. Accommodation for visitors	294	10,107.39	291	12,194.33
2. Food & Beverage Serving activities	162	3,943.68	144	3,858.85
3. Passenger transport	2	2.00	46	330.60
4. Travel agency services	31	470.82	109	835.10
5. Other services	82	2,752.36	237	7,519.55
Total		**17,276.24**		**24,738.43**

Source: TRI situational analysis data, 2023

The results in Table 5.25 served as the basis for calculating the annual water usage by the tourism enterprises in MCM. This is achieved by subjecting the total water expenditure to WSP's typical retail tariff structure for water consumption. Table 5.26 shows the typical tariff structure for a WSP adapted from the WASREB Guide, 2023.

Table 5.26: Typical retail tariff structure for a WSP

Typical Tariff Structure		
Customer Category	**Consumption Block in M³**	**Ksh.**
Domestic/Industrial	1-6	45
	7-20	50
	21-50	70
	51-100	80
	101-300	95
	300 and above	130

Source: WASREB Tariff Guide, 2023

Table 5.27 provides the estimated volume of water consumed by the tourism industry activities in MCM based on the total annual expenditure on both bottled water and water supplied by companies.

Table 5.27: Annual water consumption by tourism enterprises

	Annual Consumption From WSP in (MCM)	**Annual Consumption of Bottled Water in (MCM**	**TOTAL**
1. Accommodation for visitors	0.14	0.17	0.30
2. Food & Beverage Serving activities	0.05	0.05	0.09
3. Passenger transport	0.00	0.02	0.02
4. Travel agency services	0.05	0.03	0.07
5. Other services	0.00	0.00	0.00
Total	**0.24**	**0.27**	**0.48**

Source: TRI situational analysis data, 2023

Table 5.27 shows the water consumption by tourism enterprises in MCM. The results suggest that in 2022, tourism enterprises used 0.48 MCM of water supplied by water service providers. Accommodation services accounted for 63% of this volume, followed by food and beverage serving activities at 19%, and travel agencies at 15%.

5.8.2.2 Own Use of Abstracted Water by Tourism Enterprises

Table 5.24 shows the quantity of ground and surface water abstracted by tourism enterprises in 2022. This volume, estimated from the survey data, is equivalent to the volume of own-use abstracted water by tourism enterprises in the physical use table.

5.8.3 Balanced Water Account for Tourism Enterprises

The water accounts for the tourism enterprises in Kenya are presented in table 5.28 and 5.29.

Table 5.28: Water Physical Supply Table for Tourism Enterprises

Physical Supply Table for water (MCM)																					
		Abstraction of water, production of water, and generation of return flows																			
		Tourism Industries												Water collection , treatment and supply	Sewerage	Other industries		H/holds	Flow from R.O.W	Flows from the environment	Total Supply
		Accommodation for visitors		Food & beverage Serving visitors		Passenger Transport		Travel Agency & Reservations		Other Tourism Industries		Total Tourism Industries							Imports		
		TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total			TSM	Total				
1. Sources of abstracted water																					
	Total Supply abstracted																				
	Ground Water																			32,100.00	32,100.00
	Surface Water																			220.00	220.00
	Total																			**32,320.00**	**32,320.00**
2. Water																					
	Distribution of abstracted													460.00					0.00		**460.00**
	Own-use abstracted water	14.88	16.70	2.87	3.60	0.34	0.80	0.09	0.10	0.06	0.10	18.25	21.30								**21.30**
3. Waste water and reuse water																					
	Waste water to treatment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
	Own treatment of waste water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
	Total waste water and reused	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**								**0.00**
4. Return flows of water																					
	Total return flows																				
5. Evaporation of abstracted water, transpiration and water incorporated into products																					
	Total																				
TOTAL SUPPLY		**14.88**	**16.70**	**2.87**	**3.60**	**0.34**	**0.80**	**0.09**	**0.10**	**0.06**	**0.10**	**18.25**	**21.30**	**460.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**32,320.00**	**32,801.30**

Table 5.29: Water Physical Use Table for Tourism Enterprises

Physical Supply Table for water (MCM)																					
		Abstraction of water, production of water, and generation of return flows																			
		Tourism Industries												Water collection , treatment and supply	Sewerage	Other industries		H/holds	Flow from R.O.W	Flows from the environment	Total Supply
		Accommodation for visitors		Food & beverage Serving visitors		Passenger Transport		Travel Agency & Reservations		Other Tourism Industries		Total Tourism Industries							Imports		
		TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total			TSM	Total				
1. Sources of abstracted water																					
	Total Supply abstracted water																				
	Ground Water																			32,100.00	32,100.00
	Surface Water																			220.00	220.00
	Total																				**32,320.00**
2. Water																					
	Distribution of abstracted water													460.00					0.00		**460.00**
	Own-use abstracted water	14.88	16.70	2.87	3.60	0.34	0.80	0.09	0.10	0.06	0.10	18.25	21.30								**21.30**
3. Waste water and reuse water																					
	Waste water to treatment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								**0.00**
	Own treatment of waste water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								**0.00**
	Total waste water and reused	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								**0.00**
4. Return flows of water																					
	Total return flows																				
5. Evaporation of abstracted water, transpiration and water incorporated into products																					
	Total																				
TOTAL SUPPLY		**14.88**	**16.70**	**2.87**	**3.60**	**0.34**	**0.80**	**0.09**	**0.10**	**0.06**	**0.10**	**18.25**	**21.30**	**460.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**32,320.00**	**32,801.30**

5.9 Solid Waste Account

The SEEA-CF defines solid waste as discarded materials no longer needed by the owner, which can include both solid and liquid forms but excludes wastewater and small particulate matter released into the atmosphere. However, when solid materials like scrap metal are exchanged between economic units and the discarder receives payment, they are classified by SEEA-CF as products rather than residuals.

The solid waste accounts, outlined in the SEEA – Central Framework 2012 (UN et al., 2014), employ supply and use tables based on the SNA concepts to trace the physical waste flows within the economy. These accounts provide a structured framework for organizing data on waste types, generation, and users, allowing for the systematic tracking of physical flows between the economy and the environment.

The study developed solid waste accounts for the tourism sector, illustrating waste production categorized into organic and inorganic waste (waste supply), waste management by tourism enterprises, waste collection, and final treatment (waste final use). These accounts document waste exchanges between the tourism sector, the broader economy, and the environment

The SEEA-Tourism Solid Waste Account identify the physical flows of solid waste in the 11 tourism industries classified according to the TSA-RMF 2008. For simplicity, the industries were grouped into five categories: accommodation for visitors, food and beverage services, passenger transport, travel agencies and reservations, and other tourism industries. The account highlights the primary sector responsible for waste collection, treatment, and disposal, classified under ISIC Division E.

Due to the lack of a standard international classification for solid waste, the study used a broad classification distinguishing between organic, inorganic, and other waste. Organic waste includes food waste, kitchen scraps, paper, leather, and other biodegradable materials. Inorganic waste encompasses non-biodegradable materials such as plastics, glass, metals, and paper, whether recyclable or not. Other waste includes discarded equipment, vehicles, and electronic waste

As is typical with the SEEA Central Framework, the SEEA-Solid Waste Account records physical solid waste flows by compiling supply and use tables (PSUT) in physical units of measurement (tonnes). Data for these tables was sourced from a national survey of tourism enterprises (n=1253). Reports from government agencies, such as the National Environmental Management Authority (NEMA) and the KNBS Economic Survey 2023, provided background data on national waste volumes. The following sections detail the construction of the PSUT.

5.9.1 Physical Supply Tables -Solid Waste

The PST captures the generation of solid waste residuals classified as organic, inorganic, and other solid waste by industries, including tourism industries and households. It also tracks the flows of waste from the rest of the world as imports of solid waste and from the environment in terms of recovered residuals.

5.9.1.1 Solid Waste Generation and Collection in Major Cities 2022

Data on solid waste in Kenya is limited. However, the KNBS annually reports waste generation and collection statistics for major cities—Nairobi, Mombasa, Kisumu, and Nakuru. This information is sourced from the respective county governments, which are mandated by law (Part 2 of the Fourth Schedule of the Constitution of Kenya, 2010) to maintain and report waste statistics in their areas. Table 5.30 presents the baseline data on waste generation in Kenya's major urban areas, as reported by KNBS (KNBS, 2023).

Table 5.30: Solid Waste Generation in Major Cities 2018 -2022 (103Tonnes)

	Year ('000 Tonnes)				
County	**2018**	**2019**	**2020**	**2021**	**2022**
Nairobi	730.00	839.50	876.00	1095.00	1095.00
Mombasa	804.00	879.00	914.00	920.00	1000.00
Kisumu	215.80	220.40	224.80	229.30	236.60
Nakuru	-	-	-	-	383.30
Total	**1,749.80**	**1,938.90**	**2,014.80**	**2,244.30**	**2,714.90**

Source: KNBS, 2023

Table 5.30 reveals that in 2022, approximately 2,714,900 tonnes of solid waste were generated in the four major cities. However, a report by NEMA suggests that every Kenyan generates about half a kilogram of waste daily, amounting to 22 metric tonnes per day and 8 million tonnes annually (NEMA, 2023). Studies indicate that about 20% of urban solid waste is composed of inorganic materials, mainly plastics, while food remains, paper, and other organic materials make up the remaining 80%. Additionally, up to 70% of urban waste is classified as domestic, with industrial waste accounting for the remaining 30% (Mugua, Kinyua, & Njogu, 2021). Due to incomplete administrative data, the study relied on these statistics to estimate national solid waste volumes, distinguishing between organic/inorganic and industrial/domestic waste, for the purpose of estimating the supply of solid waste in 2022. Table 5.31 shows the estimated volume of solid waste generated based on these assumptions:

Table 5.31: Supply of Solid Waste -2022

	Source of Solid Waste	
Classification	**Domestic ('000 tonnes)**	**Industrial ('000 tonnes)**
Organic (food waste, kitchen scraps, paper, leather, and other biodegradable materials)	4,760.00	1,680.00
Inorganic (non-biodegradable materials such as plastics, glass, metals, paper, and other recyclable or non-recyclable materials)	728.00	600.00
Other (discarded equipment, vehicles and electronic waste)	112.00	120.00
Total	**5,600.00**	**2,400.00**

Source: TRI situational analysis data, 2023; NEMA (2023); Mugua *et al.* (2021).

The estimates in Table 5.31 suggest that in 2022, Kenya generated a total of 8,000,000 tonnes of solid waste, with 70% (5,600,000 tonnes) classified as domestic and 30% (2,400,000 tonnes) as industrial. Of the domestic waste, 85% was organic, while 13% was inorganic, and 2% fell under the 'other' category. For industrial waste, 70% was organic, 25% was inorganic, and 5% was 'other'. These proportions highlight the dominance of organic waste in both domestic and industrial sources, though domestic sources have a higher percentage of organic waste compared to industrial sources, which have a slightly higher proportion of inorganic waste. The results in Table 5.31 provide input for the generation of Solid Waste residuals from households and other industries in the PST

5.9.1.2 Solid Waste Generated by Tourism Enterprises - 2022

The study employed a survey questionnaire to gather primary data on solid waste generation by tourism enterprises. Respondents were asked to estimate the average monthly quantities of organic, inorganic, and other solid waste generated by their enterprises in 2022, measured in kilograms. 5.32 summarizes the volumes of solid waste generated by the tourism enterprises monthly in kilograms.

Table 5.32: Average Monthly & Annual Waste Generation by Tourism Sector -2022

Tourism Sector	n	Solid Waste Classification	Average Monthly Waste (Kg)	Annual Waste Generation (tonnes)	% Composition of S/Waste	% Proportion of Total S/Waste
Accommodation for Visitors	398	Organic Waste	3962.75	47.55	0.90	0.82
	390	Inorganic Waste	422.42	5.07	0.10	
	283	Other Waste	7.43	0.09	0.00	
Food & Beverage Serving Services	177	Organic Waste	444.12	5.33	0.75	0.11
	170	Inorganic Waste	138.08	1.66	0.23	
	115	Other Waste	12.49	0.15	0.02	
Passenger Transport	110	Organic Waste	5.45	0.07	0.39	0.00
	109	Inorganic Waste	7.27	0.09	0.50	
	106	Other Waste	1.85	0.02	0.11	
Travel Agency & Reservations	123	Organic Waste	3.83	0.05	0.02	0.05
	123	Inorganic Waste	6.02	0.07	0.02	
	118	Other Waste	254.42	3.05	0.96	
Other Tourism Industries	258	Organic Waste	69.22	0.83	0.77	0.02
	268	Inorganic Waste	19.29	0.23	0.21	
	250	Other Waste	1.3	0.02	0.02	
Total				**64.28**		**1.00**

Source: TRI situational analysis data, 2023

The survey results in Table 5.32 indicate that in 2022, accommodation for visitors' activities were the highest contributor to total solid waste, generating 82% of the waste (organic: 90%, inorganic: 10%). Food & Beverage Serving Services followed, contributing 11% (organic: 75%, inorganic: 23%, other: 2%). Travel Agency & Reservations generated 5% (organic: 2%, inorganic: 2%, other: 96%), while Other Tourism Industries contributed 2%. The results highlight that organic waste was the dominant type of waste in the accommodation, food & beverage, and other tourism industries. However, in the Passenger Transport industry, inorganic waste—mainly plastics—accounted for 50% of the waste, organic waste for 39%, and other wastes for 11%.

The results in table 5.32 imply that for hotels, restaurants, and other tourism industries, including curio shops, entertainment venues, and attractions, the bulk of the solid waste generated was inorganic, mainly consisting of food waste. For passenger transport activities, half of the solid waste generated was plastic waste associated with single-use plastic containers. On the other hand, for travel agencies and reservation services, the largest proportion of waste fell under the "other" waste categories, which included electronic waste such as discarded computers.

From the survey results (Table 5.32), the study computed the volume of solid waste generated by the tourism industries based on the population of tourism enterprises registered (N=16,964) (TRA, 2022).

For a population (N_i) of tourism enterprises in category (i), given a sample mean ($\bar{x}_{ij}$) of category (j), solid waste generated by tourism enterprises in the category (i), tourism subsector and the sample size (n_i) for the category of enterprises. The volume of category solid waste was computed using equation (3):

Eqn. 3

$$\widehat{Q}_{ij} = \frac{N_i}{n_i} * \bar{x}_{ij}$$

Where:

Qij = is the estimated total volume of solid waste category *(j)* generated by the population of tourism enterprises in category *(i)*

(Ni) = is the total number of tourism enterprises in category *iii* (population size);

ni = is the number of sampled tourism enterprises in category *iii* (sample size);

xij = is the sample mean volume of the solid waste category generated by category tourism enterprises.

The computation proceeded on the assumption that, for a large sample size (n = 1,253), the sample mean (x) is an unbiased estimator of the population mean (μ) and thus, the sample mean could be used to estimate the volume of waste generated by the population. Table 5.33 presents the results of these estimates:

Table 5.33: Volumes of Solid Waste Generated by the Tourism Sector (tonnes) - 2022

Tourism Sector	n	Solid Waste Classification	Annual Waste Generation (tonnes)	N	Total Annual (tonnes)	% Total Waste
Accommodation for Visitors	398	Organic Waste	47.55	5619	3.37	0.40
	390	Inorganic Waste	5.07		0.35	
	283	Other Waste	0.09		0.00	
Food & Beverage Serving Services	177	Organic Waste	5.33	2590	0.36	0.05
	170	Inorganic Waste	1.66		0.11	
	115	Other Waste	0.15		0.01	
Passenger Transport	110	Organic Waste	0.07	4083	0.00	0.00
	109	Inorganic Waste	0.09		0.00	
	106	Other Waste	0.02		0.00	
Travel Agency & Reservations	123	Organic Waste	0.05	4615	0.00	0.01
	123	Inorganic Waste	0.07		0.00	
	118	Other Waste	3.05		0.08	
Other Tourism Industries	258	Organic Waste	0.83	57	3.76	0.53
	268	Inorganic Waste	0.23		1.09	
	250	Other Waste	0.02		0.07	
Total					**9.21**	**1.00**

Source: TRI situational analysis data, 2023

The survey data reveals that, overall, other tourism industries, including entertainment facilities, conference and event services, game fishing outfitters, enterprises offering camps and camping equipment for hire, nature parks, nature reserves, nature trails, game ranches, amusement parks, and non-citizen tour leaders or guides, were the highest generators of solid waste, contributing 53% of the waste. They were followed by services offering accommodation for visitors at 40%. Food and beverage serving services produced 5% of the solid waste generated by the tourism sector, while travel agencies contributed 1%. Passenger transport overall produced a negligible volume of solid waste. The results suggest that in total, the registered tourism sector enterprises (N=16,964) generated 9.21 tonnes of solid waste 81% of which was organic waste. The results in Table 5.33 provide input to the PST on generation of solid waste by tourism industries.

5.9.2 Physical Use Tables -Solid Waste

The physical use table captures waste collection and disposal activities carried out by major industries involved in waste management, encompassing landfill operations, incineration, recycling and reuse practices, and various other treatment methods. The columns in this table record Intermediate Consumption, Collection, residuals, and solid waste flows into the environment. Conversely, the rows represent the collection and disposal of solid waste residuals, disaggregated by waste types into solid organic, inorganic, and other waste.

5.9.2.1 Collection and Disposal of Solid Waste Residuals - Waste Collection, Treatment and Disposal Industries

The National Environmental Management Authority estimates that out of the 8 million tonnes of solid waste generated in the country every year, 70% of that waste is collected and dumped (NEMA, 2023). On the other hand, the KNBS reported that in 2022, 65% of the waste generated in the four major cities was collected. In 2022, Nairobi City, Mombasa, Kisumu and Nakuru counties collected 74%, 65%, 30% and 60% of generated solid waste respectively demonstrating challenges in the management of solid waste. Table 5.34 shows the volume of solid waste collected against the volume generated by the major urban areas in Kenya (KNBS, 2023).

Table 5.34: The volume of Solid Waste Generated and Collected in the Major Cities

		Year ('000 Tonnes)					
County		**2018**	**2019**	**2020**	**2021**	**2022**	**% of waste collected**
Nairobi	Generation	730	839.5	876	1,095.00	1,095.00	0.74
	Collection	345	668.8	657.4	821.25	813.5	
Mombasa	Generation	804	879	914	920	1,000.00	0.65
	Collection	450	405	420	520	650	
Kisumu	Generation	215.8	220.1	224.8	229.3	236.6	0.30
	Collection	64.7	66.1	67.4	68.8	71	
Nakuru	Generation	-	-	-	-	383.3	0.60
	Collection	-	-	-	-	230	

Source: KNBS, 2023.

The study aimed to gather administrative data on waste management from county governments. However, data from the county government departments responsible for waste collection was incomplete or unavailable. The available data (KNBS, 2023) in Table 5.34 reveals that for major cities, the average waste collected was 57% of the total waste generated in 2022. Due to the lack of national data, the study relied on the NEMA estimate of the yearly volume of solid waste collected (8 million tonnes) and the estimated percentage of waste collected – 70% – to estimate the volume of waste collected in the country in 2022 as approximately 5.6 million tonnes.

5.9.2.2 Collection and Disposal of solid Waste-Tourism Sector Activities

The PUT captures data on waste management practices and quantities by tourism industries and other industries in the economy, representing intermediate consumption, collection, or residuals handled by waste collection, treatment, and disposal industries. The waste management methods envisaged include disposal in landfills, incineration, recycling, and other practices.

The study surveyed tourism enterprises to obtain data on their organic and inorganic waste management practices. To start, respondents were asked to indicate whether they compost their organic waste. From the study sample (n = 1,253), 95 % responded to the question. Table 5.35 displays the frequencies of tourism enterprises that compost their organic waste among the surveyed enterprises.

Table 5.35: Number of Tourism Enterprises Composting Organic Waste

Tourism Sector	n	Frequency	% Frequency
Accommodation for Visitors	418	38	9.09
Food & Beverage Serving Services	201	10	4.98
Passenger Transport	119	0	0.00
Travel Agency & Reservations	156	2	1.28
Other Tourism Industries	**301**	**6**	**1.99**

Source: TRI situational analysis data, 2023

The results in Table 5.35 indicate a low level of adoption of waste composting among tourism enterprises. Accommodation for Visitors had the highest frequency at 9%, followed by Food & Beverage Serving Services (5%), Travel Agency & Reservations (1%), and Other Tourism Industries (2%). None of the surveyed Passenger Transport enterprises reported composting organic waste.

With regard to inorganic waste, enterprises were asked to indicate whether they recycled their waste. From the sample, 91% responded to the question. Table 5.36 displays the frequency count of enterprises that recycle their waste.

Table 5.36: Number of Tourism Enterprises Recycling Organic Waste

Tourism Sector	n	Frequency	% Frequency
Accommodation for Visitors	385	45	11.69
Food & Beverage Serving Services	199	41	20.60
Passenger Transport	116	4	3.45
Travel Agency & Reservations	153	4	2.61
Other Tourism Industries	**283**	**28**	**9.89**

Source: TRI situational analysis data, 2023

Table 5.36 reveals the varying adoption levels of recycling organic waste among tourism enterprises. Accommodation for Visitors leads with 12%, followed by Food & Beverage Serving Services (21%). Passenger Transport and Travel Agencies & Reservations show moderate adoption rates, with 4% and 3% respectively. Other Tourism Industries exhibit a slightly lower

adoption rate at 10%. The data suggests that while some sub-sectors prioritize recycling, others have yet to fully embrace this practice.

The enterprises were asked to quantify the amount of waste composted and recycled monthly in kilograms. Table 5.37 displays the annual quantities of waste treated by the population of registered tourism enterprises (N=16,964) as computed from the survey data.

Table 5.37: Quantity of Solid Waste Treated by Tourism Enterprises in 2022

Tourism Sector	n	Solid Waste Treatment	Average Monthly Waste (Kg)	Annual Waste Generation (tonnes)	N	Total Annual (tonnes)
Accommodation for Visitors	34	Composting	583.000	7.00	5619	0.04
	1	Recycling	15050.000	180.60		0.03
Food & Beverage Serving Services	9	Composting	303.330	3.64	2590	0.01
	0	Recycling	0.000	0.00		0.00
Passenger Transport	0	Composting	0.000	0.00	4083	0.00
	0	Recycling	0.000	0.00		0.00
Travel Agency & Reservations	2	Composting	64.500	0.77	4615	0.00
	0	Recycling	0.000	0.00		0.00
Other Tourism Industries	5	Composting	274.000	3.29	57	0.29
	0	Recycling	0.000	0.00		0.00
Total						**0.38**

Source: TRI situational analysis data, 2023

The results in Table 5.37 suggest a very low level of solid waste treatment across the tourism sector, as enterprises recycled and composted only 0.38 tonnes of solid waste generated. This represents just 4% of the reported total quantity of waste generated (9.21 tonnes) in 2022. This implies that 96% of the waste generated by tourism enterprises was either disposed of in landfills/dumpsites or remained uncollected and passed into the environment.

The results indicate a significant gap in solid waste management within the tourism sector, with only 4% of waste being recycled or composted. This has practical implications for environmental pollution and public health, highlighting the need for improved waste management practices. Policymakers must prioritize policies that incentivize recycling and composting, enforce stricter waste disposal regulations, and provide support for sustainable waste management infrastructure to mitigate environmental impact and promote sustainability in the tourism industry.

5.9.3 Balanced Preliminary Solid Account for Tourism Enterprise

Table 5.38: Physical Supply Table – SEEA Solid Waste Account for Tourism

	Physical Supply Table for Solid Waste (tonnes)																
		Generation of Solid Waste												Flow from the R.O.W	Flow from the environment	Total Supply
		Tourism Industries											Other Ind.	H/holds	Import of Solid waste	Recovered residuals	
		Accommodation for visitors		Food & beverage Serving visitors		Passenger Transport		Travel Agency and Reservations		Other Tourism Industries		Total Tourism Industries					
A. Generation of solid waste residuals		TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total				
	Organic waste	3.002	3.368	0.290	0.364	0.001	0.002	0.001	0.001	2.197	3.760	5.491	7.495	1,679,992.50	4,760,000.00	-	-	6,440,000.00
	Inorganic waste	0.314	0.352	0.087	0.109	0.001	0.002	0.002	0.002	0.636	1.088	1.039	1.553	599,998.45	728,000.00	-	-	1,328,000.00
	Other waste	0.004	0.004	0.005	0.007	0.000	0.001	0.074	0.078	0.040	0.068	0.123	0.158	119,999.84	112,000.00	-	-	232,000.00
	Total Solid Waste	**3.320**	**3.725**	**0.382**	**0.480**	**0.002**	**0.005**	**0.077**	**0.081**	**2.873**	**4.917**	**6.653**	**9.207**	**2,399,990.79**	**5,600,000.00**	-	-	**8,000,000.00**
B. Generation of solid wastes Products																		
	Total Solid Waste	**3.320**	**3.725**	**0.382**	**0.480**	**0.002**	**0.005**	**0.077**	**0.081**	**2.873**	**4.917**	**6.653**	**9.207**	**2,399,990.79**	**5,600,000.00**			**8,000,000.00**

Table 5.39: Physical Use Table-SEEA Solid Wast Account for Tourism

	Physical Use Table for Solid Waste (Tonnes)															
		Intermediate Consumption , Collection or residuals											Flow from the R.O.W	Flow from the environment	Total Use
		Tourism										Final Consumption			
		Landfill		Incineration		Recycling and reuse		Other treatment		Total		Other Ind.	Households	Export of Solid Waste		
A. Collection and disposal of solid waste residuals		TSM	Total	TSM	Total	TSM	Total	TSM	Total	TSM	Total					
	Organic waste	5.24	7.151	-	-	0.252	0.344		-	5.491	7.495	1,175,994.75		-	5,263,997.75	6,440,000.00
	Inorganic waste	1.017	1.521	-	-	0.021	0.032		-	1.039	1.553	509,600.00		-	818,398.45	1,328,000.00
	Other waste	0.000	0.000	-	-	0.123	0.158		-	0.123	0.158	78,400.00		-	153,599.84	232,000.00
	Total Solid Waste	**6.26**	**8.672**	-	-	**0.396**	**0.534**		-	**6.653**	**9.206**	**1,763,994.75**		-	**6,235,996.04**	**8,000,000.00**
B. Use of solid waste products																
	Total Solid Waste	6.26	8.672			**0.396**	**0.534**	-	-	**6.653**	**9.206**	**1,763,994.75**	-	-	**6,235,996.04**	**8,000,000.00**

Stakeholder Engagement

CHAPTER SIX

6 STAKEHOLDER ENGAGEMENT

6.1 Overview

Stakeholder theory defines stakeholders as individuals and groups that can influence or be influenced by a project's activities and outcomes. This includes a wide range of groups, extending far beyond those directly responsible for the project's execution (Freeman, 1984). Stakeholder engagement involves the process of communication and collaboration between the project implementers and stakeholders through two-way interactions (Phillips, 2010).

The concept of stakeholder engagement in tourism gained prominence with the recognition that tourism development can lead to both positive and negative impacts. The United Nations World Tourism Organization (UNWTO) has emphasized the importance of stakeholder collaboration in its global tourism policies and guidelines. Consequently, scholars and practitioners in tourism policy formulation have relied on guidelines developed for stakeholder engagement. These guidelines include identifying key project stakeholders (Freeman, 1984), defining stakeholder roles (Phillips, 2003), fostering open and transparent communication (Andriof et al., 2002), engaging stakeholders early and continuously (Bryson, 2004), developing participatory methods for engagement (Reed, 2008), addressing stakeholder concerns and feedback (Rowe & Frewer, 2000), developing a stakeholder engagement plan (Project Management Institute, 2013), and monitoring and evaluating engagement processes (Arnstein, 1969).

In Kenya, the Constitution of Kenya 2010 (COK, 2010) provides a robust framework for stakeholder engagement across various sectors, including tourism. It emphasizes public participation, accountability, and transparency as fundamental principles of governance. These constitutional provisions mandate that tourism development and projects, including policy formulation in Kenya, should involve active participation from a wide range of stakeholders, such as local communities, private sector players, non-governmental organizations, and government agencies.

In Kenya, several pieces of legislation and policy instruments mandate a participatory approach in tourism development and project implementation. The Tourism Act of 2011 mandates the establishment of stakeholder forums to discuss tourism-related issues and policies, ensuring community involvement in tourism projects. Similarly, the Environmental Management and Coordination Act (EMCA) of 1999 requires Environmental Impact Assessments (EIA) with mandatory public participation, ensuring compliance and stakeholder involvement through the National Environment Management Authority (NEMA).

The County Governments Act of 2012 requires county governments to establish structures for public participation in regional development and planning processes. The Public Participation Act of 2018 aims to provide a comprehensive framework for public participation in governance and development projects, emphasizing inclusivity, transparency, and accountability in stakeholder engagement processes.

Policy instruments like Kenya Vision 2030, the national development blueprint for sustainable economic growth, emphasize stakeholder involvement, particularly of local communities, in tourism development projects. The National Tourism Strategy for 2013-2018 also highlights the need for stakeholder collaboration and public-private partnerships in tourism initiatives.

Regarding the institutional framework for stakeholder engagement, several institutions provide platforms for collaboration, regulatory oversight, and facilitate inclusive participation in tourism-related initiatives. In the public sector, the Ministry of Tourism and Wildlife develops and enforces tourism policies and facilitates stakeholder forums and consultations. The Tourism Regulatory Authority (TRA) facilitates stakeholder engagement through licensing and regulation, and ensures quality and safety in tourism services. The Kenya Tourism Board (KTB), engages with stakeholders to promote tourism and organizes marketing campaigns involving a diverse range of stakeholders. Additionally, government agencies such as the Kenya Wildlife Service (KWS), the Kenya Forest Service (KFS), and the Tourism Research Institute (TRI) are mandated to carry out their respective tourism-related responsibilities in collaboration with stakeholders in the industry.

Private sector institutions also play a significant role in broad-based stakeholder engagement in tourism development in Kenya. The Kenya Private Sector Alliance (KEPSA) represents the interests of the private sector and collaborates with the government and other stakeholders to promote sustainable tourism development. Similarly, the Kenya Association of Hotelkeepers and Caterers (KAHC), the Kenya Association of Tour Operators (KATO), and the Kenya Association of Travel Agents (KATA) engage with stakeholders on issues affecting the hospitality industry. The Kenya Tourism Federation (KTF), as an umbrella organization for tourism industry associations, coordinates stakeholder engagement across the sector and advocates for industry-wide issues. Ecotourism Kenya (EK) focuses on promoting and implementing sustainable tourism practices through stakeholder engagement. Additionally, various Community-Based Tourism Organizations (CBTOs) involve local communities in tourism projects, ensuring that benefits are shared equitably.

In this context, the TRI undertook to engage diverse tourism industry stakeholders in the current study aimed at conducting a situational analysis of climate change impacts, the adoption of sustainable best practices, evaluating the impact of climate change on Kenya's tourism sector, and designing appropriate climate responses and sustainable practices in line with global benchmarks

The overarching objective of the stakeholder engagement was to establish a comprehensive and systematic approach to engaging stakeholders throughout the project implementation period, ensuring meaningful participation, effective collaboration, and transparent communication. Specifically, the engagement adopted a four-pronged approach that entailed:

i. Stakeholder identification and analysis;
ii. Stakeholder sensitization of the study’s goals and activities;
iii. Stakeholder participation in data collection for the study; and
iv. Stakeholder participation in the validation of the study’s outcomes.

This chapter reports the results of the stakeholder engagement throughout the study project's lifecycle.

6.2 Stakeholder Identification and Analysis

The stakeholder engagement process aimed to identify and analyze primary and secondary stakeholders. Objectives included engaging internal stakeholders to clarify the project's scope and identifying key stakeholders during the project inception meeting. Desk research, including previous studies, policy documents, and official records, helped create a comprehensive database of tourism stakeholders. Data from the Tourism Regulatory Authority (TRA) and the Ninth Schedule of the Tourism Act, 2011, facilitated the identification and classification of tourism enterprises. This process produced an updated stakeholder database and, through consultations with expert teams, industry practitioners, and regional TRA officers, led to a list of key informants and FGD participants.

Table 6.1 outlines the project's stakeholders, including tourism enterprises from the eight tourism regions in Kenya classified as per the 9th Schedule of the Tourism Act 2011, tourism trade associations, regional tourism associations, government departments, and organizations with relevant data. Stakeholders are classified as primary (directly involved or affected by the project) and secondary (indirectly affected or not directly involved but still interested or influential).

Table 6.1 Identified Stakeholders

Category	Identification	Level of selection
Primary stakeholders	Tourism Enterprises • CLASS A - Businesses: Accommodation for visitors: • CLASS B - Businesses Food and beverage serving • CLASS C - Businesses Passenger transport Tour Operators; • CLASS D-Businesses in Culture/Sport & Recreation • CLASS E, F, G, H - Other tourism activities	Selected senior management of the organizations
	Ministry of Tourism, Wildlife and Heritage	Chief Accounting Officers Directorates
	State Agencies -Department for Tourism and Wildlife: • Tourism Regulatory Authority (TRA), • Tourism Research Institute and Monitoring Mechanism (TRI), • National Museums of Kenya, • Tourism Fund, • Tourism Protection Service, • Kenya Tourism Board, • Kenyatta International Convention Centre, • Kenya Safari Lodge and Hotels, • Wildlife Clubs of Kenya; • Kenya Wildlife Service; • Kenya Forest Service	Chief Executive Officers (CEO) and Senior Management

Category	Identification	Level of selection
	Agencies in the State Department for Culture and Heritage • National Heroes Council, • Kenya National Archives and Documentation Service, • Kenya National Commission for Culture and Social Services and Ushanga Kenya Initiative	Chief Executive Officers and Senior Management of the institutions
	Institutions that own administrative data • Kenya Civil Aviation Authority (KCCA), • Kenya Power and Lighting Company (KPLC), • National Transport and Safety Authority (NTSA), • Kenya Railways; • National Environmental Management Authority (NEMA) • Water Service Regulatory Board (WASREB); • Kenya National Bureau of Statistics (KNBS) • County Government Departments of Climate Change Environment, Water and Waste • Management	Chief Executive Officer (CEO) and custodians of data in selected key institutions
Secondary Stakeholders	Tourism Association (Industry) • Kenya Association of Hotel Keepers and Caterers, (KAHC) • Kenya Association of Travel Agents (KATA) • Kenya Association of Beach Hotels and Lodges (KABHAL) • The National Association for Catering and Events (NACE) • Tour Operators Society of Kenya (TOSK) • Homestay Service Providers Association of Kenya • Kenya Association of Ecotourism Operators (KAEO) • Association of Kenya Cruise Operators (ACKO) • Association of Hotel Professionals Kenya (AHPK) • Tourism Professionals Association of Kenya (TPAK) • Kenya Association of Cultural Tourism Operators (KACETO) • Association of Kenya Mountain Guides and Porters (AKMPG) • Kenya Association of Tour Guides and Drivers (KATGD) • Kenya Association of Air Operators (KAAO) • Pubs, Entertainment and Restaurants Association of Kenya (PERAK) • Tourism Students Association of Kenya (TSAK) • Kenya Tourism Federation (KTF	Chief Executive Officers/ Chairman
	Tourism Association (Regional) • Mombasa & Coast Tourist Association • North Rift Tourism Kenya • Lake Victoria Tourism Association	Chief Executive Officers/ Chairman
	Government Ministries • Ministry of Environment, Climate Change and Forestry, • Ministry of The National Treasury and Economic Planning, and • Ministry of Investments, Trade and Sector	Senior Management/ Leadership

Category	Identification	Level of selection
	Hospitality training institutions and research • Registered Technical and Vocational hospitality training and research institutions	Senior Management/ Leadership team from
	• County Governments	Senior Management/ Leadership team responsible for the hospitality sector
	Non- Governmental Organizations • Wildlife conservation and tourism • Climate change • Sustainable tourism	Senior Management/ Leadership

Stakeholders were analyzed based on stakeholder theory and Mendelow's Power-Interest model to assess their interests, roles, and influence/power in the project. This analysis provided the stakeholder engagement plan with a basis for understanding their level of influence on the project and for developing the engagement strategy.

In the stakeholder identification and analysis process, the Power-Interest Grid was key in analysing and selecting stakeholders based on their influence and vested interest. For instance, stakeholders with high power and high interest were deemed crucial due to their significant impact on policy and practice. This group included the Ministry of Tourism and Wildlife, essential for regulatory frameworks and promotion; local government authorities managing tourism at the regional level; major tour operators whose business models rely on sustainable practices; and international investors funding large-scale tourism projects. Their active involvement ensured comprehensive insights and effective implementation of sustainable initiatives.

Stakeholders with high power but low interest, such as national regulatory agencies were also important due to their ability to influence policies and standards. Their participation was crucial for aligning local practices with national and global regulations, ensuring that the study's recommendations were feasible and compliant with broader frameworks.

Low power, high-interest stakeholders, including industry and regional tourism associations, were integral to the study because of their interest in the issues of their affiliated members. Engaging the association groups provided valuable linkages with the affiliated association membership and encouraged broad-based participation.

Finally, low power, low-interest stakeholders, such as peripheral service providers, were included to offer feedback on current practices and potential improvements. Their insights contributed to a well-rounded understanding of the tourism sector's dynamics, aiding in the holistic approach to addressing climate change and promoting sustainability. Table 6.2 displays the resulting stakeholder map.

Table 6.2: Stakeholder Mapping

Stakeholder Classification	Interest in the Project	Roles in the Project	Power/Influence on the Project	Engagement Strategy
Tourism Enterprises (Class A, B, C, D, E, F, G & H)	Adequate engagement and participation; Valid, reliable and feasible results and recommendations;	• Provide accurate data on the research subject matter; • Validate the research findings and recommendations; • Support implementation of the recommendations	High	• Pilot survey; • Project Survey • FGD; • Stakeholder validation workshop; • Published project report
Line- Ministry – Ministry of Tourism and Wildlife	Timely completion of project deliverables; Valid, reliable and feasible results and recommendations.	• Policy guidance, • Oversight implementation • Provide insights on regulatory frameworks; • Provide KII insights • Participate in stakeholder validation	High	• In-person meeting; • E-mails • KII • Stakeholder validation workshop. • Published project report
Line Ministry -State Agencies and Parastatals	Adequate engagement and participation; Valid, reliable and feasible results and recommendations	• Sensitize affiliated enterprises to participate in the project • Provide KII insights • Participate in stakeholder validation	High	• KII • Stakeholder validation workshop; • Published project report
Institutions that own administrative data (e.g., KNBS, KCAA, KPLC, KRC, WASREB etc).	Adequate engagement and participation; Valid, reliable and feasible results and recommendations	• Provide administrative data • Support data analysis • Peer review of project reports • Participate in stakeholder validation	Medium	• Complete administrative data sheets • E-mail communication; • KIIs • Stakeholder validation workshop

Stakeholder Classification	Interest in the Project	Roles in the Project	Power/Influence on the Project	Engagement Strategy
County Governments Departments responsible for Sanitation, Environment and Waste Management	Adequate engagement and participation; Valid, reliable and feasible results and recommendations	• Provide administrative data; • Provide KII insights • Participate in FGDs • Participate in stakeholder validation	Medium	• Complete administrative data sheets; • FGDs • KIIs • Stakeholder workshop
Tourism Industry Associations (e.g., KATO, KATA, KAHKC, KTF)	Adequate engagement and participation; Valid, reliable and feasible results and recommendations	• Provide linkage with and sensitize membership in the tourism industry to participate in the project • Provide KII insights • Participate in FGDs • Participate in stakeholder validation	Medium	• KIIs • Stakeholder workshop; • Published project report
Tourism Regional Associations (e.g., MCTA, Lake Victoria Tourism Association)	Adequate engagement and participation; Valid, reliable and feasible results and recommendations	• Provide linkage with and sensitize affiliate tourism enterprises/stakeholders on the project. • Provide KII insights • Participate in FGDs • Participate in stakeholder validation	Medium	• KIIs • FGDs • Stakeholder validation workshop; • Published project report
Other Government Ministries (e.g., Ministry of Environment, Climate Change and Forestry, Ministry of The National Treasury and Economic Planning, and Ministry of Investments and Trade)	Adequate engagement and participation; Valid, reliable and feasible results and recommendations	• Provide administrative data; • Participate in KIIs • Participate in a stakeholder validation workshop	Medium	• KIIs • FGDs • Stakeholder validation workshop; • Published project report

Stakeholder Classification	Interest in the Project	Roles in the Project	Power/Influence on the Project	Engagement Strategy
Non- Governmental Organizations in (Wildlife Conservation and Tourism, Ecotourism, Climate Change)	Advocacy for conservation, and sustainable tourism practices; Adequate engagement and participation; Valid, reliable and feasible results and recommendations	• Participate in FGDs • Participate in a stakeholder validation workshop	Medium	• FGDs • Stakeholder validation workshop; • Published project report
TVET tourism and hospitality training Institutions	Education and training in sustainable practices; Valid, reliable and feasible results and recommendations	• Provide accurate data on the research subject matter;	Medium	• Pilot survey • Baseline survey • FGD • Stakeholder validation workshop • Published project report

Challenges during stakeholder identification and analysis included the absence of an updated database of tourism enterprises across all subsectors. The list of licensed enterprises provided by TRA was missing some currently operational facilities. Additionally, facilities not licensed under the formal Tourism Act, of 2011, such as establishments offering peer-to-peer or shared accommodation, were excluded from the database. There were also instances of incorrect contact details, such as outdated email addresses and telephone numbers. Some enterprises listed registration addresses differently from their physical business locations. The database was refined to include current contact details suitable for the study's purposes

6.3 Stakeholder Sensitization

The goal of stakeholder sensitization was to communicate the project's objectives, activities, and the roles of stakeholders, and to foster collaboration and stakeholder buy-in for the project's activities and pilot testing of data collection tools. Engagement activities included phone calls and emails to schedule data collection visits and prepare survey respondents and key informants for participation. The TRI provided introduction letters for the expert team and research assistants, which included information on the study's objectives and were shared with stakeholders. Engagement activities utilized networks such as regional TRA offices, tourism associations, and county tourism departments as entry points for sensitizing stakeholders. In-person meetings were scheduled with key informants to inform them about the upcoming project activities and secure their collaboration. During the piloting and pretesting stage, a workshop was held targeting a sample of 192 participants from various tourism enterprises and 20 participants (Table 2.6). At this one-day workshop, n=154 respondents representing a 79% response rate and 16 participants (65% response rate) were sensitized to the project's objectives, activities, and their roles. They also tested the study's data collection tools, including the survey questionnaire, interview guides, and deliberative mapping protocols. Feedback from the piloting and pretesting exercises was used to refine the data collection tools and improve the data analysis protocol. Additionally, gaps in data availability, particularly for the System of Environmental Economic Accounting (SEEA), were identified.

Further stakeholder sensitization occurred during the FGD sessions, where participants were introduced to the project and new aspects such as SEEA. The objective was to enhance their ability to provide accurate, valid, and reliable data.

Challenges during the sensitization exercise included limited stakeholder awareness of study aspects like SEEA, lengthy questionnaires and interview guides, formatting issues on the online data collection platform (COBO Collect]), and difficulties in digital mapping during the deliberative mapping exercise. However, these challenges provided valuable feedback for improving the data collection tools.

Despite these challenges, the outcomes of the stakeholder sensitization exercises included enhanced understanding of the project's objectives and stakeholder roles, increased stakeholder collaboration and support for project activities, stakeholder readiness to collaborate and support project activities, and validated and improved data collection tools for accurate data gathering

6.4 Data Collection

The goal of stakeholder engagement during the data collection phase was to obtain both qualitative and quantitative data for the study. This involved recruiting stakeholders to participate, collecting primary, secondary, and administrative data, and gathering in-depth qualitative inputs on stakeholders' perspectives regarding the research subject matter.

Participants in the data collection were identified from the TRA database of licensed tourism enterprises and the list of identified key informants. TRA regional offices, tourism associations (both regional and industry), and County Directors of Tourism provided entry points for identifying and recruiting key informants and FGD participants. A sampling frame was constructed with a contact list of participants and respondents, forming the basis for stakeholder recruitment. Direct telephone calls and email blitzes were used to contact, recruit, and schedule in-person visits by expert teams and research assistants for data collection.

Out of the targeted 2,000 tourism enterprises nationwide, 1,253 participated in the survey and completed the questionnaire, resulting in a 63% national response rate (Appendix 1 - baseline survey respondents). This satisfactory response rate was achieved through effective mobilization by the research team, leveraging sensitization through tourism industry networks, in-person visits to respondents at their business locations, use of a digital data collection platform, and real-time back-end monitoring of the survey response by the project team. Challenges during the field survey included some respondents being away from their registered business premises on field assignments. These respondents were replaced by those on a backup/waiting list.

Stakeholder engagement involved contacting identified key informants via telephone and email to schedule in-person interviews. These key informants included industry experts, opinion leaders, and members of academia with knowledge, expertise, and experience related to the study's subject matter. Of the 46 targeted key informants, 26 participated in in-person interviews, resulting in a 57% response rate. This high participation rate was achieved through follow-up emails and sensitization via introduction letters to the targeted institutions. In a few cases where key informants were unavailable for in-person interviews, online interviews were scheduled.

The engagement process faced a significant 43% non-response rate during the KIIs. Some informants were unavailable due to limited notice, and despite repeated reminders and resending of introduction letters, the affected organizations could not provide alternative personnel, citing a lack of authorization.

The stakeholder engagement collected additional qualitative data through 12 FGDs conducted nationwide. Table 6.3 details the FGD participants (n = 467) across the 24 represented counties

Table 6.3: Tallies of Focus Group Discussion Participants

Date	Location	Counties represented	Participants
21st February 2024	Amboseli	Kajiado,	26
12th February 2024	Eldoret	Turkana, West Pokot Uasin Gishu, Nandi	49
14th February 2024	Kakamega	Bungoma, Kakamega & Busia	82
2nd February 2024	Kilifi	Kilifi, Lamu & Tana River	38
7th February 2024	Kirinyaga	Kirinyaga, Embu & Nyeri	35
14th February 2024	Kisumu	Homa-Bay, Kisii, Siaya Kisumu, & Migori	55
5th February 2024	Kwale	Kwale	21
7th February 2024	Laikipia	Laikipia, Meru, Marsabit	22
9th February 2024	Narok	Narok, Bomet	14
23rd February 2024	Voi	Taita Taveta	19
26th February 2024	Virtual-Conservancies	All	48
12th February 2024	Nakuru	Nakuru & Samburu	67
		TOTAL	**476**

Except for the FGD targeting conservancies, which was conducted online, all other nationwide FGDs were held in person. Participants were invited to join the group discussions through intensive mobilization efforts. This included coordination with regional tourism associations, TRA regional offices, and county tourism departments. Email invitations and follow-up telephone calls were used to mobilize attendees. All forums, except for the one in Narok County, were well-attended and featured broad representation from private sector enterprises, public sector representatives, media, and NGOs.

During the FGDs, participants were first introduced to the project's objectives and their roles. This was followed by breakout group discussions facilitated by the expert team. These sessions included open discussions and a deliberative mapping exercise where participants identified and mapped the impacts of climate change on tourism in their areas using a digital GIS mapping platform. Participants then presented their findings during plenary sessions.

Challenges during the FGDs included a limited understanding of the SEEA study component, ambiguities in interpreting some research concepts, and difficulties with digital GIS mapping. Nevertheless, expert facilitators were available to guide the deliberation process.

The study engaged with data providers, including water service providers and county government departments, to obtain administrative data for constructing SEEA water and solid waste accounts. A mailing list of data providers was created using information from the respective organizations' websites and listings by the Water Services Regulatory Authority (WASREB). The engagement involved sending emails with introduction letters detailing the project's objectives and data requirements. Data collection sheets were attached to these

emails. Follow-up visits were conducted to gather the data. However, despite repeated phone call reminders and email follow-ups, less than 5% of the data providers supplied usable feedback. Follow-up visits revealed a lack of readily available data in the required format. Consequently, the study used secondary data to address this gap. Data for energy and greenhouse gas accounts were obtained from Kenya National Bureau of Statistics (KNBS) publications and reports by the International Energy Agency (IEA).

Overall, the combination of strategies employed in the data collection successfully met the desired outcomes. Representative stakeholder participation was achieved, resulting in the collection of rich qualitative and quantitative data that offered deeper, complementary insights into the study's subject matter. This approach also enhanced the understanding of the spatial distribution of climate change impacts and secured accurate, up-to-date data relevant to the study

6.5 Stakeholder Validation

The final phase of stakeholder engagement focused on validating the findings and recommendations of the study report. The objectives of this phase were to secure stakeholder validation and endorsement of the research findings and recommendations and to build support for implementing the project's recommendations. This phase included a stakeholder workshop and the publication of the validated report of research findings and recommendations.

A diverse group of stakeholders from the tourism industry, key informants, and academia were invited to participate in a day-long workshop on July 10, 2024, during which the project's report and recommendations were presented. A total of 56 participants attended the workshop and provided feedback.

The following issues emerged during the validation workshop and were incorporated into the final and closure reports:

i. Consideration of additional global benchmarks, including International Organization for Standardization (ISO) standards and Global Reporting Initiative (GRI) standards.
ii. A review of how stakeholders in the tourism sector are communicating their achievements regarding the Sustainable Development Goals (SDGs).
iii. A proposal for TRI and tourism sector stakeholders to pilot an incentive and disincentive framework, with a view to scaling it up nationally.
iv. A recommendation for TRI to produce a simplified version of the findings, reducing technical jargon to help the tourism sector implement the key recommendations.
v. A suggestion for TRI to enrich the study with more data from underrepresented regions, such as Western Kenya, as there were more examples from Nairobi and Coastal Kenya.

Clarifications on the feedback from the workshop were provided during the session, and the necessary amendments were incorporated into the project report. The amended report was then adopted. TRI committed to publishing an executive summary of the report, making it accessible to stakeholders.

Findings
Conclusion
Recommendations

CHAPTER SEVEN

7 SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

7.1 Overview

The chapter presents a summary of the main study findings, organized sequentially by the deliverables and aligned with the study objectives.

7.2 Summary of Findings

7.2.1 The Impact of Climate Change on the Tourism Sector in Kenya

The study uncovered moderate awareness of droughts, disease emergence, warmer temperatures, intense rainfall, floods, and wildlife ($3.50 > \bar{x} < 4.00$). Glacier melting awareness was rated slightly ($\bar{x}=2.28, SD=1.35$). Respondents showed some awareness of pests, loss of tree species, rising water levels, landscape erosion, and coral reef leaching due to climate change ($2.50 > \bar{x} < 3.50$). In general, familiarity with physical climate change impacts ($\bar{x}=3.46, SD= 0.84$) slightly exceeded awareness of biological impacts ($\bar{x}=3.39, SD= 0.99$).

In the KII, the study observed frequent mentions of climate change events like extreme weather, erratic rainfall, floods, and prolonged droughts. Other common concerns included the loss of destination attractiveness, wildlife decline, and economic impact. Thematic analysis categorized climate change impacts as "impact on life forms" (biological) and "physical environment impacts" (physical).

The study found a gender disparity in climate change awareness, with men generally exhibiting greater awareness in both categories (mean difference = 0.135, 95% CI”0.015 to 0.260 for biological impacts and mean difference = 0.140, 95% CI”0.035 to 0.245 for physical impacts). The study also found that higher education levels ($F_{(3,1248)}=8.98, p<.001$ and $F_{(3,1248)}=23.52, p<.001$) and experience ($F_{(2,1250)}=6.78, p<.001$ and $F_{(2,1250)}=10.05, p<.001$) in the industry correlated with increased awareness of climate change impacts. Although awareness of biological climate change impacts did not significantly differ across tourism regions, significant differences existed in awareness of physical climate change impacts. Notably, the coastal region showed lower awareness of physical impacts compared to Eastern, Maasai Amboseli, Rift-Valley, and Nairobi region.

Key informants emphasized climate change's impact on tourism, highlighting altered travel patterns, property damage, declining destination appeal, and resource constraints. The study revealed varied perceptions among respondents on climate change's significance for tourism enterprises. Climate change "very significantly" affected operational aspects—costs, income opportunities, seasonality, travel demand, and business interruptions. In contrast, "somewhat significant" impacts on external factors included infrastructure damage, higher insurance premiums, property damage, loss of landscape appeal, wildlife migration, and human-wildlife conflict.

The study observed no significant difference in perceptions of the significance of climate change impacts on business operations based on enterprise size. However, there were notable differences in the perception of the impacts' significance across regions and tourism enterprise categories

7.2.2 Climate Change Response Strategies by the Tourism Sector in Kenya

Key informants highlighted adaptation strategies such as beach clean-up, heritage conservation, visitor information, and wildlife conservation. Water conservation and capacity building emerged as the most frequently mentioned adaptation measures. In contrast, the most cited mitigation measures comprised tree planting, clean energy use, waste reduction, and stakeholder sensitization.

The survey results indicate incomplete adoption of climate change mitigation in tourism enterprises. Although there's the commitment to adaptive strategies, addressing specific climate-related risks needs improvement. Visitor information, conservation, and product diversification were partially adopted ($2.5 > \bar{x} < 4.0$), while practices like tree planting, structural modification, insurance, and rainwater collection had limited implementation ($1.5 > \bar{x} < 3.5$). Water recycling and desalination were not implemented. ($1.0 > \bar{x} < 2.5$).

7.2.3 Sustainable Tourism Practices in the Tourism Sector

The study uncovered varied views of sustainable tourism, spanning organizational goals to bioethical and ecocentric angles. Weaker sustainability is linked to operational aims like profitability, while stronger sustainability emphasizes resource conservation, non-utilitarianism, impact mitigation, and inter-generational equity. Overall, these perspectives encompassed economic viability, social objectives, and environmental concerns in the understanding of sustainable tourism goals.

Study results emphasize varied sustainable tourism practices, with prevalent low-investment STPs and community-focused initiatives. Common practices include training activities like capacity-building programs and visitor education. However, practices requiring substantial resource investment and organizational commitment, such as eco-certification programs, waste management, water and energy conservation, and emission reduction, were less frequent.

Materials recycling was the least adopted practice at 36%, below environmental fleet management at 47%. Compliance with laws ranked highest at 89%, followed by anti-sexual harassment policies at 82%. However, 11 out of 15 practices, including a corporate social responsibility budget, energy use monitoring, sustainable procurement, and employee training, were adequately implemented by 51% to 69% of surveyed enterprises.

STP assessment across subsectors revealed key trends. Legal compliance and anti-sexual harassment policies were widespread (over 80% adoption across all sectors). Pollution monitoring was common (70-78%) in classes A, E, F, D & G but less so (below 65%) in Class B and H. Employee training exceeded 60% adoption in all classes. Fleet management was notable in class C (77%). However, waste recycling had limited adoption (31-38%) across sub-sectors, notably among privately owned enterprises, while public sector enterprises in class D, F and G showed higher prevalence (64-75%) in certain classes.

7.2.4 Barriers/Drivers to Adoption of Climate Change Adaptation, Mitigation and Sustainable Tourism Practices

The study results reveal that enterprise features, classification, and climate change perceptions predict tourism enterprises' adoption of measures by 13-30%. Privately owned enterprises are more prone to securing special insurance (2.05 times more likely), implementing impact management plans (1.75 times more likely), and providing environmental training (1.64 times more likely). However, they engage less in conservation compared to public and community-owned enterprises (Exp(B) = 0.07).

Regarding size, medium firms showed a greater tendency to adopt varied climate change adaptation practices (Exp(B) = 2.04 – 4.17) than small and large enterprises (Exp(B) = 1.51 – 2.59). Enterprise classification also influenced the likelihood of adopting climate change practices. For instance, Class A enterprises were more prone to securing special insurance premiums (Exp (B) = 0.62), while Class E enterprises were more likely to implement climate impact management plans compared to other enterprises (Exp (B) = 0.62).

The study found that nationality of ownership influences the likelihood of adopting climate change mitigation practices. Surprisingly, foreign-owned and mixed-ownership enterprises showed a higher tendency to adopt tree planting than local ones. Overall, foreign-owned enterprises were more inclined to modify their built environment, engage in rainwater harvesting, and adopt water recycling and desalination compared to locally owned enterprises.

The study highlighted that heightened awareness of climate change impacts increases tourism enterprises' likelihood to adopt various response measures. These include mitigating rising water levels, diversifying products and markets, securing special insurance, training employees, and engaging in conservation activities for adaptations. Additionally, a stronger perception of climate change's significance on operations stimulates the adoption of practices like conservation activities, redirecting guests from sensitive areas, and informing guests about weather. Greater awareness also promotes tree planting, water recycling, and desalination measures.

The analysis identified several barriers and drivers to adopting climate change adaptation, mitigation, and sustainable tourism practices in Kenya. Qualitative feedback revealed key barriers including limited stakeholder awareness of national policies, fragmented and overlapping regulations, lack of coordination among government agencies, and technological challenges such as limited access to expertise and high costs of sustainable technology. Additionally, there is resistance to new technologies like electric vehicles and inadequate training and financial constraints hindering investment in sustainability. Confirmatory factor analysis confirmed that competitors' priorities, the level of habitat degradation, policies on technology, technological adaptability, technological innovation, technological capacity, digital technology payment access, managerial support for technology, energy use efficiency, organizational sustainability targets, and performance measurement are reliable and critical factors influencing the adoption of these practices ($t = 20.92 – 25.90$, $p < 0.001$). The factor loading coefficients of the indicators ranged from $\lambda = 0.65$ to 0.90, indicating a strong association

between the TOE factors and the latent variable.

Conversely, drivers for adoption include strong governmental policies on sustainable technology, the presence of organizational sustainability targets, performance measurements, and the use of digital payment and energy-efficient technologies. Structural equation modelling showed a significant positive relationship between these factors and the implementation of sustainable tourism practices (BTOE = 0.54, t = 12.18, p <.001). Regression analysis indicated that five factors—government policies on sustainability technology, enterprise use of performance measures, use of digital payment technology, presence of sustainability targets, and use of energy-efficient technologies—explained 47% of the differences in social sustainability practices (R=0.47; F=72.09; p<.05), while these and two additional factors explained 54% of environmental sustainability practices (R=0.54; F=86.23; p<.05). Six of the seven factors explained 57% of economic sustainability practices (R=0.57; F=116.60; p<.05).

Furthermore, enhancing access to sustainable technologies through tax incentives and improved digital infrastructure is crucial. Government policies promoting sustainable technologies accounted for a 19% improvement in social sustainability and 18% in environmental sustainability. Digital payment technologies drove a 13-14% improvement in sustainability practices across all dimensions. These findings suggest a holistic approach, integrating technological advancements and organizational culture shifts, to promote comprehensive sustainability practices in Kenya's tourism sector.

7.2.5 Extent of Implementation of Climate Change Adaptation and Mitigation Practices by Tourism Enterprises Classification

The study assessed the extent of implementation of climate change adaptation practices by tourism enterprises in the country. Quantitative results revealed that overall, the tourism enterprises had adopted climate change adaptation practices "to a little extent," with an average adoption score of 2.29 on a five-point Likert scale and little variation around the average (SD=0.82). Although the extent of adoption was low across the sector, the results indicate that most enterprises (86%) had at least adopted climate change adaptation practices to a limited extent.

Tourism enterprises in classifications A, B, C, and E adopted managerial and educational climate change practices variably. Product diversification was common among hotels (82%) and Class E enterprises (88%), while training and campaigns were prevalent among hotels (83%) and Class E (88%). Tour operators and Class E embraced redirecting tourists from sensitive areas (90%-88%). Impact management plans were less adopted but notable in hotels (72%) and tour operators (71%). Weather information for tourists varied widely across classes. Structural modifications were prevalent in hotels (74%) but less in Class C (34%). Water management saw limited adoption overall.

KIIs and FGDs supported quantitative findings, emphasizing product diversification to reduce reliance on nature-based tourism. Additional climate adaptation practices included hotels' linen-reuse programs and waste recycling efforts with plastics. Some enterprises focused on waste management training and composting. Green building adoption was limited but emerging

among new hotels. Energy conservation efforts featured improved stoves, light sensors, and organic fuels. Policy discussions centered on government regulations and conservation efforts, including ecosystem restoration and smart agriculture initiatives by tourism and public sectors.

Tourism enterprises in classes A, B, C, and E participated significantly in conservation activities ($2.5 > \bar{x} < 3.5$) to mitigate CO2 emissions. Hotels (79%), restaurants (72%), tour operators (77%), and small-scale enterprises (88%) engaged in these efforts to varying extents. Key informants and FGD participants highlighted the importance of conserving fragile ecosystems like national parks and game reserves, noting benefits for biodiversity and resilience to climate change. Protecting and restoring these areas was seen as potentially boosting tourism revenue. Tree planting as a climate change mitigation measure was implemented to a limited extent across tourism enterprises ($1.5 < \bar{x} < 2.5$), with notable adoption rates among hotels (64%), restaurants (56%), tour operators (42%), and smaller enterprises (58%).

KIIs and group discussions highlighted tree planting, especially afforestation and reforestation, as crucial practices. Interviewees and FGD participants noted that enterprises undertook tree planting primarily to sequester carbon, aiming to enhance environmental sustainability amidst climate challenges. Qualitative feedback confirmed community engagement in forest conservation supported by tourism enterprises through CSR initiatives. For instance, the Coastal Forest Conservation Unit piloted an ecotourism project at Kaya-Kinondo-Mijikenda to conserve the Kaya Forest, aiming to create income and jobs locally. Enterprises also managed invasive species, controlled wildfires, regulated grazing, and engaged in apiculture to protect fragile ecosystems and watersheds.

Stakeholders discussed carbon offset projects driving tourism's climate action, highlighting the Northern Rangeland Trust (NRT) and Mikoko Pamoja initiatives. KIIs and FGDs revealed tourism enterprises adopting emission reduction measures, focusing on renewable energy like solar and alternative fuels (e.g., briquettes, LPG). Discussions emphasized restricting fossil fuel vehicles in national parks to curb emissions, with some transitioning to non-fossil fuel vehicles and promoting sustainable transportation options like biking and trekking safaris. Waste management practices included recyclable packaging, waste treatment, composting, and staff training on responsible waste handling. Informant interviews stressed tourism research on climate change, guiding policy and sector guidelines. Some KII interviewees opined that integrating climate topics into Continuous Professional Development (CPD) enhances professionals' readiness to address climate impacts in tourism.

7.2.6 The Extent of Implementation of Sustainable Tourism Practices by Tourism Enterprises

The study assessed the extent of implementation of sustainable tourism practices by tourism enterprises in the country. Quantitative results revealed that, overall, the tourism enterprises had implemented environmental sustainability practices "to some extent," with an average adoption score of 2.86 on a five-point Likert scale and little variation around the average (SD = 0.97). Although the extent of adoption was moderate across the tourism sector, the results indicate that most enterprises (94%) had at least adopted environmental sustainability practices to a limited extent.

The study found that environmental sustainability practices among Kenyan tourism enterprises vary widely across different sectors. Environmental pollution monitoring was moderately adopted, with a range of 70% to 90% of enterprises experimenting with this practice. Similarly, environmental awareness creation was moderately implemented, with significant variation across classes: 75% in Class A, 74% in Class B, 64% in Class C, and 83% in Class E adopted it to some extent. However, eco-building design showed lower adoption rates, with over 85% of hotels and 78% of restaurants implementing it to some extent, confirmed by qualitative feedback from KIIs and FGDs highlighting its lesser mention compared to energy and waste management.

Economically, monitoring energy use for billing was moderately implemented across hotels (90%), restaurants (87%), tour operators (74%), and Class E enterprises (81%). There was also moderate adoption of minimizing paper-based marketing (79% to 91%). Conversely, environmental fleet management practices aimed at reducing fuel use and CO2 emissions were limitedly implemented by hotels and restaurants but more widely adopted by tour operators (85%) and Class E enterprises (75%).

Water management systems were moderately implemented across hotels, restaurants, and Class E enterprises, with adoption rates ranging from 73% to 91%. Employee-focused initiatives like minimizing water loss and linen reuse were prevalent, with percentages reaching 86% and 77% respectively in hotels and restaurants. However, more advanced practices such as intelligent irrigation systems and greywater recycling for irrigation were less commonly adopted. Recycling practices showed minimal adoption across all classes of tourism enterprises, ranging from 51% to 52%. Hotels emphasized waste reduction and local waste management services, with lesser focus on advanced technologies like biogas (1% to 5%). Similarly, restaurants concentrated on local waste management and environmentally friendly detergents, with recycling rates below 1% and biogas adoption at 3%.

Discussions in FGDs and KIIs underscored economic sustainability efforts such as adopting solar energy and promoting electric vehicles in tourism, particularly in eco-sensitive areas like Masai Mara. Enterprises explored alternative energy sources like LPG gas and organic briquettes, alongside implementing energy-efficient technologies and educating stakeholders on conservation. Key water management practices included conservation measures, linen reuse, and smart irrigation, reflecting widespread adoption despite challenges in waste handling and limited recycling efforts.

Social sustainability practices exhibited strong adherence to legal compliance, with high implementation rates across hotels (99%), restaurants (93%), tour operators (92%), and Class E enterprises (95%). Anti-sexual harassment policies were also widely implemented, although slightly less consistently among tour operators. Continuous education and professional development were moderately adopted across classes, emphasizing ongoing efforts in skill enhancement. However, budgeting for CSR initiatives lagged, particularly in Class E enterprises, though generally implemented to a limited extent.

Qualitative insights highlighted the widespread adoption of anti-sexual harassment policies (71%) and ongoing efforts in employee development (57%), contrasting with lower adoption rates for environmental awareness campaigns (43%). Allocation of resources to CSR initiatives remained limited (40%), pointing to opportunities for enhancing community and environmental contributions through strategic investments. FGDs emphasized comprehensive approaches to environmental education, stakeholder engagement, and training programs, underscoring efforts to foster sustainability holistically.

Overall, the study showcases tourism enterprises' commitment to community engagement through local employment and artisan capacity-building initiatives. While energy and basic waste management practices are well-established, challenges persist in advancing water management, fleet sustainability, and recycling programs. Addressing these gaps could bolster holistic environmental stewardship in Kenya's tourism sector, ensuring sustainable practices align with ethical standards, employee development, and community engagement efforts.

7.2.7 A Comparison of Climate Change Adaptation and Mitigation Practices Against Global Benchmarks

The comparison of water management practices among Kenya's tourism enterprises reveals significant gaps and opportunities for improvement against best practices. Rainwater collection, crucial for water conservation, shows limited adoption, with only 32% of enterprises implementing it to any extent. Removing salt from water, essential in regions with saline groundwater, is rarely utilized, with a mere 15% implementation rate. Water recycling, vital for sustainable resource use, sees limited adoption, with only 23% implementing it. Similarly, shielding against rising water levels, critical in flood-prone areas, is minimally adopted, with 37% implementing protective measures. These findings underscore opportunities for enhancing water management practices in Kenya's tourism sector, emphasizing the need for greater adoption of innovative technologies and comprehensive strategies to ensure sustainable water use and resilience against environmental challenges.

The comparison revealed Kenya's tourism sectors' strengths in climate change management practices such as product and market diversification, impact management plans, and training/ campaigns for employees and guests, with adoption rates ranging from 71% to 84%. These practices align well with global benchmarks, indicating a robust commitment to resilience-building and sustainability. However, gaps were revealed in implementing special insurance (60%) and redirecting guests from ecologically sensitive areas (71%), suggesting opportunities for enhancement in risk mitigation and conservation efforts. To further strengthen climate change resilience, there is a clear opportunity to expand insurance coverage and enhance strategies for guest management in vulnerable environments, thereby promoting more comprehensive and proactive climate adaptation measures across Kenya's tourism sector.

The comparison also uncovered Kenya's tourism strengths in climate change mitigation practices such as engaging in conservation initiatives, with a substantial 81% implementing these efforts to at least a limited extent, aligning well with global benchmarks. However, there are noticeable gaps in tree planting, where only 58% of enterprises have implemented

this practice to some extent. This highlights an opportunity for enhancement in expanding reforestation efforts and increasing carbon sequestration capacities within tourism operations. By scaling up tree planting initiatives and integrating them more comprehensively into sustainability strategies, Kenya's tourism sector can further contribute to mitigating climate change impacts and enhancing environmental stewardship, thereby bolstering its resilience and sustainability in the face of global climate challenges.

7.2.8 Comparison of Sustainable Tourism Practices Against Global Benchmark

Kenya’s tourism enterprises exhibit strengths in social sustainability practices, with considerable adoption rates for anti-sexual harassment policies (90%) and compliance with laws (95%), reflecting a strong commitment to ethical standards and legal compliance. However, gaps are evident in areas such as giving feedback to stakeholders (85% implementation), budgeting for CSR activities (76%), and employees' continuous education (85%), suggesting opportunities for enhancement. Strengthening stakeholder engagement through more systematic feedback mechanisms, increasing investment in CSR initiatives, and expanding professional development opportunities for employees could further enhance social sustainability efforts in Kenya’s tourism sector. These steps would not only align practices more closely with global benchmarks but also foster greater transparency, accountability, and employee well-being within tourism enterprises.

Further, the comparison revealed Kenya’s tourism enterprises strengths in economic sustainability practices such as using energy-efficient appliances (81%), minimizing paper-based marketing (86%), and purchasing from sustainable suppliers (86%), reflecting a robust commitment to operational efficiency and environmental responsibility. However, gaps are evident in recycling materials (53%), environmental fleet management (60%), and efficient water management systems (81%), highlighting opportunities for improvement. Enhancing recycling initiatives, implementing more comprehensive fleet management strategies to reduce environmental impact, and advancing water conservation technologies could further align these practices with global benchmarks. By investing in these areas, Kenya’s tourism sector can enhance its economic sustainability, reduce resource consumption, and strengthen its environmental stewardship efforts, contributing to long-term sustainability and resilience.

The comparison revealed Kenya's tourism enterprises strengths in environmental sustainability practices such as monitoring environmental pollution (84%) and creating environmental awareness (75%), aligning moderately with global benchmarks. However, gaps exist in fully implementing eco-building designs (73%) to meet global standards. Opportunities for enhancement include advancing technologies for pollution monitoring, intensifying educational campaigns on environmental conservation, and promoting more innovative and energy-efficient eco-building designs. By addressing these gaps and capitalizing on opportunities, Kenya's tourism sector can strengthen its environmental sustainability efforts, reduce ecological footprints, and bolster resilience against environmental challenges, thereby enhancing its reputation as a sustainable tourism destination on a global scale.

7.2.9 Prioritization of Climate Change Adaptation, Mitigation and Sustainable Tourism Best Practices

Through a comparison of currently adopted climate change adaptation and mitigation measures with global benchmarks, the study identified priority best practices for adoption by Kenya's tourism industry. The following practices emerged as key for promotion and adoption by tourism enterprises in Kenya. These practices offer both adaptation and mitigation benefits, while also promoting sustainable tourism.

Table 7.1: Priority Climate Change Response and Sustainable Practices

Practice	Gap
1. Water conservation practices;	Limited adoption, with 23% implementing at least to limited extent
2. Energy conservation and efficiency;	Moderate implementation, 81% at least to a limited extent
3. Ecosystem restoration and environmental conservation;	Implemented to a great extent with 81% implementing at least to limited extent.
4. Product market diversification;	Adopted to a great extent with 84% implementing at least to limited extent
5. Change on product use and shifting to open-air spaces;	Low level of adoption
6. Waste management;	Low level of adoption
7. Capacity building, training and research;	Implemented to a great extent with 83% implementing at least to limited extent.
8. Compliance with government policies and regulations;	Considerable implementation, 95% at least to a limited extent
9. Protection of fragile ecosystems and watersheds;	Low extent of implementation of tree planting
10. Investment in carbon offset projects; and	Low level of adoption
11. Use of electric vehicular transportation system.	Low level of adoption

7.2.10 Legal, Regulatory and Institutional Framework for Environmental Economic Accounting in Kenya

The study assessed the prevailing legal, regulatory, and institutional framework underpinning environmental-economic accounting in Kenya's tourism sector. The findings revealed that while the SEEA framework is gaining traction globally, its implementation in Kenya is still in its early stages, similar to countries like South Africa and Uganda that are experimenting with the framework. The findings show that Kenya has successfully developed SEEA Energy Accounts for the national economy and is at the advanced stages of developing a National Plan for Advancing Environmental-Economic Accounting. The study confirms that tourism enterprises in Kenya have not formalized environmental-economic accounting, although some enterprises monitor their energy and water consumption for cost monitoring and billing purposes. Key informant interviews, FGDs, and survey results highlight limited practices in recording, monitoring, and reporting flows related to GHG emissions and solid waste by the tourism industry.

The study highlighted several barriers to environmental-economic accounting in Kenya's tourism industry, including scepticism about its practicality and reliability and a lack of standardized reporting, with many enterprises not documenting borehole or municipal water except for billing purposes. Regulatory gaps also exist due to the absence of formal systems or mandatory requirements for comprehensive energy management. Additionally, the sector lacks systematic approaches to measuring and reporting greenhouse gas emissions, as evidenced by the absence of monitoring equipment and a standardized carbon calculator, and there is an overall lack of comprehensive monitoring and standardized reporting requirements across the sector.

On the other hand, drivers that could promote the adoption of Environmental-Economic Accounting (EEA) by the tourism industry, highlighted by the study, include the need for clear responsibilities and raising awareness about sustainable practices like water harvesting and recycling, recognition through environmental awards, involvement of local communities, compulsory certification or eco-rating systems, continuous training, development of data collection apps, rewards for compliance, and infrastructure support for tools and measuring equipment to track greenhouse gas emissions.

Findings on the policy, legal, regulatory, and institutional arrangements for EEA in tourism confirm a lack of specific laws or regulations for environmental-economic accounting (EEA) in Kenya’s tourism sector, though several existing sectoral laws and strategies, particularly for climate change, are relevant. The findings highlight the involvement of multiple institutions, including various government ministries, the Kenya National Bureau of Statistics (KNBS), and private sector organizations. However, the study uncovers a lack of coordination, inadequate synergies, and conflicting roles among these institutions, necessitating harmonization to effectively promote EEA in the tourism industry.

7.2.11 Status of Implementation of the System of Environmental-Economic Accounting for Tourism Sector in Kenya

The study findings reveal that Tourism enterprises in Kenya primarily document energy use through billing services from energy suppliers like Kenya Power, aiding in financial audits. While internal reporting for solar power exists, it lacks formal systems or mandatory requirements, leading to regulatory gaps and incomplete energy management. This highlights the need for structured, consistent energy documentation to ensure comprehensive management and sustainability practices.

Greenhouse gas (GHG) documentation and reporting are notably absent in Kenya's tourism industry. Most respondents from focus group discussions and key informant interviews reported no documentation practices. This absence is attributed to a lack of knowledge, tools, and the perception that it is costly. The sector lacks systematic approaches to GHG measurement, emphasizing the need for structured efforts to enhance environmental accountability.

Water use documentation practices vary among Kenyan tourism enterprises. Some businesses track water usage through record books and metering in specific areas like guest rooms, kitchens, and laundry. Enterprises with boreholes measure monthly water extraction

for permit compliance. Despite these practices, standardized reporting is often lacking, and many businesses only document water usage for billing purposes, indicating a need for clearer guidelines and robust reporting mechanisms.

Waste management documentation and reporting in Kenya's tourism industry show diverse practices. Some enterprises systematically track waste using spreadsheets, report books, and segregation of waste types. However, inconsistencies exist, with some organizations lacking measurement practices or facing capacity issues. Despite ambitions for accurate waste measurement, practical and reliable implementation remains a challenge, underscoring the need for standardized waste management practices and improved measurement skills.

7.2.12 Energy Accounts

The study compiled initial SEEA energy accounts for the tourism sector based on the KNBS SEEA-Energy accounts for 2022. The SEEA Energy Account for Kenya's tourism reveals that natural energy sources, primarily biomass (93%), accounted for 602,857.44 terajoules (TJ). Energy imports totalled 25,963.53 TJ, mainly motor spirit petroleum and light diesel. Energy generated by industries was 48,444.94 TJ, with households producing 559,477.32 TJ, mainly from charcoal and firewood. Accommodation and food & beverage industries generated 640.8 TJ, with only 5% of tourism enterprises producing off-grid electricity. The tourism sector consumed 14% of the electricity from the Electricity, Gas, Steam, and Air Conditioning sector (5,050.60 TJ), 11% of motor spirit petroleum, and 10% of light diesel.

The tourism sector's total intermediate energy consumption was 7,357.9 TJ, with 58% (4,281.83 TJ) attributable to tourist expenditures on tourism goods and services. The report highlights the need for the tourism industry to adopt more sustainable energy practices, such as transitioning to renewable energy sources and improving energy efficiency. These changes can reduce the industry's carbon footprint and align with global sustainability goals, ensuring long-term viability and resilience in an increasingly eco-conscious market.

7.2.13 Green House Gases Account

In 2022, the SEEA GHG emissions account for Kenya’s tourism sector, based on KNBS data, revealed significant contributions from various industries. Industries emitted 1.87 million metric tons (Mt) of carbon dioxide (CO2), with light diesel and coal/coke leading at 0.48 Mt and 0.46 Mt respectively. Household emissions were substantial due to electricity and biomass consumption, contributing 61.71 Mt CO2 emissions. Kenya’s tourism sector had relatively low GHG emissions in 2022 (0.76 Mt CO2e), primarily from passenger transport (0.46 Mt CO2e), accommodation (0.15 Mt CO2e), food and beverage services (0.09 Mt CO2e), and travel agencies (0.03 Mt CO2e), with negligible emissions from other tourism industries.

The findings suggest that compared to other industries and households, tourism in Kenya was a low GHG contributor. However, the findings underscore the tourism sector’s need for climate change mitigation strategies. Reducing CO2 emissions not only aligns with global environmental goals but also enhances the sector’s reputation among eco-conscious travellers. Adapting sustainable tourism practices will not only attract environmentally aware tourists but also pre-

emptively comply with tightening government regulations on emissions and environmental standards. Moreover, investing in energy-efficient technologies will yield cost savings and bolster economic resilience, ensuring the sustainable use of natural resources crucial for the sector's long-term growth and stability.

7.2.14 Water Account

The SEEA-Water Account for Kenya's tourism sector in 2022 details water flows from the environment to households and industries, including tourism. In 2022, 32,320 million cubic meters (MCM) of water were abstracted from surface and groundwater sources. Water services providers produced 460 MCM, supplying 54% to industries and households, with 90 MCM going to industries, including tourism. Tourism industries abstracted 21.30 MCM for their use: accommodation enterprises took 16.70 MCM, food and beverage serving enterprises 3.60 MCM, and passenger transport 0.8 MCM. Tourism enterprises also used 0.48 MCM of water supplied by water services, with accommodation services accounting for 63% of this volume. Most enterprises (97%) did not treat sewage for reuse, and the survey data on treated sewage was deemed insufficient for useful computation. Enhanced reporting of wastewater generation and treatment is needed for future SEEA water accounts for tourism.

7.2.15 Solid Waste Account

The study compiled pilot Solid Waste Accounts for the tourism sector, categorizing waste into organic and inorganic (waste supply), waste management by tourism enterprises, waste collection, and final treatment (waste final use). In 2022, Kenya generated 8,000,000 tonnes of solid waste, with 70% (5,600,000 tonnes) domestic and 30% (2,400,000 tonnes) industrial. Domestic waste was 85% organic, 13% inorganic, and 2% other, while industrial waste was 70% organic, 25% inorganic, and 5% other. Survey data was used to compute volume of solid waste generated by tourism enterprises. The waste account reveal that tourism generated 64.28 tonnes of solid waste in 2022. The results show that the Accommodation for Visitors industry was the highest contributor, generating 82% of the total solid waste (90% organic, 10% inorganic). Food & Beverage Serving Services contributed 11% (75% organic, 23% inorganic, 2% other). Travel Agency & Reservations generated 5% (1% organic, 2% inorganic, 96% other), and Other Tourism Industries contributed 2%. Organic waste dominated in the accommodation, food & beverage, and other tourism industries, while inorganic waste, mainly plastics, accounted for 50% of the Passenger Transport industry's waste. The study revealed a very low level of solid waste treatment by the tourism sector, with enterprises recycling and composting only 0.38 tonnes, or 4% of the total waste generated (9.21 tonnes) in 2022. This implies that 96% of the waste generated by tourism enterprises was either disposed of in landfills/dumpsites or remained uncollected, entering the environment.

7.2.16 Stakeholder Engagement

The stakeholder identification process aimed to classify primary and secondary stakeholders through desk research, consultations, and the use of data from the TRA on licensed tourism enterprises, in accordance with the Ninth Schedule of the Tourism Act, 2011. This process resulted in an updated database listing key informants and FGD participants, including tourism

enterprises from the eight regions of Kenya. Stakeholder theory and the Power-Interest Grid were used to assess stakeholders' influence and interest in the project, leading to targeted engagement strategies. Challenges in the identification and analysis included the lack of an updated database, missing or outdated contact information, and the exclusion of unlicensed establishments like peer-to-peer accommodations. The refined database was essential for ensuring comprehensive and inclusive stakeholder engagement.

The stakeholder sensitization phase aimed to communicate the project's objectives, activities, and stakeholder roles, fostering collaboration and buy-in. Activities included phone calls, emails, in-person meetings to prepare participants and inform key informants and a piloting and pretesting workshop. During the workshop, 154 participants were introduced to the project's goals and tested data collection tools like surveys and interview guides. Feedback from these activities refined the tools and highlighted gaps in data, such as for SEEA. Challenges during stakeholder engagement included limited awareness of the study concepts including SEEA, lengthy questionnaires, formatting issues on the online platform, and digital mapping difficulties. These challenges were addressed, leading to improved data collection tools, increased stakeholder understanding of the project, and greater collaboration and support for the project's activities.

The stakeholder engagement during data collection aimed to obtain qualitative and quantitative data by recruiting stakeholders, including 1,253 tourism enterprises and 26 key informants. Activities included phone calls, emails, and in-person visits, facilitated by TRA offices, tourism associations, and County Directors of Tourism. The project achieved a 63% response rate for enterprises and 57% for key informants, despite challenges such as unavailable respondents and a 43% non-response rate during key informant interviews. Mitigation included using a backup list, online interviews, and follow-ups. Additionally, 12 FGDs with 467 participants provided in-depth insights, although issues like limited understanding of SEEA and GIS mapping difficulties were encountered. Administrative data collection faced low response rates, mitigated by using secondary data sources. Overall, the data collection process yielded comprehensive, and reliable data for the study.

The final phase of stakeholder engagement aimed to validate and secure endorsement of the study's findings and recommendations, while building support for their implementation. A workshop on July 10, 2024, with 56 diverse participants from the tourism industry, academia, and key informants, was held to present the project's report. Feedback included the need to consider global benchmarks like ISO and GRI standards, enhance SDG communication, pilot an incentive framework, simplify the report for wider implementation, and include more data from underrepresented regions. Challenges included addressing the diverse perspectives and ensuring the final report was comprehensive and accessible. Clarifications were provided, and amendments were made to the report, which was then adopted. Lessons learned included the importance of clear communication, inclusive data representation, and stakeholder involvement in refining project outcomes

7.3 Conclusion

The study's results support the conclusion that while there is moderate awareness of various climate change impacts among stakeholders in Kenya's tourism sector, significant gaps remain. Respondents are more familiar with physical impacts like extreme weather and landscape erosion than biological impacts such as loss of tree species. Key concerns include declining destination attractiveness and economic impacts. Awareness varies by region, with the coastal area less aware of physical impacts. Gender disparities exist, with men generally more aware, and higher education and industry experience correlate with increased awareness. The study highlights the urgent need for targeted education and adaptation strategies to mitigate climate change's diverse impacts on tourism.

The findings allow the conclusion that while Kenyan tourism enterprises have adopted some climate change adaptation and mitigation strategies, significant gaps remain. Key informants identified adaptation measures like beach clean-ups, heritage and wildlife conservation, visitor information, water conservation, and capacity building. Mitigation efforts include tree planting, clean energy use, waste reduction, and stakeholder sensitization. However, the baseline survey reveals incomplete adoption of these practices, with only partial implementation of visitor information, conservation, and product diversification. Strategies such as tree planting, structural modifications, and rainwater collection are limited, and water recycling and desalination are not yet practiced, indicating room for improvement in addressing climate-related risks.

The findings indicate that the implementation of climate change adaptation and mitigation practices among tourism enterprises varies by classification. Hotels and Class E enterprises commonly adopted product diversification and training campaigns, while tour operators focused on redirecting tourists from sensitive areas. Impact management plans and structural modifications were less prevalent but notable in certain classes. Water management practices saw limited adoption, whereas waste management efforts like recycling and composting were more common. Energy conservation through improved stoves and organic fuels was noted. Tree planting and conservation activities were significant for CO2 mitigation, with stakeholder engagement in ecosystem restoration and sustainable practices like renewable energy use and waste management.

The study supports the conclusion that sustainable tourism practices (STPs) in Kenya's tourism sector are varied, with a mix of low-investment and community-focused initiatives. Common practices include capacity-building programs and visitor education. However, resource-intensive practices like eco-certification, waste management, water and energy conservation, and emission reduction are less frequent. Compliance with laws and anti-sexual harassment policies are highly adopted, while materials recycling is the least adopted. Legal compliance and anti-sexual harassment policies are widespread across all subsectors, while pollution monitoring and employee training vary. Waste recycling shows limited adoption, especially among privately owned enterprises.

The study concludes that although Kenyan tourism enterprises have implemented sustainable tourism practices to a moderate extent, environmental sustainability practices vary widely across sectors, with moderate adoption of pollution monitoring, environmental awareness, and energy use monitoring. Eco-building design and advanced water management systems, such as intelligent irrigation and greywater recycling, show lower adoption rates. Social sustainability practices, including legal compliance and anti-sexual harassment policies, are widely implemented, while economic sustainability efforts focus on solar energy, electric vehicles, and alternative energy sources. However, challenges remain in advanced waste management, fleet sustainability, and comprehensive recycling programs, indicating opportunities for enhanced environmental stewardship

The study further concludes that enterprise characteristics, classification, and climate change perceptions significantly influence the adoption of climate change adaptation and mitigation practices by tourism enterprises. The findings support the assertion that privately owned enterprises are more likely to secure special insurance, implement impact management plans, and provide environmental training, though they engage less in conservation compared to public and community-owned enterprises. On the other hand, medium-sized firms adopt varied adaptation practices more frequently than small and large enterprises. Additionally, foreign-owned enterprises are more inclined to adopt tree planting, modify their built environment, engage in rainwater harvesting, and adopt water recycling and desalination.

The findings also allude to several barriers and drivers to adopting sustainable tourism practices in Kenya's tourism sector. Key barriers include limited stakeholder awareness of national policies, fragmented regulations, lack of coordination among government agencies, and technological challenges such as high costs and limited access to expertise. Resistance to new technologies and inadequate training and financial constraints also hinder sustainability investments. Conversely, strong governmental policies, organizational sustainability targets, performance measurements, and the use of digital payment and energy-efficient technologies drive adoption. Enhancing access to sustainable technologies through tax incentives and improved digital infrastructure is crucial for promoting comprehensive sustainability practices in the sector.

On comparison of Climate Change Adaptation and Mitigation Practices Against Global Benchmarks, the study’s findings lead to the conclusion that while Kenya's tourism sector shows strengths in areas like product and market diversification, impact management plans, and training campaigns, there are significant gaps in water management practices. Limited adoption of rainwater collection, desalination, and water recycling highlights areas needing improvement. Despite strong engagement in conservation initiatives, tree planting efforts are underutilized, indicating opportunities to enhance carbon sequestration. To align more closely with global benchmarks, Kenya's tourism sector must expand its adoption of innovative water management technologies and reforestation practices.

On comparison of Sustainable Tourism Practices (STPs) against global benchmarks, the findings lead to the conclusion that Kenya's tourism enterprises demonstrate a strong commitment to social sustainability through high adoption rates of anti-sexual harassment policies and legal compliance. However, opportunities exist for improving stakeholder feedback mechanisms, CSR budgeting, and continuous employee education to align more closely with global benchmarks. In economic sustainability, the sector excels in energy-efficient appliances, minimizing paper-based marketing, and sustainable purchasing, but gaps in recycling, environmental fleet management, and efficient water management indicate areas for enhancement. Additionally, while environmental sustainability practices such as pollution monitoring and environmental awareness are well-aligned with global standards, there is a need to fully implement eco-building designs and advance pollution monitoring technologies. Promoting innovative and energy-efficient eco-building designs will strengthen Kenya’s environmental sustainability, reduce its ecological footprint, and enhance its reputation as a globally recognized sustainable tourism destination.

Through a comparison with global benchmarks, the study identifies key priority practices for climate change response and sustainable tourism in Kenya's tourism sector. These include comprehensive water conservation measures, enhancing energy efficiency and conservation efforts, promoting ecosystem restoration and environmental conservation initiatives, and diversifying product markets. Emphasizing open-air spaces and sustainable waste management practices are also crucial. Additionally, priorities include capacity building through training and research, ensuring compliance with government regulations, and protecting fragile ecosystems and watersheds. Investments in carbon offset projects and transitioning to electric vehicular transportation systems further enhance sustainability efforts. The study concludes that these practices will not only bolster climate change adaptation and mitigation but also strengthen Kenya's position as a leader in sustainable tourism, aligning with global standards and fostering long-term resilience in the face of environmental challenges.

With regards to environmental-economic accounting by the tourism industry, the study’s results support the conclusion that Kenya's tourism enterprises demonstrate varied and often inconsistent practices across different environmental domains. While energy use is predominantly documented through billing services, internal reporting for solar power lacks formal systems, leading to regulatory gaps in energy management. Similarly, greenhouse gas (GHG) documentation is notably absent due to knowledge gaps and perceived costliness, highlighting the need for structured approaches to enhance environmental accountability. Water use documentation varies, with some enterprises tracking usage for compliance but lacking standardized reporting practices. Waste management documentation shows diverse practices, with some enterprises tracking waste systematically but facing implementation challenges. Overall, the study asserts the need for standardized guidelines, robust reporting mechanisms, and enhanced capacity building to improve environmental economic accounting practices in Kenya's tourism sector, ensuring comprehensive and accurate sustainability assessments and management.

The findings on the legal, regulatory, and institutional framework for environmental-economic accounting (EEA) in Kenya's tourism sector underscore a nascent stage of implementation amidst global trends. While Kenya has made strides in developing SEEA Energy Accounts and advancing a National Plan for Environmental-Economic Accounting, practical adoption within tourism enterprises remains limited. Barriers include skepticism, lack of standardized reporting, and regulatory gaps in comprehensive energy and GHG management. Drivers for adoption identified include awareness raising, community involvement, eco-certification mandates, and infrastructure support, yet these efforts are hindered by fragmented institutional roles and insufficient coordination among governmental bodies and stakeholders. The report emphasizes the need for streamlined regulations, enhanced institutional collaboration, and clearer mandates to facilitate the widespread adoption of EEA practices in Kenya's tourism sector, crucial for advancing sustainability goals and environmental stewardship.

The pilot energy accounts compiled for the tourism sector in Kenya lead to the conclusion that while natural energy sources dominate, particularly biomass, the sector relies significantly on imported energy, mainly motor spirit petroleum and light diesel. Energy consumption within tourism enterprises highlights substantial reliance on non-renewable sources, with minimal off-grid electricity production. The findings underscore the sector's significant energy demands, consuming a notable portion of national electricity and fuel supplies. The report emphasizes the imperative for Kenya's tourism industry to transition towards sustainable energy practices, including renewable energy adoption and enhanced efficiency measures. Such initiatives are crucial for mitigating environmental impacts, reducing carbon emissions, and fostering long-term sustainability in line with global environmental objectives. Addressing these challenges effectively will ensure the sector's resilience and competitiveness in a sustainable tourism landscape.

The pilot GHG emission accounts compiled for the tourism sector in Kenya support the assertion that while the sector contributes relatively low greenhouse gas (GHG) emissions compared to other industries and households, there remains a critical need for climate change mitigation strategies. In 2022, Kenya’s tourism industry emitted 0.76 million metric tons (Mt) of CO2 equivalent, primarily from passenger transport, accommodation, food and beverage services, and travel agencies. The findings support the conclusion that opportunities for the sector to adopt sustainable practices and reduce emissions, align with global environmental goals, and enhance its appeal to eco-conscious travellers. Further, implementing energy-efficient technologies not only promises environmental benefits but also economic resilience, preparing the industry for stricter regulatory frameworks and ensuring sustainable resource management for long-term viability and growth.

In conclusion, the compiled SEEA water account for Kenya's tourism sector in 2022 reveals significant water abstraction and usage patterns among tourism enterprises. With 21.30 million cubic meters (MCM) of water abstracted for accommodation, food and beverage services, and passenger transport, the sector demonstrated reliance on both self-supplied and externally sourced water. Despite these figures, comprehensive wastewater treatment practices were

lacking, with majority of enterprises not treating sewage for reuse, highlighting a critical gap in sustainable water management. The study concluded that moving forward, improved reporting and monitoring of wastewater generation and treatment are essential for enhancing the accuracy and utility of future SEEA water accounts for the tourism sector. Addressing these challenges will be crucial in promoting water conservation efforts and ensuring the sector's resilience amid growing environmental concerns and regulatory pressures.

The SEEA solid waste analysis for Kenya's tourism sector reveals significant challenges in waste management practices. Despite considerable waste generation, particularly from the Accommodation for Visitors industry, which predominately produces organic waste, there is limited recycling and composting. The Food & Beverage Serving Services and Travel Agency & Reservations sectors also contribute to the waste stream, albeit to a lesser extent and with varying compositions of organic and inorganic waste. The Passenger Transport industry notably generates significant amounts of inorganic waste, mainly plastics. These findings underscore the urgent need for improved waste management strategies within Kenya's tourism sector. Enhancing recycling initiatives and implementing effective waste reduction measures are crucial steps toward minimizing environmental impact and advancing sustainable tourism practices in the country.

With regards to stakeholders' participation, the four-phase stakeholder engagement process achieved its objectives. During the identification and analysis phase, primary and secondary stakeholders were identified, profiled, and mapped, enabling the engagement plan to develop suitable strategies for interacting with different stakeholders. This step also resulted in a comprehensive, updated database of tourism enterprises, key informants, and other stakeholders who would participate in the project. The subsequent stakeholder sensitization exercises effectively raised awareness of the project's activities and clarified the stakeholders' roles. This was crucial in fostering collaboration for the project's implementation. The sensitization phase also served to pre-test the data collection instruments and assess data availability, particularly for constructing environmental economic accounts.

In conclusion, the engagement process provided representative and reliable data suitable for the study's purposes. Based on the data collection process's outcomes, the qualitative data collected was deemed adequate to support the research findings. However, the data collection process faced challenges, including a low response rate for key informant interviews (KII) and a lack of quantitative administrative data from key providers such as county government departments and water service providers. This necessitated the use of alternative data sources to address these gaps. The stakeholder validation workshop endorsed the study's findings and recommendations and provided a forum to garner support for implementing the report's prescriptions from a wide cross-section of tourism industry stakeholders.

7.4 Recommendations

7.4.1 Recommendations For Tourism Sector Enterprises

1. Implement climate response and sustainable tourism best Practices: Tailor climate response practices to the unique characteristics of each enterprise, ensuring flexibility and diverse responses.
2. Conduct Awareness and Training Programs: Educate stakeholders on climate change impacts, sustainable tourism benefits, and long-term value through campaigns, workshops, and training.
3. Foster Knowledge Partnerships: Collaborate with global organizations and academia to share best practices and align local efforts with international benchmarks.
4. Enhance Stakeholder Engagement: Work with local communities, NGOs, and government agencies to develop and implement sustainable tourism initiatives.
5. Promote Tourism Product Diversification: Reduce dependency on specific resources or destinations by diversifying tourism products to enhance sustainability and resilience.
6. Advocate Responsible Tourism: Educate guests and encourage participation in conservation efforts to minimize impacts on local ecosystems and communities.
7. Develop and Adopt Sustainability Performance Metrics: Create metrics aligned with social, economic, and environmental sustainability goals to drive continuous improvement and transparency.
8. Enhance Environmental Data Collection: Monitor and report environmental indicators by tracking energy consumption, water usage, GHG emissions, and waste generation, regularly updating records, and ensuring transparency for SEEA account compilation.
9. Invest in Employee Training for EEA: Enhance awareness of EEA concepts and methodologies, including data collection techniques, environmental accounting principles, and SEEA reporting requirements, empowering staff to champion sustainability and actively participate in environmental management initiatives.

7.4.2 Recommendations for Policy Makers and Regulators

1. Develop Climate-Responsive Policies: Address climate change impacts on tourism by considering variations in enterprise classes, sizes, and ownership.
2. Promote Targeted Awareness Programs: Tailor educational campaigns to specific demographics to build tourism enterprises' capacity in adopting sustainable technologies and practices.
3. Enhance Stakeholder Awareness: Improve understanding of national policies and regulations through targeted educational campaigns and capacity-building programs.
4. Align with Global Standards: Ensure local policies align with global sustainability standards and international sustainability accreditation frameworks.
5. Foster Public-Private Partnerships: Engage civil society and the private sector to implement best practices in climate response and sustainable tourism in line with global benchmarks.

6. Encourage Institutional Collaboration: Promote cooperation among public sector institutions, such as the National Climate Change Secretariat and relevant ministries, to develop unified objectives and facilitate compliance.
7. Support Research and Innovation: Invest in research and innovation in sustainable tourism practices, including technological solutions for environmental conservation and climate resilience
8. Integrate Climate Response into Marketing: Incorporate climate change response and sustainability into national tourism marketing and product development plans
9. Enhance Environmental Accounting Skills: Provide training and certification programs for tourism enterprises in environmental accounting, focusing on data collection, management, and SEEA reporting to improve sustainability practices.
10. Establish Robust Data Collection Mechanisms: Implement standardized reporting frameworks and enhance collaboration among county governments, water service providers, and tourism enterprises to improve data collection on solid waste management, water distribution, and energy consumption for EEA in the tourism sector.
11. Integrate EEA Principles: Incorporate EEA principles and SEEA accounting requirements into tourism policies, regulations, and strategies. Foster coordination among government agencies, sector associations, and stakeholders to ensure policy coherence and mainstream EEA practices within the tourism sector

7.4.3 Recommendations for Researchers

1. Apply Structural Models: Utilize structural models to investigate internal and external factors influencing the adoption of climate change response strategies and sustainable tourism practices. This research should inform targeted policy interventions integrating these practices effectively.
2. Conduct Impact Assessments: Conduct periodic, in-depth studies to evaluate the effectiveness and impact of sustainable tourism initiatives on environmental conservation, socio-economic development, and community well-being.
3. Compare Policies and Practices: Compare sustainable tourism policies and practices across different geographic regions or countries to identify best practices and opportunities for knowledge exchange and collaboration.
4. Explore Emerging Technologies: Investigate the potential of emerging technologies such as renewable energy integration, smart tourism solutions, and sustainable mobility options (e.g., electric vehicles) to enhance the resilience of tourism enterprises to climate change impacts.
5. Study Consumer Behavior: Conduct market research to understand consumer behavior and preferences regarding sustainable tourism practices, informing strategies to promote these practices effectively.
6. Assess Knowledge Requirements: Assess the knowledge and skill requirements for data providers and users in Environmental-Economic Accounting (EEA) to enhance data quality and utility.

7. Analyze Policy Frameworks: Conduct a comprehensive analysis of existing policy and regulatory frameworks related to environmental management and economic accounting within the tourism sector. Identify gaps and areas for improvement to enhance policy coherence and support SEEA initiatives.
8. Explore Innovative Technologies: Investigate innovative technologies and methodologies such as advanced data analytics, remote sensing, and digital tools to advance SEEA development for tourism in Kenya. Improve data accuracy, efficiency, and comprehensiveness to enhance environmental economic accounting practices

Implementation Frameworks

CHAPTER EIGHT

8 IMPLEMENTATION FRAMEWORKS

8.1 Adoption of Renewable Energy and Circular Economy in Kenya's Tourism Sector by 2030

At COP26 in Glasgow, UK, in 2021, Kenya committed to achieving net-zero CO2 emissions by 2030 and converting 100% of its energy needs to renewable sources. As part of this commitment, Kenya specifically mandated that all hospitality and tourism facilities in the country adopt renewable energy and circular economy practices by 2030.

The SEEA Energy Account for the Tourism Industry in 2022 estimated the sector's intermediate energy consumption at 7,357.85 TJ, representing just over 1% of the total for the economy. Of this, 21% came from fossil fuels—such as light diesel, motor spirit petroleum, and liquefied petroleum gas-while electricity accounted for 69%, and charcoal and wood fuel made up 8%. Additionally, the survey revealed that less than 5% of tourism enterprises generated their own energy from renewable sources like solar and wind. Despite the substantial proportion of electricity use, the reliance on non-renewable sources presents a significant challenge for achieving the 2030 goal of 100% renewable energy. The sector must drastically reduce fossil fuel use and increase its adoption of renewable energy to meet this target and support Kenya's climate commitments.

A comparison of Kenya’s tourism sustainable energy practices against global best practices revealed gaps in climate change mitigation efforts, such as phasing out fossil fuels, using electric vehicles, and car-pooling, which were implemented to a low extent compared to global standards. However, the study found moderate implementation of renewable energy practices (solar and wind) and energy-efficient technologies, which were somewhat better aligned with global best practices. The gaps in key climate change mitigation efforts, despite moderate progress in renewable energy and energy-efficient technologies, suggest that Kenya’s tourism sector faces significant challenges in achieving the goal of 100% renewable energy by 2030.

The study results confirmed that water resource management practices, such as rainwater collection, water recycling, and water desalination, were adopted to a limited extent ($1.00 > \bar{x} < 2.50$) by tourism enterprises in Classes A, B, C, and E, which constitute 96% of the industry. The survey also revealed that, unexpectedly, material recycling was the least adopted practice, falling behind environmental fleet management practices. These quantitative findings were supported by feedback from key informant interviews (KIIs) and focus group discussions (FGDs), which indicated that capital-intensive sustainability practices, such as advanced energy and water management technologies, were still not widely implemented. The results suggest moderate adoption of energy use monitoring, energy-saving appliances, and water management systems. These findings suggest that while there is moderate adoption of energy monitoring and efficiency measures, significant progress is needed for the tourism industry to achieve its circular economy goals by 2030.

The study results revealed gaps in climate change adaptation and mitigation practices related to circular economy including rain water collection desalination and water recycling which were adopted to a limited extent compared to global best practices. As well, waste recycling, waste reduction and waste composting were adopted to a low extent. However, the ban on single use plastics was adopted to a moderate extent compared to global best practices.

The study identified and prioritized best practices for industry-wide adoption to achieve the goal of converting 100% of energy needs to renewable sources. It emphasized energy conservation and recommended the procurement and installation of energy-efficient technologies. Reducing carbon dioxide emissions was also a priority, with the transition to electric vehicles suggested as a key practice. For achieving a circular economy by 2030, the study highlighted water conservation, recommending practices such as enhancing water efficiency and promoting water harvesting. Regarding waste management, the study advocated for recycling, waste reduction, and enforcing a ban on single-use plastics, especially in protected areas. Cross-cutting priorities include enhancing capacity building and compliance with regulatory requirements.

Based on the study's findings, it is recommended that the tourism industry universally adopt the prescribed best practices. This will significantly contribute to Kenya's commitment to achieving net-zero CO2 emissions in tourism by 2030. Key strategies include the complete transition of the industry's energy sources to renewables and the adoption of renewable energy and circular economy principles by 2030. Table 8.1 outlines an implementation matrix for achieving these goals within the tourism sector by the target date.

Table 8.1: Implementation Matrix Adoption of Renewable Energy and Circular Economy in Kenya's Tourism Sector by 2030

Target	**Adoption of Renewable 100% Energy Sources**			
Priority Area	**Best Practice**	**Key Performance Indicator(s)**	**Responsibility**	**Timeframe**
Energy Conservation and Efficiency	Procurement and installation of energy-efficient technologies	No. of energy-efficient technologies installed	Enterprises; Suppliers, TRA	2024-2026
	Use of renewable energy sources (solar & wind)	%. of energy sourced from renewables	Enterprises; Energy Suppliers, TRA	2025-2030
Carbon dioxide emission Reduction	Use of electric vehicular transportation	Number of electric vehicles in use	Enterprises, KWS, TRA, KATO	2024-2030
Target	**Adoption of Circular Economy**			
Water Conservation	Water conservation and efficiency use practices	Reduction in water usage per unit of service	Tourism Enterprises; WASREB; Water service providers (WSP)	2024-2026
	Water harvesting	Volume of water harvested and utilized	Tourism Enterprises; WASREB	2025-2030
Waste Management	Recycling materials	Percentage of waste recycled	Tourism Enterprises; Waste management Companies, NEMA, County Government	2025 -2030
	Enforce ban on single use plastics	% Compliance rate with ban regulations	Tourism Enterprises; KWS, NEMA,	2024 -2026
	Composting of biodegradable waste	Amount of waste composted	Tourism Enterprises; Waste management Companies, NEMA, County Government	2025-2030
Target	Cross-cutting issues			
Capacity building	Workshops and seminars on sustainability practices, climate change adaptation, and mitigation strategies	Number of workshops held; Number of participants	Tourism Enterprises, Training institutions, TRA	Ongoing
	Enrolling employees in certification programs	Number of employees certified	Tourism Enterprises, Training institutions, TRA	Ongoing

Target	Adoption of Renewable 100% Energy Sources			
Priority Area	**Best Practice**	**Key Performance Indicator(s)**	**Responsibility**	**Timeframe**
Compliance with regulations	Compliance with licensing requirements	Percentage of compliance with licensing regulations	NEMA, KWS, TRA, County Government	Ongoing
	Conducting EIA for new projects, annual environmental audits and compliance with EMP recommendations	Number of EIAs conducted; Audit results; Compliance rate	NEMA, tourism enterprises	Ongoing

8.2 Adoption of Framework for Environmental-Economic Accounting by The Tourism Industry

As part of Kenya's commitment at the COP26 in Glasgow, Kenya undertook to establish frameworks for documenting and measuring the economic impacts of climate change on the tourism sector, with the goal of mainstreaming quantifiable and accountable climate change actions across the entire tourism value chain. To support this effort, TRI developed a framework for environmental-economic accounting for tourism based on SEEA-CF 2012 and UNWTO TSA RMF 2008. The study assessed the existing policy, legal, and institutional frameworks for environmental-economic accounting and examined current practices among tourism enterprises, focusing on the measurement, documentation, and reporting of environmental flows related to energy, GHG, water, and solid waste.

The study found that while the SEEA framework is gaining global traction, its implementation in Kenya is still nascent. Kenya has developed SEEA Energy Accounts for the national economy and is advancing a National Plan for Environmental-Economic Accounting. However, tourism enterprises in Kenya have not formalized environmental-economic accounting. Although some monitor energy and water for cost purposes, key informant interviews, FGDs, and survey results reveal limited practices in recording, monitoring, and reporting GHG emissions and solid waste in the tourism industry.

Feedback from the FGDs and KIIs identified several bottlenecks to the adoption of environmental-economic accounting (EEA) by tourism enterprises. These include a lack of awareness of key concepts, insufficient technology for measuring environmental flows, skepticism about the value of EEA, and the absence of standardized measurement and reporting frameworks. Regulatory gaps were also noted due to the lack of formal systems or mandatory requirements for EEA. Additionally, the compilation of pilot SEEA accounts for water and solid waste was hindered by data gaps, as data providers were not routinely capturing this information. Challenges were further compounded by the absence of disaggregated data at the industry or activity levels, with the System of National Accounts (SNA) categorizing tourism activities broadly as accommodation and food services. Difficulties were also encountered in obtaining GHG conversion factors from the IEA.

Based on the research findings, the study recommends practices, policies, and research strategies to institutionalize environmental-economic accounting in the tourism industry. Table 8.2 presents an implementation matrix for establishing frameworks to document and measure the economic impacts of the tourism sector. This matrix aims to mainstream practical, quantifiable, and accountable methods for assessing tourism's environmental interactions through a system of environmental-economic accounting.

Table 8.2: Implementation Matrix for Institutionalization of the Framework for Environmental-Economic Accounting for the Tourism Sector in Kenya

Objective	Activities	Key Performance Indicator(s)	Responsibility	Timeframe
Awareness creation and advocacy for EEA	Conduct industry-wide sensitization to educate on EEA concepts, principles, methodologies, techniques, and standards.	Number of sensitization events held; percentage of industry stakeholders reached	KNBS; TRI, Tourism Enterprises	2024-2025
Capacity building for EEA	Conduct a training needs assessment to identify the knowledge and skill requirements for EEA data providers and users.	Needs assessment report;	TRI; KNBS; Tourism enterprises	2024
	Develop and offer training and certification programs in EEA for tourism enterprises.	Number of training programs conducted; Number of certifications issued.	KNBS; Universities; KUC; Tourism Enterprises	2024- 2026
	Establish online information-sharing platforms to facilitate practical learning and implementation of EEA.	Number of active users; Frequency of platform updates and interactions.	TRI; TRA; KNBS; Tourism Enterprises	2025 -2027
Integrate EEA into tourism policy and planning	Conduct a thorough analysis of existing policies and regulations related to environmental-economic accounting within the tourism sector to identify gaps and areas for improvement.	Policy analysis report	TRI; KNBS	2024-2025
	Explore the integration of core environmental-economic accounts into the tourism satellite accounting framework and the system of national accounts	Updates to tourism satellite accounts and national accounts; Publications & reports	KNBS; TRI; Universities; Research Institutions	2025 -2028
	Foster coordination among government agencies, sector associations, and stakeholders to mainstream EEA practices within the tourism sector.	Number of coordinated meetings and workshops; Level of stakeholder engagement.	TRI; KNBS; Tourism Enterprises	2025-2030

Establish a robust data collection infrastructure for the tourism industry EEA	Develop and implement standardized sustainability reporting frameworks for environmental-economic accounting targeting the core SEEA accounts- Energy, GHG, Water, and Solid Waste;	Reporting frameworks; Adoption rate among tourism enterprise	TRI; TRA; KNBS; Tourism Enterprises	2024-2026
	Enhance coordination between SEEA data producers and data users;	Number of coordination meetings; Improvements in data flow and quality	TRI; KNBS; Tourism Enterprises	2026 -2030
	Compile, update, and annually publish core SEEA accounts for tourism.	Timeliness and accuracy of published accounts; Number of published SEEA Accounts	TRI; KNBS;	2025-2030
	Develop platforms for sharing data among stakeholders, including government agencies, industry associations, and tourism enterprises, to enhance transparency and collaboration	Number of active data-sharing platforms; Stakeholder satisfaction with data access.	TRI; KNBS; Tourism Enterprises; MDAs	2025-2030
	Develop collaboration with universities and research organizations to enhance data collection methodologies and leverage academic expertise for data analysis and interpretation.	Number of research collaborations; Quality and impact of enhanced data methodologies	TRI; KNBS; Tourism Enterprises; MDAs; Universities/Research Institutions	2025-2030

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Appendices

APPENDICES

APPENDIX A: CATEGORIZATION OF TOURISM ENTERPRISES

Class "A" Enterprises

i. Hotels
ii. Members clubs;
iii. Motels;
iv. Inns;
v. Hostels;
vi. Health and spa resorts;
vii. Retreat lodges;
viii. Ecolodges;
ix. Treehouses;
x. Floatels;
xi. Service flats,
xii. Service apartments,
xiii. Beach cottages,
xiv. Holiday cottages,
xv. Game lodges,
xvi. Tented camps;
xvii. Safari or mobile camps,
xviii. Bandas,
xix. Cultural homes and centres,
xx. Villas;
xxi. Homestays;
xxii. Guest houses; and
xxiii. Time shares.

Class "B" Enterprises

i. Restaurants; and
ii. Other food and beverage services.

Class "C" Enterprises

i. Tour or safari operators;
ii. Tourist service vehicle hire;
iii. Local air charter;
iv. Travel agency;
v. Water sports;
vi. Balloon operators; and
vii. Boat excursions;

Class "D" Enterprises

i. Game fishing outfitters;
ii. Enterprises offering camps and camping equipment for hire;
iii. Nature parks;
iv. Nature reserves;
v. Nature trails;
vi. Game ranches;
vii. Amusement parks; and
viii. Non-citizen tour leaders or guides.

Class "E" Enterprises

i. Local traditional boat operators;
ii. Professional safari photographers;
iii. Curio vendors;
iv. Private zoos;
v. Citizen tour leaders or guides; and
vi. General vendors; and
vii. Beach operators.

Class "F" Enterprises

i. Entertainment facilities

Class "G" Enterprises

i. Conference and event services

Class "H" Enterprises

i. Tourism and hospitality training institutions

APPENDIX B: BASELINE STUDY SAMPLING FRAME

			CLASSIFICATION								
Region		**County**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**TOTAL**
Central		Kirinyaga	6	1	0	0	0	0	0	1	8
		Laikipia	13	4	4	4	19	0	0	1	45
		Nyeri	9	4	0	0	12	0	0	3	28
		Embu	7	5	0	0	0	0	0	2	14
		Meru	7	3	1	0	1	0	0	2	14
	Subtotal		42	17	5	4	32	0	0	9	109
Coastal		Kilifi	170	19	26	0	101	0	0	3	319
		Kwale	3	0	0	0	0	0	0	1	4
		Lamu	22	1	0	0	15	0	0	0	38
		Tana River	2	0	0	0	0	0	0	0	2
	Subtotal		197	20	26	0	116	0	0	4	363
Northern		Kitui	2	2	0	0	0	0	0	3	7
		Makueni	2	4	0	0	0	0	0	1	7
		Marsabit	1	0	0	0	0	0	0	0	1
	Subtotal		5	6	0	0	0	0	0	4	15
Nairobi Circuit		Machakos	5	11	0	0	1	0	0	6	23
		Nairobi	33	93	265	2	142	1	1	25	562
	Subtotal		38	104	265	2	143	1	1	31	585
Rift Valley		West Pokot	0	2	0	0	0	0	0	1	3
		Turkana	0	2	0	0	0	0	0	1	3
		Uasin Gishu	7	14	0	0	3	0	0	6	30
		Nakuru	8	1	9	1	18	0	0	6	43
		Nandi	0	3	0	0	0	0	0	2	5
	Subtotal		15	22	9	1	21	0	0	16	84
Maasai Mara & Amboseli		Kajiado	6	6	0	0	1	0	0	1	14
		Narok	3	0	0	0	27	0	0	1	31
	Subtotal		9	6	0	0	28	0	0	2	45
Western		Bungoma	16	3	0	0	0	0	0	3	22
		Homa Bay	7	4	0	0	0	0	0	1	12
		Kakamega	7	2	0	0	1	0	0	5	15
		Kisii	9	3	0	0	0	0	0	5	17
		Kisumu	17	1	11	0	0	0	0	3	32
		Migori	12	2	0	0	0	0	0	1	15
		Siaya	7	4	0	0	0	0	0	2	13
	Subtotal		75	19	11	0	1	0	0	20	126
GRAND TOTAL			**381**	**194**	**316**	**7**	**341**	**1**	**1**	**86**	**1327**

Source: Baseline Survey Data, 2023

APPENDIX C: TOURISM ENTERPRISES QUESTIONNAIRE

A SITUATIONAL ANALYSIS OF THE ADOPTION OF SUSTAINABLE TOURISM PRACTICES, EVALUATION OF CLIMATE CHANGE IMPACT ON THE TOURISM INDUSTRY, AND CLIMATE CHANGE MITIGATION AND ADAPTATION STRATEGIES IN KENYA

TOURISM INDUSTRY RESPONDENTS' QUESTIONNAIRE

1.0 Introduction

The Ministry of Tourism, Wildlife, and Heritage (MoTW&H) wishes to assess the tourism industry's adoption of sustainability practices and understand climate change's consequences on the tourism sector. It is in this regard that the Tourism Research Institute (TRI) has contracted the Technical University of Mombasa Enterprise Limited (TUMEL) to conduct a situational analysis. The analysis includes evaluating the adoption of sustainable best practices, assessing the impact of climate change on Kenya's tourism sector, and designing climate response strategies and sustainable practices that align with global benchmarks. To achieve this, TUMEL is conducting a survey covering the seven tourism regions in Kenya to collect data. Your enterprise/organization has been selected to participate by answering questions in this questionnaire.

The purpose of the questionnaire is to gather your views on sustainable tourism practices and climate change impacts in your circuit. All information collected will be treated confidentially and used solely for research purposes. Thank you for your willingness to participate in this important exercise.

2.0 Informed Consent

(Instructions: Kindly tick as appropriate)

Do you agree to participate in the survey as a respondent and allow your data, views, and opinions, to be recorded and used for this research? Yes [ ] NO [ ]

SECTION A: GENERAL INFORMATION

1 Location: UTM Coordinates (E) …… (N) ……

2 Tourism regions1 Nairobi [ ] Rift Valley [ ] Masai & Amboseli [ ]
Northern [ ] Western [ ] Coast [ ] Central [ ]

3 County [*list of counties to be provided per each region*]

4 License Enterprise Classification Class "A" enterprises 2 [ ] [Drop Down List]
Class "B" enterprises3 [[Drop Down List]
Class "C" enterprises4] [Drop Down List]
Class "D" enterprises5 [[Drop Down List]
Class "E" enterprises6] [Drop Down List]
Class "F" enterprises7 [[Drop Down List]
Class "G" enterprises8] [Drop Down List]
Class "H" enterprises9 [[Drop Down List]

5. Enterprise type [list of tourism industries classification by the TSARMF10 provided11]

SECTION B: RESPONDENTS' DEMOGRAPHIC CHARACTERISTICS

6 Please indicate your gender
Male [ ] Female [ ]

7 What is your highest level of formal education completed?

No formal education	[ ]	Bachelor's Degree	[ ]
Primary school certificate	[ ]	Master's Degree	[ ]
Secondary school certificate	[ ]	Doctorate Degree (Ph.D.)	[ ]
College Certificate	[ ]		
College Diploma	[ ]		

8 What is your current responsibility in your tourism enterprise?
Executive Responsibility
Managerial Responsibility
Operational Responsibility

9. Please indicate your length of experience in the tourism industry in years

SECTION C: TOURISM ENTERPRISE CHARACTERISTICS

10. What is the legal status of your enterprise?
    Sole proprietorship [ ] Limited liability company [ ] Partnership [ ]
    Government Owned [ ] Co-corporative [ ] Community Enterprise [ ]
    Others (Specify) ……..
11. What is the nationality of your enterprise ownership?
    Local [ ] Foreign [ ] Local &Foreign

12. What is the total number of persons currently employed by your tourism enterprise?

13. How long has your tourism enterprise been in operation?

14. For your category A enterprise, what is the star rating?

None	[ ]
Accredited	[ ]
1 Star	[ ]
2 Star	[ ]
3 Star	[ ]
4 Star	[ ]
5 Star	[ ]

15. How many rooms do you have in your tourism enterprise?
16. How many beds does your tourism enterprise have?
17. What was the bed occupancy rate (%) of your tourism enterprise in 2022?
    Jan - March …….....
    April - June …….....…….
    July - Sept …….....…….
    Oct - December .....……

SECTION D: IMPACTS OF CLIMATE CHANGE

18. On a scale of 1 to 5, how would you rate your level of awareness of the following impacts of climate change on the tourism sector in Kenya (where 1 = Not at all aware, 2 = slightly aware, 3 = somewhat aware, 4 = moderately aware, 5 = extremely aware).

No	Impacts	1	2	3	4	5
i.	Droughts	[ ]	[ ]	[ ]	[ ]	[ ]
ii.	Floods	[ ]	[ ]	[ ]	[ ]	[ ]
iii.	Intensive rainfall	[ ]	[ ]	[ ]	[ ]	[ ]
iv.	Strong winds	[ ]	[ ]	[ ]	[ ]	[ ]
v.	Intensive storms	[ ]	[ ]	[ ]	[ ]	[ ]
vi.	Rise in Sea level	[ ]	[ ]	[ ]	[ ]	[ ]
vii.	Bleaching of coral reefs	[ ]	[ ]	[ ]	[ ]	[ ]
viii.	Melting of glaciers	[ ]	[ ]	[ ]	[ ]	[ ]
ix.	Landscape erosion	[ ]	[ ]	[ ]	[ ]	[ ]
x.	Loss of tree species	[ ]	[ ]	[ ]	[ ]	[ ]
xi.	Biodiversity loss	[ ]	[ ]	[ ]	[ ]	[ ]
xii.	Emergence of new pests	[ ]	[ ]	[ ]	[ ]	[ ]
xiii.	Warmer temperatures	[ ]	[ ]	[ ]	[ ]	[ ]
xiv.	Emergence of diseases	[ ]	[ ]	[ ]	[ ]	[ ]

19. On a Scale of 1-5, rate the level of effect of the following climate events on your tourism enterprise for the last five years, where 1 = No effect, 2=Minor effect, 3= neutral, 4=moderate effect, and 5 = major effect.

Climate change event	**YES**	**NO**	**1**	**2**	**3**	**4**	**5**
Warmer temperature	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Extreme low temperature	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Change in rainfall seasons	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Prolonged droughts	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Hailstorms	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Flush floods	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Wild fires	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Mudslides	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Air pollution	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Sea level rise	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Strong waves	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Melting ice	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Change in inland water body levels	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

20. On a Scale of 1-5 how would you rate the significance of the following impacts of climate change on your tourism enterprise (where 1 = not at all significant, 2=slightly significant, 3= somewhat significant, 4= very significant, and 5 = extremely significant).

Impact of Climate Change	**1**	**2**	**3**	**4**	**5**
Increase in cooling costs	[ ]	[ ]	[ ]	[ ]	[ ]
Changes in seasonality	[ ]	[ ]	[ ]	[ ]	[ ]
Changes in travel patterns	[ ]	[ ]	[ ]	[ ]	[ ]
Business interruptions	[ ]	[ ]	[ ]	[ ]	[ ]
Damages to property	[ ]	[ ]	[ ]	[ ]	[ ]
Increase of insurance premiums	[ ]	[ ]	[ ]	[ ]	[ ]
Damages to infrastructure	[ ]	[ ]	[ ]	[ ]	[ ]
Loss of landscape attractiveness	[ ]	[ ]	[ ]	[ ]	[ ]
Human-wildlife conflict	[ ]	[ ]	[ ]	[ ]	[ ]
Loss of income opportunities	[ ]	[ ]	[ ]	[ ]	[ ]
Wildlife migration	[ ]	[ ]	[ ]	[ ]	[ ]

SECTION E: CLIMATE CHANGE ADAPTATION MEASURES

21. On a scale of 1 – 5, how would you rate the extent to which your tourism enterprise has implemented the following climate change adaptation actions? (Where 1 = to no extent, 2 = to little extent, 3 = to some extent, 4 = to a large extent, 5 = to very large extent)

Specific adaptation actions	**1**	**2**	**3**	**4**	**5**
Rainwater collection	[ ]	[ ]	[ ]	[ ]	[ ]
Desalting water	[ ]	[ ]	[ ]	[ ]	[ ]
Water recycling	[ ]	[ ]	[ ]	[ ]	[ ]
Structural modification of built environments	[ ]	[ ]	[ ]	[ ]	[ ]
Shielding against rising water levels	[ ]	[ ]	[ ]	[ ]	[ ]
Providing shelter against extreme weather e.g by tree planting	[ ]	[ ]	[ ]	[ ]	[ ]
Product and market diversification	[ ]	[ ]	[ ]	[ ]	[ ]
Taking special insurance	[ ]	[ ]	[ ]	[ ]	[ ]
Developing impact management plans	[ ]	[ ]	[ ]	[ ]	[ ]
Training and campaigns for employees and guests	[ ]	[ ]	[ ]	[ ]	[ ]
Engaging in conservation initiatives	[ ]	[ ]	[ ]	[ ]	[ ]
Redirecting guests away from ecologically sensitive areas	[ ]	[ ]	[ ]	[ ]	[ ]
Informing tourists of the current weather conditions	[ ]	[ ]	[ ]	[ ]	[ ]

SECTION F: ADOPTION OF SUSTAINABLE TOURISM PRACTICES

22. On a scale of 1-5, how would you rate the extent to which your tourism enterprise has adopted each of the following sustainability practices (where: 1= Not at all, 2= to a limited extent, 3 = to a moderate extent, 4 to as considerable extent and 5= to a great extent)

Sustainability Practice	**1**	**2**	**3**	**4**	**5**
Giving feedback to stakeholders on environmental and social actions	[ ]	[ ]	[ ]	[ ]	[ ]
Budgeting for corporate and social responsibility activities	[ ]	[ ]	[ ]	[ ]	[ ]
Encourage employees' continuous education and professional development	[ ]	[ ]	[ ]	[ ]	[ ]
Monitoring of environmental pollution	[ ]	[ ]	[ ]	[ ]	[ ]
Using energy appliances	[ ]	[ ]	[ ]	[ ]	[ ]
Creation of environmental awareness in the community	[ ]	[ ]	[ ]	[ ]	[ ]
Implementing anti-harassment policies such as sexual harassment	[ ]	[ ]	[ ]	[ ]	[ ]
Recycling materials within the enterprise operations	[ ]	[ ]	[ ]	[ ]	[ ]
Environmentally friendly fleet management	[ ]	[ ]	[ ]	[ ]	[ ]
Compliance with applicable legal requirements	[ ]	[ ]	[ ]	[ ]	[ ]
Minimizing paper based marketing and promotional materials	[ ]	[ ]	[ ]	[ ]	[ ]
Purchasing from environmentally friendly suppliers	[ ]	[ ]	[ ]	[ ]	[ ]
Implementing efficient water management system	[ ]	[ ]	[ ]	[ ]	[ ]
Environmentally sensitive building designs	[ ]	[ ]	[ ]	[ ]	[ ]
Measuring and monitoring energy use	[ ]	[ ]	[ ]	[ ]	[ ]

23 Which of these water management practices does your tourism enterprise apply?

	Tick
Re-using linen (bed sheets and towels)	[ ]
Reduction in pressure of water	[ ]
Collection and use of rainwater	[ ]
Taps with sensors	[ ]
Low flush toilets	[ ]
Re-use grey water for irrigation	[ ]
Intelligent irrigation systems	[ ]
Leak detection and controls	[ ]
Water filtration for the swimming pool	[ ]
Water-efficient dishwashers	[ ]

Employee involvement in water conservation [ ]
Shower-head water saving system [ ]

24. Which of these waste management practices does your tourism enterprise apply?

Waste Management Practices	**Tick**
Educating guests and staff on waste prevention	[ ]
Local waste management service providers	[ ]
Using non-disposable crockery (Plates, cups, dishes)	[ ]
Using environmentally friendly detergents	[ ]
Reusing bottles, papers and plastics	[ ]
Donating leftover foods	[ ]
Using reusable soap dispensers	[ ]
Sorting and segregating waste	[ ]
Sending waste to a recycling facility	[ ]
Use of a biogas plant	[ ]
Use of a sewage plant	[ ]
Landfills/dumping sites	[ ]

SECTION G: DRIVERS AND BARRIERS TO ADOPTION OF SUSTAINABLE TOURISM BEST PRACTICES

25. On a scale of 1 -5, how would you rate the influence of the following factors on your tourism enterprise adoption of sustainable tourism practices? Where 1= not at all influential, 2= slightly influential, 3 = somewhat influential, 4= very influential, and 5 = extremely influential

Factors	1	2	3	4	5
Social responsibility	[ ]	[ ]	[ ]	[ ]	[ ]
Enterprise guiding principle	[ ]	[ ]	[ ]	[ ]	[ ]
Policies on technology	[ ]	[ ]	[ ]	[ ]	[ ]
Political stability	[ ]	[ ]	[ ]	[ ]	[ ]
Energy usage and efficiency	[ ]	[ ]	[ ]	[ ]	[ ]
Other competing enterprise	[ ]	[ ]	[ ]	[ ]	[ ]
Level of habitat	[ ]	[ ]	[ ]	[ ]	[ ]
Performance measure	[ ]	[ ]	[ ]	[ ]	[ ]
Adhering labour laws	[ ]	[ ]	[ ]	[ ]	[ ]
~~se of greener transport services~~	[ ]	[ ]	[ ]	[ ]	[ ]
Digital technology and payment accelerators	[ ]	[ ]	[ ]	[ ]	[ ]
Population growth	[ ]	[ ]	[ ]	[ ]	[ ]
Waste reduction	[ ]	[ ]	[ ]	[ ]	[ ]
Sustainability targets	[ ]	[ ]	[ ]	[ ]	[ ]
Organizational culture	[ ]	[ ]	[ ]	[ ]	[ ]
Org. financial capacity	[ ]	[ ]	[ ]	[ ]	[ ]
Tax policy	[ ]	[ ]	[ ]	[ ]	[ ]
Brand reputation/image	[ ]	[ ]	[ ]	[ ]	[ ]
Economic performance	[ ]	[ ]	[ ]	[ ]	[ ]
Technological adaptability	[ ]	[ ]	[ ]	[ ]	[ ]
Technological innovativeness	[ ]	[ ]	[ ]	[ ]	[ ]
Technological capacity	[ ]	[ ]	[ ]	[ ]	[ ]
Level of habitat degradation	[ ]	[ ]	[ ]	[ ]	[ ]
Competitors priorities	[ ]	[ ]	[ ]	[ ]	[ ]
Public financing for sustainability	[ ]	[ ]	[ ]	[ ]	[ ]
Ethical responsibility	[ ]	[ ]	[ ]	[ ]	[ ]
Environmental responsibility	[ ]	[ ]	[ ]	[ ]	[ ]

SECTION H: INCENTIVES AND DISINCENTIVES FOR SUSTAINABLE TOURISM

26. On a scale of 1 to 5, how would you rate the level of impacts of the following initiatives on adoption of sustainable tourism practices by your tourism enterprise (where 1= Not at all impactful, 2= Slightly Impactful, 3= Moderately impactful, 4= Considerably impactful, and 5= very impactful)

	1	2	3	4	5
Access to Green Supply Chains	[ ]	[ ]	[ ]	[ ]	[ ]
Carbon taxesTax exemption and subsidies	[ ]	[ ]	[ ]	[ ]	[ ]
Word of mouth	[ ]	[ ]	[ ]	[ ]	[ ]
Higher insurance premiums	[ ]	[ ]	[ ]	[ ]	[ ]
Laws and regulations	[ ]	[ ]	[ ]	[ ]	[ ]
Access to greener technology transfer	[ ]	[ ]	[ ]	[ ]	[ ]
Green certification and recognition	[ ]	[ ]	[ ]	[ ]	[ ]
Concessional Loans	[ ]	[ ]	[ ]	[ ]	[ ]
Lower Interest rate and subsidies	[ ]	[ ]	[ ]	[ ]	[ ]
Climate Change fund	[ ]	[ ]	[ ]	[ ]	[ ]
Green bonds	[ ]	[ ]	[ ]	[ ]	[ ]
Carbon Credit Trading	[ ]	[ ]	[ ]	[ ]	[ ]
Emission trading systems	[ ]	[ ]	[ ]	[ ]	[ ]
Laws and regulations	[ ]	[ ]	[ ]	[ ]	[ ]
Licenses or accreditation	[ ]	[ ]	[ ]	[ ]	[ ]

SECTION I: TOURISM ACTIVITIES ON ENVIRONMENTAL AND ECONOMIC ACCOUNTING

27. What is the current main source of water for your tourism enterprise/organization?

Water companies	[ ]
Own abstraction – groundwater (borehole)	[ ]
Own abstraction – surface water (river/lake/spring)	[ ]
Rainwater	[ ]
Water bottling companies	[ ]
Not applicable	[ ]

28. What is the average monthly bill incurred by your tourism enterprise for water from water treatment and bottling companies in the year 2022 (indicate in Kenya Shillings)

Source: Average Amount in Ksh/Month

Water companies …….

Water bottling Companies …….

Not applicable

29. Does your tourism enterprise obtain its own water from other waters sources like borehole, river, lake or spring?

YES [ ] NO [ ]

30. If YES in Q29. Please estimate the amount of water sourced from the following sources by your tourism enterprise per day in litters

Amount in Litters/day

Ground water e.g. borehole

Surface water e.g. rivers, lake or spring

31. Do you estimate the volume of wastewater (sewage) produced by your tourism enterprise? [ ] Yes [ ] No

32. If Yes in Q31, Please indicate the average volume of sewage produced by your tourism enterprise per month for last year (2022)

……..(average volume in liters per month)

33. Does your tourism enterprise treat or recycle wastewater generated from its operations?

YES [ ] NO [ ]

34. If the answer is “Yes” in Q33, Please indicate the average volume of wastewater treated for your own use in liters or cubic meters per month for last year (2022)

……...…..(average volume in liters per month)

35. Which of these methods does your tourism enterprise use to disposal waste oil?

[ ] Grease traps [ ] Discard oil [ ] Re use waste oil [ ] Do not have waste oil

36. How does your tourism enterprise dispose of wastewater from the toilets?
Use soak pits [ ] septic tank [ ] Not applicable [ ]
Others (Specify)……

37. How does your tourism enterprise dispose of wastewater from the kitchens and hand wash systems?
Use soak pits [ ] septic tank [ ] Not applicable [ ]
Others (Specify)……

38. Do you undertake filtration of the swimming pool? [ ] Yes [ ] No [ ] Sometimes [ ] Not applicable

39. Please indicate your tourism enterprise's average monthly usage of the following energy sources in the previous year (2022), using the provided units

	Year 2022	
Energy Product	**Average Usage per month**	**Units**
Electricity	……	Kenya shillings
Solar energy	……	Kilowatts
Wind	……	Kilowatts
Coal and Coke	……	Kilograms
Petrol	……	Kenya shillings
Kerosene	……	Kenya shillings
Diesel	……	Kenya shillings
LPG	……	Kenya shillings
Charcoal & Firewood	……	Kilograms
Biogas	……	Kenya shillings
Lubricating oils & greases	……	Kenya shillings
Jet fuel	……	Kenya shillings
Aviation gasoline	……	Kenya shillings

Not applicable

40. Does your tourism enterprise generate energy for its own use?
YES [ ] NO [ ] Not applicable [ ]

41. Does your tourism enterprise have energy management policy?
[ ] Yes [ ] No [ ] Developing one [ ] Has a draft

42. Kindly provide an estimate of the average monthly quantity of the following types of solid waste generated by your tourism enterprise in the previous year (2022), using the provided units

Year 2022

Solid Waste category	Average Quantity of Solid waste generated per month	Units
Organic solid waste (e.g. biodegradable materials like food waste, and kitchen scraps)	……	Kilogram
Inorganic solid waste (non-biodegradable material like plastics, glass, metals, and other non-recyclable materials)	……	Kilogram
Other solid wastes (discarded equipment,vehicles and electronic waste)	……	Kilogram

Not applicable

43. Does your enterprise/organization compost its organic waste? YES [ ] NO [ ]

44. If you answered 'YES' to Q43, please estimate the monthly amount of organic waste composted by your tourism enterprise in the previous year (2022) in kilograms ……..(average weight in kilograms per month)

45. Please indicate by checking, the method(s) your tourism enterprise uses to manage inorganic (non-biodegradable) solid waste.

    Waste treatment method

    Recycle [ ]
    Reuse [ ]
    Reduce [ ]
    Repurpose [ ]
    Resale [ ]
    Not applicable [ ]

46. If you answered any of the waste treatment methods in Q45, please estimate the average monthly weight of inorganic solid waste treated by your tourism enterprise in 2022

Waste treatment method	
Recycle	[ ]
Re use	[ ]
Reduce	[ ]
Repurpose	[ ]
Resale	[ ]
Not applicable	[ ]

APPENDIX D: KII INTERVIEW GUIDE

A SITUATIONAL ANALYSIS OF THE ADOPTION OF SUSTAINABLE TOURISM PRACTICES, EVALUATION OF CLIMATE CHANGE IMPACTS ON THE TOURISM SECTOR, AND CLIMATE CHANGE MITIGATION AND ADAPTATION STRATEGIES IN KENYA

TOURISM SECTOR KEY INFORMANTS' INTERVIEW QUESTIONS

1.0 Introduction

The Ministry of Tourism, Wildlife, and Heritage (MoTW&H) wishes to assess the tourism sector's adoption of sustainability practices and understand climate change's consequences on the local sector. Consequently, the Tourism Research Institute (TRI) has contracted the Technical University of Mombasa Enterprise Limited (TUMEL) to conduct a situational analysis. The analysis includes evaluating the adoption of sustainable best practices, assessing the impact of climate change on Kenya's tourism sector, and designing climate response strategies and sustainable best practices that align with global benchmarks. To achieve this, TUMEL is conducting a survey covering the seven tourism Regions in Kenya to collect data. Your business/organization has been selected to participate by answering questions in the survey.

The purpose of this interview is therefore to gather your views on sustainable tourism practices and climate change impacts in the country. All information collected will be treated confidentially and used solely for this research purposes. Thank you for your willingness to participate in this important exercise.

2.0 Informed Consent

(Instructions: Kindly tick as appropriate)
I agree to participate in the interview as an informant and allow my data,
views, and opinions recorded in this interview, to be used for this research.
Agree [ ] Not Agreed [ ]

SECTION A: RESPONDENTS' DEMOGRAPHIC CHARACTERISTICS

1. Name of the tourism enterprise
2. Gender: Tick as appropriate Male [ ] Female [ ]
3. What is your current role at your tourism enterprise?
4. What is your length of experience in the tourism sector in years?
5. What is the mandate of your tourism enterprise in the tourism sector?
6. For how long has your tourism enterprise been in existence?
   [indicate the number of years since registration]
7. What is your level of academic qualification?

SECTION B: CLIMATE CHANGE AND TOURISM

8. What are your observations in regard to the ways in which tourism activities in this region has been impacted by climate change?
9. How has your tourism enterprise been affected by climate change?
10. How is your tourism enterprise addressing the following climate issues?
    a. Climate change mitigation actions
    b. Climate change adaptation actions
11. What are the challenges your tourism enterprise has encountered in implementing climate change adaptation and mitigation measures/actions?
12. In your opinion, what are some of the best practices from other countries that could be adopted to incentivize promotion of climate resilient actions in Kenya's tourism sector?

SECTION C: SUSTAINABLE TOURISM PRACTICES

13. What is your understanding of sustainable tourism?
14. What is the role of your tourism enterprise in promoting sustainable tourism?
15. What are your tourism enterprise's achievements in promoting adoption of sustainable tourism over the past three years?
16. How does your tourism enterprise communicate its sustainable tourism practices?
17. In your own experience, how would you compare the level of adoption of sustainable practices by tourism enterprises in Kenya in respect to the global best practices?
18. What have been the major challenges facing the tourism enterprises in implementing sustainable tourism practices in Kenya?
19. What do you think needs to be done in terms of incentives and disincentives to promote the adoption of sustainable tourism practices by tourism enterprises in Kenya?
20. In your opinion, what are the innovations do you believe will have the most significant influence on sustainable tourism practices in Kenya over the next five years?
21. Are there any gaps in the current institutional framework that need to be addressed to enhance sustainability in the tourism sector? IF SO, what specific recommendations would you make to improve the institutional framework in Kenya to better promote sustainable tourism practices by tourism enterprises?

SECTION D: ENVIRONMENT AND ECONOMIC ACCOUNTING

22. How are tourism activities impacting on the environment?
23. Why is it important to measure and report on the environmental and economic impacts of tourism activities?
24. What is the status of reporting on the following in terms of environmental and economic impacts of tourism activities on:
    a. Water
    b. Solid waste
    c. Energy
    d. Greenhouse gases

25. Who are the key stakeholders involved in environmental and economic measures of tourism activities?
26. What are the required enablers to stakeholders to measure and report on environmental and economic impacts of tourism activities?
27. As we conclude the interview, is there any key takeaway you would like to share with regard to:
    a. the importance of sustainable tourism practices;
    b. addressing climate change impacts; and
    c. need for measuring and reporting on environmental and economic impacts of tourism activities

THANK YOU FOR YOUR TIME

APPENDIX E: LIST OF INFORMANTS TARGETED FOR THE KEY INFORMANT INTERVIEWS (KII)

1. Lake Bogoria National Park
2. Kenya Civil Aviation Authority
3. Global Tourism Resilience and Crisis Management East Africa
4. Sunset Travel Agencies
5. Hotelier Kilifi Association
6. Kwale County, Department of Tourism
7. Kakamega County, Department of Trade, Tourism, and Investment
8. Kisumu County, Department of Water, Environment, Climate Change and Natural Resources
9. Trademark
10. Kenya Coast Tourism Association
11. Serena Hotel
12. Tourism Research Institute
13. Bomas of Kenya
14. Tourism Fund
15. Giraffe Centre
16. Radisson Blue Hotel
17. Friends of Karura Forest Association (Ecotourism)
18. National Museums of Kenya
19. Panari Hotel
20. Kenya Wildlife Service (Nairobi)
21. Stanley Hotel
22. Tourism Promotion Fund
23. Kenya Tourism Board
24. Utalii College

25. Kenya Tourism Federation
26. Kenya Association of Hotel Operators
27. Kenya Association of Travel Agents
28. Kenya Community Based Tourism Network (KECOBAT)
29. Tourism Profession Association
30. Kenya Association of Air Operators
31. Kenya Professional Safaris Guides Association
32. Pubs and Entertainment Restaurant Association of Kenya
33. Sustainable Travel and Tourism Agenda
34. Tourism Regulatory Authority
35. Kenya Tourism Board
36. Ministry of Tourism and Wildlife
37. Kenya Tourism Federation
38. Kenya Association of Hotel Keepers and Caterers
39. Kenya Association of Tour Operators
40. Eco-Tourism Kenya
41. Kenya Association of Travel Agents
42. Kenya Wildlife Service

APPENDIX F: QUANTITATIVE DATA ANALYSIS PROTOCOL

	Baseline Study Objective	**1. To evaluate the impact of climate change on tourism in Kenya**		
	Research Question	**Variables (Questionnaire Item No.)**	**Technique**	**Statistics**
1.0	What is the level of climate change awareness among tourism industry stakeholders?	• Level of stakeholder awareness of the impacts of climate change on the tourism sector in Kenya (Qsn.18) (VR18a, … VR18l)	• Measures of central tendency; • Measures of dispersion	• Mean • SD
2.0	What is the level of stakeholder awareness of biological and physical impacts of climate change?	• Level of stakeholder awareness of the impacts of climate change on the tourism sector in Kenya (Qsn.18) (VR18a, … VR18l)	• Measures of central tendency; • Measures of dispersion	• Mean • Standard Deviation
3.0	Is there a significant difference in the level of awareness of biological and physical climate change impacts across respondent's demographics and tourism regions?	• Index of awareness of biological impacts of climate change (VR47a); • Index of awareness of physical impacts of climate change (VR47b); • Gender (Qsn.6) VR6; • Level of education (Qsn.7) /literacy level (VR7b); • Experience (Qsn.9)/ VR9c; • Region (Qsn.2) (Loc_region)	• Comparison of Means Students T-Test; • One-Way between-groups ANOVA • Post-Hoc analysis - Dunnett's T3/ Tukey's	• Mean, • SD • t-statistic, • p-value; • Mean-Difference; • α =.05; • Confidence Intervals; • F-statistic
4.0	What are the effects of climate change on tourism enterprises in the last five years?	• Rating of effects of climate change on tourism enterprises (Qsn19) VR19a, …, VR19m)	• Measures of central tendency; • Measures of dispersion	• Mean • SD
5.0	What are the classes of effects of climate change events on tourism enterprises	• Changes in temperature (VR48a); • Changes in precipitation (VR48b); • Changes in water bodies (VR48c); • Changes on landscapes (VR48d).	• Measures of central tendency; • Measures of dispersion	• Mean • SD
6.0	Is there a significant difference in perce0ptions of the effect of climate change across tourism regions	• Changes in temperature (VR48a); • Changes in precipitation (VR48b); • Changes in water bodies (VR48c); • Changes on landscapes (VR48d); • Region (Qsn.2)	• Measures of central tendency; Measures of dispersion; • Comparison of Means – One way ANOVA	• Mean • SD • F-statistic • P-value
7.0	What is the significance of climate change impacts on tourism enterprises operations?	• Rating of significance of climate change impacts on tourism enterprises (Qsn.20) (VR20a…VR20k).	• Measures of central tendency; • Measures of dispersion	• Mean • SD;

	Baseline Study Objective	1. To evaluate the impact of climate change on tourism in Kenya		
	Research Question	**Variables (Questionnaire Item No.)**	**Technique**	**Statistics**
8.0	Is there a significant difference in the perception of significance climate change impacts on tourism enterprises across regions, enterprise size and classes of enterprises?	• Increase in operational costs (VR20a); • Loss of income opportunities (VR20j); • Change in travel patterns (VR20c); • Business interruptions (VR20d); • Enterprise size • Region (Qsn.2) (Loc_region) • Enterprise classification (Qsn. 4) (VR4)	• Measures of central tendency; Measures of dispersion; • Comparison of Means - One way ANOVA	• Mean • SD • F-statistic • P-value • Mean-Difference; • α =.05; • Confidence Intervals;
	Baseline Study Objective	**2. To assess climate change adaptation and mitigation measures adopted by tourism businesses**		
	Research Question	**Variables (Questionnaire Item No.)**	**Technique**	**Statistics/Visualization**
1.0	What is the extent of implementation of climate change response strategies by tourism enterprises in Kenya?	• Rating of extent of implementation of climate change response strategies (Qsn.21) VR21a, …, VR21m)	• Measures of central tendency; • Measures of dispersion	• Mean • SD;
2.0	What is the extent of implementation of climate change adaptation and Mitigation measures by tourism enterprises in Kenya?	• Index rating of extent of implementation of climate adaptation measures; • Rating of extent of implementation of climate adaptation measures (Qsn.21) VR21a, …, VR21m)	• Measures of central tendency; • Measures of dispersion	• Mean • SD;
3.0	What are the predictors of adoption of climate change mitigation and adaptation measures by tourism enterprises in Kenya?	• Adoption of climate adaptation measures (Dummy variables); • Adoption of climate adaptation measures (Dummy variables); • (VR21aa – VR21mm); • legal status, • nationality of ownership, • size (number of direct employees), • Classification (ALL DUMMY VARIABLES)	• Binary Logistic regression analysis	• LR Chi-Square (p <.001); • Nagelkerke R2 • PAC (%); • Exp(B)
	Baseline Study Objective	**3. To assess the adoption of sustainable tourism practices by tourism enterprises in Kenya**		
1.0	What are the sustainable tourism practices (STPs) adopted by tourism enterprises in Kenya?	• Rating of extent of adoption of sustainable tourism practices by tourism enterprises (Qsn 22) (VR22a – VR22o); • Converted to dummy variables	• Frequency count	• Frequency; • % of total

	Baseline Study Objective	1. To evaluate the impact of climate change on tourism in Kenya		
	Research Question	**Variables (Questionnaire Item No.)**	**Technique**	**Statistics**
	Baseline Study Objective	**3. To assess the adoption of sustainable tourism practices by tourism enterprises in Kenya**		
2.0	What are the STPs adopted across tourism enterprises classifications?	• Converted to dummy variables for adopted STPs • Enterprise classification (Qsn. 4) (VR4)	• Frequency Counts	• Frequency • % of total
3.0	What are the STPs adopted across counties?	• Converted to dummy variables for adopted STPs • Loc_County	• Geospatial Analysis • Shannon-wiener diversity index	• H • Choropleth
4.0	What are the water management practices adopted by tourism enterprises (Class A, B and H)	• Water management practices adopted (Qsn23) VR23a –VR23L	• Frequency Count	• Frequency
5.0	What are the water management practices adopted by tourism enterprises (Class A, B and H) across counties	• Water management practices adopted (Qsn23) VR23a –VR23L • Local_County	• Geospatial Analysis • Shannon-wiener diversity index	• H • Choropleth
6.0	What are the waste management practices adopted by tourism enterprises (Class A, B and H)	• Waste management practices adopted (Qsn24) VR24a –VR24L	• Frequency Count	• Frequency
7.0	What are the waste management practices adopted by tourism enterprises (Class A, B and H) across counties	• Waste management practices adopted (Qsn24) VR24a –VR24L • Local County	• Geospatial Analysis • Shannon-wiener diversity index	• H • Choropleth
8.0	What is the extent of implementation of STPs adoption by tourism enterprises in Kenya?	• Rating of extent of adoption of sustainable tourism practices by tourism enterprises (Qsn 22) (VR22a – VR22o).	• Measures of central tendency; • Measures of dispersion	• Mean • SD;
9.0	What is the extent of implementation of STPs by the TBL classification?	• Rating of extent of adoption of sustainable tourism practices by tourism enterprises (Qsn 22) (VR22a – VR22o).	• Data Reduction- Exploratory factor Analysis (EFA)	• The Kaiser–Meyer–Olkin (KMO); • Bartlett's test of sphericity; • Eigenvalues; • Factor loadings; • Communalities.
10.0	What are the categories of STPs implemented by tourism enterprises in Kenya	• Environmental Conservation Practices; • Social and Corporate Responsibility Initiatives; • Legal and Ethical Compliance Practices	• Reliability test	• Cronbach's alpha (α)

	Baseline Study Objective	1. To evaluate the impact of climate change on tourism in Kenya		
	Research Question	**Variables (Questionnaire Item No.)**	**Technique**	**Statistics**
11.0	What is the extent of implementation of Environmental Conservation Practices and Social and Corporate Responsibility Initiatives	• Index of extent of implementation of Environmental Conservation Practices; • Index of extent of implementation Social and Corporate Responsibility Initiatives	• Measures of central tendency; • Measures of dispersion	• Mean • SD;
12.0	What are the internal determinants of implementation of Environmental Conservation Practices and Social and Corporate Responsibility Initiatives	• Index of extent of implementation of Environmental Conservation Practices; • Index of extent of implementation Social and Corporate Responsibility Initiatives; • legal status; • Nationality of the firm's beneficial owners; • Size of the firm; • Awareness of climate change impacts; • Significance of these impacts on enterprise operations	• OLS regression; • Model diagnostic tests	• F-Statistic • Coefficient of determination (R^{-2}); • Regression coefficients (B) • Standardized regression coefficient (β); • VIF; • P-value • α =.05

APPENDIX G: KEY INFORMANTS PROFILE

ID	Gender	Position	Experience (years)	Educational Qualification	Mandate
P01	Male	County Tourism Director	10	Masters	County Government - Tourism
P02	Male	Sustainability Auditor	5	Masters Degree-Environmental Sciences	Sustainable tourism Advocacy
P03	Female	Director	12	PhD	Climate Research
P04	Male	County Tourism Director	24	Masters Degree-Tourism	County Government - Tourism
P05	Male	Chief Executive Officer	32	Masters	Tourism Trade Organization
P06	Male	Manager	10	Masters	Civil Aviation
P07	Male	Chairman	34	Degree	Regional Tourism Association
P08	Male	Chief Executive Officer	12	Bachelors Degree	Regional Tourism Association
P09	Male	Chairman	30	Diploma-Professional Training	Tourism Trade Organization
P010	Male	County Tourism Director	15	Masters	County Government - Tourism
P011	Male	Hotel Manager	32	Diploma- Hotel Management	Hospitality
P012	Female	Snr. Lecturer	19	PhD	Tourism and Hospitality Training
P013	Male	Front Office Manager	16	Diploma - Hotel Management	Hospitality
P014	Male	Chairman	16	Degree	Regional Tourism Association
P015	Male	Head- Research & Projects	7	Masters	Sustainability Consultancy
P016	Female	Travel Director	19	Advanced Diploma	Travel and Tours Service Provider
P017	Male	County Tourism Director	9	Diploma-Tourism	County Government - Tourism
P018	Male	Chief Executive Officer	26	Masters	Tourism Research
P019	Male	Director	26	Masters	Tourism & Hospitality Training
P020	Female	Director	3	Masters	Tours and Travel Services
P021	Female	Chief Executive Officer	25	Masters	Tourism Trade Organization
P022	Male	Chief Executive Officer	7	Masters	Tourism Trade Organization
P023	Male	Chief Executive Officer	10	Bachelor's Degree	Community Based Tourism Organization
P024	Male	Chairman	13	Masters	Tourism Professional Association

APPENDIX H: PROFILE OF FOCUS GROUP DISCUSSION PARTICIPANTS

Date	ID	Location	Counties represented	Number of Participants	TOTAL
21st February 2024	FGD01	Amboseli	Kajiado,	10	26
	FGD01_2	Amboseli		10	
	FGD01_3	Amboseli		6	
12th February 2024	FDG02	Eldoret	Turkana, West Pokot Uasin Gishu, Nandi	13	49
	FGD02_2	Eldoret		14	
	FGD02_3	Eldoret		13	
14th February 2024	FGD03	Kakamega	Bungoma Kakamega Busia	30	82
	FGD03_2	Kakamega		30	
	FGD03_3	Kakamega		22	
2nd February 2024	FGD04	Kilifi	Kilifi Lamu Tana River	10	38
	FGD04_2	Kilifi		13	
	FGD04_3	Kilifi		5	
7th February 2024	FGD05	Kirinyaga	Kirinyaga Embu Nyeri	10	35
	FGD05_2	Kirinyaga		10	
	FGD05_3	Kirinyaga		15	
14th February 2024	FGD06	Kisumu	Homa-Bay, Kisii, Siaya Kisumu, Migori	20	55
	FGD06_2	Kisumu		20	
	FGD06_3	Kisumu		15	
5th February 2024	FGD07	Kwale	Kwale	4	21
	FGD07_2	Kwale		8	
	FGD07_3	Kwale		9	
7th February 2024	FGD08	Laikipia	Laikipia Meru Marsabit	10	22
	FGD08_2	Laikipia		8	
	FGD08_3	Laikipia		4	
9th February 2024	FGD09	Narok	Narok Bomet	4	14
	FGD09_2	Narok		4	
	FGD09_3	Narok		6	
23rd February 2024	FGD10	Voi	Taita Taveta	6	19
	FGD10_2	Voi		7	
	FGD10_3	Voi		6	
26th February 2024	FGD11	Virtual-Conservancies	All	16	48
	FGD11_2	Virtual-Conservancies		16	
	FGD11_3	Virtual-Conservancies		16	
12th February 2024	FGD12	Nakuru	Nakuru Samburu	22	67
				22	
				23	

APPENDIX I STAKEHOLDERS' VALIDATION REPORT

Date: 10th July 2024

Venue: KICC, Nairobi

Number of Participants: 56

Introduction

This report summarizes the key discussions, concerns, and resolutions from the Tourism Stakeholders' Validation Workshop held on 10th July 2024 at the KICC, Nairobi. The workshop focused on the adoption of sustainable best practices, the evaluation of the impact of climate change on the tourism sector in Kenya, and the design of appropriate climate response strategies aligned with global benchmarks.

Key Discussions and Stakeholder Feedback

1. Inclusivity of Airbnb and Similar Platforms

Stakeholder Concern:

A participant highlighted the significance of Airbnb, with over 10,000 listings in Kenya, and questioned if it was included in the study.

Expert Response:

The scope of the current study was determined by the enterprises listed in the ninth schedule of the Tourism Act 2011, which did not include Airbnb. Future studies will consider incorporating Airbnb and similar platforms.

2. Use of Global Standards and Benchmarks

Stakeholder Concern:

Ecotourism Kenya inquired about the use of ISO standards and Global Reporting Initiative (GRI) standards in the benchmarking process.

Expert Response:

The study primarily focused on the Global Sustainable Tourism Council (GSTC) Criteria and UNEP framework for climate change adaptation and mitigation. While ISO and GRI standards are acknowledged, the scope was limited to specific standards due to time and resource constraints. Future studies may expand to include additional global benchmarks.

3. Pilot Testing of Recommendations

Stakeholder Concern:

The importance of pilot testing the proposed recommendations to ensure their practicality was emphasized.

Expert Response:

The study was based on empirical evidence from industry stakeholders, providing confidence in its applicability. However, pilot testing of specific recommendations is recognized as crucial and will be incorporated in future implementation plans.

4. Simplification of Report for Broader Audience

Stakeholder Concern:

A request was made to simplify the report to make it more accessible to those without a scientific background.

Expert Response:

A popular version of the report, complete with images, diagrams, and simplified language, will be created to ensure broader accessibility.

5. Representation of All Regions

Stakeholder Concern:

Concerns were raised about whether all regions, particularly Western Kenya, were adequately represented in the data collection and reporting.

Expert Response:

The data collection was conducted anonymously and regionally balanced. The results reflect the views of the industry proportionally. Efforts will be made to ensure all regions are adequately represented in future reports.

5. Vulnerabilities and Local Examples of Climate Change

Stakeholder Concern:

Participants stressed the need for more local examples of climate change impacts and the vulnerabilities of the tourism industry.

Expert Response:

Local examples of climate change impacts will be integrated into the background information. The final report will include specific vulnerabilities and relevant metrics such as the vulnerability index.

6. Addressing SME Needs

Stakeholder Concern:

Participants emphasized the necessity for recommendations to be aligned with the needs of SMEs, which make up 64% of the industry.

Expert Response:

The study recognizes the critical role of SMEs and aims to provide recommendations that are feasible and beneficial for them. Future iterations will continue to focus on the needs and constraints of SMEs.

7. Policy Review and Updates

Stakeholder Concern:

The need for reviewing and updating policies to support the implementation of sustainable practices was highlighted.

Expert Response:

The final report includes an extensive review of existing policies. Recommendations for policy updates to support sustainable practices are provided, and ongoing policy reviews will be conducted.

8. Conceptualization of Sustainable Tourism

Stakeholder Concern:

Clarification on the conceptualization of sustainable tourism in Kenya and the need for a common understanding was requested.

Expert Response:

The study addresses the conceptualization of sustainable tourism, providing definitions and principles adopted by the industry. A common framework for understanding and practicing sustainable tourism will be promoted.

Adoption of the Report with Amendments

Stakeholder Concern:

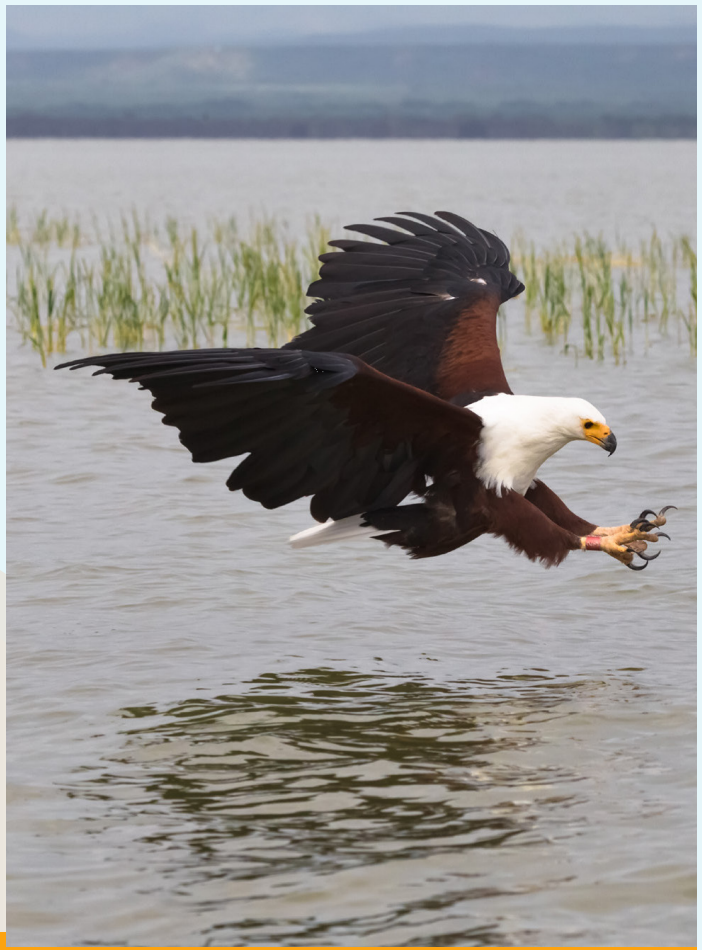
The necessity of adopting the report with the discussed amendments was underscored.

Expert Response:

The stakeholders agreed on the importance of adopting the report with the proposed amendments. The report will be revised to incorporate all valid concerns and suggestions raised during the workshop. The amended report will then be circulated for final validation and formal adoption by all stakeholders.

Conclusion

The validation workshop was successful in gathering valuable feedback from stakeholders. The concerns raised were acknowledged and addressed by the experts, with commitments to incorporate the suggestions into the final report and future studies. The collaborative effort ensures that the strategies and practices recommended are practical, inclusive, and aligned with the needs of the Kenyan tourism sector.



Ministry of Tourism and Wildlife

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