PROJECT INCEPTION REPORT (Technical)

Technical support to increase the overall transparency capacity and set-up of sectoral MRV systems in the Kingdom of Eswatini

November 2021

Mbabane, Eswatini

DISCLAIMER

PREPARED UNDER

Initiative for Climate Action Transparency (ICAT) supported by the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, the Children´s Investment Fund Foundation, the Italian Ministry for Ecological Transition, and ClimateWorks.

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

CIFF CHILDREN'S INVESTMENT FUND FOUNDATION

climateworks FOUNDATION

MINISTERO DELLA TRANSIZIONE ECOLOGICA

The ICAT project is managed by the United Nations Office for Project Services (UNOPS)

UNOPS

Contents

Acronyms and abbreviations

AFOLU	Agriculture, Forestry and Other Land Use
CSO	Central Statistics Office
CBIT	Capacity Building Initiative for Transparency
DWA	Department of Water Affairs
CSER	Centre for Sustainable Energy Research
EEC	Eswatini Electricity Company
ESA	Eswatini Sugar Association
ESERA	Eswatini Energy Regulatory Authority
ETF	Enhanced Transparency Framework
GHG	Greenhouse Gas
GHGMI	Greenhouse Gas Management Institute
ICAT	Initiative for Climate Action Transparency
IPCC	Intergovernmental Panel on Climate Change
KOBWA	Komati Basin Water Authority
LULUCF	Land Use, Land Use Change and Forestry
MNRE	Ministry of Natural Resources and Energy
MoU	Memorandum of Understanding
MRV	Measurement, Reporting and Verification
MTEA	Ministry of Tourism and Environmental Affairs
MoA	Ministry of Agriculture
NAP	National Adaptation Plan
NC	National Communication
NDC	Nationally Determined Contributions
NEP	National Energy Policy
NERCHA	National Emergency Response Council on HIV/AIDS
NIR	National Inventory Report
QA	Quality Assurance
RE	Renewable Energy
RES	Royal Swaziland Sugar Corporation
SGEP	Short Term Generation Expansion Plan
SNL	Swazi Nation Land
SRA	Eswatini Revenue Authority
UNDP	United Nations Development Programme
UNESWA	University of Eswatini

UNFCCC	United Nations Framework Convention on Climate Change
UNOPS	United Nations Office for Project Services
TDL	Title Deed Land

List of Figures

1 Introduction

Eswatini faces many risks from climate change due to its vulnerability to the impacts of climate change. Both mitigation and adaptation are complementary approaches to reduce risks of climate change impacts over different timescales. The Kingdom of Eswatini ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1996 and the Kyoto Protocol in 2002, in order to contribute to the global fight against climate change.

As part of the obligations under the UNFCCC, Eswatini submitted its First National Communication (NC1) in May 2002, the Second National Communication (NC2) in March 2012 and the Third National Communication (NC3) in October 2016. The country is currently in the process of compiling its Fourth National Communication (NC4).

As a Party to both the Convention and the Paris Agreement, Eswatini is committed to climate transparency. Transparency (understood here as disclosure of information) facilitates accountability and more effective climate action. In this case it makes climate action visible, track progress towards achieving emission reduction targets, and reduce mistrust amongst countries. As accorded by the Paric Agreement, Eswatini must provide periodic reports on what is being done to respond to the impacts of climate change in the form of national emissions inventories and progress towards achieving the Nationally Determined Contributions. The periodic reporting and review of the national GHG inventory must provide the international community with complete, accurate, transparent, consistent and comparable information on the anthropogenic GHG emissions and removals at the national level.

Furthermore, under the Paris Agreement, the GHG inventory provide a means of assessing whether the country is on track to meet its nationally determined contributions (NDCs). Article 4 of the Paris Agreement highlights that, in communicating their NDCs, all Parties will provide information necessary for clarity, transparency and understanding in accordance with decision 1/CP.21. [1] Article 13 of the Paris Agreement articulates an "enhanced transparency framework for action and support" that establishes harmonized monitoring, reporting, and verification (MRV) requirements.[2] The MRV structure should provide information on the measures taken and the support received, provided or accounted for the NDCs.

To show its commitment to multilateral climate action, Eswatini needs to establish a robust MRV system which is a core element of the enhanced transparency framework of the Paris Agreement. Reporting requirements under the enhanced transparency framework for action and support (Article 13) of the Paris Agreement, are more stringent and require more frequent reporting.

An excellent MRV system allows reliable data flows and a robust evidence base for stakeholder engagement and provides stable and enhanced transparent, accurate and comprehensive national data to be used to inform decision-makers and for international assessment of progress.[3] The MRV system also allows the Convention to gather comprehensive information on the level of emissions and track the ambition of country efforts and related progress in climate action at the national and international levels. The MRV system is central to effectively implementing the Nationally Determined Contributions (NDCs). Therefore, there is an urgent need to design and set-up multi-sectoral MRV systems, and to enhance the capacities of Eswatini's experts to comprehend and apply tools for the MRV system in all sectors of the NDCs.

To aid the effective implementation of the Paris Agreement and to track Eswatini's NDCs, the Initiative for Climate Action Transparency (ICAT), is supporting the government of Eswatini to set-up

sectoral MRV systems to enhance its transparency framework as well as to build capacity on the use of transparency related tools and ICAT sustainable development assessment tools. ICAT's implementing partner, Greenhouse Gas Management Institute (GHGMI), provides technical support to national experts on the delivery of project outputs. This work requires engagement with a wide range of different stakeholders and to set-up adequate frameworks to achieve high level of data quality. The project will focus on building capacities of technicians in the MTEA, line departments and national experts, institutions, NGOs and the Eswatini private sector, as well as other stakeholders, to develop robust sustainable data collection processes, including well-defined and understood institutional arrangements, and improved Tier 2 data for future inventory compilation.[4] In addition, the project aims to undertake a renewable energy policy assessment to model the climate, economic and social impacts of various scenarios on emissions and the community and the economy, specifically in the agriculture and LULUCF sectors.

2 Linkages and synergies to other climate change projects in the country

Eswatini's efforts to fully comply with the transparency requirements set forth by the Paris Agreement and establish capacity for the transparency framework need not start from scratch but build on and learn from current ongoing work and NDC activities under implementation or recently implemented in the country. The current ICAT project will help transition the existing MRV frameworks to an enhanced transparency framework, in line with the Paris Agreement. The National Inventory Report (NIR) 2018, identified some gaps in relation to completeness and quality of the data currently available. In general, it was observed that there is lack of proper data archiving and curation, resulting in gaps in the time series and some inconsistencies. The improvement in the collection of activity data and institutional arrangements for all the sectors of the NDCs is key in ensuring that Eswatini meets the accelerated reporting requirements under the Paris agreement.

Ongoing work in May 2021 included the revision of the country's Nationally Determined Contribution (NDC), including a section on adaptation; and preparation of the county's Fourth National Communication that includes a section of vulnerability and adaptation. Work is proceeding on the monitoring and evaluation (M&E) of adaptation including support from the Initiative for Climate Action Transparency to assist with measurement, reporting and verification (MRV) of adaptation through the establishment of baselines and a roadmap for moving forward with the water and health sectors. The country has already taken steps in designing and implementing monitoring and evaluation (M&E) system that includes indicators necessary to measure NDC implementation and intends to set-up and strengthen a sectoral MRV system. The ICAT project will build on the M&E system and other transparency projects. The framework aims to improve measurement, reporting and verification in all sectors of the NDCs. It also sets out guidelines on reporting through NCs and Biennial Update Reports (BURs) as well as on setting up domestic MRV frameworks for non-Annex I Parties.

With the requirements for transparency reporting, the Paris Agreement established a Capacity Building Initiative for Transparency (CBIT). This is meant to strengthen national institutions in the country for transparency related activities, provide relevant tools, training and assistance for meeting the provisions stipulated in Article 13 of the Paris agreement.[3] CBIT also assists in the improvement of transparency over time. Eswatini received support from the Global Environment Facility (GEF) through the CBIT to build domestic institutional and technical capacity in monitoring, reporting and verification of climate action in the country. The GEF-CBIT project will support Eswatini in establishing an overarching structure across all sectors that will ensure high quality in its transparency

instruments; and create the capacities to respond to UNFCCC's reporting requirements. Eswatini is still to implement its CBIT project to address the transparency issues through capacity building. As a non-Annex I party to the UNFCCC, Eswatini is also obligated to submit its BURs on the greenhouse gases emissions every two years. The ICAT project will build on BUR1 and enhance efforts to develop robust GHG inventories.

Table 1 summaries the linkages of ICAT project with ongoing projects. In addition to climate change initiatives from the UNFCCC, Eswatini is currently finalizing its adaptation communication (AdCom) which is also another component of the Enhanced Transparency Framework (ETF), together with CBIT and the NDCs. The AdCom was established by Article 7, paragraphs 10 and 11, of the Paris Agreement which states that Parties should submit and update periodically an adaptation communication, which may include information on its priorities, implementation and support needs, plans and actions. Its goals are to increase the visibility and profile of adaptation and its balance with mitigation, strengthen adaptation action and support for developing countries, provide input to the global stocktake, and enhance learning and understanding of adaptation needs and actions.[5] Information from this communication will be used to inform the adaptation component of the ICAT project.

Table 1: Summary of linkages of ICAT project with ongoing projects

Ongoing projects	ICAT Eswatini
NDC	Supports the implementation of the NDCs Enhances tracking progress and reporting through support from the NDC Partnership
CBIT	Provides a foundation for the Capacity Building Initiative for Transparency (CBIT), which is funded by the Global Environmental Facility (GEF). The ICAT project will provide information on institutional arrangements which will feed into the CBIT project which will begin to start formalising some of the institutional arrangements and building a Transparency Unit.
NAP	Supports the monitoring and review of the NAP (National Adaptation Plan)
NC4 and BUR1	Builds on the work done on NC4 and BUR1 Enhances efforts to develop robust GHG inventories
ADcomm	Information from this communication to be used to inform some of the activities of the adaptation component of the ICAT

3 Project objectives

The project will focus on building capacities of technicians in the MTEA, line departments and national experts and institutions, including the University of Eswatini (UNESWA), as well as other

stakeholders, to develop robust sustainable data collection processes in the agriculture and energy sectors, including institutional arrangements, and improved Tier 2 data for future inventory compilation. In addition, the project aims to undertake a renewable energy policy assessment to model the climate, economic and social impacts of various scenarios on emissions and the community and the economy as a whole, particularly in the agriculture and LULUCF sectors.

This project will have one adaptation and several mitigation components. The specific objectives are to:

1. Develop a framework for monitoring and tracking adaptation actions in the health and water sectors to meet Eswatini's NDC targets and to strengthen capacities to construct frameworks for other sectors;
2. Contribute towards ongoing efforts to build a national transparency framework that meets international standards but is tailored for domestic needs;
3. Contribute towards ongoing efforts to improve the availability, collection and quality of data required for estimating emissions in the energy and AFOLU sectors and enable Eswatini to meet its enhanced international reporting standard requirements;
4. Contribute towards the continued improvement of the GHG inventory and capacity to compile the inventory;
5. Enhance capacitates to analyse and assess the GHG emission reductions and selected SD impacts of renewable energy policies, particularly in the electricity sector; and
6. Support the implementation of NDC targets.

4 Background and objectives of specific activities of the project

The project has 6 activities:

1. Activity 1: Adaptation scoping and gap analysis for the health and water sectors
2. Activity 2: Energy sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design
3. Activity 3: Agriculture sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design
4. Activity 4: Incorporation of timber and sugarcane plantations into the LULUCF sector inventory and improved LULUCF projections
5. Activity 5: Renewable electricity policy scenario assessment and impact modelling with recommendations for implementing NDC targets
6. Activity 6: Knowledge Sharing and Lessons Learned

4.1 Activity 1. Adaptation scoping and gap analysis for the health and water sectors

In this activity, a roadmap for adaptation in the health and water sectors will be developed. Since the first National Communication, both the health and water sectors were identified as sensitive to climate change and hence at risk of climate change impacts. Adaptation strategies were mainly identified for the water sector while there were no strategies outlined for the health sector. The water

sector adaptation strategies were directed at developing robust water resource systems as well as techniques to incorporate climate change uncertainties into the long-term planning. Similar adaptation options were proposed in the NC2 which include implementation of efficient water use, strengthening of stream flow observation, early warning systems, implementation of integrated water resources management and rainwater harvesting. Although the NC2 again identifies the health sector as an important sector that needs to adapt to climate change, it did not identify specific strategies for adaptation in this sector, citing lack of data to enable linkages for climate scenarios with climate sensitive disease outcomes.

The NC3 reported that numerous adaptation measures were ongoing in the country which included various agricultural and community irrigation projects as well as biodiversity and conservation efforts which addressed cross-cutting measures in priority areas related to water and agriculture. Even though the health sector was included as a key sector that needs to adapt to climate change impacts, there were no specific adaptation measures identified. On the other hand, there were key strategies related to the water sector that were identified. These strategies were related to those identified in previous NCs and these addressed 4 priority areas;

1. Institutional strengthening to support climate change resilient strategies
2. Systems for weather and climate early warning and information
3. Community based adaptation to climate related changes in water resources (including catchment flows, rainfall pattern and intensity, and water quality)
4. Awareness raising and knowledge management for communities

The main objective of this project, with respect to the health and water sectors, is to conduct an adaptation scoping and gap analysis. It is worth noting that in the entire ICAT project, Activity 1 is the only adaptation component as other activities predominantly focus on mitigation. The specific objectives under these two sectors are to:

1. Develop an inventory of past and current climate adaptation plans, policies and activities in the health and water sector;
2. Identify key indicators for adaptation in health and water sector with emphasis on gender;
3. Identify key criteria for success for these adaptation indicators;
4. Develop a framework for measuring and tracking progress towards achieving these indicators;
5. Identify key gaps in health and water adaptation sectors;
6. Develop a draft Action plan identifying gaps (institutional, monitoring, tracking) and making recommendations to fill them;
7. Conduct a 1-day stakeholder workshop to present the Action Plan;
8. Develop a draft Roadmap reflecting gap analysis and findings from the workshop.

4.2 Energy sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design

This part of the project is on Energy sector greenhouse gas (GHG) inventory institutional arrangements and data collection roadmap with recommendations for monitoring reporting and verification (MRV) system and design. This activity aims to assist Eswatini to “measure and assess the effects of climate actions” in the country, as part of its commitments under the Paris Agreement. It is meant to improve data gathering, identify gaps and make recommendations to fill these gaps. It also aims to develop structures for producing robust sustainable energy balances in the future.

A national energy balance provides information on energy flow in an economy. It gives an account on total energy sourced from various local sources including the environment, imported, exported how it is transformed, traded and its end consumption. It also provides information on the contribution of each source and consumption by specific economic sectors. An energy balance also exposes the national energy market and helps in monitoring the effectiveness of policies through exposing information on how close targets are met.

The information availed by energy balances can be used for future assessment of energy supply and demands and reveal the state of national energy security. Energy balances can be also used to compare energy statistics to those of previous periods, and of other countries and regions. They can be also used for the future through feeding into new policies, modelling and forecasting systems, and baseline GHG emissions and climate change mitigation scenario development. Since the energy balance is important for decision making, it is important that due diligence is accorded to its production.

This work will directly benefit from the improved energy GHG determinations for the NC4 and BUR1 as outlined in the National Inventory Report (NIR). In this work, improved greenhouse estimates were determined for the years from 1990 to 2018. There were challenges encountered of data unreliability, discrepancies between years, disagreement between data sources and data gaps. The current ICAT project aims to address some of these challenges.

The objective for Activity 2 as outlined in the call for proposals is to:

Contribute towards ongoing efforts to build a national transparency framework that meets international standards but is tailored for domestic needs.

The specific objectives are as follows:

1. Contribute towards ongoing efforts to improve the availability, collection and quality of data required for estimating GHG emissions in the energy sector and enable Eswatini to meet its enhanced international reporting standard requirements;
2. Contribute towards the continued improvement of the GHG inventory and capacity to compile the inventory;
3. Support the implementation of NDC targets; and
4. Contribute towards the development of the MRV implementation in Eswatini

4.3 Agriculture sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design

A roadmap for the agriculture sector highlighting institutional arrangements, data collection process and recommendations to fill gaps will be developed in this activity. In compiling the 2018 inventory, Eswatini used the Tier 1 (T1) method from the IPCC 2006 guidelines, applying default parameters and emission factors. Tier 1 however has the lowest accuracy. To enhance the GHG inventory and to move the country to a higher tier, numerous activities have been done. For example, Tier 2 (T2) emission factors (EFs) have been developed using the Global Livestock Environmental Assessment Model (GLEAM), work that was done by MTEA in partnership with Food and Agriculture Organisation (FAO), through Climate Action Enhancement Package (CAEP) support of the NDC Partnership. The GLEAM model requires high spatial livestock distribution. Moreover, due to the lack of high-resolution livestock distribution data nationally, Gridded Livestock of the World (GLW3) had to be used to determine livestock distribution. In addition, more disaggregated activity data are typically used when applying a higher tier. In the absence of these, expert judgement and extensive

multistakeholder consultations were used. To address the issues of data availability several recommendations were proposed, both in this livestock sector improvement project and the NIR, and the current project seeks to address those recommendations.

The increasing concerns over global climate change and pollution has seen a global drive and efforts meant to reduce the overall environmental impact of animal production, these being the adaptation and mitigation. Such efforts and interventions are targeting improved/enhanced nutritional and manure management strategies for methane (enteric or from manure) and nitrous oxide emissions reductions, through improved feed, animal management and manure management-based mitigation approaches. Commonly adopted adaptation strategies involve land use decisions, animal feeding changes, genetic manipulation, and alterations in species and/or breeds. In terms of mitigation, commonly adopted options involve altered land use for grazing and feed production, feeding practices, manure treatment and herd size reduction.[6] Eswatini, through the 4th National Communication, identified 7 mitigation options which includes improving animal genetics and breeding, reducing the population of non-productive animals, improving the digestibility of pastures through introduction of forage legumes or fodder trees, efficient use of crop residues through fortification, improving grazing management systems, using bio-gas digesters, improving animal health and husbandry and finally promoting feed lotting using grain diets. Building on the advances made through the 4th National Communication and its recommendations, this project, through improved data collection and enhanced MRV tools will play a major role in improving reporting of climate action.

The overall objective of this activity is to:

- Contribute towards ongoing efforts to improve the availability, collection and quality of data required for estimating emissions in the AFOLU sectors and enables Eswatini to meet its enhanced international reporting standard requirements.

The specific objectives are as follows:

1. Complete a scoping and gap analysis report for the agriculture GHG inventory compilation process,
2. Develop data collection templates for a Tier 2 agriculture GHG inventory; and
3. Develop a roadmap for enhanced agriculture GHG emission reporting, making recommendations on institutional arrangements and data collection.

4.4 Activity 4: Incorporation of timber and sugarcane plantations into the LULUCF sector inventory and improved LULUCF projections

The agriculture and forestry play a significant role in the country's greenhouse gas (GHG) budget. This inventory includes the emissions of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (NO). The Land Use, Land Use Change and Forestry (LULUCF) sector is one of the key sectors of the economy and covers the exchange of GHG between terrestrial ecosystems (land) and the atmosphere as a result of human activities. Most of the high-value agricultural crops (sugarcane, forestry, and citrus fruits) in Eswatini are grown on Title Deed Land (TDL) and leased Swazi Nation Land (SNL) where there are high levels of investment and irrigation, and high productivity. However, most of the Eswatini population - approximately 75% - resides in rural Swazi Nation Land (SNL) areas and are engaged in subsistence agriculture. These socio-economic and land use dynamics have implications on the country's carbon budget, hence the need for continuous assessment and monitoring. There is, therefore, a need for ongoing efforts to improve the availability, collection and quality of data required for estimating emissions in the LULUCF sectors to enable Eswatini to meet its enhanced international reporting standard requirements. As such continuous improvement in the collection of activity data

and institutional arrangements for the LULUCF sector is key in ensuring that Eswatini meets the accelerated reporting requirements under the Paris Agreement.

The NIR identified some gaps in the completeness and quality of the data currently available. In general, it was observed that there is lack of proper data archiving and curation, resulting in gaps in the time series and some inconsistencies. Some of the areas of improvement identified include:

- the need to improve land cover classifications using more robust remote sensing techniques and field data,
- refining forestry data to site and species level for plantations, validation of biomass factors, and
- inclusion of crop-specific (particularly sugarcane) data and fallow croplands.

A need was also identified for the country to upscale its research with a view to determine country-specific local emission factors. This activity intends to address some of the identified gaps and/or identify strategies to address these for subsequent inventories and update the LULUCF inventory and projected baseline.

Activity 4 objectives are to:

- Update land use change maps to incorporate an enhanced land stratification (focusing on timber and sugarcane plantations).
- Create a database of country specific LULUCF activity and emission factors
- Identify drivers of land use change to develop an improved projected baseline for LULUCF.

4.5 Activity 5. Renewable electricity policy scenario assessment and impact modelling with recommendations for implementing NDC targets

The Kingdom of Eswatini relies heavily on imports for the local supply of electricity. As of 2018, Eswatini was still importing over 75% percent of locally demanded electricity from South Africa (ESKOM) and Mozambique (EDM). [7] In order to improve the security of supply, while balancing costs with the risks, the ministry of natural resources and energy has (with the help of development partners) undertaken a number of studies.[8,9] to explore the use of local resources in electricity generation. Studies such as the Short-Term Generation Expansion Plan (SGEP) of 2018 and the Energy Masterplan of 2018 extensively considered the expansion of renewable energy technologies in the country's electricity generation mix. These studies culminated in the National Energy Policy (NEP) of 2018. As a guiding policy on national energy use and supply, the NEP aims to achieve not just security of energy supply but to also cater for a number of other national development goals including:

1. Full access to modern energy
2. Eradication of energy poverty
3. Energy Efficiency
4. Liberalisation of the electricity market
5. Improving access of independent power producers to the market, etc.

While the reduction of greenhouse gases is not an explicit goal of the NEP, it is implicitly implied in the access to modern energy policy statement. In this statement, the government of Eswatini's (GoE) desire to see a transition of all Eswatini to modern energy recognizes that traditional sources, which also contribute to GHG emissions and climate pollutants, are harmful to both the environment and

human life. Additionally, the GoE's desire to increase renewables in the national electricity generation mix will significantly impact the country's NDC targets. Through the Ministry of Tourism and Environmental Affairs (MTEA), the GoE has committed to reducing greenhouse gas emissions by undertaking specific measures in the energy sector. In the 2016 NDC (energy sector), the GoE has committed to blending of motor gasoline with up to 10 percent of ethanol (produced from sugar) and ensuring that the local electricity generation mix is comprised of 50 percent renewables by 2030. Bagasse cogeneration could meet about half of electricity demand in a sustainable way, while the timber industry is also planning on increasing its cogeneration capacity to generate electricity for export to the grid. In the revised NDC 2021, the GoE has committed to additional mitigation measures in the energy sector that can help with its GHG reduction targets.

In the work to be undertaken in this activity, the NEP and other GoE's documents on energy and electricity generation will be studied and the elements of the policies on the procurement of biomass renewable electricity will be used in a GHG reduction assessment. Eswatini is currently producing biomass electricity using co-generation in the sugar industry. Royal Eswatini Sugar Corporation has installed capacity of 65.5 MW for self-consumption and Ubombo Sugar Limited has installed capacity of 41.5 MW for self-consumption and exporting excess to the national grid (14 MW). [10] In the revised NDC, the GoE is committed to increasing biomass electricity by an additional 40 MW by 2030. This is one of the scenarios (in addition to a baseline) that the NEP scenario will be contrasted with. In addition to GHG impacts of the NEP biomass electricity, wood-based energy production can contribute to rural development. [11] The potential from smallholder farmers in 'out grower' schemes could be examined to examine both increasing the supply of biomass for electricity generation and looking at ways of making wood-based energy to be sustainable. Sustainability must be achieved in bioenergy production, to make it a feasible element of climate change mitigation, adaptation, and rural development. Other co-benefits to sustainable development goals will be identified and reported. This work will yield a renewable electricity scenario assessment report (showing impacts on energy, agriculture and LULUCF sectors).

The objectives for this activity are:

1. Apply the ICAT renewable energy methodology for assessing the greenhouse gas impacts of renewable energy policies.
2. Identify potential GHG impacts.
3. Determine the technical GHG emission reduction potentials of the various scenarios.
4. Design and develop key performance indicators and parameters to be monitored and a monitoring plan developed.

4.6 Activity 6. Knowledge Sharing and Lessons Learned

Knowledge management is the process of creating, sharing, using and managing the knowledge and information of an organisation. It involves the process of capturing, distributing, and effectively using knowledge. Some types of knowledge assets include lessons learned, technical knowledge, administrative and institutional knowledge. Lessons learned is not just about collecting and validating the knowledge, the lessons learned process also goes beyond the closing of the project with conducting the lessons learned. Knowledge management and sharing is an effective means of communication of lessons learnt from a project and some of the key factors and helps build synergy of all the activities in all the sectors of the project. Applying knowledge management techniques to project management practices can result in enhanced communication [12] and better project integration. This will lead to an improved synergy and links of the ongoing ICAT project with past projects, improved decision-making, reduced risks, and continuous improvement in project performance. The Centre for Sustainable Energy Research (CSER) will fuse and share multi sectorial knowledge generated by the

project with key stakeholders in a mutual exchange of ideas and information. This will enhance the transparency of the five activities in the project.

The objectives of knowledge management and sharing are to:

1. Gather, analyse, store, share, use and maintain knowledge, information and data throughout the implementation of the project,
2. Optimize the project processes,
3. Improve the efficiency, effectiveness and quality of all knowledge generated in the project and
4. Distribute the right content to all stakeholders at right time.

5 Scope of work

5.1 Overall scope of work

The project will involve stakeholders from the different Ministries, Departments and Agencies (MDAs) at national and local levels, public and private organizations and enterprises, NGOs, community-based organisations (CBOs), and others. Stakeholder engagement will be conducted in all the identified priority sectors through an inception meeting to present the process to be carried out during the project and during a final seminar to present the outcomes of the work. Sectoral experts will be involved during the project through interviews and direct contacts with key experts and information/data sources carried out face-to-face or remotely.

Five major activities have been identified for this project, with the first activity focussed on adaptation scoping and gap analysis (focusing on health, gender, water and sanitation) for potential Eswatini adaptation actions, and the other four on mitigation. The adaptation activity will involve the development of an inventory of all climate change adaptation policies in the health and water sectors. This will be followed by a gap analysis to identify priority areas of focus. Indicators for tracking targets will be identified, along with a framework for monitoring and tracking progress towards NDC in the health and water sectors. The output will be a Roadmap outlining the way forward for adaptation tracking and gap filling in these two sectors. A workshop will be held to engage with stakeholders.

The mitigation activities are focussed on the energy, agriculture and LULUCF sectors and there are three main work streams:

a. **Strengthen the institutional arrangements and data collection process for the energy and agriculture sectors:**
   - A scoping and gap analysis will be conducted to understand the current situation in terms of institutional arrangements and data collection in place for estimating national GHG emissions. This will include an assessment of requirements for Tier 2 road transport and livestock methodologies and sustainable energy balance data.
   - Meetings will be held with the relevant ministries to assist with this process. Data providers will be identified, and data collection templates developed to improve transparency and assist with the accelerated international reporting requirements. Detailed institutional arrangements, along with roles, responsibilities and QA, will be outlined and recommendations made in terms of future MoU requirements to enhance the sustainability of the reporting system.

- A Roadmap outlining the way forward and providing recommendations of actions to be taken to fill the data and institutional gaps and future MoU requirements will be developed.
- Stakeholders and data providers will be engaged through a workshop and the outputs of this will be reflected in the Roadmap.
- The outputs of this activity will be taken forward into the CBIT project which will then formalise the institutional arrangements through MoUs and incorporate the data collection templates into the MRV system.

b. Enhance the inventory data:

- For LULUCF:
  - The current land use change maps will be updated to incorporate an enhanced land stratification (focussing on the inclusion of timber and sugarcane plantations). A database of country specific LULUCF activity and emission factor database will be created.
  - Assist Eswatini to meet sustainable development objectives, particularly among rural farmers.
  - Drivers of land use change will be identified to develop an improved projected baseline for LULUCF.

c. **Renewable energy policy assessment and scenario impact modelling**

Eswatini has major renewable energy resources, namely biomass (particularly large amounts of forest residues from commercial timber production and significant quantities of unused bagasse from sugar processing). The Ministry of Mineral Resources and Energy (MNRE) has set out ambitious policy targets for substantial increases in renewable electricity generation from the sugar and timber sectors in its National Energy Masterplan. These are mirrored in Eswatini's NDC2 and other policy documents. If the right policies are put in place, much of the targeted new renewable electricity generation could be sourced from biomass residues from these two sources to generate enough renewable electricity to meet all Eswatini's current electricity demand and export the surplus into the Southern Africa Power Pool (SAPP). Currently over 75% of Eswatini's electricity is sourced primarily from fossil fuels.

- This could be achieved, in large part, from engaging Eswatini smallholder farmers to grow sugar to increase supplies to Eswatini's three sugar factories, and, likewise, engage smallholder farmers to produce commercial wood supplies in 'out-grower' schemes to supply the timber industries' accelerating investment in renewable electricity from forest wastes/residues. Engaging these smallholder farmers/landowners in these out-grower programmes could significantly increase sustainably produced wood supplies and wood residues to the timber industry and bagasse to sugar to generate renewable electricity to both utilise at the production plants and to sell back into the Eswatini Grid. This would address the NDC goal of increasing use of renewable energy resources to reduce use of fossil fuels, and further address Government's policies and plans to engage smallholder farmers in sustainable agriculture and forestry that provide resources to generate renewable electricity.

- This activity will engage government (specifically MTEA, the Energy Department of the Ministry of Natural Resources and Energy/MNRE, the Eswatini Electricity Company/EEC, the Eswatini, the Eswatini Energy Regulatory Authority (ESERA) to assess the renewable energy policies (focussing on biomass and renewable energy) and identify various projection scenarios. These scenarios will be run in the inventory calculation files to determine the overall mitigation impact of each scenario. Workshops will be held to discuss the outputs and identify possible problems or conflicts with the various scenarios. A report will be compiled,

not only outlining the mitigation impact but also highlighting possible SD impacts that will address key SDGs including SDG 7 (Affordable and Clean Energy) and SDG 13 (Climate Action).

The objectives of the renewable energy policy assessment and scenario impact modelling component are:

- To explore concrete approaches that could significantly assist Eswatini to meet its NDC renewable energy target and
- Assist Eswatini to meet sustainable development objectives, particularly among rural farmers.

5.2 Sectorial Scope of Work

5.2.1 Adaptation scoping and gap analysis for the health and water sectors

The Kingdom of Eswatini, has taken considerable strides in responding to climate change, including conducting vulnerability and adaptation assessments for some of the key sectors (including the water sector) identified in the country's NDC to the climate change agenda. Eswatini is also in the process of revising its NDC and has done extensive work with regard to the climate agenda in the Kingdom. However, there is a considerable gap in knowledge on climate change impacts in the health sector, in Eswatini while for the water sector there is still a need to mainstream as well as understand institutional arrangements.

There has been no comprehensive assessment conducted to determine the health impacts associated with climate change as well as adaptation strategies that can be implemented to minimize the impacts of climate change in this sector. During the process of revising the NDC, one of the adaptation goals identified in the health sector is the need for awareness creation on the impacts of climate change. This will be the first and crucial step before the adaptation scoping and gap analysis exercise is undertaken for this sector. Once awareness is created among the key stakeholders, further engagements will seek to identify specific risks and climate-related impacts and the adaptation activities currently undertaken in both the health and water sector.

It is worth noting that the water sector has extensively participated in previous climate change conversations and has contributed immensely to previous national communications. It is noted that although awareness creation is essential before consultations, it will not be as extensive in this sector as it is on board the climate change agenda. Stakeholder engagements will seek to identify gaps and establish indicators, building from what has been identified during the NDC revision process for the water sector. Thereafter, the Consultants will consolidate lessons learnt from the project and facilitate knowledge sharing among participating stakeholders. There will be specific focus on WASH as well as in crafting a gender sensitive adaptation response.

5.2.2 Energy sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design

Different stakeholders shall be involved in different roles for this activity. They include the Ministry of Natural Resources and Energy (MNRE), some government departments and Agencies, public and private sector organisations and academia and research institutions. The Activity team shall solicit information from the data providers through various means including interviews, direct contact that may be face-to-face or remotely.

Activity 2 is aimed at addressing climate change mitigation and transparency in the energy sector as follows:

1. Strengthening the data collection process and institutional arrangements:
    - Investigate data collection and institutional arrangements in place for the estimation of GHG emissions to produce a sustainable energy balance. Part of this will be to determine the requirements for improving the GHG emissions to Tier 2 level in the transport sector.
    - MNRE shall play a key role in the carrying out of this activity. It will help in the identification of data providers. GHGMI shall assist in the development of data collection templates that shall be crucial to improve transparency and help the country adopt leapfrog to meet international reporting requirements. The work will also map out institutional arrangements indicating roles, responsibilities and quality assurance (QA) measures. Recommendations will be made for future MoU to support the sustainability of the reporting system.
    - A Roadmap outlining the way forward and providing recommendations of actions to be taken to fill the data and institutional gaps and future MoU requirements will be developed.
    - Stakeholders and data providers will be engaged through a workshop and the outputs of this will be reflected in the Roadmap.
    - The outputs of this activity will be taken forward into the CBIT project which will then formalise the institutional arrangements through MoUs and incorporate the data collection templates into the MRV system.

5.2.3 Agriculture sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design

The primary task for the Agriculture Sector is to develop robust sustainable data collection processes, including institutional arrangements, and improved Tier 2 data for future inventory compilation. It is meant to contribute towards on-going efforts to improve the availability, collection and quality of data required for estimating emissions in the AFOLU sector and to enable the Kingdom of Eswatini to meet its enhanced transparency international reporting standard requirements. Stakeholders, primarily, from the Ministry of Agriculture, and other relevant partners such as private organizations and NGOs will be engaged through consultation of sector experts (face-to- face consultation and/ or remotely) to establish institutional arrangements and data collection roadmap. Several mitigation activities aimed at strengthening the institutional arrangements and data collection process for the sector will be undertaken, and these will include:

- A scoping and gap analysis undertaken to understand the current situation in terms of institutional arrangements and data collection in place for estimating national GHG emissions, including an assessment of requirements for Tier 2 livestock methodologies.
- Meetings will be held with the parent ministry (MoA) and other relevant stakeholders to achieve the process and analysis. The list of data providers that were identified during the GHG compilation for the 4th National Communication [13] will be updated during the meetings, and data collection templates developed to improve transparency and assist with the accelerated international reporting requirements. These meetings will also inform the development of detailed institutional arrangements, along with roles, responsibilities and QA fully outlined. Lastly, recommendations will be made in terms of future MoU requirements to enhance the sustainability of the reporting system.
- Development of a roadmap that outlines the way forward and providing recommendations of actions to be taken to fill the data and institutional gaps and future MoU requirements.

- Stakeholders and data providers will be engaged through a workshop and the outputs of this will be reflected in the roadmap.
- Incorporating into the CBIT project the outputs of this activity, resulting in these institutional arrangements being formalised through MoUs and the data collection templates incorporated into the MRV system.

5.2.4 Incorporation of timber and sugarcane plantations into the LULUCF sect or inventory and improved LULUCF projections

Based on the gaps identified in the NIR, the project will focus on developing a robust sustainable data collection process, including institutional arrangements, and improved Tier 2 data for future inventory compilation and NDC tracking. It will also focus on building capacities for key stakeholders in Eswatini. Specifically, the project tasks under this activity are:

- Update land use change maps to incorporate an enhanced land stratification (focusing on the inclusion of timber and sugarcane plantations).
- Create a database of country specific LULUCF emission factors.
- Identify drivers of land use change to develop an improved projected baseline for LULUCF.

5.2.5 Renewable electricity policy scenario assessment and impact modelling with recommendations for implementing NDC targets

As stipulated in the Terms of Reference, the tasks of this activity are to:

- GHG impact modelling of biomass electricity generation. In this work, the use of biomass in electricity generation will be analysed and the fossil GHG-emission reductions from biomass use at different carbon price levels quantified.
- Identifying other sustainable development (SD) impacts of the policy on renewable electricity. Policies on renewable energy development will be to determine the potential contribution of different renewable energy technologies to Eswatini's NDC's goals and RE targets. This will inform policy makers to better the renewable energy policies.
- Recommendations for NDC targets on the biomass electricity generation. The results from this work will give a continual update of the renewable energy targets in the NDCs.

6 Work Approach and Methodology

The following sections of the report present detailed work approach and methodology by the sectorial consultants.

6.1 Adaptation scoping and gap analysis for the health and water sectors

The specific activities that will be conducted to achieve the set objectives will be as follows:

A. **Inception meeting**: The Consultants will participate in the inception meeting with the PMU to familiarize themselves with the scope of the work in the two sectors.

B. **Inception Report**: A report detailing the rationale for the project which will also include a presentation of the methodology will be developed. This will allow for feedback on the scope of the work to be done.

C. **Awareness creation for the health sector**: The health sector has lagged in adaptation planning in Eswatini and this activity will be necessary to bring on board the key people in the Ministry of Health. Due to the prevailing COVID-19 conditions, it is not easy to conduct large group gatherings and therefore, the awareness-raising engagements cannot be enumerated but will be sufficient to cover the vast groups and levels of stakeholders in the Ministry of Health. These groups will include, but not limited to the following:

    - *Principal Secretary and all the Directors and Deputy Directors* within the Ministry – This is the highest level of authority within the Ministry of Health and therefore to influence even the country's health strategy to incorporate climate change adaptation actions, there needs to be a buy-in from this level.

    - *Programme managers* for the different health programmes – The ministry has many programmes that address climate change adaptation activities, however, there is currently no link for these activities to the country's climate agenda and therefore lack of data.

    - *Technocrats* in the ministry and some key MoH stakeholders – Since these are the people on the ground and will be providing the necessary information as the projects maps the adaptation actions in this sector, it will be imperative to engage them and raise awareness so that they are able to link the current activities undertaken within the ministry to adaptation actions.

D. **Document review for water, health and gender**:

    - A review of existing plans, organizational reports, policies and other relevant documents from government departments, government and regional agencies, online sites, stakeholder organizations directories, and websites, peer reviewed journal reviews and any other available literature/reports.

    - The review of documents will be complemented by the review of current projects and regional reports addressing climate change adaptation including; the National Communication, NDC review amongst others.

    - Additionally, initiatives by local stakeholder entities will be assessed to ascertain the level of implementation of the country's plans to adapt to climate change.

    - This activity will focus on establishing the inventory for both the health and water sectors including gender, as well as identify gaps and indicators.

    - An inventory and gap analysis report will be synthesised

E. **Stakeholder consultations**:

    - Workshops will be organized to bring the stakeholders to deliberate on the adaptation activities in the water and health sectors.

    - All workshops will start with an awareness raising component

    - A tool for documenting current activities for climate change adaptation and adaptation indicators will be designed and administered to the stakeholders.

- Further consultations will be organized via electronic means and face-to-face consultations to compliment data gathered from the workshops.
- A draft gap analysis report will be validated with the stakeholders

F. **Development of a framework for measuring and tracking progress towards achieving the set indicators**.

- Once the adaptation indicators have been fully established and agreed upon, they need to be tracked to monitor the effectiveness of the adaptation actions.
- The indicators developed will form the basis of the framework to be developed in this task.
- Identification of responsible personnel/institutions who will oversee the monitoring of these indicators. A possible institutional arrangement structure will be proposed for reporting and monitoring of adaptation activities in both the health and water sectors.

G. Development of a national action plan and roadmap

- The information obtained through document review, stakeholder engagement will be used to draft an action plan and roadmap for adaptation actions in the health and water sectors
- The action plan and roadmap will have a strong focus on gender issues and will draw from previous climate change projects

H. **Knowledge management** – develop and avail relevant communicable information for transmission to CSER

6.2 Energy sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design

This section outlines a detailed methodology of carrying out the Activity 2 component of the project.

OUTPUT 1. SCOPING AND GAP ANALYSIS REPORT FOR THE ENERGY SECTOR

Action 1: Get Capacity Training ICAT Stakeholder Engagement Principles

GHGMI provides training on ICAT stakeholder engagement principles.

Action 2: Meeting with the Government Ministry Responsible for Energy Matters in the Country

A meeting between the executing team and MNRE will be held to establish the current status of energy balances and relevant energy statistics data, and further elaborate the stakeholders.

Energy balance issues to be discussed:

- Data sources and data types
- Methodologies of data collection
- Data collection templates
- Matters of data quality
- Examples of existing accurate data
- Existing data gaps
- Causes of data gaps and quality issues
- Current institutional arrangements for data collection
- Other challenges experienced with data collection

Action 3. Prepare and Distribute Workshop Guidance Material

Material will be prepared to guide stakeholders on how to benefit the most from the capacity building workshop.

Action 4. Hold Capacity Building Workshop

A capacity building workshop for energy balance compilers and data providers will be hosted with the Trainers (GHGMI). This will be done for the purpose of developing a sustainable framework of the process of energy balance compilation in Eswatini.

Action 5. Quality Assurance Sessions to Support Sustainable Energy Balance Framework and Tier 2 Transport Methodologies

The Activity Team will undergo training from GHGMI on the identification of data requirements for sustainable energy balance framework and Tier 2 transport methodologies.

Action 6. Data Requirements Identification for Sustainable Energy Balance

This will be an exercise to Identify data requirements for a sustainable energy balance and Tier 2 transport emissions will be identified. In addition, the Ministry of Works and transport will be engaged on transport data requirements.

Action 7. Identification of Data Sources and Data Gaps

Data sources, data suppliers and data gaps will be done through consultation with MNRE and other energy stakeholders. In particular, the Ministry of Works and transport will be engaged for Eswatini's fleet data, which is an important input in Tier 2 transport emissions.

Action 8. Identify Critical Quality Assurance

Identify points where quality assurance is critical.

Action 9. Map Out Institutional Arrangements

The necessary institutional arrangements will be mapped out with roles and responsibilities. In addition, a quality assurance framework for data collection will be developed as part of the mapped institutional arrangements.

Action 10. Recommendations on MoU Requirements

A recommendation in the form of an MOU document for an arrangement between MTEA on national GHG estimates and the main data providers will be compiled. A MOU template in the GHG Inventory Toolkit will be developed to facilitate the process of setting up an agreement for the parties. The template sets out the correct procedure for setting up an MOU and is therefore a useful tool for ensuring efficient institutional arrangements.

Action 11. A Scoping and Gap Analysis Report for the Energy Sector

A report from the findings from these actions will be produced.

OUTPUT 2. ENERGY SECTOR DATA COLLECTION TEMPLATES

Action 1. Capacity Building on Developing Subsector Specific Data Collection Templates

The Activity Team, some MNRE officers and key stakeholders will be trained by GHGMI on developing templates for specific data types taking cognisance of the variety of data sources and sets that will be required for a robust energy balance.

Action 2. Development of Data Collection Templates

With the training obtained in Action 1 and knowledge of data types, the data collection templates to aid the data collection process will be developed by the Activity Team, MNRE officers and some key stakeholders under the guidance of GHGMI.

Action 3. Further Training on Data Collection Quality Assurance

Further training of the Activity Team and MNRE officers on quality assurance in data collection shall be conducted.

OUTPUT 3. STAKEHOLDER WORKSHOP ON DRAFT ROADMAP

Action 1. Capacity Development on Roadmap for Sustainable Energy Balance Framework

There will be need amongst the Activity Team and MNRE officers to develop capacity to develop a roadmap for a sustainable energy balance framework. Such capacity will be gained from the GHGMI support and sourced from literature.

Action 2. Development of Draft Roadmap on Data Collection

A draft roadmap outlining the data collection process for the energy sector; data gaps and recommendations on filling them; institutional arrangements; and timelines will be developed. This roadmap shall be based on the revised NDC and the Eswatini Energy Master Plan 2050. Guidance shall be sought from further literature review and the support from GHGMI.

Action 3. Prepare and Distribute Background Material to Stakeholders

Some background material on the draft roadmap will be prepared and distributed to stakeholders to guide them on how to contribute towards toward its improvement. This material shall include the purpose of the workshop, expected outcomes, questions to be answered, and other items.

Action 4. Stakeholder Workshop on Roadmap

A 1-day stakeholder workshop will be conducted to present draft Roadmap and get feedback from stakeholders. The workshop will be guided by through the material provided prior.

Action 5. Produce Stakeholder Input Report

A report will be prepared on stakeholder inputs.

OUTPUT 4. FINAL ROADMAP FOR DATA COLLECTION IN THE ENERGY SECTOR

Action 1. Discussion of Stakeholder Inputs to the Roadmap

There will be a discussion on how to incorporate the feedback from stakeholders, with the participation of GHGMI.

Action 2. Finalisation of the Roadmap

Stakeholder inputs will be incorporated in the final roadmap and submitted to GHGMI for a final check.

Action 3. Archiving of the Roadmap for a Robust Sustainable Energy Balance Framework

The Project facilitator will then upload the roadmap that will be managed through an inventory archiving system.

6.3 Agriculture sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design

A. Scoping and gap analysis

The activity will be undertaken through, first profiling the current status of agriculture data in the country, both livestock and non-livestock. This will be done in consultation with the Ministry of Agriculture (MoA) and inventory compilers, and especially taking a leaf in the recently completed national study that was aimed at developing Tier 2 GHG inventory in the livestock sector and assessing the potential to reduce GHGs across the Agriculture sector in the country. The task will also focus on identifying the data requirements for Tier 2 calculations for both livestock and non-livestock sectors under Agriculture. The consultations will inform on appropriate data sources, data suppliers, as well as identify data gaps that need to be attended for improved agriculture inventory.

B. Data collection templates

A national consultative stakeholder workshop will then be held which will inform on critical institutional arrangements, roles, and responsibilities for data collection, frequency of data collection, as well as contribute towards the development of draft templates that will be used by institutions to capture and report data, both livestock and non-livestock sources (e.g., fertilizers, urea, lime, and rice). The outputs of the workshop will also include recommendations on any institutional MoUs that will need to be established with crucial institutions that are data sources/providers. The developed draft templates will then be finalised in close consultation with MoA, in preparation for roll-out as the new tools for data collection for both livestock and non-livestock data.

C. Development of a roadmap

The outputs (e.g., templates) and consultative meetings will then be used to develop a comprehensive roadmap that fully outlines the data collection process for every sub-sector of the Agriculture Sector. The roadmap will further highlight the identified existing data gaps and the recommended steps and developments critical for filling these gaps. The finalised templates and developed draft Roadmap will then be validated through a consultative stakeholder workshop, where feedback will be received and incorporated into the final document.

6.4 Incorporation of timber and sugarcane plantations into the LULUCF sector inventory and improved LULUCF projections

A. Updating land use change maps

Land use, changes in land use, and land management practices may either be “sources” of GHGs or “sinks” of GHGs (sinks remove CO2 from the atmosphere). The IPCC Guidelines (GLs) for reporting on NGHGIs [4–8] set out specific quality indicators, which implement the fundamental reporting principles established under the UNFCCC (e.g. UNFCCC decisions 24/CP.19, 17/CP.8, 12/CP.17) that countries must adhere to when compiling their reports: transparency, accuracy, consistency, completeness, and comparability (TACCC). However, estimating GHG emissions/removals from the LULUCF sector remains a complex task due to the biophysical phenomena involved, which require the stratification of land according to several variables including vegetation, climate zone, soil type, and management type and intensity, as well as disturbances. To that end, the availability of transparent, accurate, consistent and complete land representation is of the utmost importance, requiring a robust

and comparable methodology for classification that can be used across time and across space by a number of different stakeholders.

Various methods and approaches are used by different countries to collect area data for land-use classification, including but not limited to maps, censuses, surveys, ground sampling and remote sensing techniques. As part of the Open Foris initiative, [14] the FAO and Google LLC recently released Collect Earth [15] , an open-source software program featuring a number of powerful tools to assists countries in collecting, managing and analyzing land cover and land-use information, through an augmented visual interpretation of remotely sensed data based on a sampling approach. Collect Earth is increasingly being used by a number of developing countries as one of the tools needed to prepare their reports to the UNFCCC.

Consequently, the land-cover/land-use classification process will be applied to each plot to classify it within a unique land-use category and stratum, identifying a specific value or range of values for each of the land characteristics needed for estimating GHG emissions or removals. The number of land characteristics to be sampled will be based on the landcover elements (i.e. type, cover density and fraction covered as well as pattern of distribution). To achieve consistent land representation, the classification process will not be limited to a point in time but will span a time series for which satellite imagery and ancillary information are available. The period 2001 to 2020 will be covered for developing annual or biannual land use matrices. Since Google Earth images are not available for the period prior to 2001, the land cover for the period from 1990 to 2000 will be classified using supervised classification methods based on the same sample plots developed for the period 2001-2020. The choice of inter-annual intervals will be determined by imagery availability, particularly before 2000, and will also coincide with years where good quality remote sensing imageries with less cloud effect were available for the entire country. This will be supplemented by other ancillary spatial datasets in our possession. This approach is expected to provide estimates of greater certainty and will have a closer link between biomass and carbon dynamics. This will include GIS-based combinations of land cover/forest types with connections to soil properties, integrating several types of monitoring and data. Interannual land-use changes will be tracked over the period under review and possibly linked to climate and key drivers. All the analysis will be carried out using a combination of Collect Earth and ArcGIS Pro.

B. Creating and updating of country (or region) specific LULUCF activity and emission factor database

The activity data will be prepared through the following steps [16] in order to ensure a consistent land representation, and ultimately estimate GHG emissions and removals for all land-use categories in line with the relevant IPCC guidelines.

Step 1. Determine country-specific stratification scheme and define any strata (land-use categories, subcategories and subdivisions)

Step 2. Identify the land-cover elements and their distribution pattern – that is, the scene.

Step 3. Collect information on coverage of the land-cover elements in the scenes.

Step 4. Apply the two-logic approach within the plot mask to determine the land-use category.

Step 6. Calculate and assign cover density of the woody vegetation to the plot.

Step 7. Apply the same procedure to historical years.

Step 8. Documentation.

For Eswatini, emissions and removals from the LULUCF will be estimated from the following source and sink categories: This section will include GHG emissions and removals from land use and forestry. The categories will be included in the emission Based on the IPCC 2006 Guidelines.

C. Identification of drivers of land change and land use projections

Different drivers affect land use and land cover change. On the one hand, drivers of tree cover loss in Eswatini include deforestation, agricultural expansion, large-scale forestry operations, wildfire, and human settlement expansion (including urbanization). On the other hand, land use change is caused by both human and climate drivers. Decisions on land use are often based on short-term economic factors and are influenced by globalization, technological innovation, and policies at different levels (i.e. local, regional or national). For forest lands, the risk of conversion to other land uses is correlated with environmental, political, social, cultural, and economic factors.

Key drivers of this conversion include changes in demographic variables, human settlement expansion, distance to the nearest road, and deforestation for commodity production. A study by Dlamini [17] indicated that deforestation patterns in Eswatini are determined by an interaction of proximate and underlying factors primarily fuelwood use, human population and settlements, sugarcane expansion, protection and land ownership status. Other important drivers include small-scale agriculture and wildfires. Therefore, understanding the trends and long-term demographic context for population change could aid land managers and other stakeholders in mitigating the effects of human settlement development and anticipate future human population change.

Overall, the study of land use change is critical in land C dynamics and better land use planning is needed to secure ecosystem services provided by forests. Even though some C stocks may be increasing due to forest regrowth, bush encroachment or alien plant invasion, it is critical that Eswatini addresses the issue of forest conversion due to its significant contribution on the C budget.

6.5 Renewable electricity policy scenario assessment and impact modelling with recommendations for implementing NDC targets

The process of assessment of the RE policy will employ the methodology described in detail below:

A. Capacity building

A capacity building workshop with trainers (GHGMI) on the ICAT tools will be held, specifically focussing on the ICAT Renewable Energy (RE), Sustainable Development (SD) and Stakeholder Participation Guides. Selected individuals from key institutions will be part of the training on the use of these guides. The main objectives of this workshop will be to:

- To enhance understanding and strengthen the capacity of consultants and stakeholders in the domain and the use of the ICAT Renewable Energy (RE), Sustainable Development (SD) and Stakeholder Participation Guides.
- Improve the use of information and enhance the ability to choose appropriate methods and tools to conduct a renewable electricity policy scenario assessment and impact modelling with recommendations for implementing NDC targets.

The workshop will be in-person for participants in Eswatini with GHGMI connecting virtually, and the number of participants limited by the dictates of COVID regulations. In the event COVID regulations prevent a physical meeting, all participants will be requested to join the training virtually.

The key deliverable to be produced at this stage will be enhanced understanding of ICAT tools.

B. Stakeholder workshop

A stakeholder workshop will be conducted with the following identified stakeholders:

1. Ministry of Natural Resources and Energy (MNRE),
2. Eswatini Energy Regulatory Authority (ESERA)
3. Eswatini Electricity Company (EEC)
4. Ministry of Tourism and Environmental Affairs (MTEA)
5. Ministry of Agriculture (MoA)
6. Sugar, timber and out-growers
7. ESWADE
8. LULUCF experts
9. Private sector (representatives of the three sugar factories and at least five forest/timber enterprises who are active in the commercial forest sector) and
10. Smallholder out-growers.

The aim of this in-person stakeholder workshop is to identify future biomass renewable electricity scenarios and possible policies, focusing specifically on biomass and community-focussed plantation approaches (e.g., sugar bagasse, wood processing residues for electricity generation, community-based forest management of wattle, and other woodlot/village plantations and agro-forestry production). A draft agenda will be circulated in advance to solicit stakeholder inputs into a final version of the agenda. If COVID regulations prevent a physical meeting, a virtual workshop will be organized.

The key outputs to be produced at this stage will be a workshop report with possible scenarios for future biomass renewable electricity and the policy to be assessed.

C. Literature review

A predominantly desktop research approach involving systematic review, grey literature Boolean searches on technical reports and many peer-reviewed journals to:

- Review of existing policies on renewable energy. Existing policies on biomass electricity generation will be catalogued.
- Review relevant performance modelling, impact assessment and decision analysis techniques for renewable energy systems.
- Select an appropriate modelling tool for conducting the renewable electricity policy scenario assessment and impact modelling.
- Understand the purpose and applicability of the methodology that will be used to assess the greenhouse gas GHG impacts of the Eswatini's RE policy.

D. Defining the assessment

The assessment will apply the ICAT renewable energy methodology for assessing the greenhouse gas impacts of renewable energy policies. This process will be carried out in 2 steps:

a) **Clearly describing the policy to be assessed**

To effectively carry out an impact assessment a detailed analysis of the policy being assessed will be done to enhance the understanding of all the components of the policy. The following recommended information will be noted to enable a clear description of the policy to be assessed:

Table 2: Information to enable clear description of the policy to be assessed

Information	Description
Title of the policy	Policy name
Type of policy	Whether the policy is a feed-in tariff policy, auction policy or tax incentive policy.
Description of specific interventions	The specific intervention(s) carried out as part of the policy, such as the technologies, processes or practices implemented
Status of the policy	Whether the policy is planned, adopted or implemented
Date of completion	If relevant, the date the policy ceases, such as the date a tax is no longer levied or the end date of an incentive policy with a limited duration (not the date that the policy no longer has an impact)
Date of implementation	The date the policy comes into effect (not the date that any supporting legislation is enacted)
Implementing entity or entities	The entity or entities that implement(s) the policy, including the role of various local, subnational, national, international or any other entities
Objectives and intended impacts or benefits of the policy	The intended impact(s) or benefit(s) of the policy (e.g. the purpose stated in the legislation or regulation)
Level of the policy	The level of implementation, such as national level, subnational level, city level, sector level or project level
Geographic coverage	The jurisdiction or geographic area where the policy is implemented or enforced, which may be more limited than all the jurisdictions where the policy has an impact
Key stakeholder groups affected by the policy	List of stakeholders affected by the policy
Intended level of mitigation to be achieved and/ or target level of other indicators	Target level of key indicators, if relevant
Other related policies or actions	Other policies or actions that may interact with the policy assessed

b) Choose type of assessment

The objective is to estimate both the past and future impacts of the renewable energy policy, therefore a combined ex-ante and ex-post assessment will be applied. An ex-ante assessment will require the development of a baseline scenario from which the future impact of the policy will be assessed. An ex-post assessment will require a historical baseline against which the historical impact of the policy can assessed.

Key deliverable at this point: Report with clear description of the policy/policy package and type of assessment.

E. Identifying GHG impacts

The following will be done to identify GHG impacts:

a) Identify potential GHG impacts

This process will involve the following steps:

- Identifying the relevant inputs and activities associated with implementing the policy.
- Identify all potential GHG impacts of the policy and associated GHG source categories.
- Identify the main SD categories that will be affected by each of the scenarios.
- Identify and categorize in-jurisdiction and out-of-jurisdiction impacts, to more accurately link the GHG impacts to the relevant jurisdiction's inventory, targets and goals. This creates transparency around any potential double counting of out-of-jurisdiction impacts between jurisdictions.

Stakeholder consultations will help to ensure the completeness of the list of GHG impacts. Questionnaires will be sent to the following relevant stakeholders: National Climate Change Committee (NCCC), Ministry of Tourism & Environmental Affairs (MTEA), MTEA, Eswatini Meteorological Service (EMS), Ministry of Natural Resources and Energy (MNRE), MNRE, Department of Energy (DOE), Swaziland Environmental Authority (SEA), Central Statistics Office (CSO), UNDP. Telephonic interviews via zoom platform will also be used for this exercise.

b) Develop a causal chain:

A causal chain is a conceptual diagram tracing the process by which the policy leads to GHG impacts through a series of interlinked and sequential stages of cause-and-effect relationships.

The following 3 key steps in the Causal Chain Analysis (CCA) process will be followed:

- Identification of the components of the causal chain for each priority GHG impact. Information on a GHG impacts collected through a standard questionnaire from stakeholders. Experts will statistically examine each successive cause and study its links to the problem and to other causes.
- Analysis of data and outputs from step a) to map and establish linkages for the flow of changes expected to occur as a result of the policy.
- Develop a flow diagram by enclosing the policy in a box, then add linkages from the policy to the identified intermediate effects and GHG impacts.

c) Define the GHG assessment boundary

The GHG assessment boundary defines the scope of the assessment in terms of the range of GHG impacts.

- The GHG impacts identified and the associated GHG source categories will be categorized for magnitude and likelihood. Impacts will be included in the GHG assessment boundary if they are categorized as moderate or major in magnitude, and very likely, likely or possible (i.e. deemed significant).
- Impacts will also be categorized into: Environmental impacts, Social impacts, Economic impacts, transformational impacts.

d) Defining assessment period

The assessment period is the time over which GHG impacts resulting from the policy are assessed.

- For the ex-ante assessment, the assessment period will be determined by the impact with the longest term.
- For the ex-post assessment, the assessment period will be the time the policy came into effect and now (i.e. the time of the assessment).

e) Identifying sustainable development impacts

RE policies generate multiple sustainable development impacts in addition to their GHG impacts. Sustainable development impacts are changes in environmental, social or economic conditions that result from a policy or action – for example, changes in economic activity, employment, public health, air quality and energy security. These impacts will be identified following the guidance of ICATS *Sustainable Development Impact Guide*.

Key deliverable will be a table with a list of GHG and sustainable development impacts with their corresponding categories and a causal chain.

F. Assessing impacts

Determine the technical GHG emission reduction potentials of the various scenarios

Estimating the GHG impacts in an ex-ante analysis requires first an estimation of the electricity generation capacity that will be added by the policy to the national electricity generation mix. Once the capacity addition is known, then the GHG impacts ex-ante can be determined. In the case of the ex-post part of the assessment, the capacity addition of the policy is already known at the time of the assessment, hence there is no need for an estimate. The determination of GHG emission reduction potentials of the policy/policies will be a three-step process: i) Estimating capacity addition for the future period; ii) Estimating GHG emissions reductions for the future period, and; iii) Estimating GHG emissions reductions from the time of the inception of the policy up to the present.

a) Estimating capacity addition

Estimating the generation capacity of the policy/policies to be assessed will depend on whether a cap is set in the policy or not. In case where a cap is set for the entirety of the assessment period, the cap will be used as the technical potential of the capacity addition. If a cap is set for only part of the assessment period or if a cap is not set in the policy, then the potential will be estimated using data (from stakeholders) on resource availability. Once the technical potential has been determined, accounting for barriers (policy design features and financial feasibility) will result in the anticipated RE addition of the policy/policies.

b) Estimating GHG emissions reductions

To estimate GHG emissions reductions of the policy/policies, the already developed business as usual scenario will be revised to account for new developments in electricity generation. In this case, only

the electricity supply side of the model developed will be considered since the energy use side of the model will not be affected by the policy/policies. Scenarios for the historic and future parts of the policy/policies implementation will be developed and modelled.

Key deliverable: Renewable electricity policy scenario/scenarios modelled in LEAP.

G. Stakeholder workshop

A one-day stakeholder workshop will be conducted (including energy, agriculture and LULUCF experts) with the participation of Government, private sector and smallholder out-growers to consider a draft impact assessment report. Stakeholder input and recommendations will be recorded and used to finalise the draft report.

Key deliverable: workshop report

7 Outcomes

ICAT's technical support provided to the country is expected to contribute to the following outcomes:

- Improved adaptation monitoring and tracking through the development of a roadmap for future measurement and tracking of adaptation actions in the health and water sector with a strong focus on gender;
- Improved transparency and accuracy of emission estimates for the energy, agriculture and LULUCF sectors through:
    - Development of a roadmap for improved institutional arrangements and data collection procedures in the energy sector;
    - Development of a roadmap for improved institutional arrangements and data collection procedures in the agriculture sector;
    - Inclusion of timber and sugarcane plantations in the LULUCF inventory and projections; and Improved assessment and understanding of renewable electricity policy impacts on GHG emissions and sustainable development (SD) goals.

8 Work plan

The work plans for the different activities are given in this section and they are in the Gantt chart format.

Key:

	Grey all the way horizontal shading indicates deliverables
	Purple shadings indicate where GHGI technical expertise will be required
	Un-shaded ‘start’ and ‘end’ months are for 2021
	Light grey shaded ‘start’ and ‘end’ months are for 2022
	Other colours indicate actions to be taken by respective activity teams

The GHGMI experts may also recommend additional support, particularly in view of that the project has been delayed. The Project Facilitator and GHGMI are also expected to participate in the planning and holding of all the workshops.

8.1 Adaptation scoping and gap analysis for the health and water sectors work plan

Figure 1: Work plan for activity 1

Activity 1: Adaptation scoping and gap analysis for the health and water sectors	Months			2021 (months)							2022 (months)			
Actions	**Start**	**End**	**Duration**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**
Preparations	6	8	3											
0. Submit inception report	9	9	1											
1. National Health and Water Adaptation State-of-Play Inventory and Map														
a. Stakeholder engagement workshop for both health and water sectors	11	11	1											
b. Stakeholder engagement workshop for both health and water sectors	11	11	1											
c. Conduct inventory of past and current climate adaptation plans, policies and activities in the health and water sector	10	10	1											
d. Workshop on awareness raising in the health sector (Top management)	10	10	1											
e. Workshop on awareness raising in the health sector	10	10	1											
f. Online meetings, QA sessions and document reviews to support adaptation activities*	11	11	1											
g. Produce State of Play of Health and Water Inventory Map	11	11	1											
2. Gap analysis report and Action Plan														
a. Develop capacity to identify adaptation indicators and criteria for their success**														
b. Identify key indicators for adaptation in health and water sector with emphasis on gender	12	1	2											
c. Identify key criteria for success for these adaptation indicators	12	1	2											
d. Develop a framework for measuring and tracking progress towards achieving these indicators	12	1	2											
e. Identify key gaps in health and water adaptation sectors	12	1	2											
f. Develop a draft Action plan identifying gaps and making recommendations to fill them	12	1	2											

g. Draft Action Plan	1	1	1												
3. Stakeholder workshop and workshop report															
a. Plan stakeholder workshop****	1	1	1												
b. Conduct a 1-day stakeholder workshop to present Action Plan	1	1	1												
4. Roadmap for adaptation in health and water sectors															
a. Capacity building for road map development*****	1	1	1												
b. Develop a draft Roadmap reflecting gap analysis and findings from the workshop	2	2	1												
c. Circulate roadmap to stakeholders for feedback	2	2	1												
d. Finalise roadmap	3	3	1												

*GHGMI support on capacity building for QA sessions and document reviews to support adaptation activities.

** GHGMI support for identifying adaptation indicators and selecting criteria for evaluating them.

****GHGMI support in planning workshop.

*****GHGMI support for capacity to develop a road map.

8.2 Energy sector GHG inventory institutional arrangements and data collection roadmap work plan

Figure 2. Work plan for Activity 2

Activity 2: Energy sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design	Months			2021 (months)							2022 (months)			
Actions	Start	End	Duration	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**
0. Preparations	6	8	3											
1. Submit inception report	9	9	1											
2. Scoping and Gap Analysis Report for the Energy Sector														
c. Meet MNRE - status of energy balance	10	10	1											
d. Capacity for energy balance compilers and data providers *	10	10	1											
e. Map Institutional arrangements and roles and responsibilities	11	12	2											
f. Recommendations on institutional MoU requirements made	11	12	2											
g. Produce Scoping and Gap Analysis Report	12	12	1											
3. Energy Sector Data Collection Templates														
e. Meetings and QA for data requirements for tier 2 transport**	1	1	1											
f. Capacity building workshop on data collection templates***	1	1	1											
g. Data collection templates development	1	1	1											
4. **Stakeholder workshop and workshop report**														
a. Develop capacity to develop road map****	2	2	1											
b. Develop roadmap*****	2	2	1											
c. Plan stakeholder workshop*****	2	2	1											
d. Hold stakeholder workshop on road map	2	2	1											
5. **Roadmap finalised**														

a. Final road map produced	3	3	1											
b. Files and templates archiving in the existing inventory system	3	3	1											

*GHGMI support on capacity building workshop for energy balance compilers and data providers to develop sustainable energy balance system, in addition have a session on ICAT Stakeholder Participation Guide to plan future stakeholder engagement steps.

** GHGMI meetings and QA sessions to support the identification of data requirements tier 2 transport methodologies.

*** GHGMI conduct training session on the development of data collection templates and Q&A follow-up online sessions, as required.

**** GHGMI provide capacity for the development of a road map.

8.3 Agriculture sector GHG inventory institutional arrangements and data collection roadmap work plan

Figure 3. Work plan for Activity 3

Activity 3: Agriculture sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design	Months			2021 (months)							2022 (months)			
Actions	Start	End	Duration	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**
0. Preparations	6	8	3											
1. Submit inception report	9	9	1											
2. Scoping and gap analysis report for the agriculture sector														
a. Meet with Ministry of Agriculture and identify inventory compilers to find out current status of agriculture data	10	10	1											
b. Capacity for Tier 2 enteric fermentation and identification of appropriate data sources	10	10	1											
c. Identify data requirements for Tier 2 enteric fermentation calculations and ensuring the inclusion of sugarcane data	11	12	2											
d. Identify appropriate data sources, data suppliers and data gaps for improving agricultural inventory	11	12	2											
e. Map out the institutional arrangements and roles and responsibilities for data collection (including QA)	12	12	1											
f. Include recommendations on any institutional MoU requirements (for data collection purposes) which can be taken forward in the development of the full MRV system (CBIT);	12	12	1											
g. Produce Scoping and Gap Analysis Report	12	12	1											
3. Data collection templates for the agriculture sector														
a. Capacity building workshop on data collection templates**	1	1	1											
b. Develop data collection templates	1	1	1											

4. **Develop a Roadmap outlining the data collection process for the agriculture sector, data gaps and recommendations on filling them**														
a. Develop capacity to develop road map***	2	2	1											
b. Develop roadmap	2	2	1											
5. **Stakeholder workshop and workshop report**														
a. Plan stakeholder workshop*****	2	2	1											
b. Hold stakeholder workshop on road map	2	2	1											
6. **Roadmap for the agriculture sector highlighting institutional arrangements, data collection process and recommendations to fill gaps.**														
c. Final road map produced	3	3	1											
d. Files and templates archiving in the existing inventory system	3	3	1											

*GHGMI support for Tier 2 enteric fermentation and identification of appropriate data sources.

** GHGMI support on capacity building for data collection templates.

*** GHGMI support for capacity to develop road map.

**** GHGMI assists in organising stakeholder workshop.

8.4 Incorporation of timber and sugarcane plantations into the LULUCF sector inventory and improved LULUCF projections work plan

Figure 4. Work plan for Activity 4

Activity 4: Incorporation of timber and sugarcane plantations into the LULUCF sector inventory and improved LULUCF projections	Months			2021 (months)							2022 (months)			
Actions	**Start**	**End**	**Duration**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**
0. Preparations	6	8	3											
1. Submit inception report	9	9	1											
2. Report on improved LULUCF LU matrix and annual area changes (including detailed methodology														
a. Conduct a capacity building workshop on land representation and annual land area calculations*	10	10	1											
b. Incorporate timber and sugarcane plantation data into land use maps and current inventory LU matrix, and provide annual areas for land remaining and land conversion categories	10	10	1											
c. Draw up a list of required data for LULUCF inventory for each land type identified in the land maps	11	11	1											
3. **Database of activity data for LULUCF sector**														
a. Organize meetings and QA sessions to support the** identification of data requirements for LULUCF inventory	11	11	1											
b. Organize meetings and QA sessions to support the updating of the LULUCF inventory and provide further training on IPCC software should it be required***	11	11	1											
c. Undertake a literature review and develop a database of activity data, incorporating as much country specific data as possible and identify data gaps	12	12	1	+										
d. Update the LULUCF inventory	12	12	1											
4. **Updated LULUCF inventory and projected baseline.**														

a. Support the organization of the capacity building workshop on the identification of LULUCF drivers and how to calculate emission projections in the LULUCF sector****	1	1	1												
b. Plan stakeholder workshop*****	1	1	1												
c. Hold a capacity building workshop (supported by GHGMI) to identify drivers of land use change (including policies) and to discuss projections for the LULUCF sector	1	1	1												
d. Develop an improved LULUCF projected baseline which can be utilised for tracking the impacts of renewable energy NDC targets on the AFOLU sector	1	2	2												
e. Upload and manage the files and templates through the existing inventory archiving system.	1	2	2												

*GHGMI support on capacity building to hold workshop on land representation and annual land area calculations.
** GHGMI support for QA sessions to support the identification of data requirements for LULUCF inventory.
*** GHGMI support for QA sessions to support the updating of the LULUCF inventory and provide further training on IPCC software should it be required
*****GHGMI support the organization of the capacity building workshop on the identification of LULUCF drivers and how to calculate emission projections in the LULUCF sector.
*****GHGMI Assists in planning workshop.

8.5 Renewable electricity policy scenario assessment and impact modelling with recommendations for implementing NDC targets work plan

In the 'call for proposals', Activity 5 was expected to start during the 5th month after the inception of the project, but under the current circumstances of loss of time, it will also start immediately. The Activity 5 Team will start to work on their own on the tools required for the exercise. They will request GHGMI to provide them with information on the tools and how to access them right from the beginning.

The team will also have to familiarise themselves with personnel that will help provide the information they will need when they start their modelling. The private sector responds more easily to the Ministry of Natural Resources and Energy on energy matters. The Activity 5 Sectoral teams will have to grab the opportunity to acquaint themselves with the energy officers at MNRE. The PS and Director are very busy people and getting the right information directly from them usually takes a long time. The energy officers are more easily accessible and they provide quicker links to higher authority (even to the Minister through the PS). The Activity 5 Sectoral Teams will participate in Activities 2 workshops to acquaint themselves with the energy officers who will provide follow-ups on communication with the policy organs of the Ministry. These officers also have direct links with the private sector and can assist in targeting the right personnel for attending workshops. In workshops called by MTEA, the private sector usually send their environment personnel who may not be suitable to meet the needs of this Activity. The interaction of Activity 5 Sectoral Teams with industry through MNRE at an early enough stage can ensure that relevant personnel are availed for the workshops.

The initial stakeholder workshops will be held separately for the sugar industry, timber industry and small holder out-growers. This will ensure that the most accurate information is obtained from each stakeholder group. They will then be combined in one workshop to finalize the determination of potential biomass resources.

Information gathered from the above exercises will be combined with that from the LULUCF experts for conducting the modeling.

Figure 5. Work Plan for Activity 5

Activity 5: Renewable electricity policy scenario assessment and impact modelling with recommendations for implementing NDC targets	**Months**			**2021 (months)**							**2022 (months)**			
Actions	**Start**	**End**	**Duration**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**
Preparations	6	8	3											
1. Submit inception report	9	9	1											
2. Stakeholder workshops and workshop reports;														
a. Literature review	6	12	6											
b. Join Activity 2. Sectoral teams in their first engagement with MNRE to acquaint the team to energy officers	10	10	1											

c.	GHGMI provides information on tools and how to access them*	10	10	1												
d.	Hold a capacity building workshop on the ICAT tools, specifically focussing on the ICAT Renewable Energy (RE) Sustainable Development (SD) and Stakeholder Participation Guides**	12	12	1												
e.	Plan stakeholder workshops***															
f.	Conduct a stakeholder workshop with MNRE, EEC, ESERA and LULUCF experts with the participation Forestry Department and forestry companies	1	1	1												
g.	Conduct a stakeholder workshop with MNRE, EEC, ESERA and LULUCF experts and representatives of the three sugar factories	1	1	1												
h.	Conduct a stakeholder workshop with MNRE, EEC, ESERA and LULUCF experts and smallholder out-growers (sugar and forestry)	1	1	1												
i.	Conduct a workshop with all stakeholders to identify future biomass renewable electricity scenarios and possible policies looking specifically at biomass and community-focussed approaches woodlot/village plantations	2	2	1												
j.	Stakeholder workshops and workshop reports															
3.	**Renewable electricity scenario assessment report (showing impacts on energy, agriculture and LULUCF sectors)**															
a.	Identify GHG impacts and develop a causal chain for the various scenarios following the guidance provided in **chapter 6 of the ICAT RE Assessment Guide****	1	2	1												
b.	Determine the technical GHG emission reduction potentials of the various scenarios by running the scenarios through the current emission and projection spreadsheets for the energy, agriculture and LULUCF sectors	2	2	1												
c.	Organize meetings to support the planning of the scenarios workshop****	3	3	1												
d.	Identify the main SD categories that will be affected by each of the scenarios and develop a causal chain of the SD	3	3	1												

	impacts of the various scenarios (following guidance provided in the ICAT SD Assessment Guide – chapters 5 and 6)														
e.	Conduct a stakeholder workshop to present the results of the scenario modelling and impact assessment and identify further barriers and next steps (Assessment Guides can provide guidance on next steps)	3	4	2											
f.	Finalise scenario outputs	3	4	2											
g.	Compile a report on outputs from the renewable electricity scenario modelling for all three (energy, agriculture and LULUCF) sectors, including outputs and findings from the workshop. Report should also include information on possible SD impacts, next steps and recommendations for implementing renewable energy NDC targets	4	4	1											

*GHGMI support with information on tools and how to access them.

** GHGMI support for capacity building on the ICAT tools, specifically focussing on the ICAT Renewable Energy (RE)* Sustainable Development (SD) and Stakeholder Participation Guides.

***GHGMI assists in planning stakeholder workshops

****GHGMI support on the ICAT RE Assessment Guide

*****GHGMI assists to organise meetings to support the planning of the scenarios workshop.

8.6 Knowledge Sharing and Lessons Learned work plan

Activity 6: Knowledge sharing and lessons learned	Months			2021 (months)							2022 (months)			
Actions	**Start**	**End**	**Duration**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**
Preparations														
0. Overall multi-sectorial inception to PF														
a. Submission of sectorial inception reports to PMU by sectorial leaders	8	9	2											
b. Discussion of sectorial inception reports at PMU level	8	9	2											
c. Fusion and submission of sectorial inception reports to	8	9	2											
1. Submit overall multi-sectoral inception to PF														
Training by GHGMI on report writing according to ICAT format*	10	10	1											
Submit multi-sectoral inception report	10	10	1											
2. Reports against ICAT's Key Performance Indicators, which includes collection of feedback surveys from trainings and workshops and reporting on knowledge sharing activities														
a. Reports on feedback surveys from training	10	4	7											
b. Reports on feedback surveys on workshops	10	4	7											
c. Report on knowledge sharing activities	10	4	7											
3. Validation Workshop														
a. Plan validation workshop with GHGMI**	3	3	1											
b. Conduct validation workshop	4	4	1											

c. Input from stakeholders incorporated into overall project report	4	4	1											
d. Finalise inception report														
e. Upload the project report into archiving system	4	4	1											
4. Report highlighting key achievements and lessons learned														
a. Training on ICAT reporting protocols***	3	3	1											
b. Assessment of goals and objectives of project	3	3	1											
c. Compile results from lessons learned log sheet	4	4	1											
d. Identification of activities or areas needing additional effort	4	4	1											
e. Identification of effective activities or strategies	4	4	1											
f. Comparison of costs and results of different activities	4	4	1											
a. Compile knowledge sharing and lessons learnt report	4	4	1											

**GHGMI training by on report writing according to ICAT format.
**GHGMI assistance in planning validation workshop.
***GHGMI support in planning workshop.
**GHGMI support for capacity to develop a road map.

8.7 Deliverables for all activities

Activity	Deliverable	2021 (months)						2022 (months)				
		6	7	8	9	10	11	12	1	2	3	4
Activity 1: Adaptation scoping and gap analysis for the health and water sectors	State of Play of Health and Water Inventory Map											
	Draft Action plan identifying gaps and making recommendations to fill them											
	Draft Roadmap reflecting gap analysis and findings from the workshop											
Energy sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design	Produce Scoping and Gap Analysis Report											
	Energy Sector Data Collection Templates											
	Develop roadmap											
	Final road map produced											
Agriculture sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design	Produce Scoping and Gap Analysis Report											
	Develop data collection templates											
	Develop roadmap											
	Produce final roadmap											
Incorporation of timber and sugarcane plantations into the LULUCF sector inventory and improved LULUCF projections	Draw up a list of required data for LULUCF inventory for each land type identified in the land maps											
	Update the LULUCF inventory											
	Develop an improved LULUCF projected baseline which can be											

	utilised for tracking the impacts of renewable energy NDC targets on the AFOLU sector											
Renewable electricity policy scenario assessment and impact modelling with recommendations for implementing NDC targets	Stakeholder workshops and workshop reports											
	and develop a causal chain for the various scenarios following the guidance provided in **chapter 6 of the ICAT RE Assessment Guide**											
	Compile a report on outputs from the renewable electricity scenario modelling for all three (energy, agriculture and LULUCF) sectors, including outputs and findings from the workshop. Report should also include information on possible SD impacts, next steps and recommendations for implementing renewable energy NDC targets											
Knowledge sharing and lessons learned	Submit multi-sectoral inception report											
	Progress report											
	Reports on feedback surveys from training											
	Reports on feedback surveys on workshops											
	Report on knowledge sharing activities											
	Validation report											
	Compile knowledge sharing and lessons learnt report											

9 Key Stakeholders

Identified key stakeholders for the different activities are summarised in the subsections below.

9.1 Adaptation scoping and gap analysis for the health and water sectors

Table 3: List of stakeholders and their relevance to matters of to health and water sectors

#	Organization	Relevance
1	Ministry of Tourism and Environmental Affairs (MTEA)	Beneficiary
2	Ministry of Health	Policy, strategies and action plans
3	Epidemiology Programme	Data source
4	Environmental Health Programme	Data source
5	National Nutrition Council	Data source
6	National Nutrition Council	Data source
7	Municipal Council Matsapha (Environmental Health and Community Services)	Data source
8	River water basin authority	Data source
9	MNRE - DWA River Basin Authorities	Data source
10	MoPWT Planning Unit	Data source
11	MNRE -DWA Rural Water supply	Data source
12	KOBWA	Data source
13	Epidemiology Programme	Data source
14	Environmental Health Programme	Data source
15	WaterAid	Data source
16	Department of Water Affairs (DWA)	Data source
17	NERCHA	Data source

9.2 Energy sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design

Table 4. List of stakeholders and their relevance to matters of energy

#	Organization	Relevance
1	Ministry of Tourism and Environmental Affairs (MTEA)	Beneficiary
2	Ministry of Natural Resources and Energy (MNRE)	Policy, strategies and action plans
3	Ministry of Public Works and Transport	Data source
4	Ministry of Economic Planning and Development	Funding sources
5	UNDP	National Development Partner
6	European Union Microprojects	National Development Partner
7	American Embassy	National Development Partner
8	Academia and Research Institutions	Knowledge sharing / research
9	Eswatini Electricity Company	Electricity supplier / distributer
10	Eswatini Energy Regulatory Authority (ESERA)	Energy regulator
11	Eswatini Standards Authority	Standards
12	Eswatini Environmental Authority (SEA)	Environment enforcement
13	Ubombo Sugar Limited	Data source / RE* Source
14	Royal Eswatini Sugar Corporation	Data source / Potential RE Source
15	Sugar Association	Data source
16	USA Distillers	Data source / Potential RE Source
17	Montigny	Data source / Potential RE Source
18	Swaziland Plantations	Data source / Potential RE Source
19	Peak Timbers	Data source / Potential RE Source
20	Shiselweni Forest Company Ltd	Data source / Potential RE Source
21	Marteeza Investments (PTY) LTD	RE Source Equipment Supplier
22	Wundersight Investments	RE Source
23	Whatsup Solar	RE Supplier / Installer
24	Eswatini National Petroleum Company	Data source
25	Eswatini Fuel Retailers Association	Data source
26	Public Transport Associations	Data source
27	Construction Industry Council	Beneficiary
28	Eswatini Consumer Association	Beneficiary
29	Gender and Social Development	Beneficiary

*RE stands for renewable energy

9.3 Agriculture sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design

Table 5. List of stakeholders and their relevance to matters of agriculture

#	Organization	Relevance
1	Ministry of Tourism and Environmental Affairs (MTEA)	Beneficiary
2	Ministry of Natural Agriculture	Policy, strategies and action plans
3	Ministry of Agriculture (MoA)	Data source
4	Eswatini Sugar Association (ESA)	Data source
5	Rice farmers	Data source
6	Eswatini Revenue Authority (SRA)	Data source
7	Private Farms representatives	Data source
8	Eswatini Dairy Board	Data source
9	Dairy Farmers (Commercial and subsistence)	Data source
10	King's Office (Livestock Section)	Data source
11	Eswatini Meat Industries	Data source
12	Eswatini Meat Wholesalers	Data source
13	Farm Chemicals, Eswatini	Data source

9.4 Incorporation of timber and sugarcane plantations into the LULUCF sector inventory and improved LULUCF projections

Table 6. List of stakeholders and their relevance to matters of LULUCF

#	Organization	Relevance
1	Ministry of Tourism and Environmental Affairs (MTEA)	Beneficiary
2	Eswatini Sugar Association (ESA)	Data source
3	Royal Eswatini Sugar (RES)	Data source
4	Ubombo Sugar Corporation (USC)	Data source

5	Illovo	Data source
6	Eswatini Plantations Group	Data source
7	Swaziland National Agriculture Union (SNAU)	Data source
8	Montigny Investments	Data source
9	Peak Timbers	Data source
10	Shiselweni Forestry	Data source
11	Eswatini Water and Agriculture Development Enterprise (ESWADE)	Data source
12	Land Use Department (Ministry of Agriculture)	Data source
13	Department of Veterinary and Livestock Services (Ministry of Agriculture)	Data source
14	Central Statistics Office (CSO)	Data source
15	Municipal Councils	Data source
16	EWSC	Data source
17	ICAP	Data source
18	Micro Projects Programme Unit	Data source
19	RES Corporation	Data source

9.5 Renewable electricity policy scenario assessment and impact modelling with recommendations for implementing NDC targets

Table 7. List of stakeholders and their relevance to matters of renewable energy

#	**Organization**	**Relevance**
1	Ministry of Tourism and Environmental Affairs (MTEA)	Beneficiary
2	Ministry of Natural Resources and Energy (MNRE),	Policy, strategies and action plans
	Ministry of Agriculture	Data source
3	Department of Forestry	Data source
	Eswatini Sugar Association	Data source
	Sugar Industry	Data source
	Timber Industry	Data source
	Smallholder out-growers (sugar cane & timber)	Data source
4	Eswatini Meteorological Service (EMS),	Data source
6	Eswatini Environmental Authority (EEA),	Data source
7	Central Statistics Office (CSO).	Data source

8	Eswatini Energy Regulatory Authority	Electricity regulation
9	Eswatini Standards Authority	Standards development
10	Eswatini Environment Authority	Environmental regulation

10 Bibliography

1. Horowitz, C. A. Paris Agreement. *Int. Leg. Mater.* **55**, 740–755 (2016).
2. Summary of the Paris Agreement, http://unfccc.int/files/paris_agreement/application/pdf/progress_tracker_180716_1530.pdf
3. Singh, N., Finnegan, J. & Levin, K. MRV 101: UNDERSTANDING MEASUREMENT, REPORTING, AND VERIFICATION OF CLIMATE CHANGE MITIGATION. *Underst. Meas.* **101**, (2016).
4. Call for Proposals: Technical support to increase the overall transparency capacity and set-up of sectoral MRV systems in the Kingdom of Eswatini - CFP-11875-2021-03.
5. Decision-/CMA.1.
6. Zhang, Y. W., McCarl, B. A. & Jones, J. P. H. An Overview of Mitigation and Adaptation Needs and Strategies for the Livestock Sector. *Clim. 2017, Vol. 5, Page 95* **5**, 95 (2017).
7. Power Africa in Eswatini | Power Africa | U.S. Agency for International Development.
8. K*ingdom of Eswatini Energy Masterplan 2018*
9. *National Energy Policy*. http://extwprlegs1.fao.org/docs/pdf/swa203987.pdf.
10. K*ingdom of Eswatini Energy Masterplan 2034*. http://sera.org.sz/administrator/files/1550235366.pdf.
11. Prepared for ministry of natural resources and energy short-term generation expansion plan for Eswatini study report. (2018).
12. Koskinen, K. U. Knowledge Management to Improve Project Communication and Implementation. *Proj. Manag. J.* **35**, 13–19 (2004).
13. Dlamini WD, Tfwala SS, M. S. *AFOLU GHG Inventory draft*. (2020).
14. Open Foris.
15. Bey, A. *et al.* Collect Earth: Land Use and Land Cover Assessment through Augmented Visual Interpretation. *Remote Sens. 2016, Vol. 8, Page 807* **8**, 807 (2016).
16. Tzamtzis, I., Federici, S. & Hanle, L. A Methodological Approach for a Consistent and Accurate Land Representation Using the FAO Open Foris Collect Earth Tool for GHG Inventories. *Carbon Manag.* **10**, 437–450 (2019).
17. Dlamini, T. Country Report of the Land Degradation Neutrality Target Setting Programme.

11 Annex 1: Inception Workshop Report

Technical Support to increase the overall Transparency Capacity and set-up of Sectoral MRV Systems in the Kingdom of Eswatini

Project No: 11875-003/ICAT/2021/03

ICAT Eswatini Inception Workshop Report

Date: September 9 – 10, 2021

Venue: Hilton Garden Inn Hotel, Mbabane, Eswatini

Mode: Virtual and Physical

Contents

1. Introduction and Background

The Government of Eswatini has prioritized enhancing national capabilities to meet its reporting obligations under the enhanced transparency framework (ETF) of the Paris Agreement. The Ministry of Tourism and Environmental Affairs (MTEA) has received support from the Initiative for Climate Action for Transparency (ICAT) to improve institutional arrangements and data collection processes to assist Eswatini in meeting the accelerated reporting requirements under its Nationally Determined Contributions (NDC) under the UNFCCC's Paris Agreement, build capacity to incorporate more country-specific data to move to Tier 2 IPCC estimation methods for key categories, particularly in the Agriculture, Forestry and Land Use (AFOLU) sectors, and improve the ability of the country to track progress on its Nationally Determined Contributions (NDC). Additionally, the ICAT project is expected to contribute to improved adaptation monitoring and tracking in the health and water sectors, enhance transparency and accuracy of emission estimates and improve assessment of policy impacts on renewable energy and sustainable development. These activities will focus particularly on rural farmers, as out-growers, working with Eswatini sugar and forestry enterprises to increase use of sugar bagasse and timber residues to generate renewable electricity.

This project will focus on building capacities of technicians in the MTEA, line departments and national experts, institutions, NGOs and the Eswatini private sector, as well as other stakeholders, to develop robust sustainable data collection processes, including well-defined and -understood institutional arrangements, and improved Tier 2 data (IPCC) for future national greenhouse gas (GHG) inventory compilations. In addition, the project aims to undertake a renewable energy policy assessment to model the climate, economic and social impacts of various scenarios on emissions and the community and the economy, particularly in the agriculture and Land Use, Land Use Change and Forestry (LULUCF) sectors.

This project will comprise five activities, namely:

- Activity 1: Adaptation scoping and gap analysis for the health and water sectors with specific objectives to develop a framework for monitoring and tracking adaptation actions in the health and water sectors to meet Eswatini's NDC targets and to strengthen capacities to construct frameworks for other adaptation sectors.
- Activity 2: Energy sector GHG inventory institutional arrangements and data collection roadmap with recommendations for MRV system and design
- Activity 3: Agriculture sector GHG inventory institutional arrangements Project Task
- Activity 4: The incorporation of timber and sugarcane plantations into the LULUF sector.
- Activity 5: The Renewable electricity policy scenario and impact modelling.

The ICAT Eswatini project will contribute towards ongoing efforts to build a national transparency framework that meets international standards but is tailored for domestic needs. It will also contribute towards ongoing efforts to improve the availability, collection and quality of data required for estimating emissions in the energy and AFOLU sectors (particularly the sugar and timber sub-sectors) and enable Eswatini to meet its enhanced reporting requirements under the Paris Agreement

Further, the project will contribute toward the continued improvement of the GHG inventory and capacity to compile the inventory. It will also enhance capabilities to analyse and assess the GHG emission reductions and selected Sustainable Development (SD) impacts of renewable energy policies. Finally, it will support the implementation of Eswatini's NDC targets.

The MTEA held this Inception Workshop to formally launch the ICAT Eswatini Project and to share with stakeholders the different components (activities, see above)) of the project. The workshop provided an opportunity to engage with stakeholders to understand the various perspectives and obtained feedback on the project proposed activities. It provided a platform for various key stakeholders in government, civil society, the private sector and others to present their views on how to meet the ICAT Eswatini Project's objectives.

2. Objectives of the Workshop

The specific objectives of the workshop were to;

1. Launch the ICAT Eswatini Project.
2. Raise awareness amongst key stakeholders in Eswatini about the project and foster stakeholder engagement and ownership.
3. Create synergies with other on-going, planned or completed initiatives through relevant projects/programs at national and local levels.
4. Collect inputs and comments from stakeholders to improve the approach and activities proposed for the project.

3. Outcome of the Workshop

1. ICAT Eswatini Project officially launched;
2. Common understanding of the Project's goals and objectives, and an agreement on the strategies that should be undertaken to successfully meet these goals and objectives; and,
3. Created awareness of the project, project activities and project team

4. Invitations and Response Rate

A total of 106 stakeholders were invited to attend the ICAT Eswatini Inception Workshop. This included the Minister for Tourism and Environment Affairs (MTEA) (which includes the Department of Forestry and Department of Meteorology responsible for climate change and UNFCCC focal point), the MTEA's Principal Secretary, government personnel within the respective project thematic areas – Ministry of Agriculture (MOA), Ministry of Health (MOH), Ministry of Natural Resources and Energy (MNRE) (with includes the Eswatini Department of Water Affairs/DWA and the Department of Energy), municipalities, NGO and CBOs, and business entities within the respective thematic areas of the project.

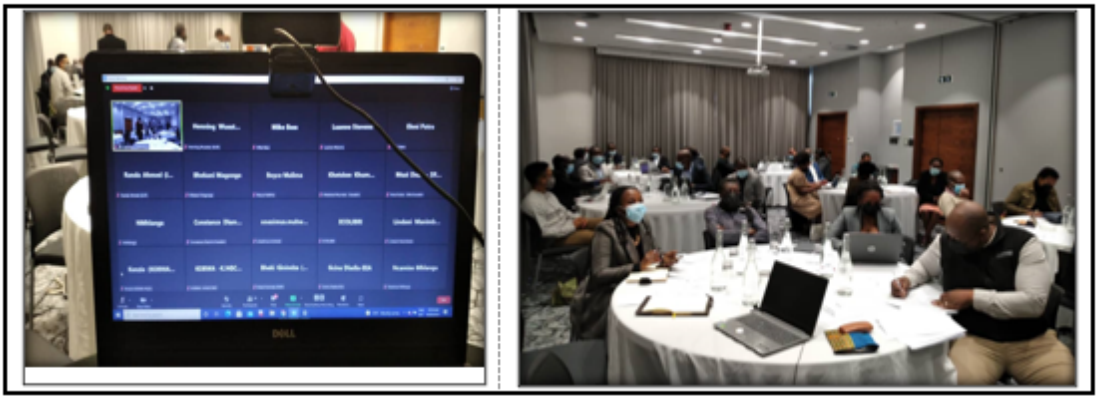


Figure 1: Workshop participants. On the left is a screenshot of virtual participants and on the right are the physical participants

Compared to the number of invites, 58 participants – both virtual and physical – attended the workshop of which 71% of them were males while the remaining 29% were female. It is worth noting that some of these were not part of the invited list implying that the invited stakeholders extended the invites to other parallel or relevant institutions. There were several private entity stakeholders which were not able to attend, and the team will ensure that these stakeholders are engaged during the project. The list of workshop participants is provided in Appendix A below.

5. Workshop Activities

The workshop took place over two days with the participation of the project's partners as well as representatives from relevant sector ministries, departments and agencies (MDAs), national experts from academia, NGOs, other civil society players and representatives of the private sector across the relevant sectors (see Appendix A for participants list).

The first day of the workshop was the official launch of the project characterized by high level remarks from key Senior Eswatini Government officials and partners, including MTEA (Department of Forestry, Department of Meteorology), MNRE (Department of Energy, and Department of Water Affairs), MOA (particularly Department of Agriculture), ICAT, GHGMI) and presentations on thematic project activities. Whilst day two had interactive discussions from the thematic groups (Energy, Health, Water, AFOLU) and solicited stakeholder inputs on the key proposed implementation modalities. The workshop programme is provided in Appendix B.

6. Day 1: Thursday September 9, 2021

a. Morning Session Presentations

On behalf of the Principal Secretary, the Director of Meteorological Services at the Ministry of Tourism and Environmental Affairs, Ms. Duduzile Nhlengethwa-Masina, opened the workshop. She described Eswatini as being in an exciting moment with numerous large climate change projects currently underway and stressed that it was a good time to ensure synergies between the projects. She described the ICAT project to "be invaluable in addressing gaps in Eswatini's climate change reporting process."

Figure 2: Ms. Duduzile Nhlengethwa-Masina (Director of Meteorology) making her welcoming remarks.

Over the next 10 months, the ICAT project will focus on both adaptation and mitigation components and will, among other things, develop a framework for adaptation tracking in the health and water sectors, complete a gap analysis and a roadmap for institutional arrangements in the energy and agriculture sector and complete a renewable energy policy assessment. These outputs will assist Eswatini meet its Nationally Determined Contributions (NDC) targets, strengthen capacities, and contribute towards ongoing efforts to build a national transparency framework that meets international standards but is tailored for domestic needs.

Dr. Henning Wuester, Director of ICAT, presented after Ms. Duduzile Nhlengethwa-Masina. In his opening remarks, he acknowledged the work that had already taken place to get this project started and discussed what ICAT can offer Eswatini as the country continues to implement its climate action plans.

“The ICAT project will support Eswatini in ongoing efforts to build a national transparency framework that meets international standards but is tailored for domestic needs and in conducting assessments of its climate policies and actions,” said Dr. Wuester. “By enhancing Eswatini’s capacity to analyze and assess greenhouse gas emission reductions and selected sustainable development impacts of renewable energy policies, the ICAT project hopes to assist Eswatini in meeting its NDC targets.”

He further highlighted the importance of continued stakeholder collaboration, and in closing said: “ICAT stands ready to support you and showcase the results. The engagement of all of you present here today will be the key to the success of this project.”

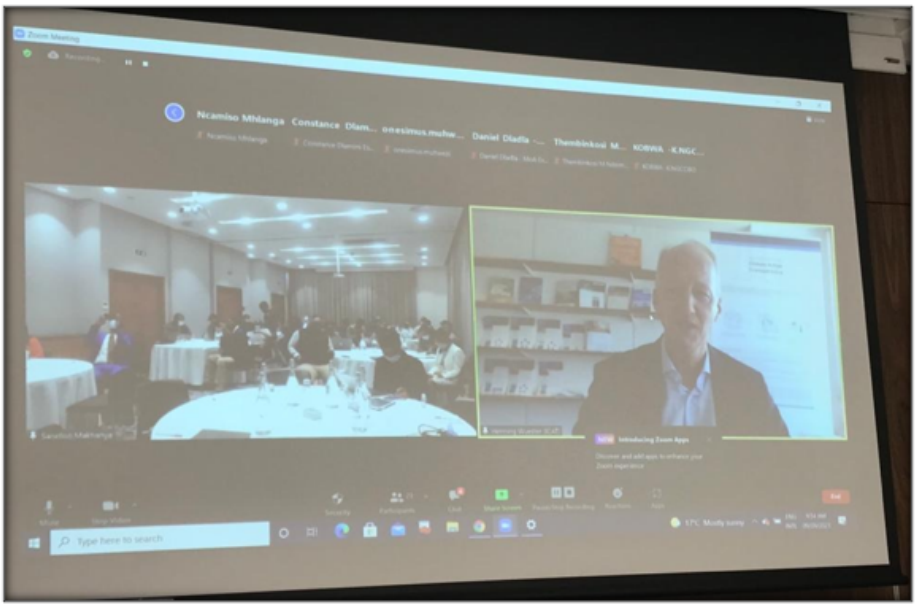


Figure 3: Dr. Henning Wuester (right) making his opening remarks

Before breaking for morning tea, the participants were requested to assemble for a group photo.

Figure 4: A group photo of the workshop participants

b. Mid-Morning Session Presentations

This session focused on challenges faced by each of the sectors with respect to measurement, reporting and verification (MRV).

The first presentation of the mid-morning session was rendered by Ms. Nolwazi Khumalo from the Ministry of Natural Resources and Energy – Department of Energy. The outline of her presentation consisted of: Overview of Energy Data; Data Requirements; Institutional Arrangements; Energy Balance; Energy Policy Context; Current Policy Development; and Challenges. The main challenges the ministry is facing include data collection and storage, allocation of energy consumption, financing data collection, stakeholder management, and technical capacity.

This was followed by a presentation by Mr. Spencer Green-Thompson from MNRE under the Department of Water Affairs (DWA) who presented on Water and Climate Change. The focus of the presentation was on the: Role of DWA; Ongoing programmes; Impacts of Climate Change on water resources in Eswatini; Current major adaptation activities in the water sector; and How the ICAT Project could assist in monitoring framework, that is, implementation of adaptation activities and track progress to NDC. The main challenges DWA faces in this regard are capacity building, resources mobilisation, institutional arrangement, to mention a few.

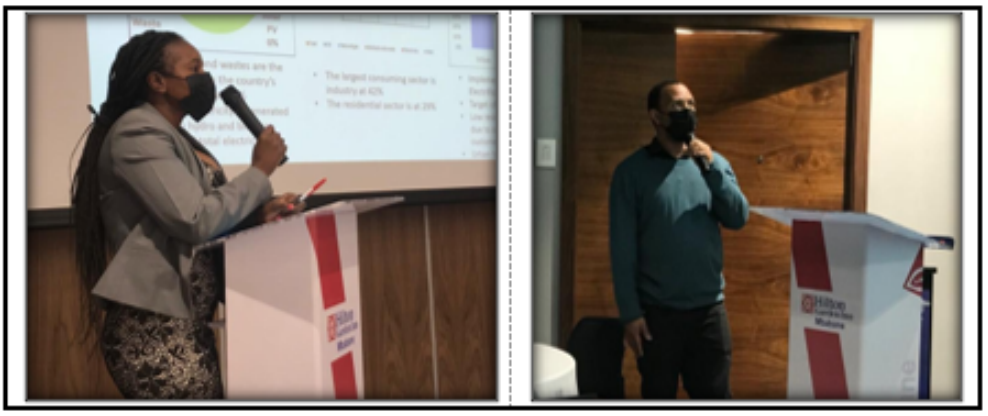


Figure 5: Some of the mid-morning presenters. Left is Ms. Nolwazi Khumalo from Department of Energy and right is Mr. Spencer Green Thompson from DWA.

According to the workshop programme, the next presenter was to be the Ministry of Agriculture (MoA). However, they could not present because of technical issues with their presentation which prompted the programme director to move on to the next presenter. The MoA's presentation was at the beginning of the following day's morning presentations; however, the discussion of the presentation is discussed here to preserve the flow of the programme.

The presentation from MoA was on Agriculture and Climate Change. The focus of the presentation was on: Agriculture and sector policy objectives; Current programmes being implemented; Climate Change Impacts in the agriculture sector; Major adaptation activities in the agriculture sector; and how the ICAT Project outputs could assist in monitoring framework – implementation of adaptation activities and tract progress toward meeting Eswatini's NDC targets. The main challenges faced by the sector include capacity building, research support, to mention few.

The last presenter of the mid-morning session was Mr. Nkosinathi Britewell Jele from the Department of Forestry under the MTEA. Like the other preceding presentations, the focus of this presentation

was on Forest and Climate Change. The major focus was on forest and data; plantations; challenges; and opportunities for the ICAT Project. The main challenges faced by the Department of Forestry are poor data collection attributed to limited information by stakeholders, forest resource assessment and database management, and absolute tools of data collection that would produce reliable results.

c. Afternoon Session Presentations

The focus of this session was specifically on the ICAT Eswatini Project. The afternoon session was opened by Ms. Khetsiwe Khumalo – MTEA's Climate Change Co-ordinator and the main focal point for the ICAT project at the Ministry of Tourism and Environmental Affairs – who presented the links between the ICAT project and other internationally-funded activities that are currently going on in Eswatini, demonstrating how the ICAT Project was building on existing work and how it was going to feed into the future activities.

The final presentation was rendered by Dr. Mduduzi Mathunjwa from Centre for Sustainable Energy Research (CSER) who presented on the scope of the consultancy and further introduced the University of Eswatini (UNESWA) team that is carrying out the work. Each of the five Activity Leaders was to present on the scope of their activities. However, in the interest of time Dr. Mathunjwa covered all these in his presentation.

Figure 6: Dr. M. Mathunjwa from CSER presenting on the scope of the consultancy at the ICAT Inception Workshop

7. Day 2: Friday September 10, 2021

The second day was more technical primarily focusing on consultative sessions led by UNESWA. The morning session was opened by Ms. Khetsiwe Khumalo (MTEA), Dr. Luanne Stevens and Mike Bess each outlining the expectation of their respective institutions of the ICAT project.

Subsequently Dr. Mathunjwa introduced the overall inception plan and further provided guideline for the breakout groups. The breakout groups were set up to go into more depth, including discussions on

adaptation in the health and water sectors, renewable energy policy, institutional arrangements for the agriculture sector, improvements of the land use change inventory and future emission projections.

- Each workshop breakout Group (i.e. Breakout Group 1 = Activity Group 1; Breakout Group 2 = Activity 2 + Activity 5; Breakout Group 3 = Activity Group 3 and Activity Group 4) had its own meeting room, projector, Zoom connection with remote/virtual participants;
- Each breakout Group had an agenda for the session, including speakers with presentations, handouts, etc.;
- Each breakout had to select a leader who will lead and manage the sessions, ensuring active participation from remote/virtual and physically present participants; and,
- Each breakout Group was to appoint a rapporteur who will take extensive notes from presentations and discussions and will prepare those in draft for Inception Meeting Report. These will form much of the basis of the revised and final Activity Group Inception reports.

a. Breakout Group 1: Health and Water Adaptation

Since Activity 1 has different stakeholders – water and health – this breakout group was subdivided into water and health breakout groups. These arrangements were made for the workshop only and does not imply that the implementation of the project would be changed to split these sub-activities.

Then, the group met as a combined health and water group to go through the presentation that was presented by the Activity leader. After the presentation they separated into the water and health sub-groups where each of these subjects was tackled.

Figure 7: Breakout session for the Water Sector (sub-group of Activity 1: Climate Adaptation in the Health and Water Sectors)

Figure 8: Breakout session for the Health Sector (sub-group of Activity 1: Health and Water Sector)

b. Breakout Group 2: Energy (Activity 2 and 5)

As Activity 2 and Activity 5 share a number of common stakeholders (e.g. Department of Energy, etc.), these two Activity groups were merged into one breakout group.

Figure 9: Breakout Group 2 combining Activity 2 (Energy) and Activity 5 (Renewable Energy Policies) Stakeholders

c. Breakout Group 3: AFOLU (Activity 3, Agriculture, and Activity 4, Forestry and Other Land Use)

Similarly, as Activity 3 and Activity 4 share common stakeholders, these two groups were also merged into one group – AFOLU for purposes of the breakout sessions during the Workshop.

Figure 10: Breakout Group 3 combining Activity 3 and Activity 4 Stakeholders

d. Afternoon Session

The groups requested to continue with the consultative process as the 3-hours' time allocated between morning tea and lunch was not sufficient to cover what was planned. From there all the team re-convened for reporting back findings from the consultative sessions.

From the presentations, it was unanimously agreed that more time needs to be allocated for additional consultative sessions as this one was not sufficient to cover everything that was planned.

8. Conclusions

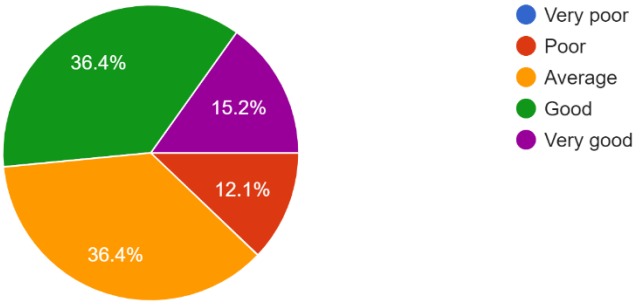
The workshop was a huge success with 60 participants attending virtually and physically, combined. Everything went as planned. It was also agreed that an additional time be scheduled for more detailed consultative sessions.

9. Post Inception Workshop Feedback

A Post workshop survey was conducted to elicit experience of the stakeholders of the Inception Workshop. As of 22 September 2021, a total of 28 responses were recorded which is 47% resonse rate. The results are presented below.

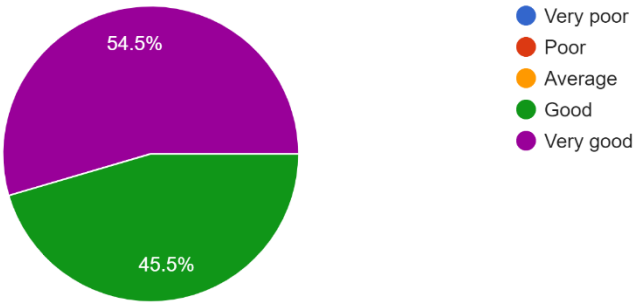
How would you rate your knowledge of the workshop topics prior to the workshop?

33 responses



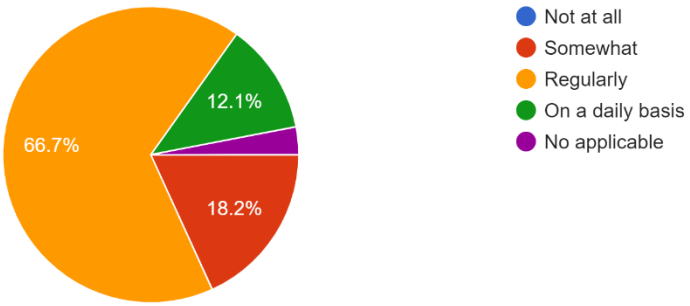
How would you rate your knowledge of the workshop topics after the workshop?

33 responses



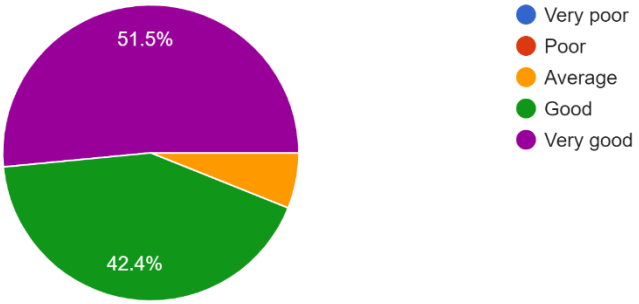
To what extent do you believe you will be able to put what you learnt at this workshop to use in your future work?

33 responses



How would you rate the workshop overall?

33 responses



Paes 72-77 were removed from this document as they contained personal information