



South Sudan's Integrated Monitoring, Reporting and Verification (MRV) Tool

User Manual

Version 1.0

February-2022

IN CONTRIBUTION TO THE



Supported by:



based on a decision of the German Bundestag



Federal Ministry
for Economic Cooperation
and Development



South Sudan's Integrated Monitoring, Reporting and Verification (MRV) Tool

(Version 1.0)

User Manual

**Version 1.0,
February 2022**

Compiled By:

Subbarao Consulting Services (SCS) Ltd.



Subbarao Consulting Services (SCS) Ltd.

229 Highcliff Road, Shiel Hill, Dunedin 9013, New Zealand

Tel: +64 3 4544775; Mobile: +64 211638635

E-Mail: srikanth@subbaraoconsulting.com

Dear User,

Welcome to Integrated Monitoring, Reporting and Verification (iMRV)Tool. You are now part of a national Greenhouse Gas Inventory and Climate Actions (mitigation/adaptation) monitoring, reporting and verification system.

An integrated monitoring reporting and verification (iMRV) tool is key to achieving long term national and international climate change objectives and sustainable development. We strongly value your contribution and are committed to make your engagement with the iMRV Tool ecosystem a smooth experience.

For a newly registered user, a lot of effort goes to understand the requirements of the domestic and international climate actions MRV acts, polices, guidelines and ensure compliance. As a measure to facilitate users and make their climate actions MRV journey smooth, the newly registered users are being provided with this iMRV Tool user manual.

The User Manual is a brief document which aims to communicate with you in simple terms, without the technical jargons. The idea is to make new user and stakeholders understand the intent, benefits and processes of MRV in a lucid and effective manner.

We strongly recommend that you go through this document carefully to understand and appreciate the processes involved in MRV Tool and MRV compliance, the do's and don'ts while using MRV Tool and good practices that would make your MRV journey smooth and easy.

Please be informed that the user manual is by no means an exhaustive document. It is only an effort to compile the most relevant information with respect to MRV requirements/compliances and help at a single place.

For more detailed and elaborate information on MRV, please refer to the national and international MRV acts, policies, rules, notifications, circulars, and advisories issued by the Government and UNFCCC.

We welcome your feedback and suggestions to improve this document so that users in the future may get benefited by the updated version of this document. We will update the user manual on your valuable feedback and suggestions.

All the Best

Important Note: The user manual is only for South Sudan's Integrated Monitoring, Reporting and Verification (MRV) tool and has been prepared for the Climate Change division and all relevant stakeholders (as designated by the CCD). The user manual has been prepared to provide guidance and explain the workflow of iMRV Tool; this a living document and information used in this document is subject to change without any prior notice. The information/data, companies, projects, names, and data used in this user manual is for illustration only, examples herein are fictitious unless otherwise noted. No part of this document can be reproduced or transmitted in any format, by any means; electronic or mechanical, for any purpose, without permission of Subbarao Consulting Services (SCS) Ltd.

About the User Manual

This Integrated Monitoring, Reporting and Verification Tool (MRV- Tool) user manual familiarizes you with the various features and functionalities of the application in a systematic and step-wise manner.

OBJECTIVES

The main objectives of this document are:

- To introduce user(s) to key functionality of the iMRV Tool
- To introduce you to the various modules of iMRV Tool
- To familiarize you with the various conventions used in the MRV Tool.
- To function as a reference manual and user guide to all the functionalities and features of the MRV Tool
- to help you performing various setups and steps by taking you through the relevant screens methodically

NON-OBJECTIVES

This user manual does not aim to

- Discuss domestic and international climate change related reporting requirements and concepts
- Discuss and explain GHG Inventory and IPCC-2006 Guidelines, Climate Finance, SDG concepts
- Act as a technical document

Contents

About the User Manual	4
1. Background and Purpose	7
1.1 iMRV Tool Operational Structure.....	11
2. User Management Module	13
Getting started with the MRV Tool.....	13
2.1 How to Access the MRV Tool.....	13
2.2 MRV Tool User Group	14
2.2.1 MRV Administrator (IT Administrator)	14
2.2.2 Nodal Officer	18
2.2.3 Users (User Group).....	19
2.2.4 New Account (User/Nodal)	19
2.2.5 Update Profile/Change Password/Logout	21
2.2.6 MRV Tool – Dashboard	22
3. GHG Inventory Module	23
3.1 Energy Sector – Inventory	24
3.1.1 Sectoral Approach	25
3.1.1.1 Sectoral Approach – Activity Data.....	25
3.1.2 Reference Approach.....	27
3.1.2.1 Reference Approach – Activity Data	27
3.1.3 Database – Energy	29
3.2 IPPU Sector – Inventory	30
3.2.1 Mineral Industry	31
3.2.1.1 Cement Production	31
3.2.1.2 Lime Production	33
3.2.2 Non-Energy Products from Fuels and Solvent Use	33
3.2.3 Product Uses as Substitutes for Ozone Depleting Substances.....	35
3.2.4 Database - IPPU	35
3.3 AFOLU Sector – Inventory.....	37
3.3.1 Livestock	38
3.3.2 Land	39
3.3.3 Aggregate sources and non-CO ₂ emissions sources on land	40
3.3.4 Database - AFOLU	47
3.4 Waste Sector – Inventory	50
3.4.1 Solid Waste Disposal.....	50
3.4.2 Biological Treatment of Solid Waste	51

3.4.3	Incineration and Open Burning of Waste	52
3.4.4	Wastewater Treatment and Discharge.....	53
3.4.5	Database - Waste	54
4.	Projects Module	56
5.	Mitigation Actions Module.....	59
5.1	Mitigation Actions - Project Information.....	59
5.2	Mitigation Actions - Monitoring Information	61
6.	Adaptation Actions Module	62
6.1	Adaptation Actions - Project Information.....	62
6.2	Adaptation Actions – Monitoring Information	64
7.	Climate Finance Module	66
7.1	Climate Finance - Project Information	66
7.1.1	Project Details.....	66
7.1.2	Financial Flow	67
7.1.3	Detailed Budget	68
7.1.4	Disbursement Year	69
7.2	Climate Finance - Monitoring Information	69
8.	SDG Assessment Module.....	71
8.1	SDG Assessment - Project Information.....	73
8.2	SDG Assessment - Monitoring Information	75
9.	Reports.....	77
9.1	Reports – GHG Inventory	77
9.2	Reports – Mitigation Tracking.....	77
9.3	Reports – Adaptation Tracking.....	78
9.4	Reports – Finance Tracking.....	78
9.5	Reports – SDG Tracking.....	78
9.6	Reports – MRV Tracking	79

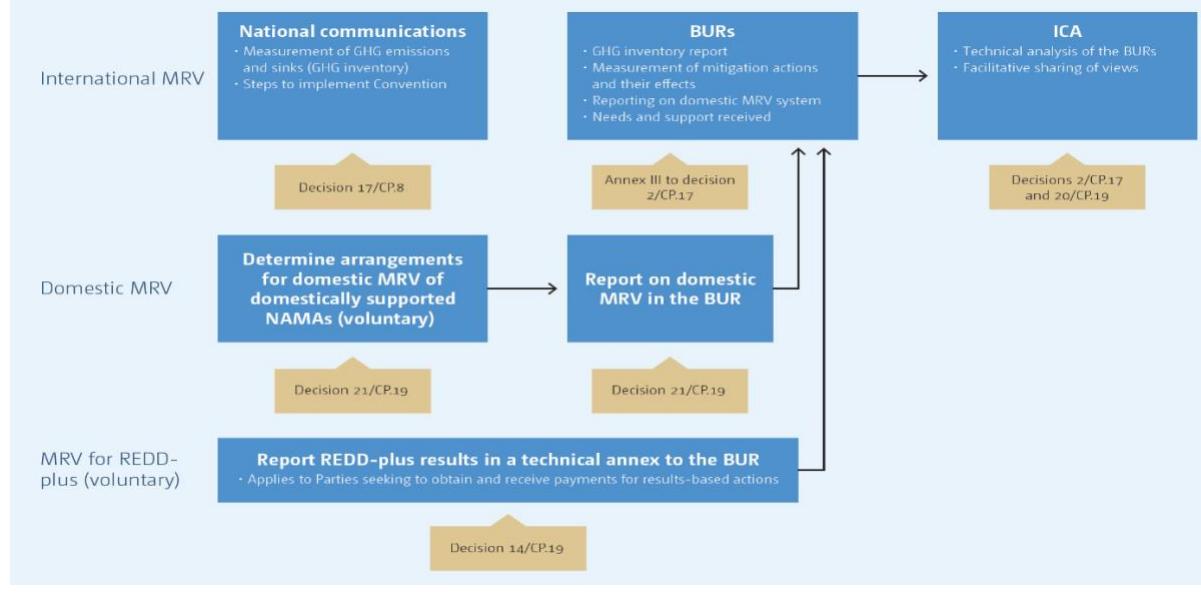
1. Background and Purpose

A robust [Monitoring \(Measuring\), Reporting and Verification \(MRV\)](#) system is important for national policy decisions and is a key requirement under [United Nations Framework Convention on Climate Change \(UNFCCC\)](#) and [the Paris Agreement \(PA\)](#). South Sudan is expected to participate in existing MRV arrangements of the UNFCCC including preparation and submission of National GHG inventory reports, National Communications and Biennial Update Reports (BUR) as well international consultation and analysis processes.

FIGURE 1.1: KEY MILESTONES IN THE DEVELOPMENT OF THE MRV FRAMEWORK FOR DEVELOPING COUNTRY PARTIES

1992/1994	The Convention establishes reporting obligations for all Parties and timelines for the initial national communications from developing country Parties (Article 12, paragraph 5, and Article 4, paragraph 3)
1996	The guidelines for the preparation of national communications from developing country Parties: scope, structure and content (decision 10/CP.2)
1997	The first reporting under the Convention by developing country Parties through the initial round of national communications
1999	The Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (CGE) is established to assist countries in their reporting obligations
2002	COP 8 adopted the revised guidelines for the preparation of national communications (decision 17/CP.8) and extended the term of the CGE for the period 2003-2007 with a broader mandate for technical assistance (decision 3/CP.8)
2007	COP 13 agreed to the principle of applying measurement, reporting and verification (MRV) to developing country Parties in the context of undertaking enhanced national/international action on mitigation of climate change (decision 1/CP.13)
2009	CGE is reconstituted for the period 2010-2012 to continue providing technical support and enhancing the capacity of developing country Parties to prepare their national communications
2010	COP 16 defined the frequency of the national communications every four years, and introduced additional elements of MRV (decision 1/CP.16): enhanced reporting in national communications, including inventories, on mitigation actions and their effects, and support received; biennial update reports (BURs) every two years; international consultation and analysis (ICA) of BURs; and domestic MRV of domestically supported mitigation actions
2011	COP 17 adopted the guidelines for the preparation of BURs and the guidelines and modalities for ICA: the first BUR to be submitted by December 2014, consistent with the capabilities and the level of support provided for reporting; least developed country Parties and small island developing States may submit this report at their discretion; the first BUR is to cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of submission; ICA will commence within six months of the submission of the first round of BURs; ICA will include a two-part technical analysis and facilitative sharing of views
2013	COP 19 adopted several decisions on the elements of the MRV framework: composition, modalities and procedures for the team of technical experts under ICA (decision 19/CP.19); general guidelines for domestic MRV (decision 21/CP.19); seven decisions of the Warsaw Framework for REDD-plus; and the term of the CGE continued for the period 2014-2018 with a broader mandate

FIGURE 1.2: KEY ELEMENTS OF THE MRV FRAMEWORK



Further, under the Paris Agreement (PA) commitments, South Sudan will be subjected to participate in [the enhanced transparency framework \(ETF\)](#), which builds on the existing arrangements and shall require to communicate the National GHG Inventory, National Communications, Biennial transparency reports (BTR), Progress on NDC Implementation, Adaptation Communications and Reporting on Support (Provided/Received). Article 13 of the PA provides the core structure of the ETF, which includes reporting, the technical expert review (TER) and a facilitative, multilateral consideration of progress. The ETF will be implemented based on the Modalities, Procedures and Guidelines for the transparency framework for action and Support (MPGs) that apply to all Parties, with flexibility to those developing countries that need it in the light of their capacities.

FIGURE 1.3: ENHANCED TRANSPARENCY FRAMEWORK (ETF) FOR ACTION AND SUPPORT ESTABLISHED BY ARTICLE 13 OF THE PA

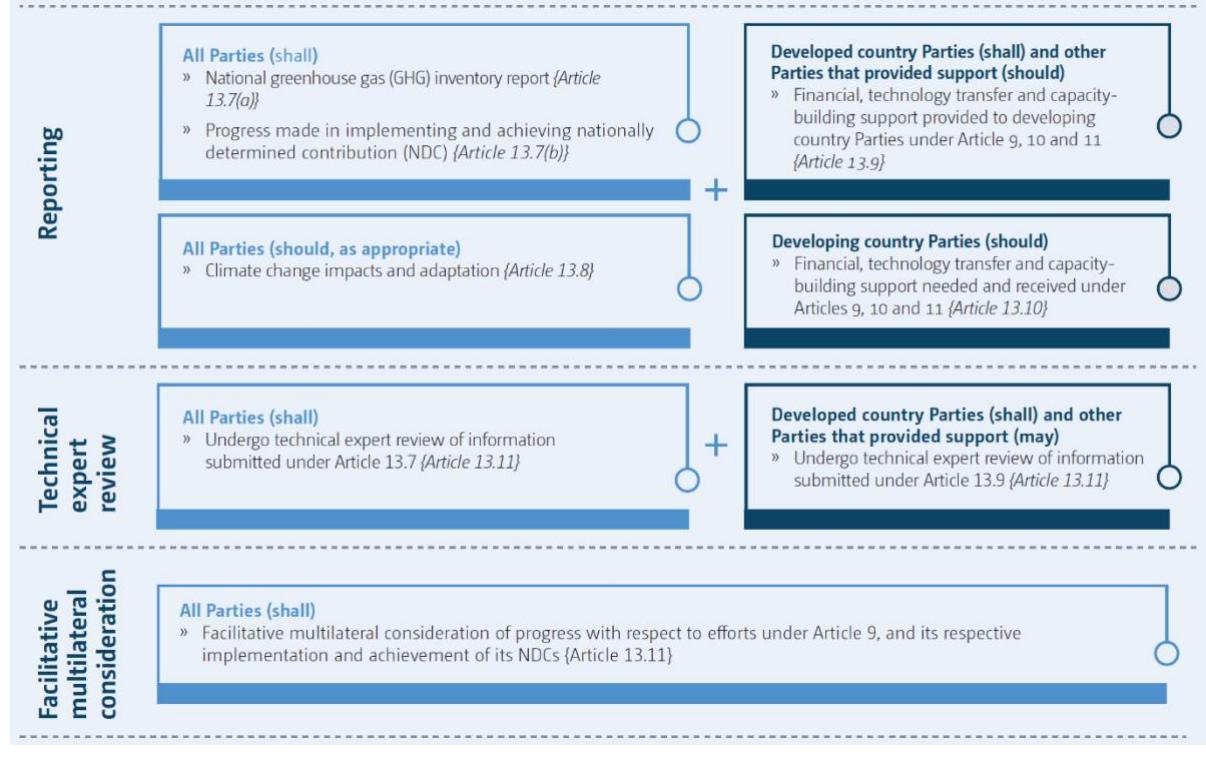


FIGURE 1.4: INFORMATION TO BE REPORTED IN THE BIENNIAL TRANSPARENCY REPORT (BTR)

National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases (GHGs)	Tracking progress of implementation and achievement of NDC under Article 4	Climate change impacts and adaptation under Article 7	Financial, technology development and transfer and capacity-building support provided and mobilized under Articles 9–11	Financial, technology development and transfer and capacity-building support needed and received under Articles 9–11
Each Party shall provide a national inventory report* of anthropogenic emissions by sources and removals by sinks of GHGs	Each Party shall provide the information necessary to track progress in implementing and achieving its NDC under Article 4 of the Paris Agreement	Each Party should provide information on climate change impacts and adaptation under Article 7 of the Paris Agreement	Developed country Parties shall provide information pursuant to Article 13, paragraph 9, of the Paris Agreement. Other Parties that provide support should provide such information, and are encouraged to use the MPGs when doing so	Developing country Parties should provide information on financial, technology transfer and capacity-building support needed and received under Articles 9, 10 and 11 of the Paris Agreement

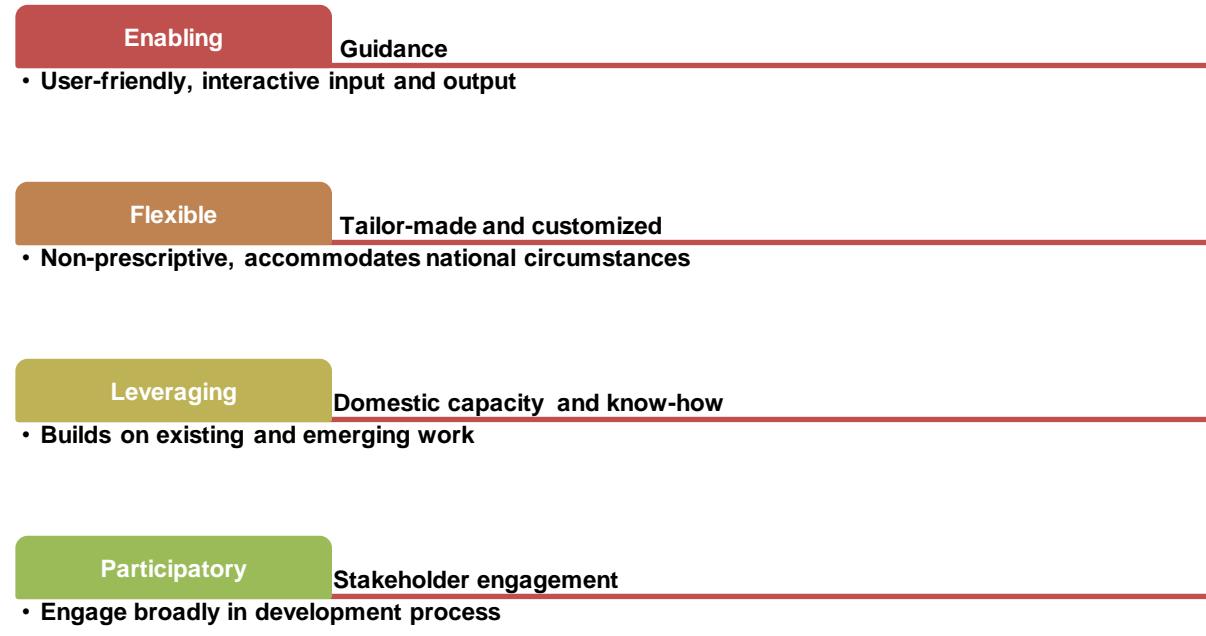
The Integrated Monitoring, Reporting and Verification (iMRV) Tool aims to assist the Climate Change Division and other line ministries/departments to develop a concise and strategic domestic/national MRV system. It is envisaged that the iMRV tool would assist in enhancing monitoring, tracking, reporting and verifying of climate actions including national GHG emissions, climate change mitigation action, adaptation actions, climate finance and sustainable development goals (SDG) impact of climate change projects, program and policies.

This is expected to assist in leveraging international, regional and domestic public and private climate finance flows. The integrated MRV Tool will be robust but built upon available resources e.g., data, human resources, capacity etc. and existing systems of monitoring and reporting (data collection and analysis) with minimal additional burden to the reporting agency and relevant stakeholders.

The iMRV Tool has been developed was finalized during the extensive multiple stakeholder consultation process, however this is a living tool and further improved over the period. Hence some of the features/requirements are kept for future development and implementation. The present version of integrated MRV Tool covers following key elements:

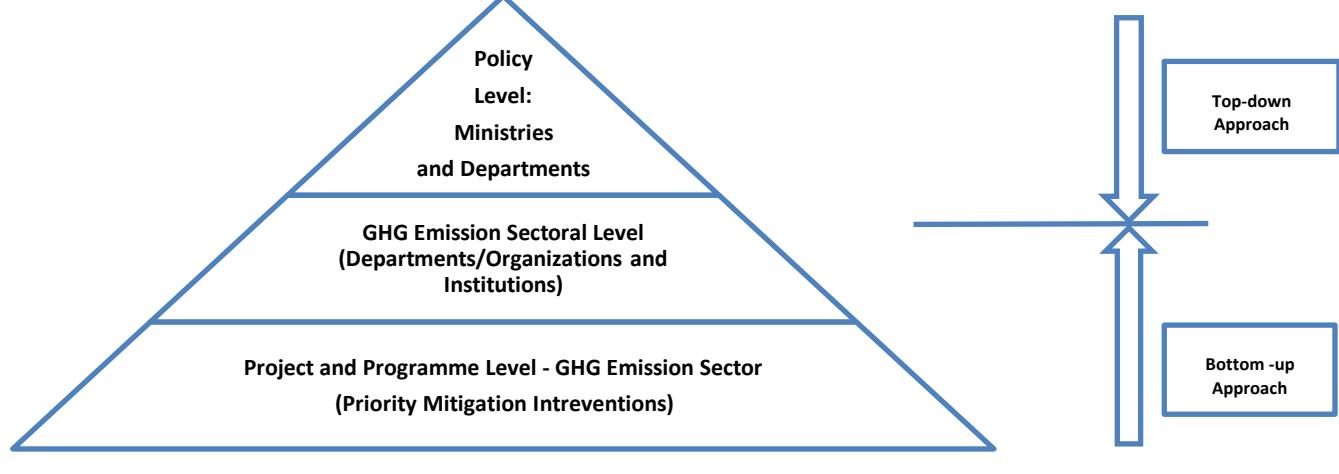
- National GHG Inventory (limited to key sector and sub-sectors)
- Monitoring and Tracking: Climate Change Mitigation Actions/Projects and GHG emission reductions
- Monitoring and Tracking: Climate Change Adaption Actions/Projects and Impacts.
- Monitoring and Tracking: Climate Finance Flow towards Climate Actions.
- Monitoring and Tracking: SDG impact of climate actions.

FIGURE 1.5: INTEGRATED MRV TOOL DESIGN PRINCIPLE



The iMRV Tool design approach was to transparently demonstrate progress made towards the targets defined in the national policies and frameworks such as Climate Change Action Plan (CCAP), Nationally Determined Contributions (NDC) etc. Besides measuring ex-post emissions baseline and mitigation actions, the national MRV system also aimed to track the progress of implementation in terms of other impacts (e.g., policies, co-benefits, achieving SDGs), plus results of means of implementation (e.g., tracking of climate finance flows, technology transfer, capacity building).

FIGURE 1.6: TOP-DOWN, BOTTOM-UP APPROACH FOR MRV FRAMEWORK DESIGN



South Sudan's integrated MRV Tool is an Information and communications technology (ICT) based Digital MRV system specifically considering the specific requirements of South Sudan and finalized post extensive desktop review of documents, stakeholder consultation and discussion with Climate Change Division. However, the iMRV tool shall be improvised over period of time and shall incorporate future decisions.

TABLE 1.1: ELEMENTS OF INTEGRATED MRV TOOL

Key Elements of Integrated MRV Tool				
Module 1: National GHG Inventory	Module 2: Mitigation Actions	Module 3: Adaptation Actions	Module 4: Climate Finance Flow	Module 5: Sustainable Development Goals (SDGs)
<ul style="list-style-type: none"> -GHG emission sectors - Monitoring and data collection - GHG emission calculation - Analysis and reporting - Results and communication 	<ul style="list-style-type: none"> - NDC implementation roadmap - Priority mitigation actions - Tracking mitigation actions - Monitoring and reporting - Results and communication 	<ul style="list-style-type: none"> - NDC implementation roadmap - Priority Adaptation actions - Tracking NDC adaptation actions - Monitoring and reporting - Results and communication 	<ul style="list-style-type: none"> - Climate finance for NDC implementation actions - Finance & resources deployment schedule - Monitoring and reporting - Results and communication 	<ul style="list-style-type: none"> - SDGs mapping and Monitoring for NDC actions based on UNDP CAIT - Data for SDGs impact monitoring - Review and analysis - SDGs Impact Reporting

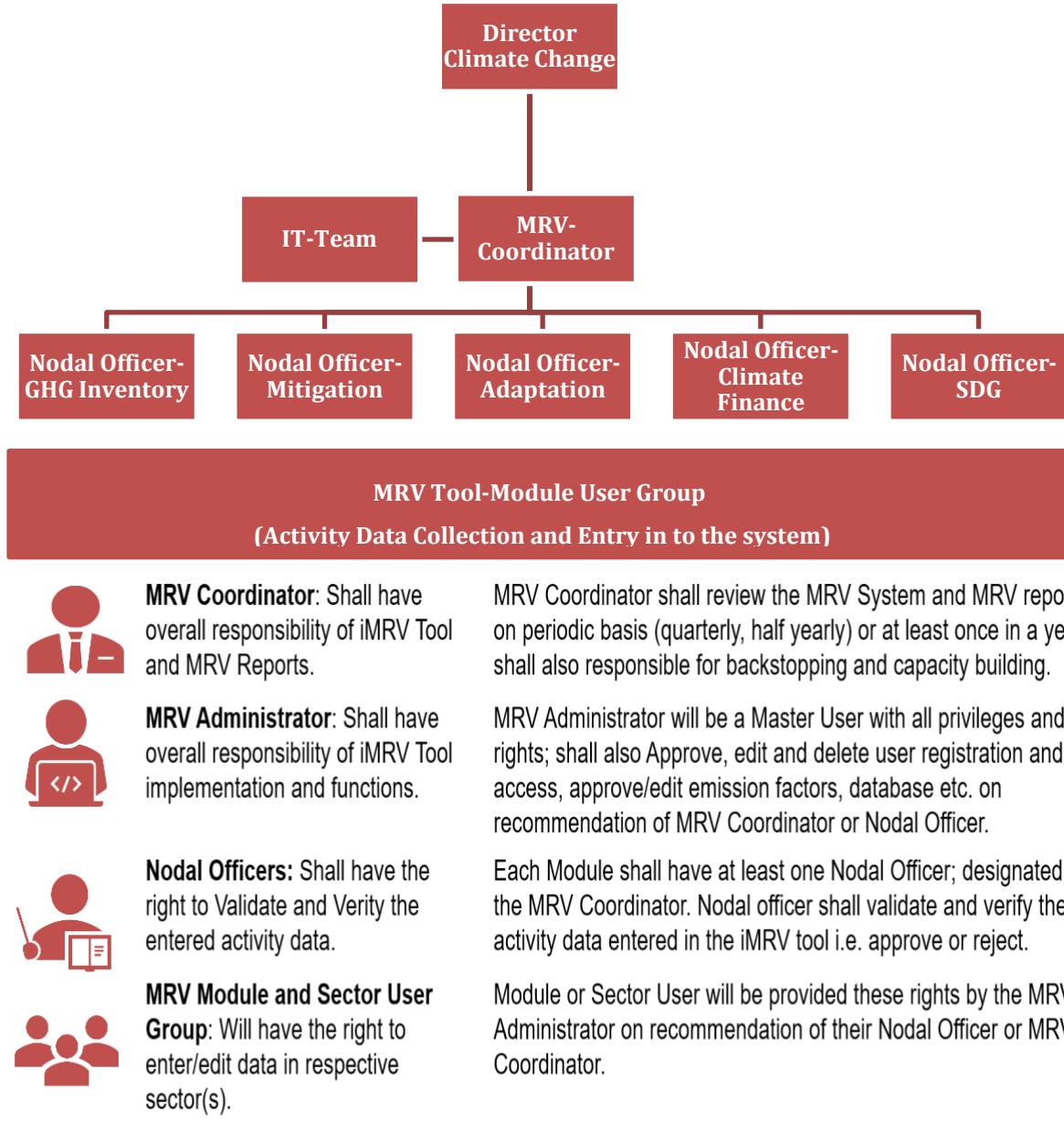
1.1 iMRV Tool Operational Structure

South Sudan's integrated MRV tool is a web-based digital integrated MRV Tool for climate actions (deployed on cloud server – AWS, please contact IT administrator for more information) designed specifically considering the domestic and international reporting requirements on climate actions. The web-based online digital iMRV tool provides robustness and increases the accessibility of the MRV tool to the different user groups.

The roles and responsibility of key MRV personal briefly discussed here:

- The users of MRV tool shall enter the data in the MRV Module i.e. GHG Inventory, Create/ Edit Project, Mitigation Actions, Adaptation Actions, Climate Finance and SDG Module.
- The designated Nodal Officer shall approve/reject each entry in to the MRV system (all modules)
- Administrator shall have access and control over all functionality of MRV Tool

FIGURE 1.7: OVERARCHING OPERATIONAL STRUCTURE FOR INTEGRATED MRV SYSTEM



2. User Management Module

Getting started with the MRV Tool

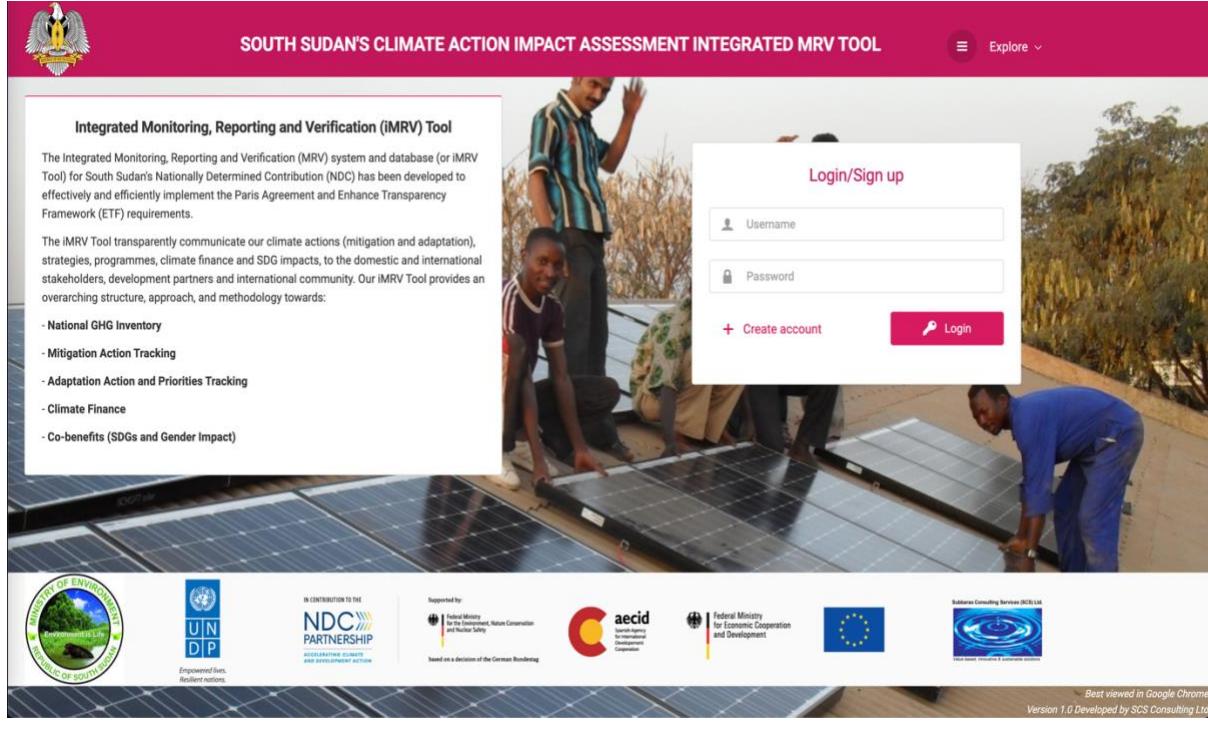
The following sections describe the steps necessary to initialize the Integrated MRV Tool and the database. Following these steps, the MRV Tool is ready for distribution and sharing among inventory compilers, NDC MRV participants and other relevant stakeholders.

2.1 How to Access the MRV Tool

The latest version of Integrated MRV Tool uploaded on the Amazon Web Services (AWS) Cloud Server. The MRV Tool can be accessed on following link:

<http://southsudanmrv1-env.eba-vitjgzhq.us-east-2.elasticbeanstalk.com/>

FIGURE 2.1: WEBPAGE OF INTEGRATED MRV TOOL (VERSION 1.0)



2.2 MRV Tool User Group

As per the user management framework of Integrated MRV Tool, following user groups are defined:

User Group	User Privilege
MRV Administrator	 Have access to the entire MRV tool and functionality, approve/delete new user credentials, edit/delete database.
Nodal Officers	 Nodal Officer can access only My Approvals and approves/rejects the data entered by the users in modules of MRV Tool.
Users - MRV Module and Sector User Group	 Will have the right to enter/edit data in respective Modules, sector(s)/sub-sectors/projects.

2.2.1 MRV Administrator (IT Administrator)



The MRV-IT Administrator will have overall responsibility of the operation of MRV Tool also responsible for defining new or additional users and has full control over the applications and corresponding databases.

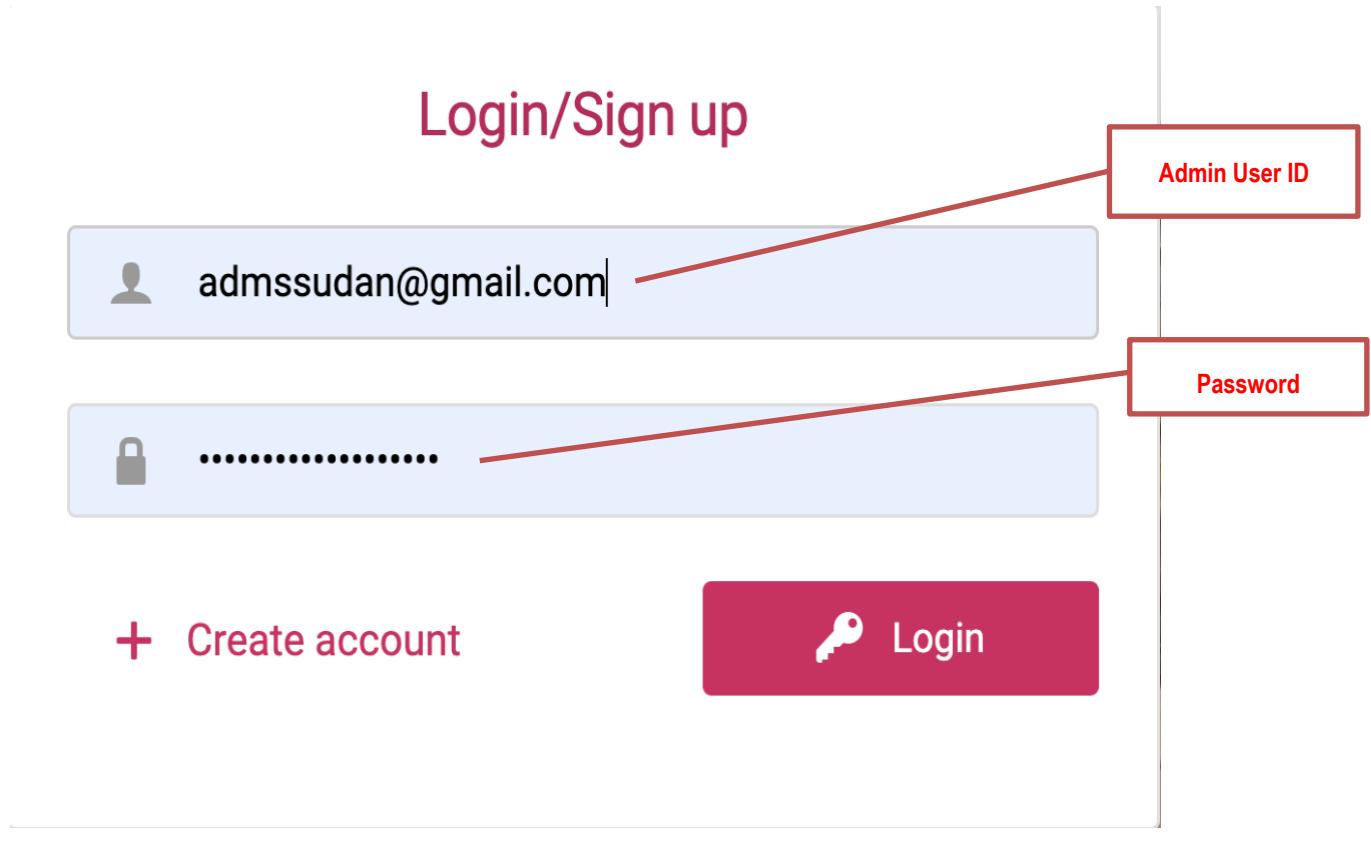
The MRV Administrator shall also:

- Ensure the functioning of the IT structure of MRV System
- Create user accounts on recommendation of MRV-Coordinator
- Assign the user rights and privilege to each Nodal officer and User group.
- Maintain the databases, back-up and system security

2.2.1.1 MRV Administrator Log-in

The CCD shall appoint/designate responsibility of MRV-Administrator.

FIGURE 2.2: INTEGRATED MRV TOOL –ADMINISTRATOR LOG-IN



2.2.1.2 MRV Administrator – Master User List

MRV-Administrator on Login can access all the features of iMRV Tool, including:

- Master User List
- New User Approval/Rejection
- Assign access rights to the new user
- Delete user account
- Access to all Approvals – Default approver
- Emission factor database -controls (edit/addition/deletion)
- Population Database controls (edit/addition/deletion)
- IPPU Emission Factor -Controls (edit/addition/deletion)
- GWP Database controls (edit/addition/deletion)
- Access to overall functionality of MRV Tool

FIGURE 2.3: MRV ADMINISTRATOR – ADMIN DASHBOARD (MASTER LIST OF EXISTING USERS)

The screenshot shows the 'USER - PERMISSIONS' section of the admin dashboard. The table lists three users:

User Name	Email	Permissions	Role	Actions
Bul Ajak	buljohnajak70@gmail.com	GHG: Energy NDC Action: Create Project,Adaptation Tracking,Mitigation Tracking Reports: Adaptation Report,Mitigation Report	User	
Dorina Keji	dorinakeji80@gmail.com	GHG: Waste NDC Action: Create Project,Mitigation Tracking,SDG Tracking Reports: Mitigation Report,SDG Report,MRV Report	User	
Peter Keliona	peterbouda@yahoo.com	GHG: Energy/IPPU,AFOLU,Waste NDC Action: Create Project,Adaptation Tracking,Mitigation Tracking,Finance Tracking,SDG Tracking Reports: GHG Report,Adaptation Report,Mitigation Report,Finance Report,SDG Report,MRV Report	User	

Showing 1 to 3 of 3 entries

2.2.1.2 MRV Administrator – User Approval and Assign Responsibilities

The MRV Administrator will have overall control on user accounts and can:

- Approve/Reject new user account
- Delete user account

FIGURE 2.4: MRV ADMINISTRATOR – APPROVAL/REJECTION

User Name	Email	Permissions	Role	Actions
Bul Ajak	buljohnajak70@gmail.com	GHG: Energy NDC Action: Create Project,Adaptation Tracking,Mitigation Tracking Reports: Adaptation Report,Mitigation Report	User	Delete
Dorina Keji	dorinakeji80@gmail.com	GHG: Waste NDC Action: Create Project,Mitigation Tracking,SDG Tracking Reports: Mitigation Report,SDG Report,MRV Report	User	Delete
Nodal User	nodaluser@123.com	GHG: Energy,IPPU NDC Action: Create Project,Mitigation Tracking Reports: Mitigation Report	Nodal Officer	Approve Reject
Peter Keliona	peterbouda@yahoo.com	GHG: Energy,IPPU,Waste NDC Action: Create Project,Adaptation Tracking,Mitigation Tracking,Finance Tracking,SDG Tracking Reports: GHG Report,Adaptation Report,Mitigation Report,Finance Report,SDG Report,MRV Report	User	Delete

FIGURE 2.5: MRV ADMINISTRATOR – DASHBOARD

View/Edit MRV User List

Master Approver: Approve/Reject Information Added in the MRV Tool by Users

- Master Approver:
 - Approve/Reject new data/information added in the MRV Tool
- Database Management:
 - Add/edit database e.g., population, emission factor, GWP-global warming potentials, Livestock emission factor, Livestock populations etc.

2.2.2 Nodal Officer



The MRV Tool have five main modules viz: Module-1: National GHG Inventory; Module-2: Mitigation Actions; Module-3: Adaptation Actions; Module-4: Climate Finance; and Module-5: SDGs; though MRV Administrator have overall control on all these modules; however as per the MRV system of South Sudan, each module shall be headed by a Nodal Office.

The main function of the Nodal officers is:

- Approval rights (or they may designate the approval rights to competent user) for the activity data entered and projects created by the user.
- Ensuring functioning of respective module and
- Coordination with MRV Administrator for smooth operation of respective module
- Coordinate among the different Nodal officers.
- Participate in review, validation and verification (internal/external) of data/information
- Any other responsibility designated by MRV coordinator or MRV administrator

2.2.2.1 Nodal Officer Log-in

Nodal officers can access the Integrated MRV Tool via following and using their respective user ID and Password:

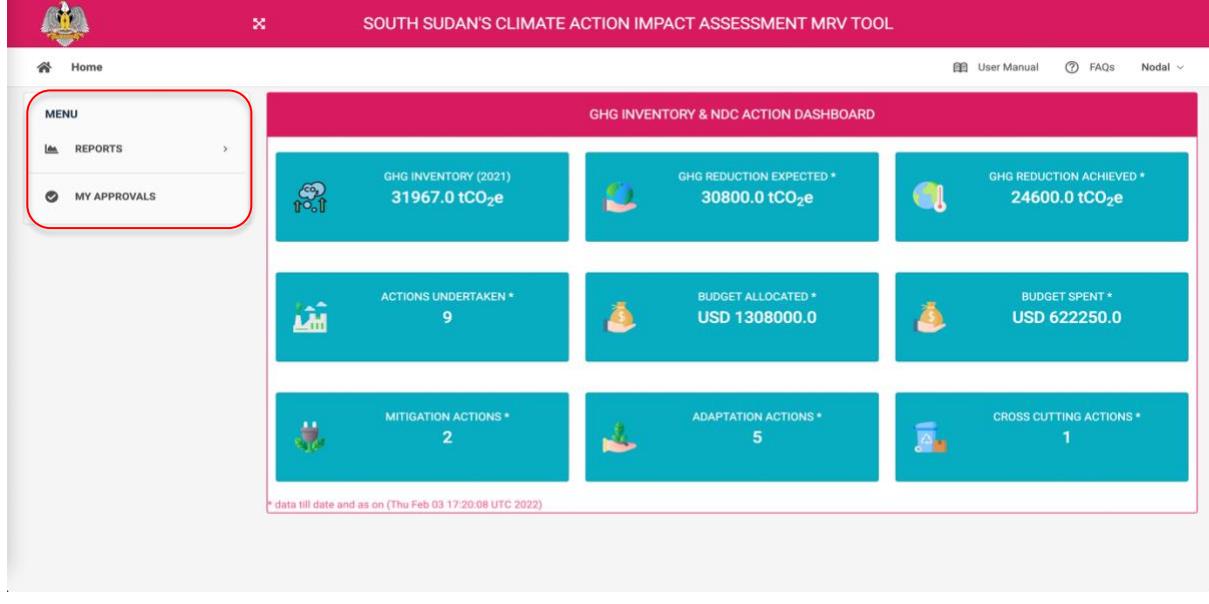
<http://southsudanmrv1-env.eba-vitjgzhq.us-east-2.elasticbeanstalk.com/>

In case of any difficulty/error in login/password, please contact MRV administrator.

FIGURE 2.6: INTEGRATED MRV TOOL –NODAL OFFICER LOG-IN

The screenshot shows the log-in interface for the Integrated MRV Tool. At the top center, it says "Login/Sign up". Below that are two input fields: one for "Nodal User ID" containing "nodaluser@123.com" and another for "Password" containing a series of dots. At the bottom left is a "Create account" button with a plus sign icon. At the bottom right is a "Login" button with a key icon. The entire form is set against a white background with red lines connecting the labels to their respective input fields.

FIGURE 2.7: INTEGRATED MRV TOOL – NODAL OFFICER DASHBOARD



2.2.3 Users (User Group)



The Integrated MRV Tool have five main modules viz: Module-1: National GHG Inventory; Module-2: Mitigation Actions; Module-3: Adaptation Actions; Module-4: Climate Finance; and Module-5: SDGs; each module shall be used by the user groups (assigned by the Nodal Officer).

There can multiple users for each module e.g., for GHG inventory there may be multiple user responsible for each sector and subsectors – Energy Sector, Transport, IPPU, Forestry, Waste etc. or single user may be eligible for using multiple modules e.g., GHG Inventory and Mitigation etc.

The user shall coordinate with different activity data providers via electronic media to collect the activity data (periodically) and shall update the data in the MRV system. The user shall also verify the data preliminary and submit for approval to the nodal officers.

2.2.4 New Account (User/Nodal)

Following steps to be followed to create new account:

Step-1: Select “Not Registered? Create an account” on iMRV Tool Screen

FIGURE 2.8: IMRV TOOL – NEW USER ACCOUNT

The screenshot shows the 'Login/Sign up' page of the IMRV Tool. At the top, there are two input fields: 'Username' with a user icon and 'Password' with a lock icon. Below these is a red-bordered button labeled '+ Create account'. To the right of this button is a red-bordered box containing the text 'New User / Nodal Account'. At the bottom right is a dark blue 'Login' button with a key icon.

Step-2: Fill the registration form with basic information:

- Email:
- Name:
- Department:
- Contact:
- Password:

Step-3: Select Role i.e., User or Nodal Officer**Step-4: Select Access Required:**

- ***GHG Inventory Sector***
 - Energy Sector
 - IPPU Sector
 - Waste Sector
 - AFOLU Sector
- ***Project Tracking - NDC Actions Tracking***
 - Create Project
 - Mitigation Projects
 - Adaptation Projects
 - Climate Finance Projects
 - SDG Projects
- ***Reports***
 - GHG Inventory Report
 - Mitigation Summary
 - Finance Summary
 - SDG Summary
 - Adaptation Summary
 - Project MRV Report

FIGURE 2.9: MRV TOOL – NEW USER REGISTRATION FORM

The screenshot shows the 'Create account' page of the MRV Tool. At the top, there is a 'Create account' button with a note that 'All fields are required'. Below this are input fields for email ('userndc123@gmail.com'), password ('.....'), first name ('Harsh'), last name ('Dixit'), and a dropdown for 'User Role' ('User' is selected). A red box highlights the entire registration form area with the instruction: 'Fill the registration form with basic information'.

Below the user role section, there is a 'Access Required' section divided into three columns: GHG INVENTORY, PROJECTS, and REPORTS. Under GHG INVENTORY, checkboxes are checked for Energy, IPPU, AFOLU, and Waste. Under PROJECTS, checkboxes are checked for Create Project, Adaptation Actions, Mitigation Actions, Climate Finance, and SDG Assessment. Under REPORTS, checkboxes are available for Adaptation Summary, Mitigation Summary, Finance Summary, SDG Summary, and Project MRV Report. A red box highlights the 'GHG INVENTORY' section with the instruction: 'Select Access Required'.

At the bottom left is a 'Create account' button with a plus sign, and at the bottom right is a red box containing the instruction: 'Select Role i.e., User or Nodal Officer'.

A red line connects the 'Create account' button to a red box on the right containing the instruction: 'Submit Registration From by clicking on "Create Account" button'.

Step-4: Select Role i.e., User or Nodal Officer

Step-5: Submit Registration From by clicking on “Create Account” button.

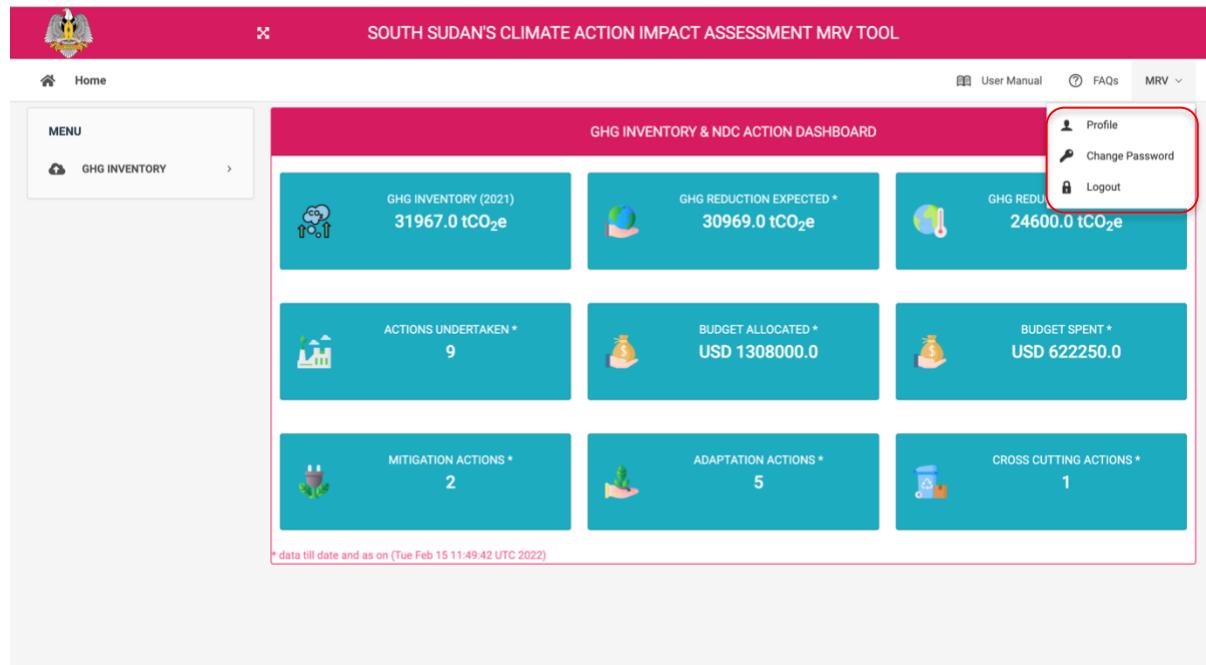
On submission of registration from, the request will be submitted to Administrator for Approval. And new user will receive an email for process.

Once new user approved by the administrator, new user can access the MRV Tool with Log-in credentials.

2.2.5 Update Profile/Change Password/Logout

After logging-in user can update profile/change password/logout by selecting the dropdown on top-right as shown in below illustration:

UPDATE PROFILE/CHANGE PASSWORD/LOGOUT

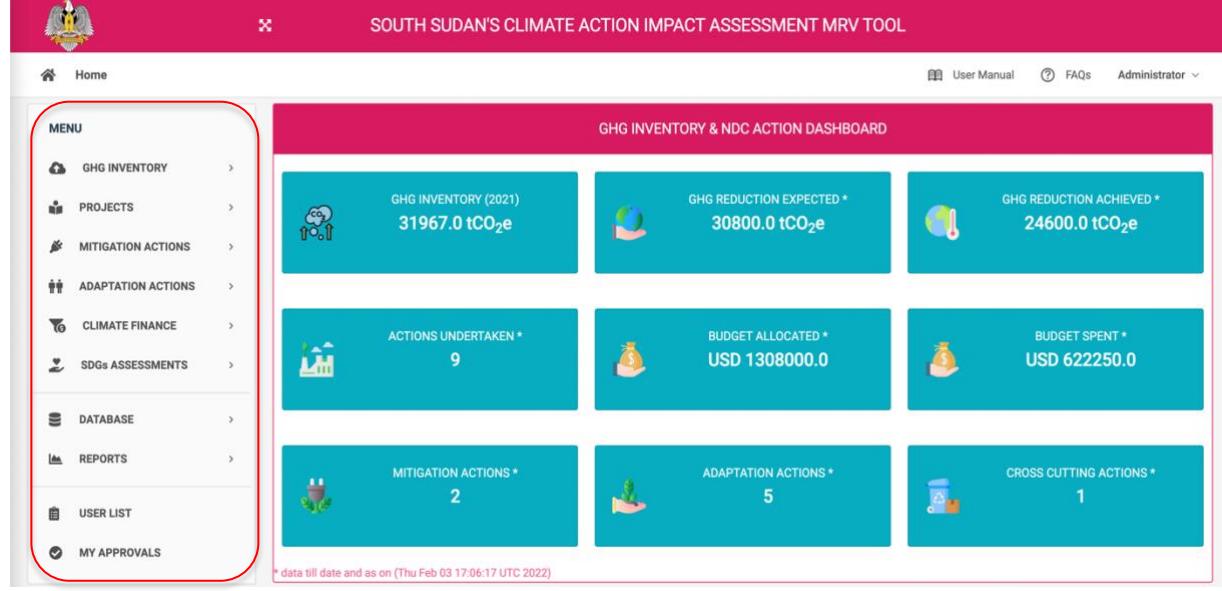
**2.2.6 MRV Tool – Dashboard**

On logging-in the Dashboard page will appear to user. On this Dashboard user will get following information:

- Total GHG emissions for inventory year,
- GHG emissions reduced (expected and achieved),
- Total climate actions undertaken
- Climate Finance allocated and spent
- Number of Mitigation/Adaptation/Cross Cutting climate actions undertaken

Further it should be noted that MRV administrator will land directly to user list and interface and nodal officer have access to My Approvals Only.

FIGURE 2.10: MRV TOOL - DASHBOARD

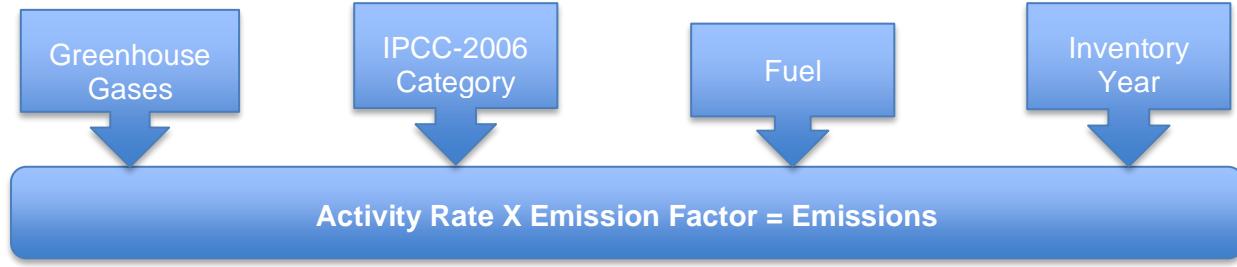


3. GHG Inventory Module

The purpose of GHG Inventory Module of MRV Tool is to implement Tier I and Tier II methodologies in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for the preparation of national GHG inventories according to 2006 IPCC Guidelines.

Further to simplify the GHG Inventory for a country the calculation sheets are customized and sector/sub-sector relevant to a country included in this version of GHG Inventory Module. The basic approach of the software is to enable filling out the 2006 IPCC Guidelines category worksheets with the activity data. The basic inventory data model looks like following Figure.

FIGURE 3.1: BASIC DATA RELATIONS



To maintain the consistency among the different GHG Inventory compilers, Green House Gases, Emission Factors and CO₂equivalent are fixed in this version of the Module. **Only the users with appropriate access rights can use the GHG Inventory Module.**

Fixed Emission Factors for Fuels: As per Table 1.2 and Table 2.2 of IPCC-2006, guidelines. Only, the MRV Administrator can edit/delete Fuel category, calorific value and emission factor.

Fixed GHG Gases: The main three GHGs i.e. CO₂, CH₄ and N₂O covered under this module.

Fixed CO₂ Equivalent types: Fixed CO₂ Equivalent values as per IPCC AR5, that can be changed or deleted only by the MRV administrator.

Sector Covered: The GHG Inventory module customized to accommodate specific requirement of South Sudan, the sector and sub-sectors not applicable has been removed for simplicity of calculations and report.

FIGURE 3.2: GHG INVENTORY MODULE-SECTOR COVERED

The screenshot shows the 'GHG INVENTORY & NDC ACTION DASHBOARD'. On the left, there is a sidebar menu with a red box highlighting the 'GHG INVENTORY' section. The menu items include: 1-ENERGY, 2-INDUSTRIAL PROCESSES AND PRODUCT USE, 3-AGRICULTURE, FORESTRY AND OTHER LAND USE, 4-Waste, PROJECTS, MITIGATION ACTIONS, ADAPTATION ACTIONS, CLIMATE FINANCE, and SDGs ASSESSMENTS. The main dashboard area displays various metrics in teal-colored boxes:

- GHG INVENTORY (2021): 31967.0 tCO₂e
- GHG REDUCTION EXPECTED *: 30884.0 tCO₂e
- GHG REDUCTION ACHIEVED *: 24600.0 tCO₂e
- ACTIONS UNDERTAKEN *: 8
- BUDGET ALLOCATED *: USD 858000.0
- BUDGET SPENT *: USD 393100.0
- MITIGATION ACTIONS *: 2
- ADAPTATION ACTIONS *: 4
- CROSS CUTTING ACTIONS *: 1

* data till date and as on (Wed Feb 02 10:34:51 UTC 2022)

3.1 Energy Sector – Inventory

The energy sector emissions include total emission of all greenhouse gases from fuel combustion in stationary and mobile energy activities as well as fugitive emissions for Oil and Natural Gas production and subsequent activities. The Energy Sector emissions can be calculated using both Sectoral Approach and Reference Approach.

Sectoral Approach: The CO₂ emissions by IPCC Sectoral (Bottom-Up) Approach are calculated based on Energy consumption data and Emission factors. For the Sectoral Approach, total CO₂ is summed across all fuels (excluding biomass) and all sectors. The ‘bottom-up’ approach is generally the most accurate, where the energy consumption data are reasonably complete and readily available.

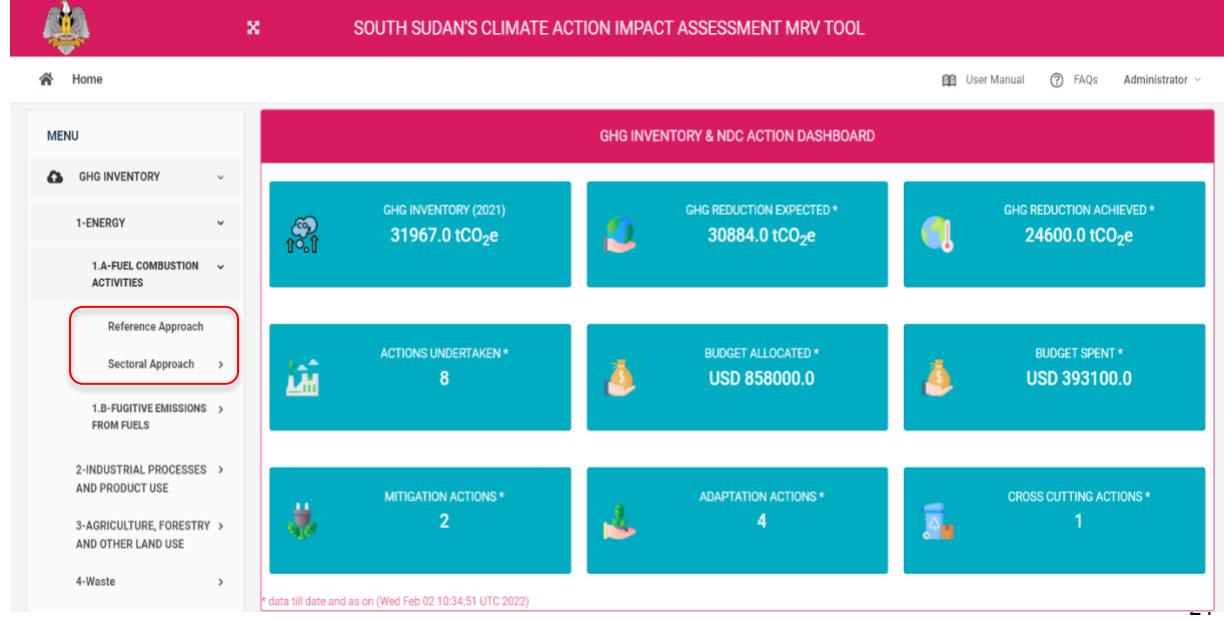
Reference Approach: The Reference Approach is a top-down approach, using a country’s energy supply data to calculate the emissions of CO₂ from combustion of mainly fossil fuels. Reference approach does not include detailed information on how the individual fuels are used in each sector.

The Reference Approach estimates CO₂ emissions from fuel combustion in several steps:

- Estimation of fossil fuel flow into the country (apparent consumption);
- Conversion to carbon units;
- Subtraction of the amount of carbon contained in long-lived materials manufactured from fuel carbon;
- Multiplication by an oxidation factor to discount the small amount of carbon that is not oxidized;
- Conversion to CO₂ and summation across all fuels

The Reference Approach provides only aggregate estimates of emissions by fuel type distinguishing between primary and secondary fuels, whereas the Sectoral Approach allocates these emissions by source category. Estimates of emissions based on the Reference Approach will not be the same as estimates based on the Sectoral Approach. It is good practice to apply both a sectoral approach and the reference approach to estimate a country’s CO₂ emissions from fuel combustion and to compare the results of these two independent estimates.

FIGURE 3.3: ENERGY SECTOR APPROACH



3.1.1 Sectoral Approach

As per the IPCC Methodology, for the Sectoral Approach, total CO₂ is summed across all fuels (excluding biomass) and all sectors. The input screen includes following:

FIGURE 3.4: SECTORAL APPROACH ENERGY INDUSTRIES

GHG INVENTORY - ENERGY INDUSTRIES			
Inventory Year	1990	Sector	1-Energy
Category	1.A-Fuel Combustion Activities	Sub Sector	1.A.1-Energy Industries
Sub Category	1.A.1.a-Electricity Generation	Calculation Approach	Tier I

Inventory Year: Select the GHG inventory year from drop-down list.

Category: The IPPC methodology includes following energy sector category:

- 1.A - Fuel Combustion Activities: (Included in the Inventory Module)
- 1.B - Fugitive emissions from fuels: (Included in the Inventory Module)
- 1.C - Carbon dioxide Transport and Storage (Not included)

Sub-Sector: The Energy Sector's Sub-Sectors are:

- 1.A.1 - Energy Industries
- 1.A.2 - Manufacturing Industries and Construction
- 1.A.3 – Transport
- 1.A.4 - Other Sectors
- 1.A.5 - Non-Specified (Not Included)
- 1.B.1 – Solid Fuels (Not Included)
- 1.B.2 – Oil and Natural Gas
- 1.B.3 - Other emissions from Energy Production

Sub-Category: The Sub-categories under the above sub-sectors as per IPCC.

Calculation Approach: Select the Tier I or Tier II

3.1.1.1 Sectoral Approach - Activity Data

Activity data for energy sector are the amount and type of fuel combusted whereas amount of oil or natural gas is activity data for estimating emissions from fugitive activities. It is good practice to use fuel combustion and production statistics rather than delivery statistics where they are available. Quantities of solid and liquid fuels delivered to enterprises will, in general, differ from quantities combusted by the amounts put into or taken from stocks held by the enterprise.

FIGURE 3.5: ENERGY ACTIVITY DATA

The screenshot shows the 'Energy Data' section of the MRV Tool. It features a table titled 'Energy Data' with columns: Fuel Type, Fuel, Unit, Amount, Reference, and Action. A single row is present: 'Liquid Fuels' (Fuel Type), 'Gas / Diesel Oil' (Fuel), 'tonnes' (Unit), '19481.0' (Amount), 'Annual Energy Supply Report' (Reference), and an empty checkbox in the Action column. Below the table is a 'Delete Row' button. To the right of the table is a red callout box with the text: 'Click on the 'Add' button to insert fuel consumption data'. Below the table is a form for 'Add Energy Data' with fields: Fuel Type (dropdown with 'Select'), Fuel (dropdown with 'Select'), Unit (dropdown with 'tonnes'), Amount (text input 'Enter fuel consumed'), and Reference (text input 'Enter data source'). To the right of this form is an 'Add' button. At the bottom left is a 'Remarks' text area. To the right of the 'Save/Submit' button is a red callout box with the text: 'Enter Comments/observations if any related to activity data.' A red callout box at the bottom left points to the 'Save/Submit' button with the text: 'Submit the activity data by clicking save/submit button'.

Fuel Type : Select Fuel Type from the drop-down list. Fuel Types are: Liquid Fuels, Solid Fuels, Gas, Other Fossil fuels, Peat, Biomass.

Fuel: Select the fuel from the drop-down list. (*Ref: Table 1.1 of 2006 IPCC guidelines, Vol.2: Energy, Chapter 1: Introduction, p. 1.12-1.16*)

E.g. -

- If 'Liquid Fuels' is selected in Fuel Type then Fuels in drop-down list are: Crude Oil, Orimulsion, Motor Gasoline ...etc.
- If 'Solid Fuels' is selected in Fuel Type then Fuels in drop-down list are: Anthracite, Coking Coal, Lignite...etc.
- If 'Gas' is selected in Fuel Type then fuels are: Natural Gas.

Unit: Tonnes (Default)

Amount: Enter Actual fuel consumed.

Reference: Data source for specific entry of fuel consumption.

Click on the 'Add' button to insert fuel consumption data.

Remarks: Comments/observations if there related to activity data.

You need to submit the activity data using save/submit button.

Action: Select the checkbox for any fuel activity data that needs to be deleted

Delete: Remove the fuel activity data.

You need to click on Save/submit button to remove the fuel activity data entry after clicking on Delete button.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nqgip.iges.or.jp/public/2006gl/>)

Fugitive emissions Activity data form:

Category	Sub-Category	Amount	Unit	Reference
Oil Production	All		10 ³ m ³ of Total Oil Produced	
Oil Upgraded	All		10 ³ m ³ of Oil Upgraded	
Oil Transported (Pipelines)	All		10 ³ m ³ of Oil Transported (Pipelines)	
Oil Transported (Tanker Trucks and Rail Cars)	Venting		10 ³ m ³ of Oil Transported (Tanker Trucks)	

3.1.2 Reference Approach

As per the IPCC Methodology, in reference Approach, using a country's energy supply data to calculate the emissions by fuel type distinguishing between primary and secondary fuels. The input screen includes following:

FIGURE 3.6: ENERGY REFERENCE APPROACH

GHG INVENTORY - ENERGY (REFERENCE APPROACH)

Inventory Year: 1990

Sector: 1-Energy

Calculation Approach: Tier I

Inventory Year: Select the GHG inventory year from drop-down list.

Calculation Approach: Tier-1 (Default)

3.1.2.1 Reference Approach – Activity Data

The Reference Approach starts from statistics for production of fuels and their external (international) trade as well as changes in their stocks. It also needs a limited number of values for the consumption of fuels used for non-energy purposes where carbon may be emitted through activities not covered or only partly covered under fuel combustion.

FIGURE 3.7: REFERENCE APPROACH ACTIVITY DATA

Activity Data										
Fuel Type	Fuel	Unit	Production	Imports	Exports	International Bunkers	Stock Change	Excluded Consumption	Reference	
Liquid Fuels	Liquefied Petroleum Gases (LPG)	tonnes	0.0	3000.0	0.0	0.0	0.0	300.0	Annual Energy Supply stats	<input type="checkbox"/>
Liquid Fuels	Jet Kerosene	tonnes	0.0	9000.0	0.0	7000.0	15.0	0.0	Annual Energy Supply stats	<input type="checkbox"/>
Liquid Fuels	Gas / Diesel Oil	tonnes	0.0	35000.0	0.0	0.0	40.0	20.0	Annual Energy Supply stats	<input type="checkbox"/>
Liquid Fuels	Motor Gasoline	tonnes	0.0	12000.0	0.0	0.0	150.0	0.0	Annual Energy Supply stats	<input type="checkbox"/>

[Delete Row](#) [Add Row](#)

Click on the “Add Row” button to get following activity data sheet form:

Add Energy Data

Fuel Type <input type="text" value="Liquid Fuels"/>	Fuel <input type="text" value="Gas / Diesel Oil"/>
Unit <input type="text" value="tonnes"/>	Production <input type="text" value="0"/>
Imports <input type="text" value="10000"/>	Exports <input type="text" value="2000"/>
International Bunkers <input type="text" value="1000"/>	Stock Change <input type="text" value="300"/>
Excluded Consumption <input type="text" value="700"/>	Reference <input type="text" value="sample data"/>

[Add](#)

Production: Enter the amount of fuel produced

Imports: Enter the amount of fuel imported

Exports: Enter the amount of fuel exported

International Bunkers: Enter the amount of fuel used in international bunkers

Stock change: Enter the net increase and decrease in stocks of fuel

Excluded Consumption: Enter the amount of fuel which does not lead to combustion activities

Click on the ‘Add’ button to insert fuel consumption data.

You need to submit the activity data using save/submit button.

Select the checkbox of a particular row activity data, click on the ‘Delete Row’ button and submit the form to delete the selected entry.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nqgip.iges.or.jp/public/2006gl/>)

3.1.3 Database – Energy

The database menu can be accessed through the Home Page. On the left-hand side of the home-page, you would see the ‘Database’ which you shall use to navigate the system and access different functionality. In this sub-section of database menu ‘Emission Factor – fuels’ and ‘Emission Factor – Fugitive Emissions’ are maintained. The input screen includes following:

FIGURE 3.8: FUEL EMISSION FACTOR DATABASE SCREEEN

EMISSION FACTOR DATABASE - FUEL							
Fuel Type	Fuel	NCV (TJ/Gg)	CO ₂ Emission Factor (kgCO ₂ /TJ)	CH ₄ Emission Factor (kgCH ₄ /TJ)	N ₂ O Emission Factor (kgN ₂ O/TJ)	Reference	Select
Biomass	Biodiesels	27.0	70800.0	3.0	0.6		<input type="checkbox"/>
Biomass	Biogasoline	27.0	70800.0	3.0	0.6		<input type="checkbox"/>
Biomass	Charcoal	29.5	112000.0	200.0	4.0		<input type="checkbox"/>
Biomass	Landfill Gas	50.4	54600.0	1.0	0.1		<input type="checkbox"/>
Biomass	Municipal wastes (biomass fraction)	11.6	100000.0	30.0	4.0		<input type="checkbox"/>
Biomass	Other Biogas	50.4	54600.0	1.0	0.1		<input type="checkbox"/>
Biomass	Other Liquid Biofuels	27.4	79600.0	3.0	0.6		<input type="checkbox"/>
Biomass	Other Primary Solid Biomass	11.6	100000.0	30.0	4.0		<input type="checkbox"/>
Biomass	Sludge Gas	50.4	54600.0	1.0	0.1		<input type="checkbox"/>
Biomass	Sulphite Lyes (black liquor)	11.8	95300.0	3.0	2.0		<input type="checkbox"/>
Biomass	Wood / Wood Waste	15.6	112000.0	30.0	4.0		<input type="checkbox"/>

Add Fuel

Fuel Type -Select-	Fuel	NCV	EF CO ₂	EF CH ₄	EF N ₂ O	Reference	Add
Select fuel type	Enter fuel	TJ/Gg	kgCO ₂ /TJ	kgCH ₄ /TJ	kgN ₂ O/TJ	Enter data source	

Filter: Enter name of any fuel/fuel-type to search.

Show: Select number from the drop-down list to display as many results in one page.

Copy: Click to copy on clipboard the results displayed on the page.

Excel/CSV/PDF: Click on the format name to be exported.

Fuel Type: Select fuel type from the drop-down list.

Fuel: Enter name of fuel to be inserted into database.

NCV: Enter value of NCV for the fuel to be inserted into database.

EF CO₂: Enter value of CO₂ emission factor for the fuel to be inserted into database.

EF CH₄: Enter value of CH₄ emission factor for the fuel to be inserted into database.

EF N₂O: Enter value of N₂O emission factor for the fuel to be inserted into database.

Add: Click on the 'Add' button to insert fuel emission factor data.

You need to submit the fuel emission factor data using save/submit button.

Fugitive Emission Factor Screen

EMISSION FACTOR - FUGITIVE EMISSIONS

Fugitive Emission Factors - Oil Fugitive Emission Factors - Natural Gas

Fugitive Emissions - Oil

Category	Sub-Category	Source	CH ₄ Emission Factor	CO ₂ Emission Factor	N ₂ O Emission Factor	Unit	Reference
Oil Production	Oil Production	Fugitives	37.0	4.7	0.0	tonnes per 1000 m ³ total oil produced	
Oil Production	Oil Production	Venting	12.0	2.5	0.0	tonnes per 1000 m ³ total oil produced	
Oil Production	Oil Production	Flaring	0.029	47.0	7.44	tonnes per 1000 m ³ total oil produced	
Oil Transported (Pipelines)	All	All	0.0054	4.94	0.0	tonnes per 1000 m ³ oil transported by pipeline	
Oil Transported (Tanker Trucks and Rail Cars)	All	Venting	0.025	0.0026	0.0	tonnes per 1000 m ³ oil transported by tanker trucks	
Oil Upgraded	All	All	0.0	0.0	0.0	tonnes per 1000 m ³ oil upgraded	

Select to access Natural Gas emission factors tab.

Edit the emission factors as required

Select Save/Submit after editing the emission factors.

3.2 IPPU Sector – Inventory

The Industrial Processes and Product Use (IPPU) sector covers greenhouse gas emissions occurring from industrial processes, from the use of greenhouse gases in products, and from non-energy uses of fossil fuel carbon. The input screen includes following:

GHG INVENTORY - CEMENT

Inventory Year	1990	Sector	2-Industrial Processes and Product Use
Category	2.A-Mineral Industry	Sub Sector	2.A.1-Cement Production
Calculation Approach	Tier I		

Inventory Year: Select the GHG inventory year from drop-down list.

Category: As per the IPPC methodology inventory module includes following IPPU sector category:

- 2.A- Mineral Industry
- 2.D - Non-Energy Products from Fuels and Solvent Use
- 2.F - Product Uses as Substitutes for Ozone Depleting Substances

Sub-Sector: The IPPU Sector's Sub-Sectors included in inventory module are:

- 2.A.1 - Cement Production
- 2.A.2 - Lime Production
- 2.D.1 - Lubricant Use
- 2.D.3 - Solvent Use
- 2.F.1 - Refrigeration and Air Conditioning

Calculation Approach: Select Tier I or Tier II from the dropdown list

3.2.1 Mineral Industry

The inventory module calculates the process-related carbon dioxide (CO₂) emissions resulting from the use of carbonate raw materials in the production and use of a variety of mineral industry products. This includes emissions from Cement Production and Lime Production.

3.2.1.1 Cement Production

In cement production, emissions are based on clinker production estimates inferred from cement production data, correcting for imports and exports of clinker. The input screen includes following:

Cement Data				
Cement Type	Amount of Cement Produced (tonnes)	Clinker Fraction in Cement (%)	Reference	Select
OPC	1000.0	0.95	sample data	<input type="checkbox"/>

Delete Row **Add Row**

Clinker Import (tonnes)	Clinker Export (tonnes)	Reference
1000.0	200.0	sample data

Remarks

Save/Submit

Click on the 'Add Row' button to get following cement data sheet form:

Add Cement Data

Cement Type	Amount Produced (tonnes)
OPC	32877
Clinker Fraction in Cement (%)	Reference
0.95	sample c
Add	

Cement Type: Enter the name of cement type produced.

Amount Produced (tonnes): Enter the quantity for type of cement produced.

Clinker Fraction in Cement: Enter the fraction of clinker in particular type of cement produced.

Add: Click on the 'Add' button to insert cement production data.

Clinker Import (tonnes): Enter the quantity of imports for consumption of clinker.

Clinker Export (tonnes): Enter the quantity of exports for consumption of clinker.

You need to submit the cement production data using save/submit button.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nrgip.iges.or.jp/public/2006gl/>)

3.2.1.2 Lime Production

In lime production, emissions are calculated based on an output-based approach. The input screen includes following:

Lime Type	Amount of Lime Produced (tonnes)	Reference	Select
Quick lime	1000.0	Sample Data	<input type="checkbox"/>

Add Lime Data

Lime Type	Amount Produced (tonnes)	Reference	Add
-----------	--------------------------	-----------	-----

Remarks

Save/Submit

Inventory Year: Select the GHG inventory year from drop-down list.

Calculation Approach: Select Tier I or Tier II from drop-down list.

Lime Type: Enter the name of lime type produced.

Amount Produced (tonnes): Enter the quantity for particular type of lime produced.

Click on the 'Add' button to insert lime production data.

You need to submit the lime production data using save/submit button.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nrgip.iges.or.jp/public/2006gl/>)

3.2.2 Non-Energy Products from Fuels and Solvent Use

The inventory module calculates emissions by applying analytical approach, which is to apply emission factors to activity data on the amount of lubricant or solvent consumption, from the first use of fossil fuels as a product for primary purposes other than energy or feedstock/reducing agent. The input screen includes following:

FIGURE 3.9: LUBRICANT USE INPUT SCREEN

GHG INVENTORY - LUBRICANT USE

Inventory Year	1990	Sector	2-Industrial Processes and Product Use
Category	2.D-Non-Energy Products from Fuels and Solve...	Sub Sector	2.D.1-Lubricant Use
Calculation Approach	Tier I		

FIGURE 3.10: ADD LUBRICANT ACTIVITY DATA FORM

Lubricant Use Data

Lubricant Used	Amount Consumed (TJ)	Carbon Content (tonne C/TJ)	Fraction Oxidized (fraction)	Reference	Action
Grease	1000.0	20.0	0.2	Sample Data	<input type="checkbox"/>

[Delete Row](#)

Add Lubricant

Lubricant Name	Amount Consumed	Carbon Content	Fraction Oxidised	Reference
<input type="text"/>				
(TJ)	(tonne C/TJ)	(fraction)		Add

Remarks

[Save/Submit](#)

Inventory Year: Select the GHG inventory year from drop-down list.

Calculation Approach: Select Tier I or Tier II from drop-down list.

Lubricant Name: Enter the name of lubricant type consumed.

Amount Consumed (TJ): Enter the quantity for particular type of lubricant consumed.

Carbon Content (tonne C/TJ): Enter the carbon content of particular lubricant type.

Fraction Oxidized (fraction): Enter the oxidation fraction of particular lubricant type.

Click on the 'Add' button to insert lubricant use data.

You need to submit the lubricant use data using save/submit button.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nqgip.iges.or.jp/public/2006gl/>)

3.2.3 Product Uses as Substitutes for Ozone Depleting Substances

The inventory module calculates HFC emissions from stationary and mobile air-conditioning, refrigeration equipment. The input screen includes following:

FIGURE 3.11: ADD SUBSTITUTES FOR ODS GAS CONSUMPTION FORM

Gas Consumed	Unit	Amount	Reference	Select
HFC-134a	tonnes	2.5	Annual Customs Services Statistics	<input type="checkbox"/>

Add Data

Gas Consumed -Select-	Unit tonnes	Amount	Reference	Add
--------------------------	----------------	--------	-----------	-----

Remarks

Save/Submit

Gas Consumed: Select the type of gas consumed from drop-down list.

Amount: Enter the quantity for particular type of gas consumed.

Click on the 'Add' button to insert gas consumption data.

You need to submit the gas consumption data using save/submit button.

For submission of gas consumption data related to mobile air conditioning, please click on 'Mobile Air Conditioning' tab and add the data accordingly. User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nqip.iges.or.jp/public/2006gl/>)

3.2.4 Database - IPPU

In this sub-section of database menu emission factor for clinker, lime and GWP for gases are maintained. The input screen includes following:

EMISSION FACTOR - IPPU

Emission Factors - IPPU				
Sub-Sector	Emission factor	Unit	Reference	
Cement	0.53	tCO ₂ /ton of clinker	sample data	
Lime	1.0	tCO ₂ /ton of lime	sample data	

Save/Submit

Emission factor: Enter value of emission factor for the respective sub-sector.

User needs to submit the emission factor values using save/submit button.

GWP Database

FIGURE 3.12: GWP DATABASE SCREEEN

GWP DATABASE

Gas Name	GWP	Reference	Select
Carbon Dioxide	1.0		<input type="checkbox"/>
HFC-125	3170.0		<input type="checkbox"/>
HFC-134	1120.0		<input type="checkbox"/>
HFC-134a	1300.0		<input type="checkbox"/>
HFC-143	328.0		<input type="checkbox"/>
HFC-143a	4800.0		<input type="checkbox"/>
HFC-152	16.0		<input type="checkbox"/>
HFC-152a	138.0		<input type="checkbox"/>
HFC-161	4.0		<input type="checkbox"/>

Filter:

Show:

Add New Gas	Gas <input type="text"/>	GWP <input type="text"/>	Reference <input type="text"/>	<input type="button" value="Add"/>
Save/Submit				

Filter: Enter name of any gas to search.

Add New Gas

Gas: Enter name of gas to be inserted into database.

GWP: Enter value of global warming potential for the gas to be inserted into database.

Select 'Add' button to insert gas GWP data.

You need to submit the gas GWP data factor data using save/submit button.

3.3 AFOLU Sector – Inventory

The AFOLU sector covers emissions and removals of CO₂ and non-CO₂ greenhouse gases from land, land-use, livestock and aggregated sources. The input screen includes following:

FIGURE 3.13: AFOLU SECTOR INVENTORY YEAR INPUT SCREEN

The figure shows a user interface for entering AFOLU sector inventory data. It consists of four horizontal dropdown menus. From left to right: 1. 'Inventory Year' dropdown set to '1990'. 2. 'Sector' dropdown set to '3-Agriculture, Forestry, and Other Land Use'. 3. 'Category' dropdown set to '3.A-Livestock'. 4. 'Sub Sector' dropdown set to '3.A.1-Enteric Fermentation'. Below these dropdowns is another field labeled 'Calculation Approach' with a dropdown menu set to 'Tier 1'.

Inventory Year: Select the GHG inventory year from drop-down list.

Category: As per the IPPC methodology inventory module includes following AFOLU sector category:

3.A - Livestock

3.B - Land

3.C - Aggregate sources and non-CO₂ emissions sources on land

Sub-Sector: The AFOLU Sector's Sub-Sectors included in inventory module are:

3.A.1 – Enteric Fermentation

3.A.2 – Manure Management

3.B.1 – Forest Land

3.B.2 – Cropland

3.B.3 – Grassland

3.B.4 – Wetlands

3.B.5 – Settlements

3.B.6 – Other Land

3.C.1 – Emissions from Biomass Burning

3.C.2. – Liming

3.C.3 – Urea Application

3.C.4 – Direct N₂O emissions from managed soils

- 3.C.5 - Indirect N₂O emissions from managed soils
- 3.C.6 – Indirect N₂O Emissions from Manure Management
- 3.C.7 – Rice Cultivation

Calculation Approach: Tier I (Default)

3.3.1 Livestock

Emissions from enteric fermentation and manure management are calculated by the backend engine from the livestock population data maintained in the database menu. User only needs to select the **inventory year** from the drop-down list and emissions will be displayed.

FIGURE 3.14: AFOLU ENTERIC FERMENTATION

GHG INVENTORY - ENTERIC FERMENTATION

Inventory Year	2011	Sector	3-Agriculture, Forestry, and Other Land Use
Category	3.A-Livestock	Sub Sector	3.A.1-Enteric Fermentation
Calculation Approach	Tier 1		

Enteric Fermentation

Category	Heads	GHG Emissions (tCO ₂ e)
Dairy Cows	10000	19040.0
Goats	20000	2800.0
Horses	6000	3024.0
Swine	19000	532.0

FIGURE 3.15: AFOLU MANURE MANAGEMENT

GHG INVENTORY - MANURE MANAGEMENT

Inventory Year	2011	Sector	3-Agriculture, Forestry, and Other Land Use															
Category	3.A-Livestock	Sub Sector	3.A.2-Manure Management															
Calculation Approach	Tier 1																	
Manure Management <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="background-color: #e6194b; color: white;">Category</th> <th style="background-color: #e6194b; color: white;">Heads</th> <th style="background-color: #e6194b; color: white;">GHG Emissions (tCO₂e)</th> </tr> </thead> <tbody> <tr> <td>Dairy Cows</td> <td>10000</td> <td>2821.4</td> </tr> <tr> <td>Goats</td> <td>20000</td> <td>224.7</td> </tr> <tr> <td>Horses</td> <td>6000</td> <td>340.6</td> </tr> <tr> <td>Swine</td> <td>19000</td> <td>599.6</td> </tr> </tbody> </table>				Category	Heads	GHG Emissions (tCO ₂ e)	Dairy Cows	10000	2821.4	Goats	20000	224.7	Horses	6000	340.6	Swine	19000	599.6
Category	Heads	GHG Emissions (tCO ₂ e)																
Dairy Cows	10000	2821.4																
Goats	20000	224.7																
Horses	6000	340.6																
Swine	19000	599.6																

3.3.2 Land

This inventory module is a data entry form in which land area under respective land category and emissions are to be entered. The input screen includes following:

FIGURE 3.16: LAND EMISSIONS INVENTORY YEAR INPUT SCREEN

GHG INVENTORY - FOREST LAND

Inventory Year	1990	Sector	3-Agriculture, Forestry, and Other Land Use
Category	3.B-Land	Sub Sector	3.B.1-Forest Land
Calculation Approach	Tier I		

Inventory Year: Select the GHG inventory year from drop-down list.

Calculation Approach: Select Tier I or Tier II from the drop-down list.

FIGURE 3.17: AFOLU LANDUSE DATA FORM

Forest Data			
Forest Category	Area (Ha)	GHG Emissions (tCO ₂)	Reference
Other Land converted to Forest Land			
Settlements converted to Forest Land			
Wetlands converted to Forest Land			
Grassland converted to Forest Land			
Cropland converted to Forest Land			
Forest land Remaining Forest land	4200	-25340	Annual Forest Resource Assessment

*Please refer to the calculation sheet attached in the User Manual for estimating GHG emissions

Remarks

Save/Submit

Area (Ha): Enter the land area alongside appropriate land-use category.

GHG Emissions (tCO₂): Enter the amount of GHG emissions alongside appropriate land-use category.

You need to submit the land use area and emissions data using save/submit button.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nqgip.iges.or.jp/public/2006gl/>)

3.3.3 Aggregate sources and non-CO₂ emissions sources on land

This category includes emissions from burning of biomass in different land-use, use of limestone or dolomite, usage of urea, anaerobic decomposition of organic material in flooded rice fields which escapes to the atmosphere primarily by transport through the rice plants, direct/indirect emissions resulting from soil management and volatile nitrogen losses during manure management. The input screen for various sub-sector are as follows:

Emissions from Biomass Burning:

The process for inserting activity data for estimating emissions from biomass burning starts with selection of 'Inventory year' and 'Calculation Approach'. The steps are same as discussed in previous sections. After this selection user needs to provide information for various parameters in the below biomass activity data form:

FIGURE 3.18: AFOLU BIOMASS BURNING ACTIVITY DATA FORM

Add Biomass Burning Data

Initial Land Use	Land Use during Reporting Year
Forest Land	Forest Land
Subcategory	Area burnt (Ha)
Areas of grazing within Forest Land	494114
Mass of fuel available for combustion (tonne/Ha)	Combustion Factor
13.5	0.36
EF CO ₂ (kg/tonne dm burnt)	EF N ₂ O (kg/tonne dm burnt)
1580	0.2
EF CH ₄ (kg/tonne dm burnt)	Reference
6.8	sample data
Add	

Initial Land Use: Select the land-use from the drop-down list.

Land Use during Reporting year: Select the current land-use from the drop-down list.

Area burnt (ha): Enter the value of land area burnt.

Subcategory: Enter the subcategory name if any.

Mass of fuel available for combustion (tonne/Ha): Enter the amount of fuel available for burning.

Combustion factor: Enter the appropriate value of combustion factor for fuel burned.

EF CO₂ (kg/tonne dm burnt): Enter the value of emission factor for CO₂ emitted per unit of dry matter combusted.

EF N₂O (kg/tonne dm burnt): Enter the value of emission factor for N₂O emitted per unit of dry matter combusted.

EF CH₄ (kg/tonne dm burnt): Enter the value of emission factor for CH₄ emitted per unit of dry matter combusted.

You need to submit the biomass burning data using save/submit button.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nqgip.iges.or.jp/public/2006gl/>)

Liming:

The process for inserting activity data for estimating emissions from Liming starts with selection of 'Inventory year' and 'Calculation Approach'. The steps are same as discussed in previous sections. After this selection user needs to provide information for different parameters in the below Liming activity data form:

LIMING ACTIVITY DATA FORM

Liming Data			
Lime Type	Lime Used (tonne per year)	Emission Factor (tC/ton of Lime produced)	Reference
Limestone		0.12	
Dolomite		0.13	

Remarks

Save/Submit

Lime Used (tonne per year): Enter the amount of lime used annually.

Emission Factor (tC/ton of Lime produced): Default IPCC emission factor values are provided for Limestone and Dolomite. User can edit these values and provide country-specific emission factors if needed.

User need to submit the liming activity data using save/submit button.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nqgip.iges.or.jp/public/2006gl/>)

Urea Application:

The process for inserting activity data for estimating emissions from Urea Application starts with selection of 'Inventory year' and 'Calculation Approach'. The steps are same as discussed in previous sections. After this selection user needs to provide information for different parameters in the below Urea Application activity data form:

UREA APPLICATION ACTIVITY DATA FORM

Urea Application Data

Sub-category	Urea Applied (tonne per year)	Emission Factor (tC/ton of Urea produced)	Reference	Action
Delete Row				
Sub-Category	Urea Applied	Emission Factor (default value 0.2)	Reference	Add
	(tonne per year)	(tC/ton of urea)	Please enter data source	

Remarks

[Save/Submit](#)

Sub-Category: Enter the subcategory name.

Urea Applied: Enter the amount for Urea applied annually

Emission Factor: Default IPCC emission factor values are provided. User can edit these values and provide country-specific emission factors if needed.

Add: Select add button to insert the activity data in the Urea Application table.

User need to submit the urea application activity data using save/submit button.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nrgip.iges.or.jp/public/2006gl/>)

Direct N₂O emissions from managed soils:

To insert activity data for estimating direct emissions from managed soils at first user needs to select 'Inventory year' and 'Calculation Approach' by following the same steps as discussed in above sections. Further the next step for user is to provide information for different parameters as shown in below Direct N₂O emissions from managed soils activity data form:

DIRECT N₂O EMISSIONS FROM MANAGED SOILS ACTIVITY DATA FORM

Select tab to provide information for each section

Managed Soils	Flooded Rice	Managed Organic Soils	Grazed Soils
---------------	--------------	-----------------------	--------------

Managed Soils Data

Anthropogenic N input type	Amount (kg/yr)	Emission Factor (kg N ₂ O-N per kg N input)	Reference
F _{SN} : N in Synthetic Fertilizers		0.01	
F _{ON} : N in animal manure, compost, sewage sludge, other		0.01	
F _{CR} : N in crop residues		0.01	
F _{SOM} : N in mineral soils that is mineralised, in association with loss of soil C from soil organic matter as a result of changes to land use or management		0.01	

Enter amount of N input for each category

Indirect N₂O emissions from managed soils:

To insert activity data for estimating indirect emissions from managed soils at first user needs to select 'Inventory year' and 'Calculation Approach' by following the same steps as discussed in above sections. Further the next step is for user to provide information for different parameters as shown in below Indirect N₂O emissions from managed soils activity data form:

INDIRECT N₂O EMISSIONS ACTIVITY DATA FORM

N ₂ O from Atmospheric Deposition				N ₂ O from N Leaching/ Runoff
				Select tab to provide information for this section
N ₂ O Atmospheric Deposition Data				
Description	Value	Unit	Reference	
Annual amount of synthetic fertilizer N applied to soils		kg N /year		
Fraction of synthetic fertilizer N that volatilises	0.1	(kg NH ₃ -N + NO _x -N) per (kg of N applied)	IPCC Default	
Annual amount of animal manure, compost, sewage sludge and other organic N additions intentionally applied to soils		kg N /year		
Annual amount of urine and dung N deposited by grazing animals on pasture, range and paddock		kg N /year		
Fraction of applied organic N fertilizer materials and of urine and dung N deposited by grazing animals that volatilises	0.2	(kg NH ₃ -N + NO _x -N) per (kg of N applied or deposited)	IPCC Default	
Emission factor for N ₂ O emission from atmospheric deposition of N on soils and water surfaces	0.01	(kg N ₂ O-N) per (kg NH ₃ -N + NO _x -N volatilized)	IPCC Default	

Enter value for each description

Indirect N₂O emissions from manure management:

Indirect emissions from manure management are calculated by the backend engine from the livestock population data maintained in the database menu. User only needs to select the **inventory year** from the drop-down list and emissions will be displayed.

FIGURE 3.19: INDIRECT N₂O EMISSIONS SCREEN

GHG INVENTORY - INDIRECT N₂O EMISSIONS FROM MANURE MANAGEMENT

Inventory Year	2011	Sector	3-Agriculture, Forestry, and Other Land Use															
Category	3.C-Aggregate sources and non-CO ₂ emis...	Sub Sector	3.C.6-Indirect N ₂ O emissions from manure...															
Calculation Approach	Tier 1																	
Manure Management - Indirect N₂O Emissions <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #e6194b; color: white;">Category</th> <th style="background-color: #e6194b; color: white;">Heads</th> <th style="background-color: #e6194b; color: white;">GHG Emissions (tCO₂e)</th> </tr> </thead> <tbody> <tr> <td>Dairy Cows</td> <td>10000</td> <td>762.4</td> </tr> <tr> <td>Goats</td> <td>20000</td> <td>38.9</td> </tr> <tr> <td>Horses</td> <td>6000</td> <td>19.5</td> </tr> <tr> <td>Swine</td> <td>19000</td> <td>20.3</td> </tr> </tbody> </table>				Category	Heads	GHG Emissions (tCO ₂ e)	Dairy Cows	10000	762.4	Goats	20000	38.9	Horses	6000	19.5	Swine	19000	20.3
Category	Heads	GHG Emissions (tCO ₂ e)																
Dairy Cows	10000	762.4																
Goats	20000	38.9																
Horses	6000	19.5																
Swine	19000	20.3																

Rice Cultivation:

To insert activity data for estimating emissions from Rice Cultivation, at first user needs to select 'Inventory year' and 'Calculation Approach' by following the same steps as discussed in above sections. Further the next step is for user to provide information for different parameters as shown in below Rice Cultivation activity data form:

FIGURE 3.20: AFOLU RICE CULTIVATION DATA FORM

Rice Data				
Eco system	Upland	Irrigated	Rainfed	Deepwater
Sub Category				Rice fields
Harvested Area (Ha)				15000
Cultivation Period (days)				120
Baseline Emission Factor w/o Organic Amendments (kgCH ₄ /ha/day)				1.3
Scaling Factor - Water Regime (Cultivation Period)				0.27
Scaling Factor - Water Regime (pre-season)				1.22
Organic Amendment Applied (tonnes/ha)				12.5
Conversion factor Organic Amendment				0.14
Scaling factor for soil type, rice cultivar, etc.				1
Reference				

Sub Category: Enter the subcategory name in applicable ecosystem column.

Harvested Area (Ha): Enter value for land area harvested.

Cultivation Period (days): Enter value for cultivation period of rice.

Baseline Emission Factor w/o Organic Amendments (kgCH₄/ha/day): Enter value for daily emission factor.

Scaling Factor – Water Regime (Cultivation Period): Enter value for scaling factor to account for the differences in the water regime during the cultivation period.

Scaling Factor – Water Regime (pre-season): Enter value for scaling factor to account for the differences in water regime in the pre-season before the cultivation period

Organic Amendment Applied (tonnes/ha): Enter value for application rate of organic amendment.

Conversion factor Organic Amendment: Enter value of conversion factor for organic amendment.

Scaling factor for soil type, rice cultivar, etc.: Enter value of scaling factor for soil type, rice cultivar if available.

You need to submit the rice cultivation data using save/submit button.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nqgip.iges.or.jp/public/2006gl/>)

3.3.4 Database - AFOLU

In this sub-section of database menu livestock population and emission factor are maintained. The input screen includes following:

FIGURE 3.21: DATABASE LIVESTOCK POPULATION SCREEN

The screenshot shows a web-based form titled "GHG INVENTORY - LIVESTOCK POPULATION". At the top, there is a dropdown menu labeled "Inventory Year" with "2012" selected. Below this is a table titled "Livestock Population" with four columns: "Category", "Heads", "Reference", and "Select". Two rows are present: one for "Dairy Cows" with 12000 heads and one for "Goats" with 22000 heads. A red "Delete Row" button is located below the table. Below the table is a section titled "Add Livestock Data" with three input fields: "Category" (dropdown menu with "-Select-"), "Heads" (text input field), and "Reference" (text input field). A red "Add" button is positioned next to the reference field. At the bottom of the form is a "Remarks" text area and a red "Save/Submit" button.

Category	Heads	Reference	Select
Dairy Cows	12000		<input type="checkbox"/>
Goats	22000		<input type="checkbox"/>

Inventory Year: Select inventory year from drop-down list.

Category: Select livestock category from the drop-down list.

Heads: Enter value for number of head of livestock category.

Click on the 'Add' button to insert livestock population data.

You need to submit the livestock population data using save/submit button.

Emission Factor – Livestock

FIGURE 3.22: LIVESTOCK EMISSION FACTOR DATABASE SCREEN

LIVESTOCK EMISSION FACTOR DATABASE											
Category	EF _{Fermentation} Fermentation (kgCH ₄ / head/ year)	EF _{Manure} Management (kgCH ₄ / head/ year)	N Excretion Rate (kgN/ 1000kg animal/ day)	Typical Animal Mass (kg)	Nitrogen Excretion Managed in MMS (%)	EF Direct N ₂ O-N Emissions from MMS	Managed Manure N lost in MMS (%)	Fraction of managed livestock manure nitrogen that volatilises	EF N ₂ O emissions from atmospheric deposition of nitrogen on soils and water surfaces	Reference	
Buffalo	55.0	1.0	0.32	380.0	10.0	0.01	100.0	0.3	0.01		
Camels	46.0	1.92	0.38	217.0	10.0	0.01	100.0	0.3	0.01		
Dairy Cows	68.0	1.0	0.44	500.0	76.0	0.01	24.0	0.3	0.01		
Goats	5.0	0.17	1.42	30.0	10.0	0.01	100.0	0.3	0.01		
Horses	18.0	1.64	0.3	238.0	10.0	0.01	100.0	0.3	0.01		
Mules and Assess	10.0	0.9	0.3	130.0	10.0	0.01	100.0	0.3	0.01		
Other Cattle	47.0	1.0	0.5	330.0	91.0	0.01	9.0	0.3	0.01		
Poultry	0.0	0.02	1.1	0.9	10.0	0.01	100.0	0.3	0.01		
Sheep	5.0	0.15	1.13	28.0	10.0	0.01	100.0	0.3	0.01		
Swine	1.0	1.0	0.52	45.0	10.0	0.01	100.0	0.3	0.01		

Showing 1 to 10 of 10 entries

← 1 →

[Delete Row](#) [Add Row](#)

Click on the 'Add Row' button to get
livestock emission factor form

[Save/Submit](#)

Click on the 'Add Row' button to get below livestock emission factor form:

Add New Livestock Category

Livestock	X
<input type="text" value="Buffalo"/>	<input type="text" value="55"/>
EF Enteric Fermentation (kgCH ₄ / head/ year)	
<input type="text" value="1"/>	<input type="text" value="0.32"/>
EF Manure Management (kgCH ₄ / head/ year)	
<input type="text" value="380"/>	<input type="text" value="10"/>
Typical Animal Mass (kg)	N Excretion Rate (kgN/ 1000kg animal/ day)
<input type="text" value="0.01"/>	<input type="text" value="100"/>
EF Direct N ₂ O-N Emissions from MMS	Nitrogen Excretion Managed in MMS (fraction)
<input type="text" value="0.3"/>	<input type="text" value="0.01"/>
Fraction of managed livestock manure nitrogen that volatilises	Emission factor for N ₂ O emissions from atmospheric deposition of nitrogen on soils and water surfaces
<input type="text" value="sample data"/>	<input type="button" value="Add"/>

Livestock: Enter livestock category name for which emission factor is to be inserted

EF Enteric Fermentation (kgCH₄/ head/ year): Enter value of emission factor for the livestock category during enteric fermentation.

EF Manure Management (kgCH₄/ head/ year): Enter value of emission factor for the livestock category during manure management.

N Excretion Rate (kgN/ 1000kg animal/ day): Enter value for default N excretion rate of livestock category.

Typical Animal Mass (kg): Enter value of typical animal mass for livestock category.

Nitrogen Excretion Managed in MMS (fraction): Enter value for fraction of total annual nitrogen excretion for each livestock category that is managed in manure management system.

EF Direct N₂O-N Emissions from MMS: Enter value of emission factor for direct N₂O emissions from manure management system.

Managed Manure N lost in MMS (%): Enter value for amount of managed manure nitrogen for livestock category that is lost in the manure management system.

Fraction of managed livestock manure nitrogen that volatilizes: Enter value for fraction of managed manure nitrogen for livestock category that volatilizes.

Emission factor for N₂O emissions from atmospheric deposition of nitrogen on soils and water surfaces: Enter value of emission factor for N₂O emissions from atmospheric deposition of nitrogen on soils and water surfaces.

You need to submit the livestock emission factor data using save/submit button.

3.4 Waste Sector – Inventory

The Waste sector covers emissions from incineration, open burning, wastewater treatment and for changes in carbon stored in solid waste disposal sites. The input screen includes following:

FIGURE 3.23: WASTE SECTOR INPUT SCREEN

Inventory Year: Select the GHG inventory year from drop-down list.

Category: As per the IPPC methodology, inventory module includes following waste sector category:

- 4.A – Solid Waste Disposal
- 4.B – Biological Treatment of Solid Waste
- 4.C – Incineration and Open Burning of Waste
- 4.D – Wastewater Treatment and Discharge

Sub-Sector: The Waste Sector's Sub-Sectors under the above categories as per IPCC.

Calculation Approach: Select Tier I or Tier II from dropdown list.

3.4.1 Solid Waste Disposal

This category includes emissions from solid waste deposited at disposal sites. The input screen includes following:

FIGURE 3.24: SOLID WASTE ACTIVITY DATA FORM

Solid Waste Data (Managed and Unmanaged)						
Urban Population	Waste Per Capita (kg/capita/year)	% of waste going to managed sites	% of waste going to unmanaged sites	CH ₄ Generation per ton of waste (kg/tonne) - Managed	CH ₄ Generation per ton of waste (kg/tonne) - Unmanaged	Reference
250000	0.67	0.0	0.3	0.0	25.0	National Solid Waste Management Report

Urban Population: This information is fetched from Population database.

Waste Per Capita (kg/capita/year): Enter value for mass of waste generated.

% of waste going to managed sites: Enter value for fraction of waste disposed at managed sites.

% of waste going to unmanaged sites: Enter value for fraction of waste disposed at unmanaged sites.

CH₄ Generation per ton of waste (kg/tonne) – Managed: Enter value for CH₄ generation potential of waste deposited at managed SWDS

CH₄ Generation per ton of waste (kg/tonne) – Unmanaged: Enter value for CH₄ generation potential of waste deposited at unmanaged SWDS

You need to submit the Solid waste data using save/submit button.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nqgip.iges.or.jp/public/2006gl/>)

3.4.2 Biological Treatment of Solid Waste

This category includes emissions from biological treatment (composting, anaerobic digestion in biogas facilities). The input screen includes following:

Waste Data - Biological Treatment					
Treatment Type	Amount of waste treated (tonnes)	Emission Factor (kgCO ₂ /ton of waste)	Reference	Action	
Composting	32000.0	180.41	sample data	<input type="checkbox"/>	

Delete Row

Add Data

Treatment Type	Amount of waste treated	Emission Factor	Reference	Add
<input type="text"/>	<input type="text"/> tonnes	<input type="text"/> (kgCO ₂ /ton of waste)	<input type="text"/>	<input type="button" value="Add"/>

Treatment Type: Enter name for the type of biological treatment employed.

Amount of waste treated: Enter quantity of waste treated in the biological treatment method.

Emission factor: Enter value of emission factor for the typical biological treatment.

Add: Click on the 'Add' button to insert biological treatment of waste data.

You need to submit the biologically treated waste data using save/submit button. User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nqip.iges.or.jp/public/2006gl/>)

3.4.3 Incineration and Open Burning of Waste

This category includes emissions from incineration and open burning of all types of combustible waste. The input screen includes following:

Waste Data - Incineration								
Waste Incinerated (wet weight) (tonnes)	Dry Matter Fraction-DM	Carbon Fraction in dry matter-CF	Fossil Carbon Fraction in Total carbon- FCF	Oxidation Factor- OF	Reference			
29354	0.79	0.78875	0.0011	1	sample data			

Waste Data - Open Burning								
Urban Population	Waste Per Capita (kg/year)	Fraction of Population Burning Waste	Dry Matter Fraction-DM	Carbon Fraction in Dry Matter-CF	Fossil carbon Fraction in Total Carbon- FCF	Oxidation Factor- OF	Reference	
75000	600	0.35	0.066	0.066	0.000924	0.58	sample data	

Remarks

Incineration

Waste Incinerated: Enter quantity of waste incinerated.

Dry Matter Fraction-DM: Enter value for fraction of dry matter content in the waste incinerated.

Carbon Fraction in dry matter-CF: Enter value for fraction of carbon in the dry matter content of waste incinerated.

Fossil Carbon Fraction in Total carbon-FCF: Enter value for fraction of fossil carbon in the total carbon of waste incinerated.

Oxidation Factor-OF: Enter value for oxidation factor.

Open Burning

Waste per Capita: Enter the quantity of waste generated.

Fraction of Population Burning Waste: Enter value for fraction of population burning waste.

Dry Matter Fraction-DM: Enter value for fraction of dry matter content in the waste open burned.

Carbon Fraction in dry matter-CF: Enter value for fraction of carbon in the dry matter content of waste open burned.

Fossil Carbon Fraction in Total carbon-FCF: Enter value for fraction of fossil carbon in the total carbon of waste incinerated.

Oxidation Factor-OF: Enter value for oxidation factor.

You need to submit the incinerated and open burned waste data using save/submit button.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters.(<https://www.ipcc-nppgip.iges.or.jp/public/2006gl/>)

3.4.4 Wastewater Treatment and Discharge

This category includes emissions from treatment or disposition of wastewater discharged through sources. The input screen includes following:

Domestic Wastewater:

Wastewater Treatment and Discharge - CH ₄ Emissions				
Population	Degradable Organic Component (kgBOD/capita/year)	Correction Factor for Industrial BOD Discharged in Sewers	Methane Producing Capacity (kgCH ₄ /kgBOD)	Reference
500000	13.5	1.25	0.6	IPCC Default

Wastewater Treatment and Discharge - N ₂ O Emissions				
Population	Per capita Protein Consumption (kg/person/year)	Nitrogen Fraction in Protein	Emission factor (kgN ₂ O-N/kgN)	Reference
500000	10.0	0.1	10.0	

Remarks

Degradable Organic Component: Enter value for per capita BOD in given inventory year.

Correction Factor for Industrial BOD Discharged in Sewers: Enter value of correction factor for additional industrial BOD discharged into sewers.

Methane Producing Capacity (kgCH₄/kgBOD): Enter value for methane producing capacity.

Per capita Protein Consumption (kg/person/year): Enter value for annual per capita protein consumption.

Nitrogen Fraction in Protein: Enter value for fraction of nitrogen in protein.

Emission factor (kgN₂O-N/kgN): Enter value of emission factor for N₂O emissions from discharged to wastewater.

Industrial Wastewater:

Domestic Waste Water				Industrial Waste Water				
Industrial Wastewater Treatment and Discharge								
Industry Sector	Treatment Type	Production (tonnes/year)	Waste Water Generated (m³/tonne)	COD (kgCOD/m³)	Maximum Methane Producing Capacity (kgCH ₄ /kgCOD)	Methane Correction Factor (fraction)	Sludge Removed (kgCOD/year)	Methane Recovered (kgCH ₄ /year)

Industry Sector: Enter name for the industrial sector (e.g., Alcohol Refining)

Treatment Type: Enter name for the treatment type (e.g. Anaerobic Lagoon)

Production (tonnes/year): Enter amount for total industrial product for the industrial sector

Wastewater Generated (m³/tonne): Enter the amount for wastewater generated

COD (kgCOD/m³): Enter amount of industrial chemically degradable organic component in wastewater

Maximum Methane Producing Capacity (kgCH₄/kgCOD): Enter value for maximum methane producing capacity

Methane Correction Factor (fraction): Enter fractional value for methane correction factor

Sludge Removed (kgCOD/year): Enter amount of sludge removed in inventory year

Methane Recovered (kgCH₄/year): Enter amount of methane recovered in inventory year

You need to submit the wastewater treatment data using save/submit button.

User may look into the IPCC 2006 guidelines for more information and definitions of the key input parameters. (<https://www.ipcc-nqip.iges.or.jp/public/2006gl/>)

3.4.5 Database - Waste

In this sub-section of database menu urban and rural population are maintained. The input screen includes following:

FIGURE 3.25: DATABASE WASTE ADD POPULATION DATA SCREEN

POPULATION					
Year	Rural Population	Urban Population	Total Population	Reference	Action
2019	250000	250000	500000	Census	<input type="checkbox"/>
2018	6855800	1404200	8260000	Census	<input type="checkbox"/>
2011	83000	17000	100000	Census	<input type="checkbox"/>

Delete Row

Add Population

Inventory Year Rural Population Urban Population Reference

—Select—

Inventory Year: Select inventory year from drop-down list.

Rural Population: Enter value for rural population in given inventory year.

Urban Population: Enter value for urban population in given inventory year.

You need to submit the population data using save/submit button.

4. Projects Module

The first activity to developing the mitigation/adaptation/climate finance/SDG impact database is to create an action or project in the MRV database. This activity captures basic information about the action or project. The sub-modules required for mitigation action or project to be created using the information entered in this module.

FIGURE 4.1: PROJECTS SCREEN NAVIGATION AND SEARCH PROJECT SCREEN

The screenshot shows the 'CREATE PROJECT' form. The left sidebar has a 'PROJECTS' section with a 'Create New Project' button highlighted by a red box. A red callout box with the text 'Click on the link to access the project creation form.' points to this button. The main form fields include:

- Project Title *
- Cause: Climate Change
- Division *: -Select-
- Sector *: -Select-
- Sub-Sector *: -Select-
- Implementing Agency *
- Executing Agency
- Lifetime (years)
- Commissioning Date (actual/expected) *
- Project End Date *: dd-mm-yyyy
- Financial Closure Date *: dd-mm-yyyy
- Part of NAP/NAPA/NAMA *: -Select-
- Included in NDC *: -Select-
- Project Location *: -Select-
- State/District/City

FIGURE 4.2: CREATE PROJECT DATA INSERTION FORM

PROJECT: SS-012-11|EMISSIONS FROM TRANSPORTATION SECTOR IN SOUTH SUDAN

Project Title *	Emissions from Transportation Sector in South Sudan		
Cause	Climate Change	Division *	Mitigation
Sector *	Transportation	Sub-Sector *	Road
Implementing Agency *	UNDP	Executing Agency	University of Juba
Lifetime (years)	5.0	Commissioning Date (actual/expected) *	28-03-2022
Project End Date *	28-03-2027	Financial Closure Date *	28-07-2022
Part of NAP/NAPA/NAMA *	NAMA	Included in NDC *	Yes
Project Location *	City	State/District/City	Juba
Geo Coordinates	4.8594 N, 31.5713 E	Source of Funding *	Gov, Grant or Loan
Project Cost (USD) *	300000.0	Project Cost (SSP)	39078000
<small>* Mandatory Field</small> Remarks			
<input type="button" value="Submit"/>			

Project Title: Enter title for the project (this should be short and simple to identify the project).

Cause: Climate Change (Default)

Division: Select applicable division from the drop-down list. By definition enablers refer to those projects/programmes which focus on enhancing capacities of systems and societies to mitigate/adapt to the associated climate change, while achieving sustainable development, eradicating poverty and reducing inequalities. These can include finance/technological innovations, strengthening of policy instruments in a country etc.

Sector: Select the sector from the drop-down list.

Sub-Sector: Select the sub-sector from the drop-down list.

Implementing Agency: Enter the name of implementation agency (keep the name short and consistent).

Executing Agency: Enter other party involved in the project implementation/financing etc.

Lifetime (years): Enter operational lifetime of the project. By definition lifetime refers to the length of the time that a equipment, machinery, construction work etc. established is expected to function and after that period it will fail or stop working.

Commissioning Date (Actual/Expected): Enter actual/expected date of effectiveness for the project.

Project End Date: Enter end date for the project.

Financial Closure Date: Enter financial closure date for the project. By definition it refers to the date on which the total expenditure, sources of revenue and how this revenue will be spent are finalized and signed, for successful completion of the particular project/action.

Part of NAP/NAPA/NAMA: Select appropriate option from the drop-down list.

Included in NDC: Select 'Yes' or 'No' from the drop-down list.

Project Location: Select location of the project from the drop-down list.

State/District/City: Enter the name of state/district/city in the text box.

Geo Coordinates: Enter the geographical coordinates (latitude and longitude) of project activity site.

Source of Funding: Select the source of funding for the project from the drop-down list.

Project Cost (USD): Enter value for the project cost.

Project Cost (SSP): Enter value for project cost in SSP.

Remarks: Enter comments/observations if there related to project.

User should provide information for all the identifiers marked with asterisk (*) for successful submission of a project.

User need to submit the project data in the database using 'Submit' button and a unique project Id is created at the backend.

5. Mitigation Actions Module

The Mitigation Action Tracking Module focus on both project implementation and operation phase. The bottom-up approach is applied to develop a comprehensive and integrated system considering the unique requirement of a country. However, this is being developed as a living framework and shall be updated on periodic basis or as and when required. It is important to integrate the existing national processes for project monitoring with the new tool to avoid duplication and maximize the use of resources. The module will allow for efficient integration and strengthening between what exists and what is expected be developed. Importantly, appropriate monitoring indicators and parameters (e.g., raw data needs) will be identified and monitored at either the mitigation action level, or at the sub-sector level.

5.1 Mitigation Actions - Project Information

To initiate the Mitigation action monitoring, user needs to include the baseline project information in the database against which NDC mitigation action project can be tracked/monitored.

FIGURE 5.1: MITIGATION ACTION PROJECT INFORMATION FORM

MITIGATION ACTION - PROJECT INFORMATION			
Project *	SS-012-6 Sample Waste to Energy project		
Mitigation Sector	Energy Supply/Electricity Generation	Mitigation Sub-Sector	Renewable Energy
Included in NDC	Yes	Project Location	City
Implementing Agency	UNDP	Executing Agency	
Contact Details	Ministries Road, Juba, South Sudan	Contact Details	
Project Cost (USD)	1512300.0	Source of Funding	Broad source funding
Project End Date	07-12-2030	Financial Closure Date	28-09-2015
Commissioning Date	08-12-2015	Lifetime (years)	30800.0
Expected GHG Savings (tCO ₂ e/ year) *	30800.0	Target GHGs *	CH4
Project Contributions *	Economic, Environmental, Gender and other Vulnerable Groups	Project Status *	Operational
Project Beneficiaries *	Local Residents	Gender Inclusiveness Assessment *	Yes
Expected Project Outputs *	Institutional capacity, public awareness and 3R improved	Project Impacts *	Positive
Registered With Market Based Mechanism *	Yes	Provide Weblink	https://cdm.unfccc.int/
Issuance of Carbon Benefits	Yes	Verification Status (rounds)	2
Part of NAP/NAPA/NAMA	NAMA		

Project: Select the projects already created (using Projects module) from the drop-down list.

Contact Details: User should provide key contact information such as address for the Implementing Agency as well as for Executing Agency if present.

Expected GHG Savings (tCO₂e/ year): Enter value for expected annual GHG emission reductions in the project.

Target GHGs: Select appropriate GHGs reduced by implementation of the project activity from the drop-down list.

Project Contributions: Select appropriate project contributions from the drop-down list.

Project Status: Select appropriate value for project status from the drop-down list.

Project Beneficiaries: Enter name of beneficiaries related to project activity.

Gender Inclusiveness Assessment: Select appropriate option from the drop-down list.

Expected Project Outputs: Enter name of expected project outputs related to project activity.

Project Impacts: Enter name of project impacts related to project activity.

Registered With Market Based Mechanism: Enter name of market-based mechanism for which the project activity is registered.

Provide Weblink: Enter URL of market-based mechanism for which the project activity is registered

Issuance of Carbon Benefits: Enter in brief if any type of carbon benefits is issued.

Verification Status (rounds): Enter value for verification rounds conducted in relation to issuance of carbon benefits.

FIGURE 5.2: MITIGATION ACTION PERFORMANCE INDICATOR FORM

PERFORMANCE INDICATORS														
Indicator	Unit	Value	Reference	Select										
Annual electricity generation	MWh	17827		<input type="checkbox"/>										
delete row														
Add Performance Indicator <table border="1"> <tr> <td>Performance Indicator</td> <td>Unit</td> <td>Value</td> <td>Reference</td> <td>Add</td> </tr> <tr> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td>Add</td> </tr> </table>					Performance Indicator	Unit	Value	Reference	Add	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Add
Performance Indicator	Unit	Value	Reference	Add										
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Add										

Use this section to add new performance indicators data

Performance Indicator: Enter name of performance indicator to monitored for project activity.

Unit: Enter name of unit in which the performance indicator to be measured and monitored for project activity.

Value: Enter expected value for the performance indicator to be measured and monitored for project activity.

Add: Click on the 'Add' button to insert performance indicator data.

User need to submit the project information data using submit button.

5.2 Mitigation Actions - Monitoring Information

To track the NDC Mitigation action user need to enter the monitoring data on annual basis.

FIGURE 5.3: MITIGATION ACTION MONITORING INFORMATION FORM

MITIGATION ACTION - MONITORING INFORMATION	
Project *	SS-012-6 Sample Waste to Energy project
Monitoring Year *	2015
Mitigation Sector	Energy Supply/Electricity Generation
Included in NDC	Yes
Implementing Agency	UNDP
Contact Details	Ministries Road, Juba, South Sudan
Project Cost (USD)	1512300.0
Project End Date	07-12-2030
Commissioning Date	08-12-2015
Lifetime (years)	
Project Contributions	Economic, Environmental, Gender and other Vulnerable Groups
Project Beneficiaries	Local Residents
Expected Project Outputs	Institutional capacity, public awareness and 3R improved
Actual GHG Savings (tCO ₂ e/ year) *	24600.0
Registered With Market Based Mechanism	No
Issuance of Carbon Benefits	
Mitigation Sub-Sector	Renewable Energy
Project Location	City
Executing Agency	
Contact Details	
Source of Funding	Broad source funding
Financial Closure Date	28-09-2015
Part of NAP/NAPA/NAMA	NAMA
Target GHGs	CH4
Project Status	Operational
Gender Inclusiveness Assessment	Yes
Project Impacts	Positive
Provide Weblink	
Verification Status (rounds)	

Project: Select the project from the drop-down list.

Monitoring Year: Select monitoring year from the drop-down list.

Actual GHG Savings (tCO₂e/ year): Enter value for actual annual GHG emission reductions for the project.

FIGURE 5.4: MITIGATION ACTION PERFORMANCE INDICATOR MONITORING FORM

PERFORMANCE INDICATORS			
Indicator	Unit	Value	Data Source
Annual electricity generation	MWh	17470	monitoring report

Value (Performance Indicator): Enter actual value for the performance indicator measured and monitored for project activity.

User need to submit the project monitoring data using submit button.

6. Adaptation Actions Module

The Adaptation action tracking module will follow similar bottom-up approach and methodology as for GHG inventory and Mitigation Action Tracking. Adaptation module shall perform tracking both for qualitative as well as quantitative information.

6.1 Adaptation Actions - Project Information

FIGURE 6.1: ADAPTATION ACTION - PROJECT INFORMATION FORM

ADAPTATION ACTION - PROJECT INFORMATION			
Project Id*	SS-011-3 Strengthening the Capacity of Government and Communities in South Sudan to Adapt to Climate Cha...		
Adaptation Sector	Agriculture Livestock and Fisheries	Adaptation Sub-Sector	Livestock
Included in NDC	Yes	Part of NAP/NAPA/NAMA	NAPA
Implementing Agency	UNDP	Executing Agency	Ministry of Environment and Forestry
Project End Date	15-01-2021	Financial Closure Date	15-01-2021
Commissioning Date	15-01-2020	Lifetime (years)	1.0
NDP Objective Coverage*	Enhance value addition in key growth opportunities		
NDP Coverage*	Development Plan Implementation		

* Mandatory Field

Project Id: Select the projects already created and stored in the database from the drop-down list.

NDP Objective Coverage: Select NDP objective from drop-down list. Following objectives are included:

- Enhance value addition in key growth opportunities
- Strengthen the private sector to create jobs
- Consolidate and increase the stock and quality of productive infrastructure
- Enhance the productivity and social wellbeing of the population
- Strengthen the role of the state in guiding and facilitating development

NDP Coverage: Select NDP coverage from drop-down list. Following NDP coverage area are included:

- Agro-Industrialization
- Mineral-based Industrialization
- Petroleum Development
- Tourism Development
- Water, Climate Change and ENR Management
- Private Sector Development
- Manufacturing
- Digital Transformation

- Integrated Transport Infrastructure and Services
- Sustainable Energy Development
- Sustainable Urban and Housing Development
- Human Capital Development
- Community Mobilization and Mindset Change
- Innovation, Technology Development and Transfer
- Regional Development
- Governance and Security
- Public Sector Transformation
- Development Plan Implementation
- Climate Hazard

By clicking on the priority area name (agriculture, livestock and fisheries, water, energy, health, human settlements, disaster risk reduction, tourism and recreation, industry and infrastructure, ecosystem, environment and biodiversity conservation and others) qualitative and quantitative questionnaire form will be displayed for each priority area.

Qualitative Impact

FIGURE 6.2: QUALITATIVE IMPACT FORM

The screenshot shows a user interface for a questionnaire. At the top, there are five tabs: 'Agriculture, Livestock, and Fisheries' (highlighted in red), 'Water', 'Energy', 'Health', and 'Other Adaptation Impacts'. Below the tabs, a red header bar contains the text 'AGRICULTURE, LIVESTOCK, AND FISHERIES'. Underneath this, a section titled 'Qualitative Impact' is expanded, showing a list of questions for the 'Agriculture' category. Each question has a dropdown menu next to it labeled '-Select-'.

Question	Dropdown Options
Does the action enhance crop productivity?	-Select-
Does the action diversify livelihoods to adjust to a changing climate?	-Select-
Does the action promote the transition to clean cooking with alternative clean fuels in urban areas; and clean biomass (charcoal and wood) cookstoves and alternatives in rural areas?	-Select-
Does the action improve digital marketing?	-Select-
Does the action improve land productivity and promote alternatives to livelihoods?	-Select-
Does the action improve watershed management?	-Select-

Qualitative Impact: Click on 'Qualitative Impact' to expand the section for questionnaire.

User can select 'Yes/No/Not Applicable' as preferred from the drop-down list against each qualitative indicator.

Quantitative Impact

FIGURE 6.3: QUANTITATIVE IMPACT FORM

The screenshot shows the 'QUANTITATIVE IMPACT FORM' interface. At the top, there are tabs for Agriculture, Livestock, and Fisheries; Water; Energy; Health; and Other Adaptation Impacts. The 'Agriculture, Livestock, and Fisheries' tab is active. Below it, under the heading 'AGRICULTURE, LIVESTOCK, AND FISHERIES', there are two main sections: 'Qualitative Impact' and 'Quantitative Impact'. The 'Quantitative Impact' section is expanded, showing three sub-sections: 'Agriculture', 'Number of farmers with crop insurance' (with a baseline data input field containing '100000'), 'Number of farmers accessing agriculture input subsidies' (with a baseline data input field containing '50000'), and 'Number of institutions harvesting water' (with a baseline data input field containing '50'). Each input field has a 'Data Source' dropdown and a 'Detailed Project Report' link.

Quantitative Impact: Click on 'Quantitative Impact' to expand the section for questionnaire.

Baseline Data: Enter baseline data for the respective quantitative assessment.

Data Source: Enter reference for baseline data of respective quantitative assessment.

User need to submit the project information data using submit button.

6.2 Adaptation Actions – Monitoring Information

FIGURE 6.4: ADAPTATION ACTION - MONITORING INFORMATION FORM

The screenshot shows the 'ADAPTATION ACTION - MONITORING INFORMATION' form. At the top, there are tabs for Agriculture, Livestock, and Fisheries; Water; Energy; Health; and Other Adaptation Impacts. The 'Agriculture, Livestock, and Fisheries' tab is active. Below it, under the heading 'AGRICULTURE, LIVESTOCK, AND FISHERIES', there are two main sections: 'Monitoring Year' (set to 2012) and 'Monitored Data'. The 'Monitored Data' section contains three sub-sections: 'Number of farmers with crop insurance' (with a monitored data input field containing '60000'), 'Number of farmers accessing agriculture input subsidies' (with a monitored data input field containing '6700'), and 'Number of institutions harvesting water' (with a monitored data input field containing '12'). Each input field has a 'Data Source' dropdown and a 'Detailed Project Report' link. A note at the bottom left indicates '* Mandatory Field'.

Project Id: Select the projects already created and stored in the database from the drop-down list.

Monitoring Year: Select monitoring year from the drop-down list.

Monitored Data: Enter value for actual data for the respective quantitative assessment.

Data Source: Enter references for data of respective quantitative assessment.

By clicking on the priority area name (agriculture, livestock and fisheries, water, energy, health, human settlements, disaster risk reduction, tourism and recreation, industry and infrastructure, ecosystem, environment and biodiversity conservation and others) quantitative assessment form will be displayed for respective priority area.

User need to submit the project monitoring data using submit button.

7. Climate Finance Module

The Climate Finance Flow Module has been designed to cater both domestic and international Climate Finance Tracking requirements. Climate Finance Flow Tracking Sub-Module can be accessed through the Home Page or Dashboard. On the left-hand side of the Dashboard, you would see the Climate Finance Sub-Module tab which you shall use to navigate the system and access different functionality.

FIGURE 7.1: CLIMATE FINANCE MODULE MENU NAVIGATION

The screenshot shows the 'GHG INVENTORY & NDC ACTION DASHBOARD'. On the left, a sidebar menu is open, showing various options like GHG Inventory, Projects, Mitigation Actions, Adaptation Actions, and Climate Finance. The 'CLIMATE FINANCE' option is highlighted with a red box, and its sub-options 'Project Information' and 'Monitoring Information' are visible. The main dashboard area displays several cards with climate data:

- GHG INVENTORY (2021)**: 31967.0 tCO₂e
- GHG REDUCTION EXPECTED ***: 30800.0 tCO₂e
- GHG REDUCTION ACHIEVED ***: 24600.0 tCO₂e
- ACTIONS UNDERTAKEN ***: 9
- BUDGET ALLOCATED ***: USD 858000.0
- BUDGET SPENT ***: USD 393100.0
- MITIGATION ACTIONS ***: 2
- ADAPTATION ACTIONS ***: 5
- CROSS CUTTING ACTIONS ***: 1

* data till date and as on (Thu Feb 03 13:09:35 UTC 2022)

7.1 Climate Finance - Project Information

This sub-module is used to enter the planned financial data related with NDC action/project. This sub-module has four components:

7.1.1 Project Details

FIGURE 7.2: CLIMATE FINANCE - PROJECT DETAILS FORM

The screenshot shows the 'CLIMATE FINANCE - PROJECT INFORMATION' form. At the top, there is a dropdown for 'Project*' containing 'SS-012-6|Sample Waste to Energy project'. Below this, there are four tabs: 'Project Details', 'Financial Flow', 'Detailed Budget', and 'Disbursement Year'. The 'Project Details' tab is active and contains the following fields:

Financial Year*	2015	Applied Exchange Rate (SSP/USD)*	130
Financing Mode*	On Budget	Budget Code*	MoE002
Project End Date	07-12-2030	Financial Closure Date	28-09-2015
Commissioning Date	08-12-2015		

* Mandatory Field

Project: Select the projects already created and stored in the database from the drop-down list.

Financial Year: Enter value for the financial year. (e.g., 2021-22)

Applied Exchange Rate: Enter value for the applicable exchange rate.

Financing Mode: Select the financing mode from the drop-down list.

Budget Code: Enter the value as per the climate finance budgetary reporting.

7.1.2 Financial Flow

FIGURE 7.3: CLIMATE FINANCE - FINANCIAL FLOW FORM

Funding Type	National/International	Amount (USD)	Financing Channel	Funding Agency	Select
Loan-Concessional	International	1000000.0	Multilateral	AfDB	<input type="checkbox"/>

Delete Row

Add Row

Funding Type	National/International	Amount (USD)	Channel	Funding Agency	Add
-Select-	-Select-		-Select-		<input type="button" value="Add"/>

Project Size (million USD): Select the mode based on the project cost from the drop-down list.

Project Cost (USD): It gets auto populated after selection of a project.

National Budget (USD): Enter value for national budget if applicable.

Sub National Budget (USD): Enter value for sub-national budget if applicable.

Green Bonds (USD): Enter value for debt investment (if any) made for the project.

Others (USD): Enter value for other investment (if any) made for the project.

Sources of Finance

This section specifically enables users to record finances received from the multiple sources like World Bank, AfDB, EU AID etc. for the successful implementation of climate change project/action in the country.

Funding Type: Select type of funding for the project from drop-down list.

National/International: Select funding for the project is national/international from drop-down list.

Amount (USD): Enter value for amount funded for the project.

Channel: Select channel for funding of the project from drop-down list.

Funding Agency: Enter name of funding agency for the project.

Add: Click on 'Add' button to insert finance source data.

7.1.3 Detailed Budget

FIGURE 7.4: CLIMATE FINANCE - DETAILED BUDGET FORM

Project Details	Financial Flow	Detailed Budget	Disbursement Year																									
PROJECT COST BREAKDOWN <table border="1"> <thead> <tr> <th>Disbursement Category</th> <th>Amount (USD)</th> <th>Reference</th> <th>Select</th> </tr> </thead> <tbody> <tr> <td>Civil Work</td> <td>50000.0</td> <td>Financial Closure Statement</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Equipment & Machinery</td> <td>150000.0</td> <td>Financial Closure Statement</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Office Supplies</td> <td>10000.0</td> <td>Financial Closure Statement</td> <td><input type="checkbox"/></td> </tr> </tbody> </table> <p>Delete Row</p> <p>ADD CATEGORY</p> <table> <tr> <td>Disbursement Category</td> <td>Amount (USD)</td> <td>Reference</td> </tr> <tr> <td>-Select-</td> <td></td> <td></td> </tr> <tr> <td colspan="3">Add</td> </tr> </table>				Disbursement Category	Amount (USD)	Reference	Select	Civil Work	50000.0	Financial Closure Statement	<input type="checkbox"/>	Equipment & Machinery	150000.0	Financial Closure Statement	<input type="checkbox"/>	Office Supplies	10000.0	Financial Closure Statement	<input type="checkbox"/>	Disbursement Category	Amount (USD)	Reference	-Select-			Add		
Disbursement Category	Amount (USD)	Reference	Select																									
Civil Work	50000.0	Financial Closure Statement	<input type="checkbox"/>																									
Equipment & Machinery	150000.0	Financial Closure Statement	<input type="checkbox"/>																									
Office Supplies	10000.0	Financial Closure Statement	<input type="checkbox"/>																									
Disbursement Category	Amount (USD)	Reference																										
-Select-																												
Add																												

Disbursement Category: Select relevant disbursement category from drop-down list.

Amount (USD): Enter value for amount funded for disbursement category.

Add: Select 'Add' button to insert detailed budget data.

7.1.4 Disbursement Year

FIGURE 7.5: CLIMATE FINANCE - DISBURSEMENT SCHEDULE FORM

Project Details	Financial Flow	Detailed Budget	Disbursement Year																						
DISBURSEMENT SCHEDULE <table border="1"> <thead> <tr> <th>Disbursement Year</th> <th>Amount (USD)</th> <th>Reference</th> <th>Select</th> </tr> </thead> <tbody> <tr> <td>2015</td> <td>245000.0</td> <td>Financial closure statement</td> <td><input type="checkbox"/></td> </tr> <tr> <td>2016</td> <td>500000.0</td> <td>Financial closure statement</td> <td><input type="checkbox"/></td> </tr> <tr> <td>2017</td> <td>450000.0</td> <td>Financial closure statement</td> <td><input type="checkbox"/></td> </tr> </tbody> </table> <p>Delete Row</p> <p>ADD YEAR</p> <table> <tr> <td>Year</td> <td>Amount (USD)</td> <td>Reference</td> </tr> <tr> <td>-Select-</td> <td></td> <td></td> </tr> </table> <p>Add</p>				Disbursement Year	Amount (USD)	Reference	Select	2015	245000.0	Financial closure statement	<input type="checkbox"/>	2016	500000.0	Financial closure statement	<input type="checkbox"/>	2017	450000.0	Financial closure statement	<input type="checkbox"/>	Year	Amount (USD)	Reference	-Select-		
Disbursement Year	Amount (USD)	Reference	Select																						
2015	245000.0	Financial closure statement	<input type="checkbox"/>																						
2016	500000.0	Financial closure statement	<input type="checkbox"/>																						
2017	450000.0	Financial closure statement	<input type="checkbox"/>																						
Year	Amount (USD)	Reference																							
-Select-																									

Year: Select disbursement year from drop-down list.

Amount (USD): Enter value for amount disbursed.

Click on 'Add' button to insert disbursement schedule data.

User need to submit the project information data using submit button.

7.2 Climate Finance - Monitoring Information

FIGURE 7.6: CLIMATE FINANCE MONITORING INFORMATION FORM

CLIMATE FINANCE - MONITORING INFORMATION																																										
Project*	SS-012-6/Sample Waste to Energy project																																									
Monitoring Year*	2015	Financial Year	2015																																							
Applied Exchange Rate	130.0	Financing Mode	On Budget																																							
Budget Code	MtE002	Project End Date	07-12-2030																																							
Financial Closure Date	28-09-2015	Commissioning Date	08-12-2015																																							
<small>*Mandatory Field</small>																																										
DISBURSEMENT DETAILS <table border="1"> <thead> <tr> <th rowspan="2">Disbursement Category</th> <th colspan="4">Amount (USD)</th> <th rowspan="2">Reference</th> <th rowspan="2">Select</th> </tr> <tr> <th>Q1</th> <th>Q2</th> <th>Q3</th> <th>Q4</th> </tr> </thead> <tbody> <tr> <td>Civil Work</td> <td>45000.0</td> <td>30000.0</td> <td>70000.0</td> <td>3000.0</td> <td>Invoice</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Equipment & Machinery</td> <td></td> <td></td> <td></td> <td>80000.0</td> <td>Invoice</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Office Supplies</td> <td>600.0</td> <td>250.0</td> <td>0.0</td> <td>300.0</td> <td>Invoice</td> <td><input type="checkbox"/></td> </tr> </tbody> </table> <p>Delete row</p> <p>ADD ROW</p> <table> <tr> <td>Disbursement Category</td> <td>-Select-</td> <td>Add</td> </tr> </table>								Disbursement Category	Amount (USD)				Reference	Select	Q1	Q2	Q3	Q4	Civil Work	45000.0	30000.0	70000.0	3000.0	Invoice	<input type="checkbox"/>	Equipment & Machinery				80000.0	Invoice	<input type="checkbox"/>	Office Supplies	600.0	250.0	0.0	300.0	Invoice	<input type="checkbox"/>	Disbursement Category	-Select-	Add
Disbursement Category	Amount (USD)				Reference	Select																																				
	Q1	Q2	Q3	Q4																																						
Civil Work	45000.0	30000.0	70000.0	3000.0	Invoice	<input type="checkbox"/>																																				
Equipment & Machinery				80000.0	Invoice	<input type="checkbox"/>																																				
Office Supplies	600.0	250.0	0.0	300.0	Invoice	<input type="checkbox"/>																																				
Disbursement Category	-Select-	Add																																								
<p>Remarks</p> <div style="border: 1px solid #ccc; height: 40px; width: 100%;"></div> <p>Submit</p>																																										

Project: Select the projects already created and stored in the database from the drop-down list.

Monitoring Year: Select monitoring year from drop-down list.

Disbursement Category: Select relevant disbursement category from drop-down list.

Click on 'Add' button to insert disbursement category in 'disbursement details' form.

Amount (USD): Enter value for disbursed amount under appropriate quarter of monitoring year.

User need to submit the project monitoring data using submit button.

8. SDG Assessment Module

SDG assessment module has been developed and integrated with this tool to help a broad range of stakeholders in managing the design, development, implementation, financing, measurement, reporting and verification of the various type of actions. This will enable the stakeholders to identify significant impacts, define indicators, quantify impacts and set targets and track the progress of the actions towards the NDCs.

For consistency with internationally accepted definitions, the terminologies used in this tool were aligned with the definitions of the Initiative for Climate Action and Transparency (ICAT): <http://www.climateactiontransparency.org/about/>. This tool is based on UNDP CAIT tool <https://climateimpact.undp.org/> and uses a bottom-up tool that can be applied to track 'significant, direct impacts' of actions. For more information or clarification on SDGs, please refer the UNDP website: <https://www.undp.org/content/undp/en/home/sustainable-development-goals.html>

The tool focuses on consolidating the direct impacts resulting from a proposed action. The tool provides the flexibility to the user to define what impact can be considered significant and direct – and is an outcome (short-term or long term, intended or unintended) of the proposed action. The 5 principles below provide the users with a basis for decision making.

Principle	Description
Relevance	Ensure the assessment appropriately reflects the sustainable development impacts of the policy or action and serves the decision-making needs of users and stakeholders, both internal and external to the reporting entity. Applying the principle of relevance depends on the objectives of the assessment, broader policy objectives, national circumstances, and stakeholder priorities.
Completeness	Include all significant impacts in the assessment boundary. Disclose and justify any specific exclusions.
Consistency	Use consistent accounting approaches, data collection methods, and calculation methods to allow for meaningful performance tracking over time. Transparently document any changes to the data, assessment boundary, methods, or any other relevant factors in the time series.
Transparency	Provide clear and complete information for internal and external reviewers to assess the credibility and reliability of the results. Disclose all relevant methods, data sources, calculations, assumptions, and uncertainties. The information should be sufficient to enable a party external to the assessment process to derive the same results if provided with the same source data.
Accuracy	Ensure that the estimated impacts are systematically neither over nor under actual values as far as can be judged and that uncertainties are reduced as far as practicable. Achieve decisions with reasonable confidence as to the integrity of the reported information. Accuracy should be pursued as far as possible, but once uncertainty can no longer be practically reduced, conservative estimates should be used.

Moreover, the tool provides an assessment criterion to decide whether the impact is significant enough to warrant additional information. The significance is based on the following criteria:

- Define the likelihood that an impact will occur; and
- The expected magnitude of each impact.

For likelihood, the tool uses a 5-point scale as below:

Likelihood	Description
Very likely	Reason to believe the effect will happen (or did happen) as a result of the action. (For example, a probability in the range of 90-100%).
Likely	Reason to believe the effect will probably happen (or probably happened) as a result of the action. (For example, a probability in the range of 66-90%).
Possible	Reason to believe the effect may or may not happen (or may or may not have happened) as a result of the action. About as likely as not. (For example, a probability in the range of 33-66%).
Unlikely	Reason to believe the effect will probably not happen (or probably did not happen) as a result of the action. (For example, a probability in the range of 10-33%).
Very unlikely	Reason to believe the effect will not happen (or did not happen) as a result of the action. (For example, a probability in the range of 0-10%).

For magnitude, the tool uses a 3-point scale as below:

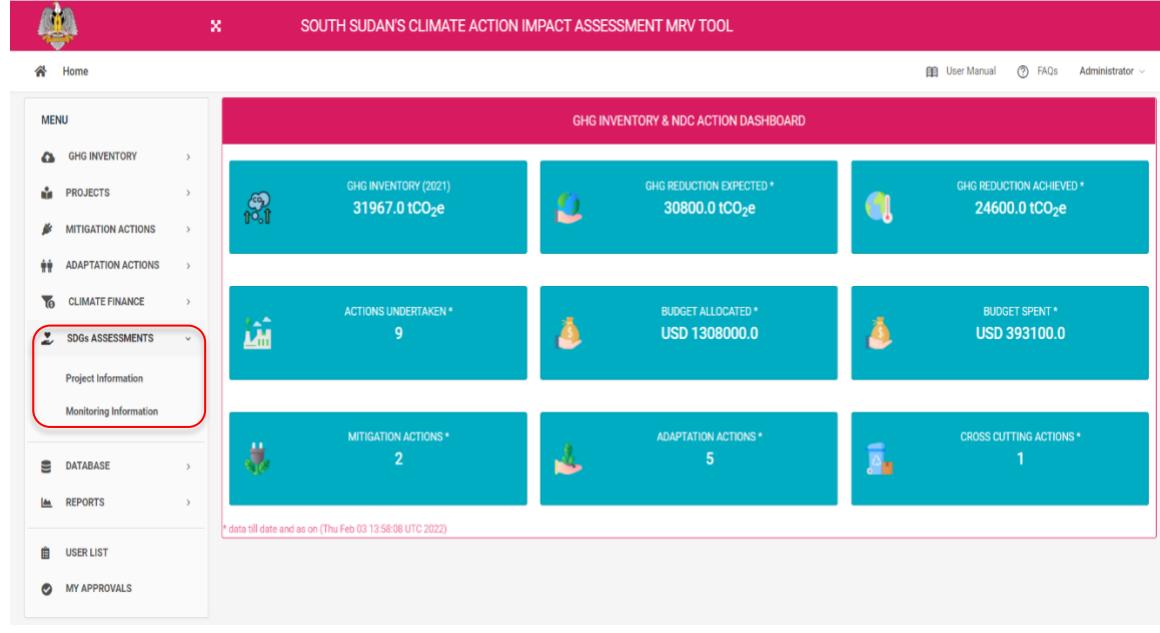
Magnitude	Description
Major	The change in the impact category is likely to be significant in size (either positive or negative).
Moderate	The change in the impact category could be significant in size (either positive or negative).
Minor	The change in the impact category is expected to be insignificant in size (either positive or negative).

Based on the above consideration, the tool then determines whether the impact is significant and will then require the user to provide additional information in the form of a quantitative data (e.g. quantitative targets a basis to track the progress of the implementation of the action through an MRV system).

The Sustainable Development Goals (SDGs) module can be accessed through the Home Page or Dashboard. On the left-hand side of the Dashboard, you would see the SDG

Assessment of the system which you shall use to navigate the system and access different functionality.

FIGURE 8.1: SDG ASSESSMENT MODULE NAVIGATION FROM HOME SCREEN



8.1 SDG Assessment - Project Information

This sub-module allows user to provide basic project information and baseline/expected SDG benefits for the already created projects. The input screen includes following:

FIGURE 8.2: SDG ASSESSMENT - PROJECT INFORMATION FORM

SDG ASSESSMENT - PROJECT INFORMATION

Project Id: SS-012-6|Sample Waste to Energy project

Describe environmental and social screening approach, identified risks and management approach (if conducted): ESA conducted as per the requirements of National EIA legislation act,2006 and World Bank Operational Policies (OP 4.01 and others as applicable)

Stakeholder Consultation	Poverty Reduction	Reducing Inequality	Gender Parity	Other SDG Impacts

STAKEHOLDER INPUTS

Stakeholder Feedback

Government

Strengths	Affordable and Clean energy for all	Opportunities	Contribution to national energy security measures
Weakness	Use of imported equipments	Threats	Impact due to natural calamities

Project Id: Select the projects already created and stored in the database from the drop-down list.

Describe environmental and social screening approach, identified risks and management approach (if conducted): If Social and environmental risk screening conducted then user should describe screening approach, identified risks, and management approach. (Please refer following weblink for more information on UNDP's Social and Environmental Standards

<https://www.undp.org/content/undp/en/home/librarypage/operations1/undp-social-and-environmental-standards.html>

Stakeholder Feedback: Click on 'Stakeholder Feedback' to expand the section for various stakeholders. Following stakeholder are included:

- Government
- Private Sector
- NGOs
- Civil Society
- Direct Beneficiaries
- Others

By clicking on the stakeholder's name feedback form with four sections viz. Strengths, Opportunities, Weakness and Threats will be displayed for respective stakeholder. User can enter feedback summary in these sections for respective stakeholder.

SDG Benefits

User should click on the SDG benefit name tab, so that qualitative and quantitative questionnaire form will be displayed for respective SDG benefit.

FIGURE 8.3: SDG ASSESSMENT - QUALITATIVE IMPACT FORM

Qualitative Impact: Click on 'Qualitative Impact' to expand the section for questionnaire.

Likelihood: Select type of likelihood from the drop-down list for the respective question.

Impact: Select magnitude of impact from the drop-down list for the respective question.

FIGURE 8.4: SDG ASSESSMENT - QUANTITATIVE IMPACT FORM

SDG ASSESSMENT - PROJECT INFORMATION

Project Id: SS-012-6|Sample Waste to Energy project

Describe environmental and social screening approach, identified risks and management approach (if conducted): ESA conducted as per the requirements of National EIA legislation act,2006 and World Bank Operational Policies (OP 4.01 and others as applicable)

Stakeholder Consultation, Poverty Reduction, Reducing Inequality, Gender Parity, Other SDG Impacts

GENDER PARITY

- + Qualitative Impact
- Quantitative Impact

Number of women employed under the action

Data:	40	Data Source:	Detailed project report
-------	----	--------------	-------------------------

Number of women trained under the action

Data:	200	Data Source:	Detailed project report
-------	-----	--------------	-------------------------

Quantitative Impact: Click on 'Quantitative Impact' to expand the section for assessment.

Data: Enter value for actual data for the respective quantitative assessment.

Data Source: Enter references for data of respective quantitative assessment.

You need to submit the project information data using submit button.

8.2 SDG Assessment - Monitoring Information

Once project information submitted, the database file created for each project and monitoring information are being mapped against the project baseline information. Monitoring for the SDG shall be carried out on an annual basis or as situated to the MRV Team. Annual monitoring of the mapped SDG benefits from the climate actions (qualitative and quantitative information) over period of time will be entered by the user in this sub-module. The input screen includes following:

FIGURE 8.5: SDG ASSESSMENT MONITORING INFORMATION FORM

The form is titled "SDG ASSESSMENT - MONITORING INFORMATION". It includes fields for "Project Id" (SS-012-6|Sample Waste to Energy project) and "Monitoring Year" (2015). Below these are five tabs: "Poverty Reduction", "Reducing Inequality", "Gender Parity" (selected), "Infrastructure, Innovation, Industry", and "Other SDG Impacts". A section titled "GENDER PARITY - MONITORED DATA" contains two entries: "Number of women employed under the action" (Data: 10, Data Source: Detailed project report) and "Number of women trained under the action" (Data: 45, Data Source: Detailed project report).

Project Id: Select the projects already created and stored in the database from the drop-down list.

Monitoring Year: Select year for which monitoring data is to be submitted from the drop-down list.

Data: Enter value for actual data for the respective quantitative assessment.

Data Source: Enter references for data of respective quantitative assessment.

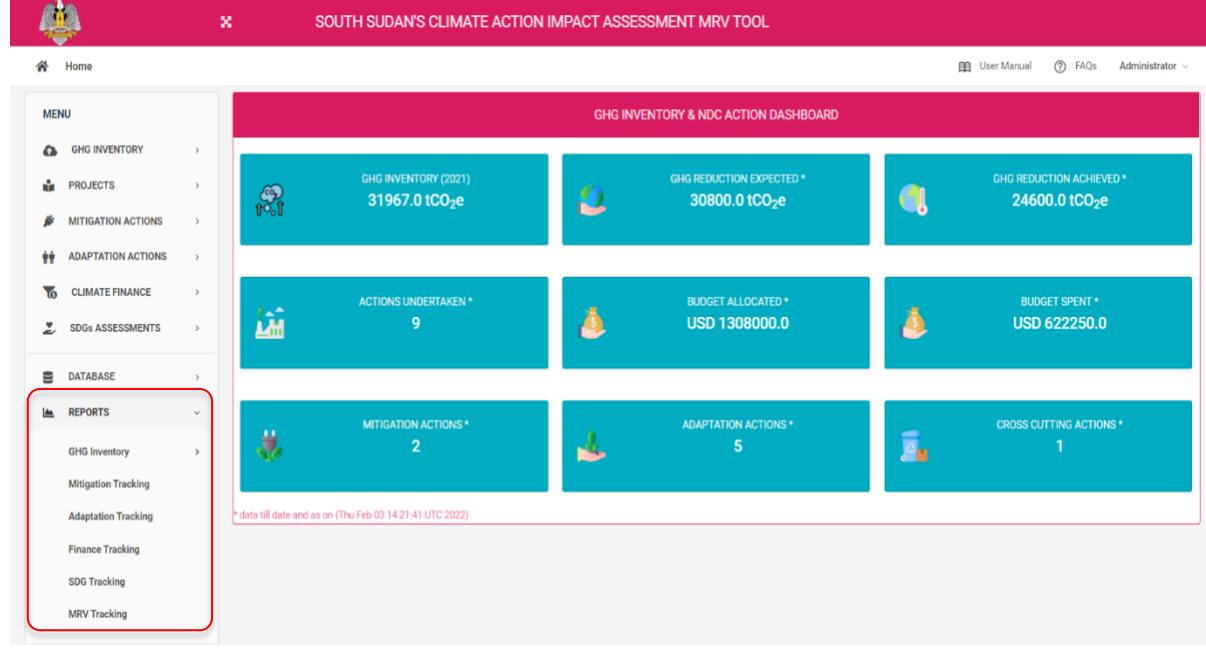
User should click on the SDG benefit name tab, so that quantitative assessment form will be displayed for respective SDG benefit.

You need to submit the project monitoring data using submit button.

9. Reports

The integrated MRV Tool has in-built reporting template for sectors and institutions. The reporting templates are designed considering the domestic and international reporting requirements as per ETF.

FIGURE 9.1: REPORTS NAVIGATION ON MENU SECTION



9.1 Reports - GHG Inventory

This Report Module of MRV Tool provides the result and Output for the national GHG Inventory.

FIGURE 9.2: GHG INVENTORY REPORT - USER INPUT SCREEN

Select Inventory Years: Select from and to year for which report has to be generated from the drop-down list.

Select Inventory Unit: Select inventory unit from the drop-down list.

User should click on 'Get Report' to see the GHG inventory report for selected inventory year.

9.2 Reports - Mitigation Tracking

On the left-hand side of the Dashboard, you would see the Reports section in which you shall navigate to Mitigation Tracking for accessing the report. User should select year from the drop-down list and click on 'Get Report' to see the Mitigation tracking report for selected year.

FIGURE 9.3: MITIGATION ACTION TRACKING REPORT - USER INPUT SCREEN

MITIGATION ACTION TRACKING REPORT ()

Select Year

2012

Get Report

9.3 Reports – Adaptation Tracking

On the left-hand side of the Dashboard, you would see the Reports section in which you shall navigate to Adaptation Tracking for accessing the report. User should select category from the drop-down list and click on ‘Get Report’ to see the Adaptation tracking report for selected category.

FIGURE 9.4: ADAPTATION TRACKING REPORT - USER INPUT SCREEN

Adaptation Tracking Report

Select Category

Agriculture, Forestry, Water

Get Report

9.4 Reports – Finance Tracking

This functionality is used to generate Finance tracking reports. On the left-hand side of the Dashboard, you would see the Reports section in which you shall navigate to Finance Tracking for accessing the report. User should select year from the drop-down list and click on ‘Get Report’ to see the Finance tracking report for selected year.

FIGURE 9.5: CLIMATE FINANCE TRACKING REPORT - USER INPUT SCREEN

CLIMATE FINANCE TRACKING REPORT ()

Select Year

2012

Get Report

9.5 Reports – SDG Tracking

On the left-hand side of the Dashboard, you would see the Reports section in which you shall navigate to SDG Tracking for accessing the report. User should select category from the drop-down list and click on ‘Get Report’ to see the SDG tracking report for selected category.

FIGURE 9.6: SDG TRACKING REPORT - USER INPUT SCREEN

SDG Tracking Report

Select Category

Poverty Reduction, Food Security and Hunger, Water and Sanitation

Get Report

9.6 Reports - MRV Tracking

On the left-hand side of the Dashboard, you would see the Reports section in which you shall navigate to MRV Tracking for accessing the report. User should select project from the drop-down list and select 'Get Report' to see the MRV tracking report of the project. This includes basic project details, mitigation summary for mitigation project, adaptation summary for adaptation project, finance summary and SDG summary.

FIGURE 9.7: MRV REPORT - USER INPUT SCREEN

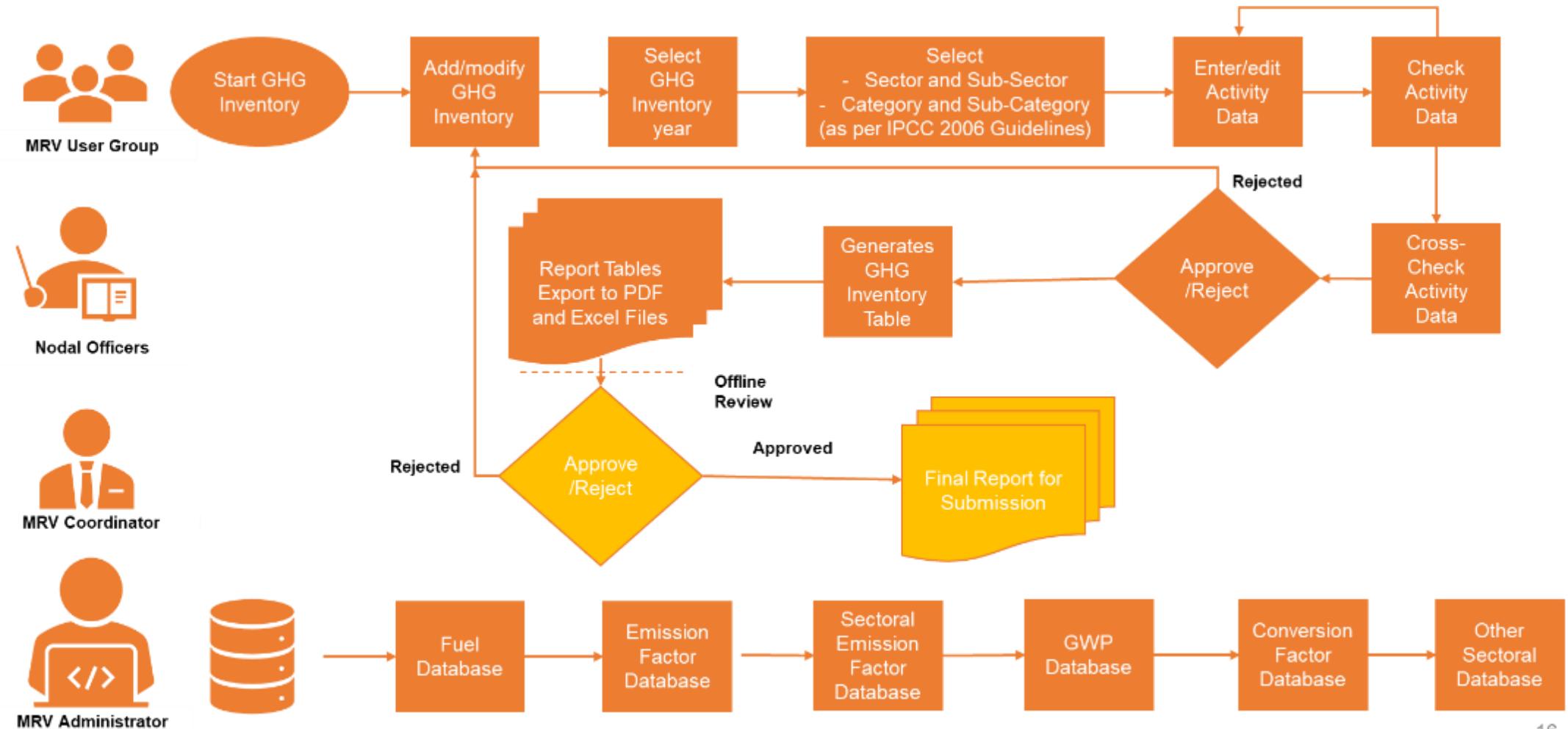
The screenshot shows the 'MRV REPORT' interface. At the top, there is a navigation bar with a dropdown labeled 'Project' set to 'SS-011-12|South Sudan Agriculture Program' and a 'Get Report' button. Below the navigation bar, there are five tabs: 'Project Details', 'Mitigation Summary', 'Adaptation Summary', 'Finance Summary', and 'SDG Summary'. The 'Project Details' tab is active. Under 'Project Details', there is a table with columns for 'Indicator' and 'Value'. The table contains the following data:

#	Indicator	Value
1	Project Title	South Sudan Agriculture Program
2	Project Cost (USD)	450000.0
3	Project Location	District
4	Implementing Agency	UNDP
5	Executing Agency	Local Government
6	Commissioning Date	2012-03-01
7	Operation Lifetime (years)	15.0

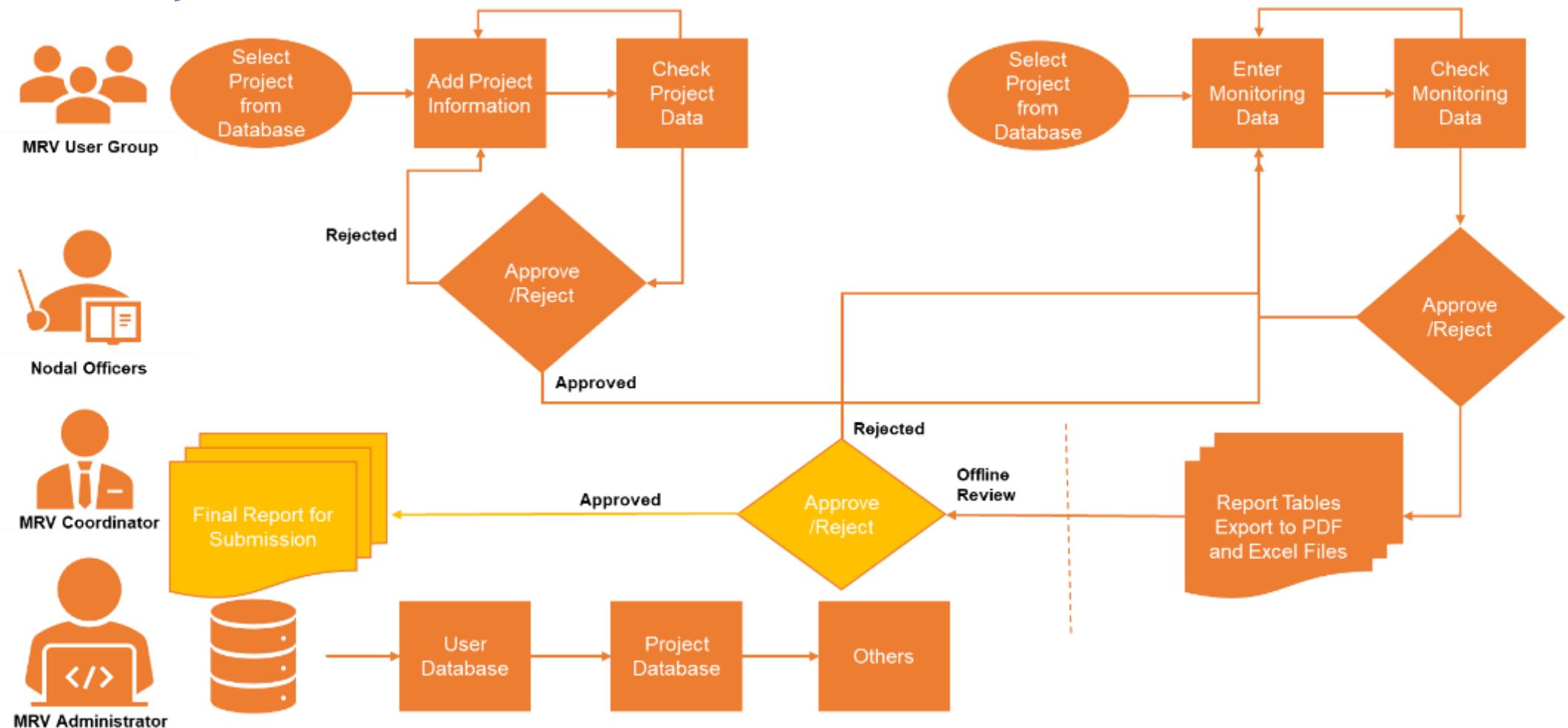
At the bottom of the table, it says 'Showing 1 to 7 of 7 entries'. There are also 'Export' and 'CSV PDF' buttons at the top right of the table area.

In all the above report sections, by clicking on 'Export' user can download report in CSV/PDF format.

MRV Tool - GHG Inventory Workflow (Illustrative)



MRV Tool - Climate Action Modules Workflow (Illustrative)



Contact Us

For more information or clarification, please write to Subbarao Consulting Services (SCS) Ltd.

At:

Subbarao Consulting Services (SCS) Ltd.

229 Highcliff Road, Shiel Hill, Dunedin 9013, New Zealand

Tel: +64 3 4544775; Mobile: +64 211638635

E-Mail: srikanth@subbaraoconsulting.com