



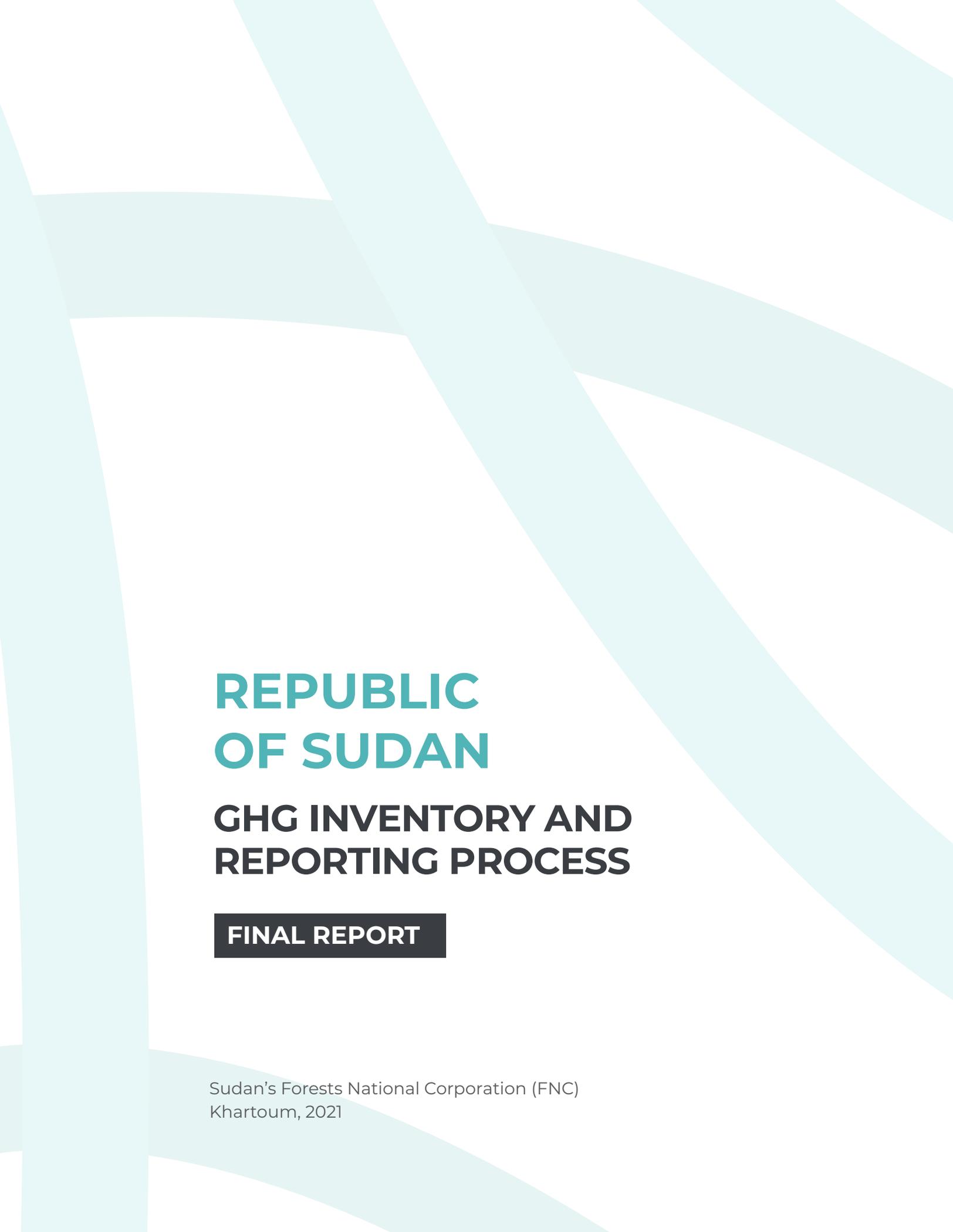
Food and Agriculture
Organization of the
United Nations

REPUBLIC OF SUDAN

GHG INVENTORY AND REPORTING PROCESS

FINAL REPORT





REPUBLIC OF SUDAN

GHG INVENTORY AND REPORTING PROCESS

FINAL REPORT

Sudan's Forests National Corporation (FNC)
Khartoum, 2021

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List of Acronyms

AFOLU	Agriculture, Forestry, and Other Land Uses
ARC	Agriculture Research Corporation
BUR	Biennial Update Report
CH₄	Methane
CO₂	Carbon Dioxide
FAO	Food and Agriculture Organization of the United Nations
FNC	Forests National Corporation
GHG	Greenhouse Gases
GIS	Geographic Information system
GPS	Global Positioning System
HCENR	Higher Council for Environment and Natural Resources
IPCC	Intergovernmental Panel on Climate Change
LUCF	Land Use Change and Forestry
MRV	Measurements, Reporting and Verification
N₂O	Nitrogen Oxide
NCs	National Communications
QA	Quality Assurance
QC	Quality Control
REDD	Reducing Emissions From Deforestation and Forest Degradation
RPGD	Range and Pasture General Directorate
RSSA	Remote Sensing and Seismology Authority
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

A technical agreement was signed between the Republic of Sudan and the Food and Agriculture Organization of the United Nations (FAO) for the provision of technical assistance for the implementation of support to design the Monitoring, Reporting and Verification (MRV) system in the framework of Reducing Emissions from Deforestation and Forest Degradation (REDD+) readiness in Sudan.

The objective of this study is to undertake institutional mapping, gap analysis and capacity needs assessment for the Greenhouse Gases Inventory (GHG-I) process for the purpose of development of National Communications (NCs), Biennial Update Reports (BURs) and (REDD+). This will help to support the design of (MRV) system in the framework of REDD+ readiness in Sudan.

Output 5 of the technical agreement included three main activities:

- Capacity assessment on land-use related GHG-Inventories and work plan development.
- Strengthen the GHG-Inventory process.
- Strengthen the GHG-Inventory team.

The implementation of component 5 started by formulation of GHG-I technical team comprising 20 members representing different institutions related to agriculture, forestry and rangeland (List of the technical team attached as an [Annex](#)). A two-day workshop was held on 30 May - 1 June 2019, at the premises of Forests National Corporation, Khartoum, with the objective of enhancing and facilitating the implementation of Output 5: Development of GHG inventory and reporting process for the AFOLU sector.

GHG inventory technical team formulated from different institutions to implementing output 5 attended the workshop. The workshop included many presentations in the following area:

- Climate change phenomena, causes and impact and the global response.
- Overview about the Greenhouse Gas inventory process and the cross cutting issues, and the commitments of Sudan towards the United Nations Framework Convention on Climate Change (UNFCCC) with the focus on the National Communication Reports prepared and Submitted by Sudan.
- National and institutional arrangements for the GHG inventory process.
- The GHG inventory for agriculture and forestry sector.

The workshop was ended with a way forward session discussed how output 5 will be implemented and what are the timelines and human workforces needed to achieve the targets.

The GHG-I technical team held eight regular meetings to report and discuss on work progress and new assignments for the groups. All the activities performed by the technical team were documented and reported.

2. Capacity assessment on land-use related GHG-Inventories and work plan development

This activity reviewed the past GHG-Inventories for the land-use sector as included in the official reporting to the UNFCCC. The available and required data was also assessed. A technical and functional capacity assessment was carried out to understand most urgent needs for capacity development. Work plan was developed along the lines of UNFCCC' submissions schedule.

The aims of this activity was:

- To develop consistent work plan for GHG-related activities in Sudan, considering the needs of the country and all processes. Facilitate workshops for stakeholders mapping; clarification of relevant Government authorities' rules and responsibilities for GHG-I reporting that serve the National Communications (NCs), Biennial Update Report(BUR) and REDD+ activities.
- To conduct additional trainings to (i) increase the knowledge on principles and requirements in line with IPCC guidelines (ii) augment practitioners' skills in the relevant ministries and institutions; (iii) enhance knowledge exchange and transfer through South-South Cooperation.

2.1 GHG data assessment

The technical team assigned to undertake this activity reviewed the data availability for the compilation of AFOLU GHG inventory under the First (HCENR, 2003), Second (HCENR, 2013), and the ongoing Third National Communication. The activity mainly included assessing data reliability, availability and gaps.

The following data gaps and challenges were identified:

- Several sources for the secondary data with low accuracy used to estimate GHG emissions for land use change and forestry. The low accuracy mainly attributed to the methodologies of data collection used by the institutions.
- Lack of data on soil, fertilizers and legume crops to estimate N₂O and CO₂ emissions from soil due to urea fertilizer application nor biological nitrogen fixation activities.
- Inaccurate areas under rice cultivation to estimate CH₄ emission. Land area data were collected from multiple sources with contradicting data and low reliability and consistency.
- Difficulties and limitations in soil data due to the diversity of ecological zones.
- Limited biomass data concerning:
 - Biomass fractions burned on site
 - Above-ground biomass carbon fraction burned in-situ
 - Annual growth rate of above-ground biomass
 - Shoot- root ratios for all forest tree species
 - Biomass left to decay
 - Annual growth rate of urban trees
 - The IPCC Guidelines definition and specification for source/sink categories, didn't suit Sudan's conditions and circumstances.
- Difficulty to develop land use change matrix due to lack of land use/cover maps in Sudan.

- Data on annual wood removals and annual volume of fuel wood removal are lacking.
- Lack of conversion factors to convert the different harvested wood products from local units to international units.
- No recent study to estimate per capita annual consumption of fuel wood.
- Lack of country-specific emission factors, only default emissions factors were used.
- Difficulties in obtaining accurate livestock data as there is no livestock census since 1976.
- Lacks of proportion number of animals kept within specific production systems for each ecological zone.
- Lack of cattle characterization and herd structure to be used according to 2006 IPCC software.
- Lack of data and information regarding the distributions of livestock types in different production systems under different ecological zones.
- Difficulties in obtaining estimates of the amount of animal manure for each livestock type based on feeding system and ecological zones.
- Lack of country-specific emission factors for different animal species.
- Challenges in obtaining the forest area subjected to wildfire, no fire monitoring system in Sudan.

2.2 Software limitations

The 2006 IPCC Software is used for the first time in Sudan. A lot of constraints and challenges were encountered in using the software. It is too detailed and required comprehensive sets of activity data which are difficult to be found in Sudan. Data availability and consistency is another challenge that confronts the GHG-I. The challenges and limitation can be summarized below:

- For agriculture sector - cropland rearing cropland, IPCC 2006 software dictate that the harvested area should be equal to or more than the cultivated areas. However, this is not the case especially in the rainfed agriculture sub-sector where the harvested area usually less than the cultivated area. This is also stands for the rice cultivation.
- To calculate N₂O emissions resulting from application of synthetic fertilizers, data available isn't consistent with the software.
- Sudan dominant species aren't included in the list of species presented in the software.
- Categorization by temperature didn't suit Sudan climatic conditions and distributions within different ecological zones; (the max temp used in the software is 28Co).

2.3 Capacity Building Needs:

- Development of database and information systems for agriculture and forestry sectors to ensure availability and proper archiving of required and needed data and information.
- Introducing of more accurate survey methods to estimate the different activity data (e.g. crop residue burning)
- Development of country-specific calculation worksheets to compile and compute GHG-I data.
- Mapping and evaluation of forest area affected by wildfire.
- Development of country specific emission factor for the key category sources.

2.4 GHG-Inventory Work Plan

Activity	Timeframe (Month)																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Communications with GHG-Inventory technical team.	█																	
Conduct training workshop for GHG-I methodologies and guidelines.	█																	
Identify Key source categories.		█																
Data collection process.		█	█	█	█	█	█	█	█									
Conduct QC check.		█	█	█	█	█	█	█	█									
Data entry in the worksheet (data documentation)										█								
Convene a training workshop on the software to be used for data computation and analysis.											█							
Conduct QA check											█	█						
Prepare first draft GHG-I sectoral reports.													█	█	█	█		
Convene validation workshop																	█	
Prepare the final GHG-I compiled report.																		█

3. Strengthening the GHG-Inventory Process:

The aim of this activity is to strengthen the preparation of a national GHG-I and strengthening the consistency of the submission processes (NC, BUR, etc.). As stipulated in Cancun Agreement in 2010, developing countries should submit National Communications Report every four years and Biennial Update Reports every two years. To ensure the consistency of this timeline submission, the GHG Inventory process should be strengthened. This activity started by assessing the different institutions that contribute to the work of GHG- I as data providers, the technical team also assess the institutional arrangements and mapping was also assessed and upon completion of this assessment technical support needed to strengthen the GHG-I was identified. The team also identify some areas that needs more improvement to enhance the GHG-I process.

Recommendations were formulated for strengthening the GHG-Inventory process and for addressing technical capacity gaps.

This activity followed the context and the result of the institutional gap analysis done by the project for the 3 pillars of the MRV and NFMS (ongoing study and consultation process planned in the Output 1 of the project).

3.1 Institutional Arrangements:

The importance of the institutional arrangement is to clarify which kind of entities and institutional, legal and procedural arrangements are needed to prepare a greenhouse gas inventory (GHGI). Many institutions are collaborating to prepare GHG-I for AFOLU (Agriculture, Forestry and Other land Use) sector in Sudan. However, it is very crucial to establish a framework of institutional arrangements among different entities to fulfill all functions needed to prepare a sustainable GHG-I. These institutions are considered as data providers. These institutions included- but not limited to- the following:

- Higher Council for Environment and Natural Resources.
- Ministry of Agriculture and forestry (General Directorate of Planning and Agriculture Economy, and Forests National Corporation).
- Agricultural Research Corporation (ARC)
- Ministry of Animal Resources (Range and Pasture General Directorate).
- Ministry of Interior Affairs (Custom Administration).
- Faculty of Forestry (Universities of Khartoum and Sudan).
- Remote Sensing and Seismology Authority.

To accomplish functions a set of relations between these institutions and other subjects are needed, meant to ensure:

- Sustainability of the inventory preparation
- Consistency of reported estimations
- Quality of the results

There are three group of functions to ensure successful GHG-I which includes management, planning and preparation. For each function an appropriate institutional arrangements within entities shall be set up in order to ensure efficient performance of the function itself. An implementing entity must be identified for each of the functions. In order for the entity to perform the assigned function, it must have sufficient capacity in terms of financial and human resources and technical expertise, and legal authority.

3.1.1 Higher Council for Environment and Natural Resources (HCENR)

Sudan was concerned with environmental issues. In 1991, it established a national body for the protection of the environment and policies of the Higher Council for Environment and Natural Resources (HCENR). The Council consists related ministers and institutions of direct relevance and representatives of research institutions and academic and representatives of civil society organizations legal persons or

experts in the field of the environment. The General Secretariat has technical capabilities in the areas of coordination and capacity building, studies, research, planning and implementation of projects. The HCENR Secretariat includes coordinating unit for international conventions, including the UNFCCC. Currently, the General Secretariat also coordinate the institutional linkage between the members of the Council from the institutions involved in the field of environmental issues at the state level. This resulted in many programs of action from joint work programs and projects being implemented in all states of Sudan.

HCENR is responsible for developing public policies for the environmental protection in coordination with the relevant Ministries. They also coordinate scientific research in all fields of environment and natural resources, build environmental awareness and setting up long-term strategies and programs in the field of environment and natural vision.

The HCENR coordinates the efforts of the state to join the environmental conventions, including the UNFCCC. In this role, the HCENR is coordinating the NGGI and the third National Communication. This includes coordinating the activities of the sub-structures that have been established for the National Greenhouse Gases Inventory.

3.1.2 The Ministry of Agriculture:

Ministry of Agriculture was established in 1953 as a Department of Forests and later was named Ministry of Agriculture. Since then, the name has been changed according to specialties and tasks allocated to the Ministry. The Federal Ministry of Agriculture and Forestry at the federal government is responsible for developing, training, monitoring, policies and programs related to agriculture sector and there are 18 Agriculture State Ministries located at different Sudan's states. The State Agriculture Ministries, responsible for implementing local activities pertaining these states. The Agriculture and Forestry Ministry at the federal government consisted of several departments and 2 corporations which include the General Directorate of planning and agriculture economy, Agricultural research Corporation (ARC) and Forests National Corporation (FNC). The General Directorate of planning and agriculture economy department is responsible for agricultural policies, ministry plans, crops statistics, food security activities, and cost of the production and prices of the crops.

3.1.3 Forests National Corporation:

Forests are one of the most important national treasures that have contributed greatly to raising the national economy with its various wood and non-wood products and its diverse environmental services.

The Department of Forests was established in January 1902, its responsibilities were limited to the provision of firewood for Nile ships and in the protection of Nile forests.

Forestry Department it was the first governmental department its objectives, responsibilities and powers were derived from their own policies, laws and legislations.

The core mandate of the Forests National Corporation is forest reservation and protection, afforestation and reforestation, production of fuel wood and charcoal in addition to production of sawn timber, railway sleepers, non-wood products (Gum Arabic, forest fruits, etc.).

Forests are considered as a source of timber, wood products, non-wood forest products, in addition to its important role in environmental protection and biodiversity conservation. Forests are also considered as an opportunity for recreation, educational purposes and scientific research.

3.1.4 Agricultural Research Corporation (ARC):

The Agricultural Research Corporation (ARC) was established in 1906 as Shambat Research Station for cotton. ARC now is semi-autonomous national research body directly responsible to the minister of Agriculture and Forestry. The vision of the ARC is to become a center of excellence in agricultural research by developing skilled manpower and conducting quality research. The generation of technologies to ensure sustainable crop production and the active role in technology transfer are among pivotal roles of ARC. The mission of the ARC is to plan, develop and implement research designed to produce technologies and systems that are required to ensure high and sustainable crop productivity and food security. The main goals are to contribute to the achievement of food security, alleviation of poverty, generation of incomes, promotion of agricultural export and conservation of natural resources. Almost all of applied agricultural research in Sudan is now the responsibility of the Agricultural Research Corporation. ARC has 27 research stations spreading all over Sudan covering different climatic zones in addition to 14 specialized research centers. ARC is the sole body via which all the agricultural- related technologies must pass for approval before recommendation to relevant stakeholders. The ARC includes three National Technical Committees: 1) The National Variety Release Committee (NVRC); 2) The National Crop Husbandry Committee (NCHC); and 3) The National Pests and Diseases Committee (NPDC). ARC have high caliber of research scientists and relevant supporting staff with about 473 research scientists in addition to other supporting staffs. ARC research scientists are already involved in regional climate projects dealing with climate change impacts and adaptation. The expertise includes calibration of crop simulation models and generation of climate risk scenarios in addition to field testing related to impacts and adaptation options. Results were also planned to be used and disseminated to wider users including decision makers and relevant stakeholders for better formulation of strategies and early warning systems. ARC is also participating in climate downscaling training programs to enhance the capacities of the relevant scientists in dealing with climate change scenario generation and testing.

3.1.5. Rangeland and Pasture Directorate

Range and Pasture General Directorate (RPGD) affiliated to Ministry Animal Resources and Fisheries as General Directorate According to, Constitutional Decree No (22) for 2010, with 18 State RPA offices aims to ensure significant contribution of the rangelands in the national income and GDP through the use of appropriate technologies that ensure perpetuation of the Natural Resources to accomplish sustained maximum production

Total numbers of human resources working at RPGD all over Sudan equal to 753 represents post graduates, graduates, under graduates and labors RPGD mandate include : Policies and regulations formulates capable to protect the rangelands ;Monitor and evaluate changes on the range resources; conserving, the genetic resources of the natural forage plants and Keeps the environmental balance, mitigates drought effects and control desert encroachment that have led to the resources deterioration and tough livelihoods.

The Mandate of the Ministry includes:

1. To develop legislation, strategies, policies and plans livestock sector within the framework of the national policies.
2. Develop veterinary extension ,services and to improve animal health;
3. Improve animal production and marketing at national, regional and global levels.
4. It is responsible for controlling livestock diseases, regulating domestic and export trade, and formulating national livestock policy.

3.1.6 Remote Sensing and Seismology Authority (RSSA)

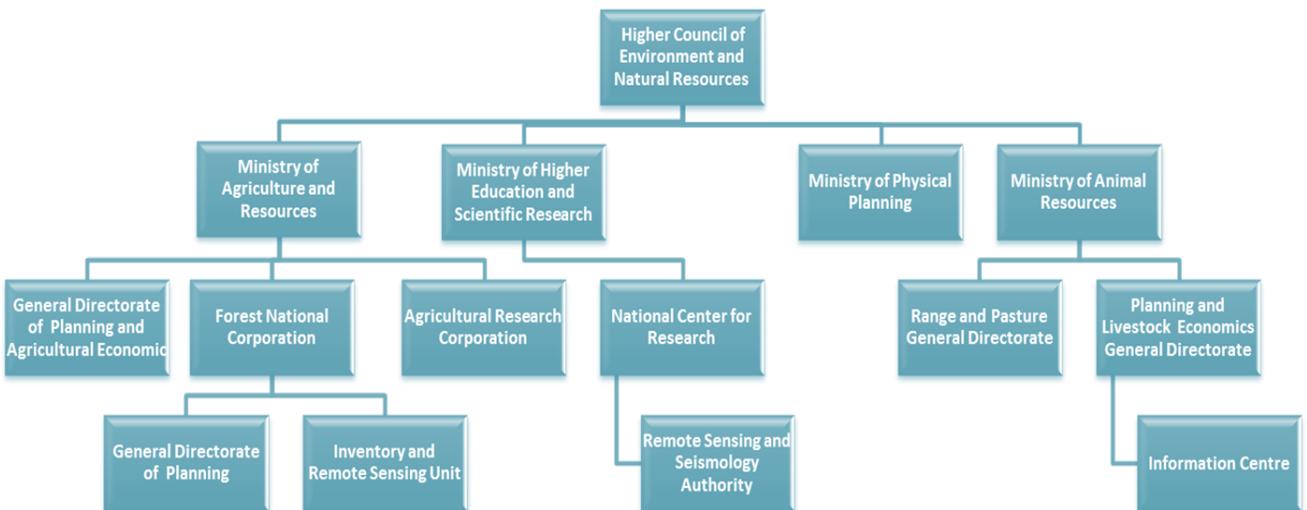
Remote Sensing Authority (RSSA) was established in 1977, as a National Remote sensing Center hosted in the National Council for Research, Ministry of Higher Education and Scientific Research. In 1996 the Remote Sensing Center was renamed to Remote Sensing and Seismology Authority and affiliated to the National Center for Research, Ministry of Science and Technology.

RSSA is doing research in the field of remote sensing, geo-informatics and GPS technology applications for natural resources, environment and disasters. The Institute provides value-added services in natural resources management, remote sensing, GIS, GPS and technology transfer.

About 45 full time enrolled candidates are serving the RSSA in its different departments. Staff members are of different qualifications (Ph.D., M.Sc. and B.Sc.) and backgrounds (geology, geography, agriculture, engineering, forestry, computer science, etc.). In addition to the permanent staff, the RSSA cooperates with highly qualified local and regional expertise on demand.

3.2 Institutional Mapping of Greenhouse Gases Inventory for AFOLU Sectors:

Figure 2.1



3.3 GHG-Inventory Institutional Structure.

The structures of the GHG -I institutional arrangements currently are in place and well operational according to the envisaged structures and developed Terms of References’.

The institutional structure for the GHG-Inventory includes:

- National Climate Change Committee.
- National Communication Project Management Unit.
- Resource persons for the technical team.
- Technical team formulated from relevant institutions.

3.4 Data Provider for the GHG-Inventory

Many institutions act as data providers for the GHG-I. These institutions considered as data sources for the activity data needed to compile and estimate the GHG emissions associated with the AFOLU sector in Sudan. These institutions include:

- Information Centre-Ministry of Animal Resources, Fisheries and Rangelands.
- Range and Pasture Administrations at State level.
- Forest National Corporation.
- Central Bureau Statistics.
- General Administration of Planning and Agriculture Economics, Ministry of Agriculture and Natural Resources.
- Customs Affairs (Ministry of Interior).
- Remote Sensing and Seismology Authority.

Other data sources also include the following:

- National Rice Project, (Ministry of Agriculture and Natural Resources).
- Technical studies and reports.
- International organizations (FAO).
- IPCC 2006 Guidelines and IPCC Good Practice Guidance for Land use- Land use Change and Forestry 2003.
- Expert’s judgment.

3.5 Recommendation to Improve the GHG Inventory Process

The GHG Inventory process involves cooperation of many institutions working in the field of agriculture, forestry and rangelands and in close coordination and collaboration with HCENR as indicated in the Figure 2.1 above. All members who are part of the technical GHG-I team are affiliated to these institutions. They participate in data collection and analysis in addition to report preparation. However, a lot of effort is needed to strengthen and put in place a robust GHG-Inventory system, this may include:

- Strengthen the GHG Inventory units which were established by HCENR through connecting these institutions with a server (e.g. I-Cloud). This will enhance continuous flow and sharing of

data between these institutions, and facilitate update of GHG-I data needed for the NCs, BUR and REDD+.

- Promote institutional and inter-ministerial cooperation. A robust linkage between all units of environment in different institution should be created to update the data and make it available.
- Establish a database information system for the GHG-I.
- Creation of country-specific calculation worksheet to avoid using the 2006 IPCC software which is not relevant to our National Circumstances.
- Generation of country-specific emission factor especially for the key categories of the AFOLU sector.
- Develop and put in place an effective quality control and quality assurance plan.
- Institutionalization of the GHG Inventory process with clear defined term of references, responsibility and accountability.
- Development of a LUCF-based database information system based on scientific research, field surveys and technical studies to develop country specific activity data.
- Improve data accessibility across national institutions to enhance timely flow of data.
- Build a robust data archiving system.
- Strengthening the research capacity of the research institutions and universities to perform and carryout studies help in providing accurate data and factors that help in the GHG-Inventory (e.g. support to obtain needed instruments and technology to measure and asses the emissions of GHGs for different activities)
- Establish multi-sectoral coordination mechanism focusing on AFOLU sector that ensures data availability, consistency and accuracy.
- Establishment of GHG-I unit to be hosted within the HCENR, this units consists of permanent focal points nominated by their institutions for the five IPCC sectors (energy, industry, agriculture, land use change and forestry and waste sector). These focal points communicate with the related institutions to collect the activity data for their designated sectors. These units should be established through a ministerial decree.

4. Strengthening the GHG-Inventory Team.

This activity aims to strengthen the technical capacity of the technical staff involved in GHG-Inventory in Sudan. The GHG-Inventory team for the land-use sector should comprise experts from the Monitoring and Reporting Unit, dedicated to the context of REDD+, and at the FNC, and a member from the Ministry of Urban Planning. The GHG-I team should also include experts on different soil specializations (e.g. soil surveys, soil physics, soil chemistries, soil microbiology etc..).

The technical capacity of the cross-institutional GHG-Inventory team for land-use should be strengthened to be able to perform the reporting requirements under the UNFCCC and Paris Agreement. This involves training on GHG-Inventory compilation according to the latest IPCC guidelines, and use of calculation tools but also in reporting (provision of the knowledge for the design of the BUR).

Using the work conducted under the forest reference level for REDD+ as a point of departure, should be provided to the GHG-Inventory team to compile a GHG Inventory for the land-use sector.

4.1 Personal Capacity in GHG-Inventory in Different Institutions:

At the federal Ministry Of Agriculture and Forestry there are 30 agricultural officers received training on climate change themes related to agriculture and food security (e.g. inventory, adaptation, mitigation etc...). Ten of them at the General Directorate of planning and agriculture economy and 20 of them on the other General Directories of the ministry. The trainings were focused on the following topics:

- IPCC 2006 Software for GHG-Inventory
- IPCC and UNFCCC methodologies and guidelines.

There are 7 members from ministry of Animal Resources; Fisheries and Rangeland were trained in the field GHG-Inventory. Two of them from RPGD. Those who get trained, they need further advanced training in different analytical GHG-Inventory related issues, however, considerable staff from the ministry should be acquainted with GHG-Inventory in livestock sector from different concerned department (RPGD, Animal Production Department , Information Centre& Animal Resources Authority). Four researchers from the RSSA had participated in the Second and Third National Communications. They were trained in the methodologies and guidelines for the preparation of the national communication and the use of the IPCC 2006 software.

4.2 Recommendation to Strengthen GHG Inventory Team:

To strengthen the technical capacity of the personnel involved in the GHG-Inventory process,

- Train the national experts on the inventory methodology and application of IPCC guidelines.
- Improve coordination between the concerned institutions and national Communication Project management unit at HCENR.
- Formulate a permanent GHG-I technical team consisting members from all institutions represented in Figure 2.1 above.
- The GHG inventory team for the land-use sector comprises experts at the Monitoring and Reporting Unit, dedicated to the context of REDD+, and at the FNC.
- The technical capacity of the cross-institutional GHG-I team for land-use should be strengthened. This involves training on GHG-I compilation according to the latest IPCC guidelines, in use of calculation tools but also in reporting (provision of the knowledge for the design of the BUR).
- More involvement of specialized research institutes and universities to include in their research programs studies that will provide data and information that can nourish the GHG-I.
- Inspiration of the higher education institutions to include in their education programs and syllabuses materials related to AFOLU GHG-I.
- Mainstreaming of gender in all stages of the GHG inventory process.

5 ANNEX

List of GHG Inventory Technical Team

Name	Gender	Organization	E-mail
Anwar Sid Ahmed Mohamed	Female	Remote Sensing and Seismology Authority	
Alyass Ahmed Alyass	Male	University of Khartoum	
HanadiAwadallaAbdelrasoul	Female	Forests National Corporation	
Ilham Jameelallah	Female	Forests National Corporation (REDD)	
Imad-eldin Ahmed Ali-Babiker	Male	Agriculture Research Corporation	
Khalda Abbas Hassan	Female	Forests National Corporation	
Lyla Izeldeen Ibrahim	Female	Forests National Corporation	
Mohamed Elgamry Atta Elmanan	Male	University of Sudan	
Mohamed Merghani Mohamed	Male	University of Sudan	
Mona Abdelrahman Ahmed	Female	Forests National Corporation (REDD)	
Nagla MahgoubHamadain	Female	Forests National Corporation	
Omema Mohammed Ahmed	Female	Range and Pasture General Directorate	
RashaAbdallaFadul	Female	Forests National Corporation	
RihabMahgoub Mohammed	Female	Forests National Corporation	
Safaa Ahmed Biraima	Female	Forests National Corporation	
SawsanAbdalla Ali	Female	Forests National Corporation	
SawsanFouad Ahmed	Female	Ministry of Agriculture	
SawsanKhairEleseidAbdelrahim	Female	Range and Pasture General Directorate	
SirraajEldeen Mohamed Shareef	Male	Forests National Corporation (REDD)	
Suaad Ibrahim Abdalla	Female	Ministry of Agriculture	

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