Information Matters
Transparency through Reporting

Training Report: IPCC Guidelines 2006 for National GHG Inventory Preparation
25-27 January,2017
Borjomi, Georgia

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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Introduction

The First Capacity Building Mission for Georgia under the *Information Matters* project was conducted between 24th and 27th of January 2017. This mission consisted of two separate activities. The first one was a Workshop on the "Institutional Set-up of an MRV System in Georgia", which took place on 24 January in Tbilisi. The second activity comprised a training on the 2006 IPCC[1] Guidelines for National Greenhouse Gas Inventories (2006 IPCC GL) and took place on 25-27 January in Borjomi, Georgia. A workshop report on the first activity has been published separately by GIZ. This report focuses on the training on the 2006 IPCC GL. A detailed agenda of the workshop is included in Annex 1.

The training on the 2006 IPCC GL was attended by 20 participants including representatives from different Ministries and governmental agencies, private consultants and NGOs relevant for GHG inventory preparation in Georgia. A full list of participants is included in Annex 2.Three experts from NIRAS and one expert from the Food and Agriculture Organization of the United Nations (FAO) conducted the training. The local counterpart, the Climate Change Service of the Ministry of Environment and Natural Resources Protection of Georgia (MoENRP) was very engaged and provided strong support, showing deep appreciation of the capacity-building effort and its long-term benefits.

The training aimed at providing participants a comprehensive knowledge of the key concepts, definitions and methods for establishing a national greenhouse gas (GHG) inventory using the 2006 IPCC GL and more in-depth sector-specific knowledge for each relevant IPCC sector (Energy, Industrial Processes and Product Use, Waste, Agriculture, Forestry and Other Land Use). The participants were also trained on the use of the IPCC Inventory Software[2] for the preparation of GHG Inventories.

[1] Intergovernmental Panel on Climate Change
[2] The IPCC Inventory Software implements the methods in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and as such is a useful tool to practitioners working on GHG inventory preparation. It can be downloaded under http://www.ipcc-nggip.iges.or.jp/software/

1 Background

The Information Matters project, implemented by the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) GmbH on behalf of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) provides support to a number of selected partner countries to strengthen their in-country capacities for enhanced reporting under the United Nations Framework Convention on Climate Change (UNFCCC). The project has a special focus on the preparation of Biennial Update Reports (BURs) and the development and implementation of sustainable systems for measurement, reporting and verification (MRV). During a first project phase (2013-2016), support has been provided to Chile, the Dominican Republic, Ghana and the Philippines. For the second phase (2016-2017), Colombia, Egypt, Georgia and Viet Nam joined the project, allowing building upon the results, experiences and 'lessons learned' gained during the first phase.

In the context of Georgia, the project aims to provide technical support to the Climate Change Service of the Ministry of Environment and Natural Resources Protection (MoENRP) and targets the specific needs in terms of capacity building for the elaboration of national reports on climate change. The technical work is provided with the support of the consortium formed by *NIRAS A/S* and *IP Institut fur Projektplanung Gmbh*.

The activities developed in January 2017 formed part of the roadmap for a Capacity Building Plan for Georgia under Information Matters agreed upon between the Climate Change Service of Georgia and the GIZ in October 2016.

2 Objectives and purpose of the training

This mission aimed at developing the technical capacities of the representatives of MoENRP's Climate Change Service as well as other national experts from government authorities and Civil Society Organizations (CSO) related to climate change reporting on the use of the 2006 IPCC GL. In this regard, the objectives of the training were as follows:

- Familiarize the targeted group with the key GHG Inventory concepts;
- Train Georgian experts on methodologies for the estimation of GHGs emissions in different sectors;
- Provide hands-on training to the Georgian experts on the use of the IPCC Inventory Software.

3 Training approach and content

The training was structured into two parts across 3 days.

The first part was conducted on the first day and was dedicated to cross cutting issues and general concepts as follows:

- What is a GHG inventory?
- Georgia's GHG Inventory;
- Introduction to Methodology for GHG inventories – Elements, Principles, Cycles;
- Introduction to the IPCC Inventory Software;
- Methodological choices and identification of Key Categories;
- Time series consistency;
- Data Collection, QA/QC, Verification, and Uncertainty assessment.

The second part was conducted on the second and third days, where the audience was divided into three groups, according to the IPCC sectors in the 2006 IPCC GL: (1) Energy and Industrial Processes and Product Use (IPPU), (2) Agriculture, Forestry and Other Land Use (AFOLU); and (3) Waste. Due to the limited number of participants for IPPU, this sector was merged with the Energy sector.

In these parallel sessions, a sectoral overview for Georgia was presented followed by the presentations on the relevant emitting and sink categories for each sector and on the principles and methods for estimating emissions. The assessment of relevance of sources and sinks of GHG emissions in Georgia was performed through a review of Georgia's first Biennial Update Report (BUR) to the UNFCCC, which was published in 2016. The presentations were complemented with hands-on exercises where the trainees were trained on the IPCC Inventory Software.

The training was designed to include both theory and practice. Approximately 65% of the time was allocated to practical exercises on IPCC Inventory Software and structured discussion.

4 Activities and results achieved

5.1 Part 1: General concepts and cross-cutting issues

The first part of the training had as goal to familiarize the Georgian experts with key GHG Inventory concepts. As such, it was more of theoretical nature, with input by the NIRAS consultants. As a first step, the concept or GHG inventory reporting was presented along with international reporting requirements under the UNFCCC for developing countries. This was followed by an introduction to the methodology for the development of GHG inventories based on the 2006 IPCC GL. This included an overview of concepts such as emissions estimates, activity data, emission factors, key category analysis, quality assurance and quality control (QA/QC) and uncertainty analysis.

5.2 Part 2: Parallel Sessions on IPCC categories

The second part of the training focused in hands-on training of the Georgian experts on methodologies for the estimation of GHGs emissions in different sectors, with the support of the IPCC Inventory Software. The following sections describe the main activities conducted, topics discussed and results achieved for all IPCC GHG inventory sectors.

5.2.1 Energy and Industrial Processes and Product Use (IPPU)

This session was divided into three modules, one for general overview and two modules for specific source categories in the Energy and in the IPPU sectors. The training covered almost all categories in the Energy sector (Stationary combustion, Mobile combustion and Fugitive emissions). The only category that was not covered in this sector was Carbon Dioxide (CO_2) Transport, Injection and Geological Storage, as this category relates to CO_2 capture and storage (CCS), a practice that is not occurring in Georgia. The IPPU source categories of Lime, Cement and Nitric Acid were selected to be included in the combined parallel session, since these were the three IPPU key categories that contributed the most to Georgia's GHG emissions according to the country's most recent inventory, published under the first Biennial Update Report (BUR) in 2016.

General Overview

The first module included two presentations. The first one was conducted by a local expert and was dedicated to the characteristics of the Georgian energy sector, the Georgian energy statistics and on how the inventory had been prepared. The purpose of the second presentation was to provide an overview of the energy sector GHG inventory, describing all categories and subcategories in the sector, and discussing the differences among less and more complex methodological approaches. The contribution of the Energy sector in the national Inventory of different countries was also presented in order to highlight the relevance of the sector.

Energy

The Energy module followed the same structure for each of the source categories covered. This included presentations covering the key elements for the preparation of a GHG inventory of the

category (emission sources, methodological issues, completeness, time series consistency, uncertainty assessment and QA/QC), questions and answers and a practical exercise using the IPCC Inventory Software.

The categories covered in the training were stationary combustion, mobile combustion – road transportation, civil aviation, rail and water borne transport –, and fugitive emissions. In each subsector, the differences between methodological approaches Tier 1 and Tier 2, which define the level of accuracy of the GHG inventory, were presented and the requirements in terms of information and resources to use a Tier 2 approach in the subsector were discussed.

After the presentation and a questions and answers session for each subsector, the trainees were asked to use the IPCC Inventory Software and estimate emissions based on examples relevant to Georgia: stationary combustion in several sectors (energy industries, manufacturing industries and commercial/institutional), road transportation for different types of vehicles, and fugitive emissions for natural gas activities. The trainer observed that the trainees could complete the exercises successfully.

An exam was held at the end of the session. The evaluation of the results of the exams was positive, showing that the trainees understood the key concepts of the training such as the use of the IPCC Inventory Software, key GHGs in the sector and differences among different methodological approaches (Tier 1 vs Tier 2).

Industrial Processes and Product Use (IPPU)

The IPPU categories of Lime, Cement and Nitric Acid were selected to be included in the third module of the combined parallel session.

The training on Lime emissions focused on the differences between Tier 1 and Tier 2 methods. It also highlighted the importance of identifying non-market production of lime, which may be relevant in the country due to the metal industries. Participants practiced applying the IPCC Inventory Software to calculate emissions from Lime production using Tier 1 methods for a series of years.

The training on Cement emissions compared differences and similarities with the Lime calculations, including how to calculate an emission factor for clinker[3] production using the method provided by the IPCC. Since Georgia's most recent inventory applied Tier 2 methods, the presentation discussed differences between Tier 1 and Tier 2 methods and sources of uncertainty when applying Tier 2. Participants practiced calculating the emission factor and applied the Tier 1 method for a series of years using the IPCC Inventory Software.

The training on the IPPU sector also covered emissions estimation methods for nitric acid (HNO_3) production. Participants learned about the activity data and emission factor to apply and also about abatement technologies relevant for the sector and how these affect the inventory methods. The hands-on exercises used the IPCC Inventory Software to test Tier 1 calculation methods and explore common challenges with communication with data providers, such as typing errors and incomplete information.

An exam was held at the end of the training. The exam results showed that most participants learned the important differences between lime and cement calculations and understood the main emissions sources in nitric acid production.

5.2.2 Waste

The waste sector training started with a presentation from a local expert on the characteristic of the sector and how inventory data for this sector is estimated in Georgia. Subsequent sessions were

[3] In cement manufacture, CO_2 is produced during the production of clinker, a nodular intermediate product that is then finely ground, along with a small proportion of calcium sulfate [gypsum ($CaSO_4 \cdot 2H_2O$) or anhydrite ($CaSO_4$)], into hydraulic (typically portland) cement.

dedicated to understand the estimation of waste amounts generated as well as waste composition, which are relevant for inventory preparation. Additionally, general changes between the 1996 and 2006 IPCC GL were discussed.

The training included separate sessions for each of the following source categories:

- Solid Waste Disposal
- Biological Treatment of Solid Waste
- Incineration and Open Burning
- Wastewater Treatment and Discharge (Domestic and Industrial)

In each of the sessions, a presentation was delivered to explain the key concepts and to discuss methodologies used to estimate emissions using different methodological tier approaches. Moreover, sources of data, QA/QC, and uncertainty in parameters were discussed.

In the category solid waste disposal (SWD), the First Order of Decay (FOD) Model was presented as a tool to estimate emissions and a discussion on how to select each of the parameters needed for applying the model was held. Moreover, methodologies on how to account for emissions from managed, unmanaged and uncategorized solid waste disposal sites were presented. Exercises on the IPCC Inventory Software on estimating emissions from solid waste disposal sites (managed, unmanaged, and uncategorized) were conducted with the trainees.

Although biological treatment of solid waste (Anaerobic digestion and composting) or incineration are not relevant emission categories for Georgia, methodologies to estimate emissions from these source categories were also presented and exercises on the IPCC Inventory Software were conducted. This was done in order to prepare the experts for estimation of emissions from these source categories in case such treatment technologies are adopted in the future.

For the wastewater treatment and discharge source category (domestic and industrial), a presentation of the impact of different treatment techniques used in the country on the estimated emissions was held. Further, approaches used for different methodological tiers were discussed. Exercises on the use of the IPCC Inventory Software on how to estimate emissions from wastewater handling (domestic and industrial) were also conducted with the trainees.

The training sessions also included questions and answers time slots, where trainees inquired about specific issues relevant to the Georgian context, especially for SWD and wastewater handling, which they face while preparing the GHG inventory. Potential solutions to these problems were discussed during these slots. The participants learned how to apply the methodologies for estimating emissions from these source categories and how to overcome the lack of data and make assumptions relevant to the local context.

An exam was held at the end of the training and the results showed that all trainees grasped most of the concepts as the grades were very good overall (Two of the trainees achieved the full mark).

5.2.3 AFOLU

The parallel session on Agriculture, Forestry and Other Land Uses (AFOLU) focused on the key categories for Georgia. These include enteric fermentation, direct and indirect soil emissions, including from managed soils in agriculture and forest land (removals), grassland and croplands (removals) in LULUCF.

The first day of this session was dedicated to introduce how to conduct a complete and consistent land representation using three different approaches to estimate land use changes. An exercise was

made to illustrate all approaches. Georgia does not conduct land use assessments on a regular basis and therefore an approach 1[4] was used to develop the LULUCF emissions/removals for the latest GHG Inventory report. There was a discussion to improve the current land use data of Georgia in the future to be able to improve the land representation to a minimum of approach 2[5].

The estimation method using a gain-loss method for living biomass was introduced for an approach 2 level which estimated land use remaining in the same land use separately from land use converted to another land use. Forest land and conversion to forest land was treated separately from other land uses such as grassland, cropland, wetlands, settlements and other land. In addition, it was discussed how to calculate CO_2 emissions/removals from dead organic matter and soil organic matter. Since CO_2 emissions/removals from soils related to changes in land use and management practices in grasslands and croplands are key categories of Georgia, the method to estimate N_2O emissions due to land/use management changes from soil, currently not estimated in the GHG inventory of Georgia, was introduced.

During the second day of this session, the training was focused on the calculation of the GHG emissions from enteric fermentation (CH_4) and manure management (N_2O, CH_4). Among other, it was discussed how to improve the data on Average Annual Populations (AAP) of chickens, and the use of default values for livestock, given that Georgia currently uses default values both from the Eastern European Region (early maturing cow) and the Asian Region (late maturing cow and other animals). Methods to calculate an "approximate emission factor" for enteric fermentation had been introduced to enable further disaggregation of the livestock characterization with available parameters from GEOSTAT (e.g. milk production or live weight). An exercise on enteric fermentation and manure management was conducted directly in the IPCC Inventory Software with the use of the national data reported in the latest Biennial Update Report (BUR).

Given the complexity of the sector and the mixed level of experience among participants to this session, exercises were difficult to understand and time-consuming. This was also the result of the exam that took place at the end of the training session, which was rated moderate to too difficult by the participants. Nevertheless, the general opinion among the participants was that the sessions were very informative with good presentations and discussion.

5 Outputs and outcomes

The training achieved its objectives, described under section 3 of this report. There was good attendance from across the relevant sectors and participants were very engaged and active.

As a result of the training, the participants are able to understand essential concepts and mandatory elements of the GHG inventory reporting according to UNFCCC requirements. From a knowledge perspective, the participants have acquired a comprehensive understanding for the development of GHG inventories in different sectors. The participants also acquired knowledge needed to use the IPCC Inventory Software in the development of GHG inventories. Participants were examined at the end of the training to be able to test the acquired skills. This issue made the participants very focused and enthusiastic during the training.

[4] Under approach 1, land use categories are identified and areas quantified; however, because data are not spatially-explicit, land use/management changes are neither identified nor quantified.
[5] Under approach 2, land use categories are identified and areas quantified; further, land use/management changes are identified and the areas of changes quantified between 2 points in time, although the areas of changes are not tracked over time.

6 Recommendations and next steps

Based on the outcome of the training, the feedback of the participants, and the results from the exams, some recommendations and suggestions for next steps have been outlined. These are summarised in the sections below.

7. 1 Recommendations

It is recommended that Georgia moves ahead towards GHG inventory institutionalisation and improvement. In order to do so, Georgia should define roles and responsibilities for the regular update of the GHG inventory, define a time plan for regular inventory compilation and define capacity building and GHG inventory improvement plans.

The level of knowledge of current and future GHG inventory practitioners is very diverse in experiences ranging from very basic (beginner) to high level expert (UNFCCC expert GHG inventory reviewers) with different roles related to compilation and data collection. It is recommended that, once roles and responsibilities for the regular update of the GHG inventory are clear, future technical capacity-building trainings take place. These should include trainings on data collection, on QA/QC, on the use of software tools and on inventory improvement.

Regarding data collection, trainings should focus on collection of data from varied sources, from general basic statistical information (GEOSTAT) to official reports from Georgia and findings from internationally supported projects. In addition, it is recommended to focus on discussions related to data collection and compilation to improve data sharing, management, collection and archiving.

Time-series consistency, uncertainty analysis and QA/QC have been seen as important further elements to focus on in future trainings.

Future steps to improve the GHG Inventory for the Energy Sector should be based on considering using the IPCC Inventory Software and moving to Tier 2 from Tier 1, especially for key categories such as Stationary combustion, Mobile combustion - Road and Fugitive emissions.

Several improvements are possible for the GHG inventory in the waste sector. For emission estimates from solid waste disposal, this may include (1) providing more transparency when presenting assumptions used in the estimation of emissions using the FOD model, (2) considering moving to Tier 2 by collecting historical data on amounts of waste disposed in solid waste disposal sites and (3) conducting surveys to estimate the split between disposal in managed, unmanaged, and uncategorized sites. For emissions from wastewater handling, also transparency in presenting assumptions used in the estimation of emissions from domestic and industrial wastewater is encouraged. In addition, it is recommended to collect data on composting activities, even if it is done on small scale, in order to improve estimates from the waste sector in the long term.

In the AFOLU sector, it is recommended to apply the 2006 IPCC GL. Regarding land use data, it is recommended to move to higher approaches, for which it will be necessary to collect country specific activity data. Further, it is recommended that Georgia considers the use of FAOSTAT data for categories where there is no national data, such as organic agricultural soils, to estimate non-CO_2 emissions due to drainage and rewetting. Regarding livestock emissions, it is encouraged that diary and non-dairy cattle are disaggregated, that the Annual Average Population of chickens estimated based on the total population (quarterly collected and summed at the end of the year by GEOSTAT) is used, that animal live weight or milk production statistics are used to calculate "approximate" EF and that animals are stratified by temperature group (cool, temperate, warm) to calculate CH_4 emissions from manure management.

In the IPPU sector, technical training relevant to GHG inventory improvement for those categories not estimated or where data is difficult to obtain is recommended, such as the estimation of HFC emissions from fire extinguishers and solvents.

Further training should be focused on hands-on exercises and the use of the IPCC Inventory Software.

7. 2 Next steps

Under the *Information Matters* project, further capacity building activities on the preparation of the GHG inventory are planned. The third capacity building mission to take place in September 2017 will be dedicated to trainings on data collection, as well as on quality assurance and quality control (QA/QC). One day of the training will be dedicated to collection of raw data used for GHGs estimation while another day for training on QA/QC activities during data collection. This will help improving the skills and knowledge on how to handle scarcity of data and how to implement and improve the QA/QC activities conducted during the process of data collection. The latter is very important for improving the accuracy of the GHG inventory of Georgia.

The capacity building plan under *Information Matters* also includes the provision of technical backstopping relevant to GHG inventory improvement. Specifically in the area of GHG Inventory, the plan includes providing technical assistance for data collection related to the estimation of HFC emissions from fire extinguishers and solvents. This backstopping activity will help the improvement of estimation for emissions from this source in Georgia. This assistance will be provided during the second and third quarters of 2017.

ANNEX 1: Training Agenda

DATE/TIME	TOPIC/ACTIVITY	SPEAKER
25th January	All participants	
9:30 – 10:00	**Arrival of participants and Registration**	
10:00 – 10:30	**Welcome remarks** **Brief Introduction to the Information Matters Project**	Irakli Samkharadze, GIZ Oscar Zarzo / Irakli Samkharadze, GIZ
10:30-11:00	**Presentation of Training objectives and structure** **What is a GHG inventory? Requirements for GHG inventories for Non-Annex I countries under UNFCCC**	Daniel Perczyk, NIRAS Amr Abdel-Aziz, NIRAS
11:00-11:30	Coffee break	
11:30 –12:45	**Introduction to Methodology for GHG inventories – the IPCC 2006 Guidelines** **Overview of Guidelines** **GHG Inventory – Elements, Principles, Cycles.** **What are the changes between the 1996 and 2006 IPCC Guidelines?** **Introduction to the IPCC Inventory Software**	Amr Abdel-Aziz, NIRAS
12:45-13:30	**Identification of Key Categories** **- Presentation** **- Example**	Daniel Perczyk, NIRAS
13:30-14:30	Lunch break	
14:30-15:15	**Time series consistency** **- Presentation** **- Practical Exercise**	Jessica Wade-Murphy, NIRAS
15:15-15:45	Coffee break	
15:45-17:00	**Data Collection, QA/QC, Verification, and Uncertainty assessment** **- Presentation** **- Practical Exercise**	Amr Abdel-Aziz, NIRAS
26th January	**Issue**	
9:30 – 10:00	**Energy Sector and IPPU Sector Characteristics and Statistics in Georgia**	Giorgi Mukhigulidzvili, World Experience for Georgia (WEG)
10:00-10:30	**Energy Sector and IPPU Sector Inventory overview**	Daniel Perczyk, NIRAS Jessica Wade-Murphy, NIRAS
10:30-11:00	**Stationary combustion** **- Presentation** **- Practical Exercise**	Daniel Perczyk, NIRAS
11:00-11:15	Coffee break	
11:15-12:00	**Stationary combustion (cont.)**	Daniel Perczyk, NIRAS

DATE/TIME	TOPIC/ACTIVITY	SPEAKER
	- Presentation - Practical Exercise	
12:00-13:00	Mobile combustion: Road transportation - Presentation - Practical Exercise	Daniel Perczyk, NIRAS
13:00-14:00	Lunch break	
14:00-14:30	Mobile combustion: Road transportation (cont.) - Presentation - Practical Exercise	Daniel Perczyk, NIRAS
14:30-15:45	Mineral industry: Cement production and Lime production - Presentation - Practical Exercise	Jessica Wade-Murphy, NIRAS
15:45-16:00	Coffee break	
16:00-17:00	Mobile combustion: Civil aviation - Presentation - Practical Exercise	Daniel Perczyk, NIRAS

Parallel Session 1: Energy Sector and Industrial Processes and Product Use (IPPU) Sector

DATE/TIME	TOPIC/ACTIVITY	SPEAKER
27th January	Issue	
9:30-10:30	Chemical industry: Nitric Acid production - Presentation - Practical Exercise	Jessica Wade-Murphy, NIRAS
10:30-11:00	Coffee break	
11:00-12:30	Fugitive emissions - Presentation - Practical Exercise	Daniel Perczyk, NIRAS
12:30-13:30	Lunch break	
13:30-14:30	Exam	Daniel Perczyk, NIRAS Jessica Wade-Murphy, NIRAS

Parallel Session 2: Waste Sector

DATE/TIME	TOPIC/ACTIVITY	SPEAKER
26th January	Issue	
9:30 – 10:00	**Waste Sector Characteristics and Statistics in Georgia**	Anna Sikharulidze, Remissia
10:00-11:00	**General Overview of Waste Sector** **Waste Generation and Management Data, Waste composition Data** **- Presentation** **- Practical Exercise**	Amr Abdel-Aziz, NIRAS
11:00-11:15	Coffee break	
11:15-12:30	**Solid Waste Disposal Sites: Managed** **- Presentation** **- Introduction to the IPCC waste model** **- Practical Exercise**	Amr Abdel-Aziz, NIRAS
12:30-13:30	Lunch break	
13:30-15:00	**Solid Waste Disposal Sites: Unmanaged and Uncategorized** **- Presentation** **- Practical Exercise**	Amr Abdel-Aziz, NIRAS
15:00-15:30	Coffee break	
15:30-17:00	**Incineration and Biological Treatment** **- Presentation** **- Practical Exercise**	Amr Abdel-Aziz, NIRAS
27th January	Issue	
9:30-11:00	**Wastewater Handling: Domestic** **- Presentation** **- Practical Exercise**	Amr Abdel-Aziz, NIRAS
11:00-11:15	Coffee break	
11:15-12:30	**Wastewater Handling: Industrial** **- Presentation** **- Practical Exercise**	Amr Abdel-Aziz, NIRAS
12:30-13:30	Lunch break	
13:30-14:30	**Exam**	Amr Abdel-Aziz, NIRAS

Parallel Session 3: Agriculture, Forestry and Other Land Use (AFOLU)

DATE/TIME	TOPIC/ACTIVITY	SPEAKER
26th January	Issue	
9:30 – 10:00	AFOLU Sector Characteristics and Statistics in Georgia	Marina Shvangiradze, Remissia
10.00-10.15	AFOLU Sector Inventory overview	Esther Mertens
10:15-11:00	Consistent Land Representation • Presentation • Practical exercise	Esther Mertens
11:00-11:15	Coffee break	
11:15-12:00	Consistent Land Representation (cont.) • Presentation • Practical exercise	Esther Mertens
12:00-12.30	Land: Forest land (forest land remaining forest land and other land use converted to forest land) • Presentation • Practical exercise	Esther Mertens
12:30-13:30	Lunch break	
13:30-14:30	Land: Forest land (forest land remaining forest land and other land use converted to forest land) (cont.) • Presentation • Practical exercise	Esther Mertens
14.30-15.30	Land: Forest land converted to any other land use • Presentation • Practical exercise	Esther Mertens
15:00-15:30	Coffee break	
15:30-16.30	Land: Forest land converted to any other land use (cont.) • Presentation • Practical exercise	Esther Mertens
16:30-17:00	Aggregated sources and non-CO_2 sources on land: Direct and indirect N_2O emissions from agricultural Soils • Presentation • Practical exercise	Esther Mertens

DATE/TIME	TOPIC/ACTIVITY	SPEAKER
27th January	**Issue**	
9:30-10:30	**Aggregated sources and non-CO_2 sources on land: Direct and indirect N_2O emissions from agricultural Soils (cont.)** • **Presentation** • **Practical exercise**	Esther Mertens
10:30-11:00	**Livestock: Enteric Fermentation and Manure Management** • **Presentation** • **Practical exercise**	Esther Mertens
11:00-11:15	Coffee break	
11:15-12:30	**Livestock: Enteric Fermentation and Manure Management (cont.)** • **Presentation** • **Practical exercise**	Esther Mertens
12:30-13:30	Lunch break	
13:30-14:30	**Exam**	