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Final report of the work on project activity 3.1: Development of a program of work (PoW) to support and improve the calculation and reporting of GHG emissions and removals from the LULUCF sector

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Table of Contents

1. Introduction

The objective of the project activity 3.1 was to develop a work programme to support and improve the capacity of Turkey to estimate and report GHG emissions and removal from the LULUCF sector. The Programme of Work (PoW) will support the LULUCF inventory team to prioritize activities and to improve the calculation and reporting of GHG emissions and removals from the LULUCF sector.

The main tasks under activity 3.1 were:

- Development of a Programme of Work for short, mid and long term based on the outcome from Result 1 (Result 1: A needs analysis report on the required information about land areas to estimate C stocks and emissions and removals of GHG associated with LULUCF activities based on a thorough assessment of the current reporting.) with a short visit to Ankara for interviews (implemented in Ankara from 31.10 to 2.11.2018).
- Preparation of a compendium with clear description of work procedures.
- An annual work plan prepared and embedded into the Programme of Work.
- A workshop organized to discuss the PoW proposal (implemented in Ankara on 20.12.2018).
- A workshop organized as the Opening workshop of the PoW (implemented in Ankara o 23.1.2019).
- A short report of max 12 pages prepared and to be disseminated with the relevant agencies.

The principal objective of the summary report is to inform decision makers and key persons at the institutions which are responsible to implement activities in the LULUCF sector (as proposed by the Programme of Work). Moreover, this report summarizes the key findings from outcomes of all tasks implemented under the project activity 3.1. The recommendations, which are important particularly for decision making, are highlighted in blue fields at the end of each chapter.

2. Need analysis report

2.1. Key findings and implications

The need analysis report was prepared as a first step to identify potential gaps and shortcomings in the LULUCF reporting of Turkey. It has enabled a better development of programme of work to support and improve the calculation and reporting of GHG emissions and removals in the LULUCF sector. The report consists of general observations and findings, category-specific issues, recommendations and next steps.

Key findings are:

- The thorough assessment showed that reporting for the LULUCF sector has generally improved in the past few years. However, transparency and completeness are considered to be main issues, which should be addressed appropriately. Transparency can be improved in short term, whereas completeness in medium to long term and it depends on data availability.
- The main cause of incomplete reporting was found to be lack of activity data to fill land-use change matrix (i.e. land-use changes that are likely to occur in the nature). So far, Turkey has used two types of activity data, namely CORINE and areas of forest land from the ENVANIS database. However, it is expected that consistency issues of activity data will no longer be relevant, since new sets of activity were produced based on satellite imagery, including the land-use change matrices.
- Most important issues were found to be related to forest land and cropland categories. Transparency of ENVANIS database management is among the key issues to be resolved in forest land category, while cropland lacks appropriate structure of subcategories, methodological explanation and information on management systems. The latter does not allow country to apply the default method for estimating the soil organic carbon stock changes in cropland remaining cropland, so associated emissions are assumed underestimated.
- All category-specific issues were shortly defined in the report and recommendations were given how to tackle them. In order to highlight issues or possible solutions the references were given, where possible. The main issues had been discussed with the national sectorial experts during the in-country interviews.

2.2. Summary of report

The thorough assessment of the current reporting in the LULUCF sector was carried out by reviewing the main documents, such as CRF tables, National Inventory Reports, Annual Review Reports, Synthesis and Assessment Report and Status Reports. Notes were recorded to present the key issues in the need analysis report. There were few Skype meetings with Norman Kiesslich (GeoVille), Yıldıray Lise (DKM project director) and Yusuf Serengil (team leader) which described the project objectives and discussions were related to topics, such as forest land definition, criteria used for land identification, data sources, minimum mapping unit, level of subcategorization etc. In addition, there was short expert mission held in Ankara from 31st October to 2nd November 2018. During the in-

country interview the national experts gave some important information for both fields, agriculture and forestry.

The assessment review of documents, reported under the UNFCCC, showed that the LULUCF reporting of Turkey has improved since 2014. The most important categories in terms of net emission contributions to total emissions of the sector were found to be forest land and harvested wood products (HWP). In general, the review outlined main category-specific issues that were ranked in order of importance. For each category or subcategory short description were given on the current state, including the short definition of issues.

Transparency and completness were found to be the main issues in the LULUCF reporting. Generally, calculations of emissions and removals are transparent and referenced to equations used according to 2006 IPCC guidelines and the last annual submissions also include clear explanations and assumptions on the recalculations in the LULUCF sector. Completness issues are largely related to missing data on land use changes. For example, several conversions in the land-use change matrix are denoted with notation keys, such as not occuring (NO) and not estimated (NE), and some of them were not used appropriately. It is asssumed that new activity data that will be produced for the period 1990-2015 based on high resolution satellite imagery will greately increase the completness of emission estimations as well as reporting.

Regarding category-specific issues, the most important are those in forest land and cropland categories. The issues in forest land are related to forest definition, forest stratification, ENVANIS database (e.g. lack of explanation of database treatment and annual update) and some missing information regarding the changes in emission factors used in current annual submission compared to those in previous submissions. Cropland faces issues with both, transparency and completeness. The structure of cropland remaining cropland need to be improved and methodological approach should be separated for annual and perennial crops. More effort should be given to improvement of information on equations and assumptions used for estimation of emissions and removals. National experts also explained that there are no or very limited data available on management systems, occurring on arable lands. This does not allow country to estimate changes in soil organic carbon of mineral soil, which may result in underestimation of emissions. Other issues are considered of minor importance, however they should be addressed and resolved as well.

For each identified issue recommendations and next steps were proposed. As activity data are the core variable to estimate GHG emissions and removals, country should develop a robust land use monitoring system that is capable of producing geographically-explicit land-use conversion data in the future. In its NIR, Turkey should explained in more detail, how data are collected, manipulated and updated within the ENVANIS database. For some subcategories (e.g. grassland converted to forest land and vice versa) emission factors should be reconsidered and LIFE MediNet project was suggested to be used as a reference. The same project can also serve data and parameters for perennial crops, which should be further disaggregated. Country should consider the correct use of notation key, particularly for land-use conversions that are assumed to occur in the nature.

Recommendations for decision making:

Though the GHG reporting in the LULUCF sector has much improved in the recent years, it is recommended to improve the transparency and completeness. More effort should be given to key categories (forest land, HPW) as they present the majority of total emissions in the sector.

3. Programme of Work

3.1. Key findings and implications

The Programme of Work (PoW) is the main outcome of the project activity 3.1 and was prepared on basis of the need analysis report and in cooperation with key stakeholders. It will be the guidance for planning and improving the LULUCF sector reporting for the next years. The PoW includes key activities and defines short, medium and long term category-specific planned improvements. It will help responsible institutions to determine priorities in the LULUCF, improve GHG emission and removal estimates and contribute in achieving climate goals. It is expected that implementation of the PoW will results in higher quality reporting, enhanced knowledge and capacity of national sectoral experts, better collaboration among the key stakeholders, and increased performance to monitor state and progress towards a GHG reduction targets.

Key findings are:

- The structure of PoW follows the components as foreseen by the project proposal. It includes the main body, annual work plan (AWp) and compendium. While the main body includes key activites, the annual work plan specifies timeline and responsibilites by organisations, including the plan for each CRF table of the LULUCF sector.
- The Results-Based Management (RBM) approach was suggested to monitor implementation of the PoW. This approach is focused on achieving objectives and outcomes of the PoW, however objectives and progress indicators need to be clearly defined. The SMART (specific, measurable, achievable, relevant, time-based) criteria were recommended for setting the objectives.
- The PoW constitutes of six sections and for each section objectives, priorities, and key activities were defined. Key activities describe what should be done and where should be focus. It is general description of tasks that are further explained in detail in compendium.
- One of the more important section is continuous improvement and update plan, which has an indicative timeline for short, medium and long term improvements to be implemented in the LULUCF. The plan sets improvements that are listed by categories and/or subcategories.
- The content of PoW, AWp and compendium were presented and discussed with key stakeholders at two workshops in Ankara.

3.2. Summary of report

The main body of PoW describes activities that are standard part of the GHG inventory (Figure 1). It explains what should be done for each section and sets priorities at category and subcategory level and suggests approximate timing for implementation. The second component of PoW is the annual work plan, explaining when and by whom the activities should be provided. The AWp has a particular plan for each CRF table and addresses also tasks related to LULUCF sector for preparation of biennial report and national communication report. The third component of PoW is the compendium, which includes a detailed description of tasks and procedures, making an idea how activities should be implemented by responsible institutions. The AWp and the compendium were prepared as a separate document in the form of annex.

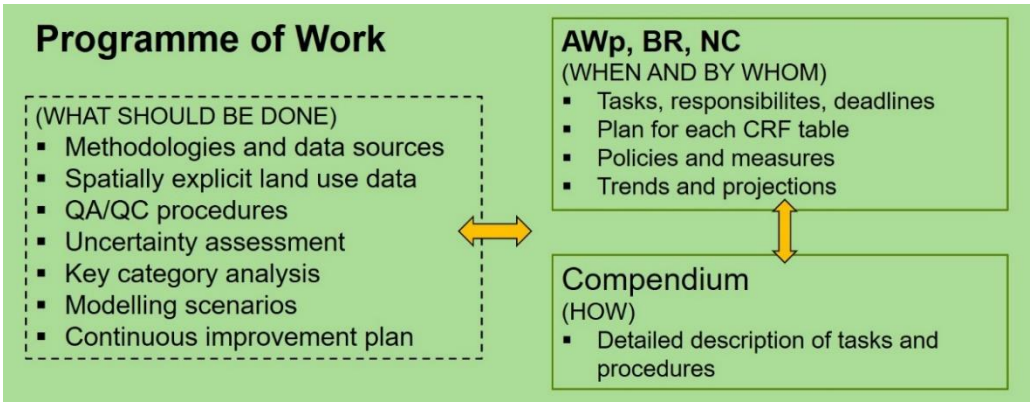

Figure 1: Components of the Programme of Work

It was suggested that the RBM approach is used to control and monitor how the implementation of PoW is progressing towards achieving its objectives and outcomes. The RBM is a management strategy by which all actors, contributing directly or indirectly to achieving a set of results, ensure that their processes, products and services contribute to the desired results (outputs, outcomes and higher level goals or impact) and use information and evidence on actual results to inform decision making on the design, resourcing and delivery of programmes and activities as well as for accountability and reporting (UN, 2011). The objectives need to be measureble and realistic, moreover, it was recommended to use the SMART criteria when setting the objectives. It is important to monitor project outcomes by using progress indicators which should be periodically checked (e.g. twice a year) at different levels.

The PoW is divided into six sections and for each section objectives, priorities, and key activities were defined. In general, the PoW describe what should be done in the next years to improve the LULUCF reporting. Below, there are some highlights for each section of the PoW.

Methodologies and data sources including appropriate tier level:

- *Data collection and update of the EF database:* the emphasis should be on collecting data for the categories Forest land remaining forest land, Land converted to forest land, and harvested wood products, because these categories contribute the most to total net emissions of the LULUCF sector.

- *Category and source-specific data manipulation:* most data management is suggested to dedicate to forest land, cropland, grassland and harvested wood products.
- *Auxiliary calculations for input data:* needed for forest land, cropland, grassland, wetlands, settlements and harvested wood products; forest land has priority.
- *Estimation of emissions and removals:* improved emission and removal estimation are expected in short term due to new set of activity data, which will also improve completeness.
- *Capacity building and knowledge transfer:* includes workshop and mentor style trainings to increase the knowledge on GHG inventory methods.

Spatially explicit land use data for different land use categories and subcategories:

- *Collection and update of activity data:* country is expected to apply spatially-explicit data in short term, however it is recommended to increase the knowledge and human capacities in this field. Country should also conisder the use of LPIS data for LULUCF reporting in the future.
- *Development of land transition matrix:* there were three options proposed to produce land-use change matrix. The country should consider the choice of preferred option within a wider stakeholder group, taking into account its multipurpose use and best value for money.
- *Preparation of activity data:* includes preparation of maps in relation to soil type, climate, and management system and wetland regime. National experts suggested to stratify forest land into ecozones and forest ecoregions.
- *Capacity building and knowledge transfer:* includes workshop and mentor style trainings in relation to LULUCF activity data and generic methods with practices for activity data.

QA/QC procedures:

- *Continuous improvement of the QA/QC plan:* It seems that the LULUCF sector does not face any major problems regarding the QA/QC procedures, however it was suggested to improve and update the plan when specific changes in the inventory process occur.
- *General QC procedures:* The national compiler is responsible that general QC procedures take places on data collection or shared databases of external sources. Responsibilities and timing should be clearly defined in the QA/QC plan.
- *Category-specific QC procedures:* The focus of category-specific QC procedures should be on key categories; thus, these activities were suggested to be performed after completion of key category analysis.
- *QA procedures:* includes QA provided by independent reviewers that have sound background knowledge and expertise and it is good practice to pay more attention on key categories.
- *Verification:* include comparisons with emission or removal estimates that originate from other (independent) studies and assessments and data derived from these studies should be included in the reference library for documentation.
- *Documentation, archiving and reporting:* includes all crucial information about inventory, including activity data, emission factors, rationale for method selection etc.

Uncertainty assessments and key category analysis:

- *Uncertainty assessment of activity data:* For the land use/cover datasets it is usual to provide accuracy assessment, which relates to user accuracy and producer accuracy; it is suggested that uncertainty assessment is to be provided by experienced experts.
- *Uncertainty assessment of emission factors:* It is good practice to explain on what basis the uncertainty of emission factors is calculated; may be estimated from published research studies, default values or expert judgments.

- *Uncertainty assessment of emissions by (sub)categories:* combined uncertainty at the category or subcategory level helps inventory team to identify which carbon pools contribute the most to total uncertainty of specific category and indicate where improvements are needed in the future.
- *Uncertainty assessment for the sector:* helps inventory team to identify the categories with high uncertainty; should be carried out by national inventory compiler every year.
- *Sensitivity analysis:* the purpose of a sensitivity analysis for inventory compilers is to identify which individual parts of the inventory might influence their conclusions. Different approaches are possible to perform this analysis at various levels of the inventory.
- *Identification of key categories:* the key category analysis is the most important information which help country to prioritize resources for improving its GHG inventory. It is usually performed by the inventory compiler.
- *Documentation of the key category analysis:* The KCA should be prepared for all sectors, both with and without LULUCF. The results of the KCA shall be annexed to the NIR in each annual submission to the UNFCCC.

Modelling scenarios without measures, with measures and with additional measures for the LULUCF sector:

- *Survey and selection of models, most suitable to national circumstances:* Modelling scenarios for making projections that help decision makers to understand what can happen under certain assumptions and conditions. Suitability and features of models should be reviewed first taking into account national circumstances.
- *Definition of WOM, WEM and WAM scenarios for LULUCF sector:* it was suggested that list of all policies and measures relevant to LULUCF sector should be prepared with regard to their importance in terms of relative contribution to GHG emissions and removals.
- *Modelling and preparation of GHG projections:* It was recommended that the country starts modelling with LULUCF key categories. The following modelling steps were proposed in as shown in Figure 2.

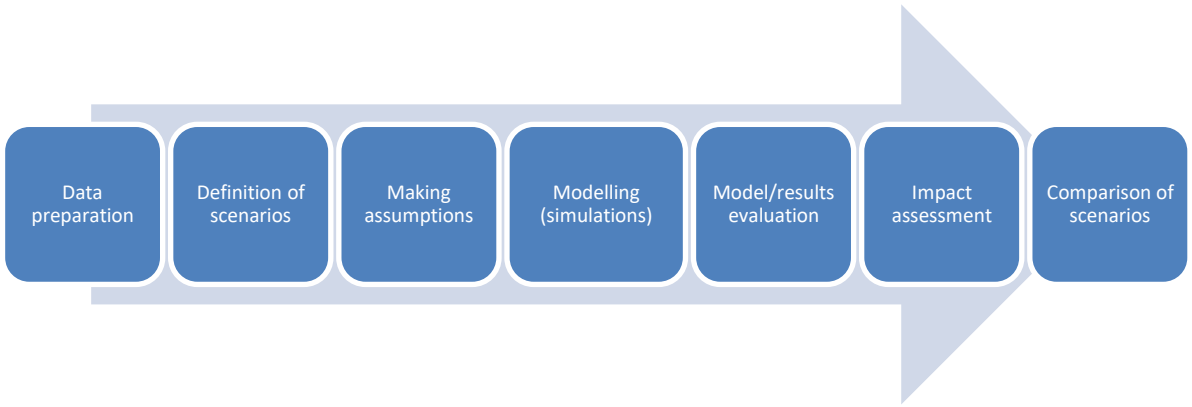

Figure 2: Proposed modelling steps in preparation of LULUCF GHG projections

- *Trainings and capacity building:* include workshop style trainings and development of scenarios for LULUCF, including HWP.

Continuous improvement and update plan:

- *Evaluation of the previous work and definition of the annual work plan:* evaluation report from previous work is the basis to find out how far the planned improvements have been implemented. It helps the LULUCF inventory team to define annual work plan each year.
- *Other common tasks:* include category-specific recalculations, filling the CRF tables and import the files into CRF Reporter, description of category-specific planned improvements and overall improving and updating the LULUCF chapter of the NIR.
- *Reference Library:* references that are used in support to the inventory as well as information about a description of the basis for methodological choice, emission factors, activity data and other estimation parameters, including appropriate references and documentation of expert judgements.
- *Archiving procedures:* Archive inventory information for each year is mandatory in accordance with the UNFCCC decisions. All archive information need to be available to expert review teams.
- *BR and NC specific chapter:* in relation to LULUCF sector, it was proposed to focus on topics, such as policies and measures, and projections. The WEM scenario for projections is obligatory according to the UNFCCC guidelines on reporting for BR and NC.
- *Category-specific planned improvements:* improvements per category and subcategory were wrapped up, indicating indicative time period and responsible organization for their implementations. They were suggested based on findings of the Need analysis report.

The contents of PoW, AWp and Compendium were presented and discussed with key stakeholders at two workshops in Ankara. The first workshop was held at the Latanya Hotel on 20 December 2018 and the second at the Mövenpick Hotel on 23 January 2019. At the first workshop, the structure of the Programme of Work, including the Annual Workplan and Compendium were presented to participants from key institutions (GDF, GDAR and TurkStat). At the second workshop, the first draft version of PoW was presented to participants, which gave some useful suggestions for its improvement.

Key highlights of the workshops were:

- it was suggested to review the 2018 annual review report and update some of the actions as follows from the recommendations,
- it was emphasized that TurkStat has its own QA/QC guidelines, which may be used for cross-referencing,
- participants pointed out that there are some national restrictions in data sharing among government organizations,
- TurkStat raised a question related to its legal power and proposed idea on establishment of that a new governance mechanism (i.e. active working groups),
- stakeholders suggested to include some examples in the Compendium for the complicated calculations,
- under the Ministry of Agriculture and Forestry a new working group may be established with members from: General Directorate of Forestry, General Directorate of Agricultural Reform, General Directorate of Agricultural Research and Policies,
- because there are no activity data for orchards, a specific research project may be proposed for this topic,
- a specific action should be included in the PoW for the improvement of EFs for some categories,

- an EF Database and Reference Library should be developed with the main elements, such as sector, EF and reference,
- it was pointed out that recommendations for BR and NC reporting should be related only to LULUCF not to general topics.

Recommendations for decision making:

It is suggested to apply Results-Based Management (RBM) approach to monitor implementation and progress of the Programme of Work. Short, medium and long term improvements should follow activities as recommended by continuous improvement and update plan.

4. Annual work plan

4.1. Key findings and implications

The annual work plan (AWp) includes activities to be implemented for LULUCF sector within the inventory year. It defines specific tasks to be completed, responsible institutions, deadlines and a brief description of activities. The AWp guides national inventory team for timely activities and improved reporting according to UNFCCC requirements.

Key findings are:

- The AWp was divided into two parts, namely common tasks and specific tasks. Common tasks are those routinely carried out every year, while specific tasks are those largely related to emission and removal estimation by each requested category.
- Detailed annual work plan was prepared for each Common Reporting Format (CRF) table. The latter includes tasks, responsible organization, description of process of storing and archiving data, annual schedule, estimation method, assumption and requirement about mineral and organic soils, and overview table of information related to each category.
- The schedule of AWp is generally consistent with time schedule of the GHG inventory cycle. However, national experts can adjust the schedule of tasks to be carried out for the LULUCF sector reporting.
- Beside the AWp, work plan was prepared also for Biennial Report and National Communication submission.
- Main responsible organizations for implementing the tasks of the AWp are GDF, GDAR and TurkStat.

4.2. Summary of report

The AWp comprises 13 common tasks and 3 specific tasks (Table 1) which should be completed for the LULUCF reporting every year. There are 12 out of 13 task that are quite standard in the GHG inventory for the UNFCCC reporting regardless of the sectoral particularities. One additional task was recommended to be included in the annual LULUCF activities - Evaluation of the implemented

improvements (Task 1). The outcome of the evaluation analysis should be in form of a short report that states which improvements have been implemented so far. The report helps to identify what improvements are to be planned and will be finished in the future.

Detailed annual work plan was prepared for all CRF tables of the LULUCF sector which need to be reported under the UNFCCC. For each CRF table exact tasks were defined, both common and specific. Moreover, responsible organizations were defined for activity data collection, treatment of mineral and organic soil data, and selection of appropriate emission factors and estimation method (Tier). Short description was given for data storage and archiving as well as for annual schedule of tasks. Overview tables were created for the main LULUCF categories, summarizing all important information.

Indicative schedule for implementation of the AWp tasks was prepared according to timetable of the GHG inventory cycle for the NIR. Tasks of the AWp are in most cases consistent with time schedule of the GHG inventory. Planning activities are scheduled for the period May to October, preparation from September to April and management from April to May. Nevertheless, national LULUCF experts may change the timetable to implement activities regarding their preferences. This should be discussed with national GHG inventory compiler (i.e. TurkStat) and agreed at the first assembly meeting.

Table 1: Common and specific tasks of the AWp

Common tasks		**Start date**	**Deadline**
Task 1	Evaluation of the implemented improvements	tbd	tbd
Task 2	Definition and update of the annual work plan	tbd	tbd
Task 3	Collection and update of activity data	01.11.XX-1	31.12.XX-1
Task 4	Data collection and update of the EF database	tbd	tbd
Task 5	Category-specific recalculations	01.05.XX-1	30.09.XX-1
Task 6	Filling the CRF tables and import into CRF Reporter	15.02.XX	15.03.XX
Task 7	Identification of key categories	15.02.XX	15.03.XX
Task 8	Uncertainty assessment and time-series consistency	15.02.XX	15.03.XX
Task 9	Category-specific QA/QC and verification	15.12.XX-1	15.02.XX
Task 10	Category-specific planned improvements	15.02.XX	31.03.XX
Task 11	Improving and updating the LULUCF chapter of the NIR	15.02.XX	31.03.XX
Task 12	Establishment of a reference library	tbd	tbd
Task 13	Data storage, backup and archiving	15.04.XX	30.05.XX
Specific tasks		**Start date**	**Deadline**
Task 14	Category and source-specific data manipulation	tbd	tbd
Task 15	Auxiliary calculations for input data	tbd	tbd
Task 16	Estimation of emissions and removals, and reporting	15.12.XX-1	15.01.XX

Although the BR and NC submission is not part of the AWp the work plans were also suggested. The BR submission need to be prepared every 2 years and NC submission every 4 years. However, it should be noted that future timing of NC is not specified in the Paris Agreement. Activities for preparation of the BR and NC should start early enough to allow for their timely submission. It was suggested that country should pay more attention to topics, such as description of LULUCF related policies and measures and preparation of the GHG projections. It was also recommended that GDF and GDAR make a review of BR and NC before approval and official submission to UNFCCC.

Generally, GDF is responsible for implementation of tasks for forest related categories (forest land, HWP and biomass burning), while GDAR is responsible for other categories (cropland, grassland etc.). TurkStat is responsible for storing and archiving data.

Recommendations for decision making:

It is suggested that the timeline of the Annual work plan for the LULUCF sector is consistent with that for the GHG inventory cycle. Sectoral experts should respect deadline of each task of the plan in order to allow for timely reporting, including the NIR, BR and NC submissions.

5. Compendium

5.1. Key findings and implications

The Compendium should be understood as a brief guidance that includes all important tasks to be completed in the LULUCF sector to improve the UNFCCC reporting, taking into account the TACCC principles. The Compendium is an integral part of the Programme of Work and explains in detail how tasks should be implemented. It was prepared based on the findings of the need analysis reports, interviews with national experts and discussions during both workshops in Ankara. The Compendium is consistent with the IPCC guidelines, but should not be treated as their substitute. It is rather a brief explanation of tasks for key aspects of the LULUCF GHG inventory and in many sections, it relates to the IPCC guidelines.

Key findings are:

- The central and key part of Compendium is section 2 - Methods used in the NIR. It gives detailed guidance on methodology, including category and source-specific data manipulation, auxiliary calculations for input data, and estimation of emissions and removals. For carbon pools where emissions and removals have not been estimated yet there are suggestions what activities and/or assumptions should be made by country to improve transparency and completeness in the sector.
- Management of Spatial Data is considered second most important part of Compendium which explains how activity data should be collected, the land transition matrix developed, and data prepared according to requirement of the CRF tables.

- Other important sections of Compendium in terms of LULUCF annual inventory preparation are Management of EF database, QA/QC procedures, Uncertainty assessment and Key category analysis.
- The Compendium also includes two sections that are considered relevant from the policy perspective, namely Modelling for Scenarios and BR and NC specific chapter. While modelling is employed to make GHG projections, BR and NC chapter for the LULUCF sector should focus on both, projections and policies/measures.

5.2. Summary of report

Section 2 of the Compendium deals with the methodologies for estimating carbon stock changes according to required carbon pools and (sub)categories. Guidance was given by considering methods currently explained in the Turkish NIR, gaps found in the need analysis report and the latest annual review report. For some subsections (FL, HWP), procedure of emission estimation was demonstrated by step-wise approach and supplemented by example of calculation. In order to increase transparency, it was suggested which assumptions should be made in the future. Activities needed to improve the completeness of the GHG reporting are included in the improvement plan of the PoW. As regards the short-term improvements, it was noted that several of them have already been implemented, as evidenced by the NIR 2019 report.

Collection and update of activity data is the only task that falls under management of spatial data. However, it includes activity data collection/update, development of land transition matrices based on observation of land-use changes, and preparation of these for reporting tables. Country faced several issues in the past regarding activity data, such as lack of information for all land-use changes, mismatch of forest-related activity data etc., which resulted in incomplete and inconsistent reporting. The main cause for that was different source for activity data (i.e. CORINE, ENVANIS). This is assumed not to be issue anymore as Turkey has applied spatially-explicit approach using satellite imagery for new activity datasets, including the updated land transition matrix. It was noted the approach improved consistency and completeness of the LULUCF reporting. However, country should aware that one of the disadvantages of using the remote sensing (satellite imagery) is costly data processing, which requires large capacities in computer equipment, human resources and knowledge.

It was suggested that Turkey establish the EF Database and revise some of EFs that were found questionable. So far, the country has established the EF Database and Reference Library and stated that EFs currently used can be improved via new research. It was recommended that country should keep in mind the appropriate selection of EFs as wrong selection may lead to under- or overestimation of emissions and removals. It is of great importance to harmonize EFs for forest land category, in particular in view of new stratification of forests applied.

Regarding the QA/QC procedures, uncertainty assessment and key category analysis no big issues were found. It was highlighted that QA/QC procedures and verification are part of the QA/QC plan and its development and implementation is under responsibility of national compiler. Because the LULUCF sector is quite complex, it is suggested to develop a sector-specific QA/QC plan, which would include sector-specific QA/QC procedures, including the timing for implementation and table of responsibilities. It is assumed that the QC activities are carried out by the sectorial experts within the

institutions, while it is good practice that QA activities are provided by indipendent experts outside the actual inventory compilation. Both, QA and QC activities should focus on key categories. It was also suggested to check the correct use of notation key, particularly for “not occuring” (NO) and “not estimated” (NE) to apply them consistently. The key category analysis should be understood not just as a requirement (e.g. as annex to the NIR), but to identify those categories that contribute most to total emissions. Similarly, uncertainty assessment helps country to determine which categories have the largest variation in estimates. In this way, country can define categories that are key and for which more effort and attention shall be given.

The LULUCF is considered a complex sector as it deals with different land categories, carbon pools and greenhouse gases. Different modelling approaches can be used to make GHG projections, which help decision makers to set most appropriate policies and measures. It was suggested that country make a survey and selection of existing models that would most fit to country circumstances and give focus on key categories when making projections. The activities related to LULUCF sector in preparation of BR and NC report should be directed to two topics, namely policies and measures and projections. Country should describe how it has given the priority to those policies and measures with the largest impact on GHG emissions and removals.

Recommendations for decision making:
It is recommended that Turkey continues to use a spatially-explicit land use system and directs the resources into development of the national forest inventory and considers the use of LPIS data for the LULUCF reporting purposes in the future.

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