
Environment and Climate Regional Accession Network (ECRAN)

Report on the Regional
Training Seminar on the
assessment of GHG
inventories in agriculture

21-22 June 2016, Zagreb

ENVIRONMENT AND CLIMATE REGIONAL NETWORK FOR ACCESSION - ECRAN

WORKSHOP REPORT

Activity 3.2 (Task 3.2.2A)

**REPORT ON THE REGIONAL TRAINING SEMINAR ON ASSESSMENTS OF GHG
INVENTORIES IN AGRICULTURE**

Zagreb, 21-22 June 2016



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LIST OF ABBREVIATIONS	
ADCP	Annual Data Collection Plan
AFOLU	Agriculture, Forestry and Other Land Use
AWMS	Agricultural Water Management System
BIH	Bosnia and Herzegovina
CRF	Common Reporting Format
ESD	Effort Share Decision
EU	European Union
FAO	
GHG	Greenhouse Gases
INSTAT	Statistical Data of Annual Publication of Albania
IPCC	Intergovernmental Panel on Climate Change
KEPA	Kosovo* Environmental Protection Agency
LUCF	Land Used Change and Forestry
LULUCF	Land Use, Land Use Change and Forestry
MMD	Monitoring Mechanism Decision, Decision No 280/2004/EC
MMR	Monitoring Mechanism Regulation, Regulation (EU) No 525/2013
MonStat	Office of Montenegro
MRV	Monitoring, Reporting and Verification
NA	Not Applicable
NatExp	National Expert
NE	Not Estimated
NIR	National Inventory Report
NO	Not Occurring
OSP	Official Statistics Programme
QA/QC	Quality Assurance / Quality Control
SEPA	Serbian Environmental Protection Agency
SNC	Second National Communication
SOM	Soil Organic Matter
TCCCA	Transparency, Consistency, Comparability, Completeness, Accuracy
TNA	Technology Needs Assessment
UNDP	United Nations Developing Programme
UNFCCC	United Nations Framework Convention on Climate Change
WG	Working Group
Ym	Milk yield



I. Background/Rationale/Legislation covered

Effective monitoring, reporting and verification (MRV) of greenhouse gas (GHG) emissions is critical for tracking progress towards the achievement of emission reduction targets. As Parties to the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol, the European Union and Member States are required to report annually on their GHG emissions. They also have to report regularly on their climate change policies and measures through National Communications.

The annual EU GHG inventory report is prepared on behalf of the European Commission by the European Environmental Agency each spring. In line with UNFCCC reporting requirements, each Member State's annual inventory covers emissions up until two years previously.

Regulation (EU) No 525/2013 on mechanisms for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change (hereinafter: Monitoring Mechanism Regulation or MMR) revises and strengthens the EU's greenhouse gas monitoring and reporting framework in order to provide a better platform for EU action to tackle climate change. It fully substitutes the Decision No 280/2004/EC (Monitoring Mechanism Decision or MMD). Its main goals include improving the quality of the data reported, enabling the implementation of the Climate and Energy package through accurately tracking the progress of the Union and EU Member States towards meeting their emission targets for 2013-2020 and taking into account the periodic update at international level of the use of metrics (Global warming potentials) and methodologies (IPCC Guidelines) in the determination of greenhouse gas inventories.

Prior to the workshop country experts supported by local experts were expected to do the following:

1. Prepare presentations on their Agriculture estimates in accordance with the Sub topic/Content outlined in the 10:00 – 11:00 and 11:15 – 12:00 sessions of day 1.
2. Complete the assessment of progress with estimation methods on the ECRAN knowledge sharing portal “National System Progress” [here](#)
 - Under “**Method**” Identify the method used for estimating GHGs. e.g. 2006 IPCC, GPG, IPCC 1996 etc. If the category is not occurring in the country please use "NO", if it is not estimated please use "NE", if it is included with another category use "IE" and explain where.
 - Under “**Tier**” Identify the tier used for estimating GHGs. e.g. Tier 3, Tier 2, Tier 1 etc. If the category is not occurring in the country please use "NO", if it is not estimated please use "NE", if it is included with another category use "IE" and explain where.
 - Under “**Current Situation**” Describe the current situation on institutional arrangements, e.g. organisations that are involved with the estimation and data supply.

Under “**Planned Improvements**”: Briefly highlight planned improvements and reference any further documentation of these.

II. Objectives of the Training

Objectives

The aim of this training seminar was to gradually improve/increase technical knowledge and institutional and procedural capacities of the ECRAN countries to prepare submissions of the National Inventory Reports according to the requirements of the MMR.

The training seminar is covering following activities of ECRAN's Working Group 2 on "National inventory systems and the EU Monitoring Mechanism Regulation":

- Sub-task 2.2.A. related to regional technical training seminars on GHG inventory in **Agriculture** sectors in accordance with the Revised 2006 IPCC Guidelines)
 - Sub-task 2.2.A. is dealing with identification of gaps in activity data and providing recommendations for establishment of data flow system for gap filling as well as checking the overall quality of implemented emission factors in GHG emission estimates with focus on key categories in Agriculture.
 - The results of this training will feed into assessment report which will include recommendations for short and long-term inventory improvements in relation to applied methodology, activity data and emission factors in the beneficiaries.

This regional training seminar is based on the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

Participants were requested/encouraged to bring to the workshop their latest estimates (preferably in electronic form) for GHG emissions in the agriculture sector prepared in the framework of the UNFCCC reporting exercises. The training will address best practices, but also will go through the national inventory reporting on the agriculture sector in the Agriculture Reporting Clinics on day 2.

Expected Results

The expected results of the seminar were:

- Quality control check of key categories with focus on completeness and accuracy;
- Identification of activity data gaps and providing recommendations and guidance for gap filling;
- Improved skills in selecting emission factors and other calculation parameters in agriculture;
- Setting priorities for country-specific short and long-term GHG inventory improvements.



III. Highlights from the Training

Reference is made to Annex I for the agenda. Below only the main elements are highlighted. The presentations are presented in Annex III.

Highlights Day 1 – 21 June 2016

Day 1 – Hotel Panorama, Zagreb, Croatia, 21 June 2016

Introduction to the workshop: – Justin Goodwin

The presentation started with a wrap up of the terminology used throughout the ECRAN exercise and explained the objectives and expected results of the proposed workplan for the so called MMR exercise. The need was emphasised to see the building of National Systems as building national centres of excellence.

The relevance of aligning with the MMR requirements for the ECRAN beneficiary countries becomes more urgent with the Paris Agreement. To allow countries to properly follow up on above requirements, there is a need to develop permanent national systems for (1) the estimation of anthropogenic emissions of greenhouse gases by sources and sinks; for (2) the assessment of the impacts of policies and measures for greenhouse gas emissions as well as (3) for greenhouse gas projections, and for (4) the reporting of inventories and national inventory reports.

Mr Goodwin went into depth into the key terminology to put the work in this workshop in context:

- **National systems:** A team of organisations (people), available resources, data providers, and agreed processes and tools focussed on efficiently and repeatedly:
 - **Estimating & reporting** GHGs of timely & ensuring “acceptable” quality (TCCCA)
 - **Engaging** with stakeholders and external review activities (verification) and the outside world!
 - **Improving estimates** and **evolving itself** (the National System) to fit with governance structures and data suppliers.
- National system actors: **National/Country Experts (NatExp):** Experts identified in the “National System” as country representative experts. **Sector Experts** with recognised knowledge of the countries sectoral emissions/removals. (e.g. Agriculture).
- ECRAN TAIEX/support: The local experts and international experts were introduced and their roles were explained.
- The National Systems knowledge sharing portal was presented¹.

The Chapters of the 2006 IPPC Guidelines for the AFOLU sector was presented. In addition a short introduction was given to the CRF tables (the emission tables and background tables) used for agriculture.

¹ <https://aetherltd.sharepoint.com/sites/ECRAN-WG2/SitePages/GHG%20National%20System%20Forum.aspx>



The focus will be on emissions from livestock and manure management and N₂O emissions from managed soils and CO₂ emissions from lime and urea application.

Beneficiary status updates: progress and issues in beneficiary countries

Bosnia and Herzegovina

The BiH structure and governmental framework is presented - decentralized political and administrative structure, two Entities and District of Brcko. For the Republika Srpska the Institute of Statistics has the biggest role. For the agricultural sector the Ministry of Agriculture, Forestry and Water and the Agriculture Institute have an important role.

Problems relate to:

- missing data for the years 2002 and 2003;
- missing data for the area of organic soils (histosols);
- missing data for the synthetic fertilizer N for the all years (only one person was estimating the N fertilizer and procedure of calculation is unknown to other team members, only the final number);
- lack of data for the higher Tier level (Tier 1);
- two different sources – two different data;
- lack of people for the estimating the data;
- For the agriculture sector in GHG inventory the following was not estimated;
- flooded rice field and savanna burnings – because non-existent;
- burning of agriculture residue – because it's forbidden by law in RS;
- Progress made and planned improvements;
- Complete the series from 2002 - 2014;
- There is a plan to improve the GHG inventory and start using the IPCC 2006 Methodology, already tried the calculation for 2 years;
- The model for estimation of the N synthetic fertilizer is tried out;
- To find a way to influence the institution that collecting data, to be compatible with needs for GHG inventory calculation - to use higher Tier level.

For the country the general assessment of the completeness includes the following:

- Key source analyses performed;
- Key category level and trend assessments performed in the Third National Communication;
- The completeness is evaluated following the IPCC methodology and appropriate use of the following notation keys: NO (not occurred); NE (not estimated); NA (not applicable);
- Gaps in the availability and collecting of activity data described where appropriate.

The data sources for the whole country were provided for the livestock number. The production of N-fixing crops and non N fixing crops, the area of histosols and the activity data on mineral fertilisers.



In the Agricultural sector there are two significant methane emission sources present: enteric fermentation in the process of digestion of ruminants (dairy cows represent the major source) and different activities related with storage and use of organic fertilizers (manure management).

Within the agriculture sector, three sources of nitrous oxide emissions (N₂O) are identified:

- direct emissions of N₂O from agricultural land;
- direct emissions of N₂O from livestock;
- indirect N₂O emissions caused by agriculture activities.

The gaps/ needs and wanted improvements relate to a long list of issues:

- Statistical data not fully harmonized in the country – difference in the methodology of data collection on different levels;
- Credibility of data questionable;
- Lack of (reliable) data is main constrain for application of higher TIER method(s);
- Lack of relevant regulations for implementation of the data gathering commitment
- Lack of activity data needed for reporting to IPCC and implementing commitments under UNFCCC;
- Lack of administrative capacities for preparation of high-quality subordinate legislation governing the activity data collection;
- There is a need for financial resources, expert assistance in the institutional strengthening and the development of the national system for the inventory compilation (entire cycle), QA/QC and reporting.
- Identified key categories: agriculture soils and enteric fermentation;
- Improvement of the TIER method – especially or at least for the key categories;
- Harmonization of the activity data collection;
- Categorization of activity data;
- Capacity building & training of staff.

Albania

The GEF/UNDP prepared Initial National Communication (INC), which was submitted to the UNFCCC in July 2002. The core focus of the INC was the preparation of the GHG emissions inventory *for the year 1995*, considering *seven main GHG-emitting sectors*: (i) energy, (ii) industrial processes (iii) agriculture and livestock, (iv) land use change and forestry (LUCF); (v) waste; (vi) solvents; and (vii) international bunkers. The inventory was the basis for the GHG mitigation analysis, which projected GHG emissions for each year up to the end of 2020.

The Second National Communication (SNC) built on the results of the INC and the 2004 Technology Needs Assessment (TNA) extended the inventory of anthropogenic GHG emissions and removals to the *period 1990-2000, with 2000 being the base year*. The SNC considered *six main GHG-emitting sectors*: i) energy, ii) industrial processes, iii) agriculture, iv) waste, v) LUCF, and vi) solvent and other product uses.(Uncertainties particularly on fuel wood consumption) The inventory was again the basis



for the GHG mitigation analysis, which was extended to 2025 and had a pronounced focus on energy and transport (the main emitting sectors).

GHG Inventory in the Third National Communication (draft) has narrower and deeper analysis than the previous inventory (i.e., more detailed activity levels, data permitting) with the baseline year of 2005. The inventory adopted the higher tiers of the IPCC methodology and maintained a strong data validation focus on the energy and transport sectors. The inventory covers the refined time-series for the period 2000-2009. TNC is developed using the 1996 revised IPCC Guidelines.

The results from the agriculture sector as indicated in the TNC are presented.

Sector issues in relation to the agriculture sector that Albania would like to work on include:

- Gathering data on land that is burnt.
- Need for an unified methodology for calculating the GHG emissions in the surfaces that are burned or permeates fire.
- Country specific emission factor of GHG emissions from livestock, since it has specific nature (The IPCC coefficients are used).
- Gather accurate data for organic soils.
- Gather data on the systems (if any) for the treatment of sewage farms, no data for the number of livestock and no data for the quality of pastures.

Montenegro

The Environmental Protection Agency (EPA) of Montenegro is the institution responsible for preparing the GHG inventory. Development of gas and pollutant inventory by EPA is prescribed by national legislation and ratified international treaties – Convention on Long Range Trans-boundary Air Pollution (CLRTAP) and the United Nations Framework Convention on Climate Change (UNFCCC).

EPA calculates emissions and sinks in forestry using data supplied by the Forest Administration under the Ministry of Agriculture and Rural Development, and the Statistical Office of Montenegro-Monstat.

EPA employs three people for conducting gas inventory, as part of the Department for Monitoring, Analysis and Reporting; Mr Duško Mrdak is delegated the sector of agriculture, forestry and Other Land Use (AFOLU).

The First Biennial Update Report (BUR) was drafted according to instructions from the IPCC Guidelines 2006, in cooperation with the UNDP.

The report includes recalculated data for the period 1990-2011, and calculations for 2012 and 2013. Emissions produced by the agriculture sector include the following GHG: CO₂, N₂O and CH₄. Data for the Agriculture were done as part of the new AFOLU sector, and the total sink for this sector in 2013 is -1.941,37 Gg CO₂ eq.

Data on the number of livestock, sheep, goats, horses, pigs and cattle were obtained from the inventory of agriculture from Monstat. Using this data, CH₄ emissions from enteric fermentation and manure management was calculated. For estimating direct N₂O emissions, data on imports of nitrogen fertilizers were used, and were obtained from Monstat.



In terms of non-estimates no calculation was done for the use of lime in agriculture, as well as urea application, also due to lack of input data for these activities.

Critical issues relate to:

- Lack of data
- The quality of existing data (the estimates were made for the surface areas)
- A relatively high percentage of uncertainty for the data
- Use of default emission factors and the absence of country specific data
- QA/QC Plan and Verification was not carried out (QA/QC) outside of the Environmental Protection Agency by anyone else. It is planned for the 2017

The project for the 3rd National Communication for Climate Change is being drafted, with certain data and categories further improved, and thus the Montenegro Report is becoming more complete and more complex.

Kosovo*²

Kosovo* has a GHG inventory for the period 2008-2013.

- Step 1: Years 2008 and 2009
 - Experts from Charles University, Czech Republic, under the project “Transfer of Czech Experience: Developing Kosovo* Greenhouse Gas (GHG) Inventory Management System”. (Supported by UNDP)
 - During the process National expert were trained and relevant data was collect.
- Step 2: Year 2012
 - From KEPA under the “Transfer of Czech Knowledge: Activating Kosovo* Greenhouse Gas (GHG) Monitoring System.” (Supported by UNDP),
 - National Experts- Assessment, collection of data, calculation, NIR, with supervision from Czech Expert.
- Step 3: Years 2010, 2011, 2013
 - From KEPA experts - Assessment, collection of data, calculation, summary report 2008-2013.

The activity data include

- Livestock categories and number of population,
- Manure management systems/Fractions,
- Urea applied/consumed/annual amount,
- Synthetic fertilisers used/ annual amount,
- Agricultural production/amount for specific categories (Annual harvest/fixing crops/Crop residues-N),

² The designation is without prejudice to position on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo declaration of independence.



- Area burned in land use categories,
- Climate region and average temperature.

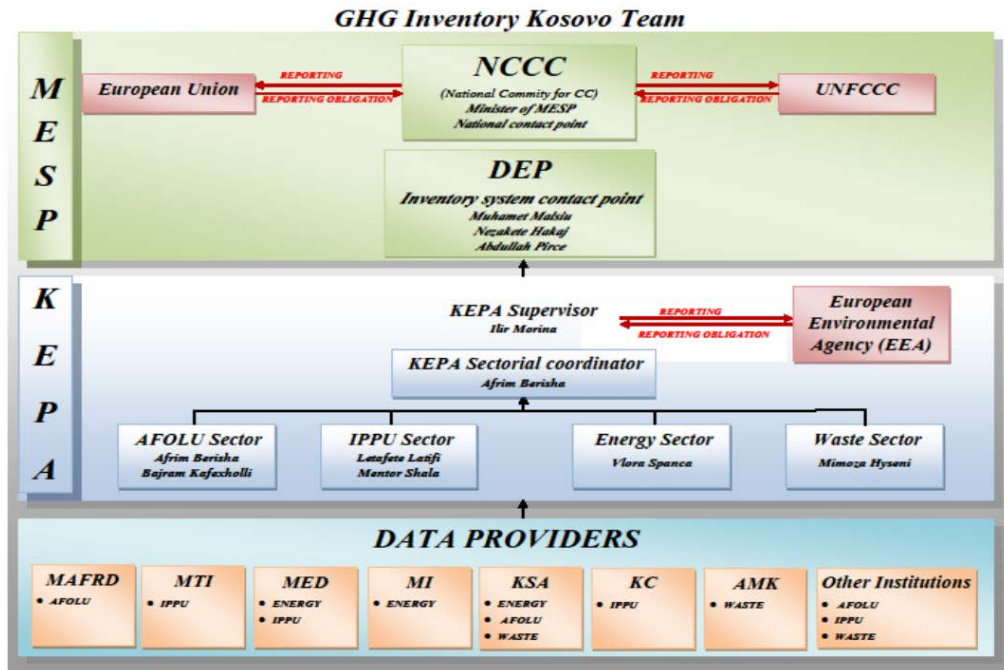
The data providers include the Agricultural Households Survey (KSA&MAFRD) (Livestock categories, Urea and Synthetic fertilizers used, Agricultural production). In addition the country works with expert estimates from Ministry from Agriculture, Forestry and Rural Development and Agriculture Faculty for Manure Management systems and fractions, and area burnt in cropland areas. The Kosovo* Forestry Agency provides data on area burnt in forest areas.

The main needs relate to:

- Improvement of data (statistical surveys) for:
 - Livestock categories,
 - Average life of livestock,
 - Use of synthetic fertilizers,
 - Manure management systems.
 - Other relevant data.
- Improvement of cooperation with:
 - Kosovo* Statistical Office,
 - Ministry of Agriculture, Forestry and Rural Development,
 - Kosovo* Agency of Forestry
 - Faculty of Agriculture
 - Farmers and Association in Agriculture sectors.
- Trainings and seminars
- Studies and analyses in this sector.
 - Including (Noted by International Experts at the workshop) checking the time series consistency of the data for all years estimated (2008 – 2013).

The figure below depicts the organogram for the GHG Inventory Team.





Serbia

SEPA finished GHG inventories for the period 1990 – 2014. The current methodology is based on Tier 1 methodology. In the Second national Communication (planned for 2016) the whole period will be covered. SEPA uses 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Chapter 10 - Emissions from livestock and manure management).

Data supplier for 3A and 3B is the Statistical Office, while SEPA makes all the calculations.

Reference is made to the IPA II Twinning project: Establishment of a mechanism for implementation of MMR (1.2 million EURO)

In the framework of the twining project the following documents are prepared:

- The Rules and procedures for implementing MMR requirements: The objective of this document is to describe the rules and procedures to ensure appropriate implementation of the MMR requirements and expected related reporting. So such description will deal especially with data/product flows as well as timely submission of data and information relevant for climate change issues that are requested within the implementation of the Mechanism for Monitoring and Reporting greenhouse gas emissions regulation (MMR) and the Effort Share Decision (ESD).
- The Assessment report and the Recommendations report: The objective of this report is to provide recommendations based on an assessment synthesis of the existing institutional arrangements and organization, data flows, responsibilities and tasks, and options on how to arrange them for the requirements of the MMR and the EU Effort Sharing Decision, as well as the LULUCF Decision. The conclusions of the assessment represent the recommendations for the Serbian organization to implement the MMR EU requirements.
- QA/QC procedures for the national inventory system



The objective of quality procedures in the framework of the preparation of national GHG emissions inventory is to satisfy the criteria of transparency, consistency, completeness, accuracy, and traceability, comparability required by UNFCCC, and to meet the deadlines for the MMR requirements submission.

Quality procedures have to cover:

- The requirements on data which have to be transmitted in the framework of MMR;
- The preparation of a National Inventory Report (NIR) in accordance with UNFCCC requirements (e.g. content of the NIR, CRF format, good use of notation keys);
- The development of the relevant procedures for the emission calculations, as methodology choices, references, data collection, processing data, data validation, data archiving;
- The uncertainty estimates.

Turkey

The GHG emissions inventory is prepared by the “GHG Emissions Inventory Working Group”, which includes the following institutions:

- Coordination Board on Climate Change and Air Management (CBCCAM).
- Official Statistics Programme (OSP) based on the Statistics Law of Turkey No. 5429

Turkish Statistical Institute (TURKSTAT) is the responsible organization for the coordination of this working group (WG) and also the UNFCCC Inventory focal point of Turkey.

An overview is presented for the agriculture sector:

Agriculture	Time Frame	Territory	GHG	Method Applied	Emission Factor
Enteric Fermentation	1990-2014	TR	CH4	T1	D
Manure Management	1990-2014	TR	CH4, N2O	T1	D
Rice cultivation	1990-2014	TR	CH4	T1	D
Agricultural soils	1990-2014	TR	N2O	T1	D
Prescribed burning of savannas	1990-2014	TR	NOT OCCURRED		
Field burning of agricultural residues	1990-2014	TR	CH4, N2O	T1	D
Liming	1990-2014	TR	NOT ESTIMATED		



Urea application	1990-2014	TR	CO2	T1	D
Other carbon-containing fertilizers	1990-2014	TR	NOT ESTIMATED		

Planned improvements include the use of a higher Tier method, specifically Tier 2, for key categories:

- enteric fermentation (CRF3A)
- agriculture soils category (CRF 3D)
- manure management (CRF 3B).

In order to increase Tier level the following are required:

- Livestock parameters related to the characterization of subgroup of significant livestock species, methane conversion factor, gross energy intake
- Detailed information on animal characteristics and manure management practices
- Emission factors under different conditions for subcategories of agricultural soils category

In order to achieve completeness of the agriculture sector:

N2O emissions from;

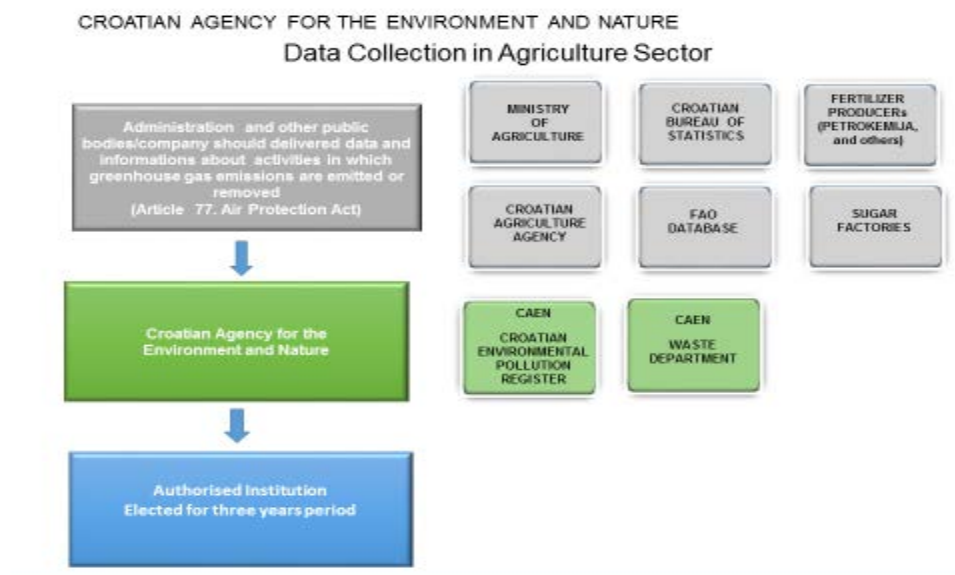
- Sewage sludge applied to soils (CRF 3D.2b)
- Cultivation of organic soils (CRF 3D.6)

and CO2 emissions from;

- Liming (CRF 3G)
- Other-carbon containing fertilizers (CRF 3I) is planned to be estimated.

Croatian work and experiences in estimates on Agriculture – Tatjana Obucina.

The data collection in the agriculture sector are presented and is summarised in below organigramme:



For the sectors CRF 3A (Enteric fermentation in domestic livestock), CRF 3B (manure management), CRF 3D (Agriculture soils) and CRF 3G (Liming) and CRF 3H (Urea applications), the main document for



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collecting data is the Annual data Collection Plan (ADCP) for Agriculture Sector which contains source categories, activity, activity data, data source and competent authority. The Ministry of Agriculture is responsible for most of the data.

For CRF 3 A, the data suppliers are:

- Croatian Bureau of Statistics and FAO database: numbers of animals produces annually for all category, weight and milk yield for dairy cattle
- Croatian Agriculture Agency: numbers of dairy cattle and horses

For CRF 3B on manure management the data suppliers are:

- Croatian Bureau of Statistics and FAO database: numbers of animals produces annually for all category
- Croatian Agriculture Agency: numbers of horses, mules/asses

For CRF 3D (Agricultural soils) the data suppliers are:

- Croatian Bureau of Statistics - data of used Synthetic fertilizers
- Fertilizers producers (Petrokemija and others)- data of produced and used Synthetic fertilizers
- CAEN - sewage sludge applied to soils (2005-2014), cultivation of Organic Soils

For CRF 3G (liming) the data suppliers are:

- Sugar Factories in which lime has been produced as by -product

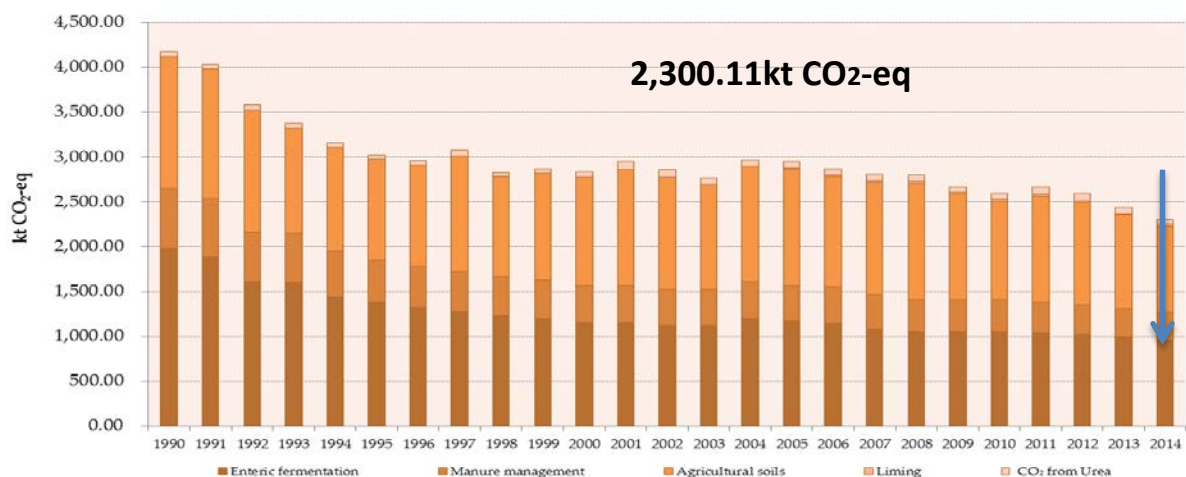
For CRF 3H (Urea applications) the data suppliers are:

- Croatian Bureau of Statistics (data of used Synthetic fertilizers)
- Fertilizers producers (Petrokemija and others)- data of produced and used Synthetic fertilizers
- CAEN - sewage sludge applied to soils (2005-2014), cultivation of Organic Soils

National Inventory report (NIR) 2016 – Dora Magdic

A presentation is provided on the Agricultural sector as presented in the NIR. Key highlights are that:

- Agriculture represents **10%** of the total inventory emission 2014
- **37% of CH₄** comes from Enteric fermentation (cattle)
- **65% of N₂O** comes from Agricultural soils (nitrogen fertilizers)



The results for the different CRF sectors (3A, 3B, 3D 3G and 3H) are presented, including the tiers applied as well as the planned improvements in the different sub-sectors.

CRF 3A: Enteric Fermentation:

Methane is a direct product of animal metabolism generated during the digestion process. Dairy cattle is the single major source of CH₄ emissions from enteric fermentation. The emission trend follows the trend of animal population which significantly decreased during the war period in the early 1990s (up to 1996). The IPCC 2006 Tier 2 methodology has been used to calculate methane emission from enteric fermentation for cattle, swine and sheep. National emission factors for animal species were developed with the assistance of experts from the Faculty of Agriculture, University of Zagreb. Development of national emission factors marks a significant change and ongoing improvement of the inventory.

Planned improvements include continued investigation of activity data (livestock population) with the purpose of gathering more detailed activity data, particularly of sheep annual population subcategorization and also improvement to swine subcategorization to prevent overestimation of emissions. Continued improvements and verifications of parameters for Tier 2 emission calculation and factors is ongoing.

CRF 3B: Manure management:

Management of livestock manure produces both methane (CH₄) and nitrous oxide (N₂O) emissions. CH₄ produced during the storage and treatment of manure. Methane emission from manure management for the period from 1990 to 2014 is presented. The emission trend depends on the animal population trend. The 2006 IPCC methodology, Tier 2 method has been used to calculate methane emission from manure management. National emission factors were developed for all animal species with the assistance of experts from the Faculty of Agriculture, University of Zagreb.

Direct N₂O emissions occur via combined nitrification and denitrification of nitrogen contained in the manure, dependant on storage and treatment types and methods. Emissions of nitrous oxide (N₂O) from all animal waste management systems are estimated (anaerobic lagoons, liquid systems, solid storage, dry lot and other systems). Default emission factors were used for the final estimate calculation of direct N₂O emissions. The emission trend depends on the animal population trend. Activity data regarding livestock population are the same as for the calculation of CH₄ emission from enteric fermentation and manure management. Indirect emission is from volatile nitrogen losses that occur in the forms of ammonia and NO_x, and losses through runoff and leaching into soils.

Planned improvements relate to continued improvements of fractions for N excretion for livestock categories (primarily cattle and swine) in manure management systems with the purpose of further verification of source data.

CRF 3D: Agricultural soils:

Direct N₂O emissions are estimated separately from indirect emission, though both use the same set of activity data. Direct N₂O emissions from agricultural soils include total amount of nitrogen applied to soils through human induced N additions and/or change of practices.

In order to calculate emission from agricultural soils, the IPCC methodology (Tier 1) has been used. Emission factors were taken from the 2006 IPCC Guidelines.



Calculations of indirect N₂O emission from nitrogen used in agriculture are based on two pathways - volatilization and subsequent atmospheric deposition of NH₃ leaching and runoff of the nitrogen that is applied to or deposited on soils.

Continued improvements in direct N₂O emission include a more detailed explanation of the activity data trends and further verification of source data. The investigation of the difference in statistical data of mineral fertilizer usage that is leading to the possible overestimation of direct N₂O emissions from the agricultural soils is carried out. They collect relevant data from all relevant national institutions that can provide relevant information in order to provide additional detail on sourcing of AD and improve transparency.

Furthermore there is a shift from Tier 1 to Tier 2 for the entire direct emissions from soils

CRF 3G: Liming and CRF 3H (Urea application):

Liming - The application of lime on agricultural soils was estimated for NIR 2014 for the first time. Data that are collected come from the sugar factories in Croatia in which lime has been produced as by-product. All quantities of lime produced are applied on soils. This has been practice in Croatia since 2005 in case of one sugar factory, and in case of another sugar factory since 2010.

Urea - CO₂ emissions resulting from nitrogen from fertilizers and other agricultural inputs that is lost through leaching and run-off were estimated using Tier 1 methodology, using default emission factors. Activity data for applied urea was taken from common dataset used for direct N₂O emission from agricultural soils emission estimates for inorganic N fertilizers.

Planned improvements relate to the calculation of direct N₂O emissions from agricultural soils, including the development of proportion estimates of urea in applied urea solutions.

Agriculture good practice examples and lessons learned from Member States and review.

This session focused on examples and lessons learned from member states, including issues related to institutional arrangements, planning, the choice of methods, preparation and archiving, ensuring sectoral expertise, QA/QC, establishing regular data suppliers, the drafting of the National Inventory reports, archiving and review and international consultation and analysis (ICA) experiences.

Slovakia – Janka Szemesova and Kristina Tonhauser

Agriculture produces about 27% of the total methane and more than 80% of the total nitrous oxide emissions. The share of ammonia emissions is more than 90%. Especially, intensive farming of animals is the most loading activity. Key categories are emissions from animal husbandry and storage and spreading of manure and slurry on the soil.

Key messages 1: Follow national circumstances analyse past trends; do prioritization; make key category analyses; Do the inventory consistently across GHG and air pollutants.

The data suppliers and providers are

- Ministry of the Agriculture and Rural Development of the Slovak Republic: concepts, strategies, plans...mostly for projections



- Statistical Office of the Slovak Republic: (number of the livestock, milk yield; Data is available on 30/6 each year)
- National Agricultural and Food Centre – Research Institute for Animal Production: Emissions of methane from enteric fermentation, Emissions of methane and ammonia from manure management
- Central Controlling and Testing Institute in Agriculture: The amount of synthetic and organic fertilizers applied on soil, sewage sludge
- Research Institute for Soil Protection: Information on soils, plant production, liming and urea application on the soil

Key messages 2: It is important to create a robust National System in Agriculture, to institutionalize your system, involve different institutions/experts and to train new experts in-house – This is important for good reporting.

The latest Slovak data improvements in the agricultural subsectors are summarized in the table below.

Methane from Enteric Fermentation	Methane from Manure Management Systems	N2O from Manure Management Systems	N2O from Managed Soils
Gross energy intake	Percentage of average waste manure systems	Nitrogen excretion rate	Manure applied to the soils
Methane conversion factor	Volatile solid excretion rates	Percentage of average waste manure systems	Manure applied to the soils by grazing
Digestibility			Sewage sludge

Key messages 3: Prepare improvement plans; Plan future inventory in manageable way; Asses reached improvements; Recalculate back to base year; Use consistent data and methodology for time series

An example was provided of a review process on the Y_m (milk yield) parameter.

Key messages 4: Do quality assurance (during inventory preparation); Do quality control (after finishing inventory); Prepare experts for review; Do good documentation/references/national study; Do careful archiving

Denmark: Steen Gyldenkærne

Assessments on the agriculture sector seem difficult

- So keep it simple
- You cannot do it better, than the data you have

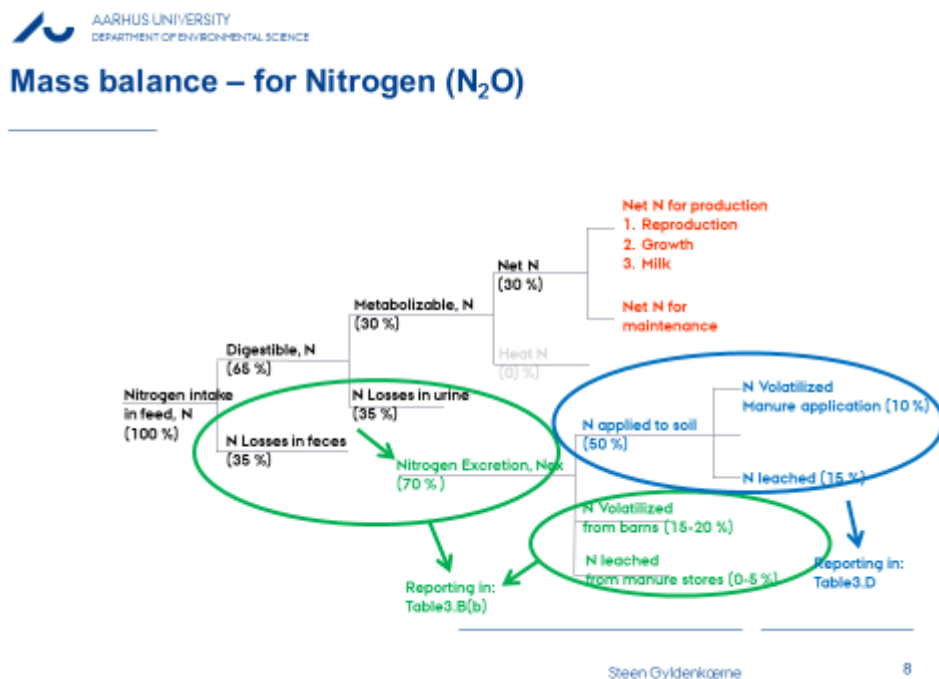


It is recommended that if you have uncertain data, to keep Tier 1. Do not spend too much time on "updating old data": Use average data and expert judgement.

Agronomic parameters in husbandry are explained and examples of the mass balance/mass flow of nitrogen and carbon. Issues to consider in the mass flow:

- An animal eats some feed containing carbon and nitrogen
- In the animal, part of the feed is degraded
- Part of it is exhaled through the mouth
- Part of it is taken up by the body and deposited in fat, muscles, bones, foster, and milk
- The rest is excreted in faeces or urine (manure)
- Manure is degraded and may yield CO₂, CH₄ and N₂O
- Part of it is very difficult to degrade and end up in the soil when the manure is applied to the soil
- In the soil further degradation takes place and may yield CO₂, CH₄ and N₂O
- Part of the manure may be incorporated in the soil as soil organic matter (SOM)

The mass balance – for nitrogen (N₂O) is presented in below organogram:



In addition a mass balance for organic matter (CH₄) resulting from the carbon introduced into the system is presented. The presentation was concluded with some examples of manure management systems.

France: Etienne Mathias

In France the data are provided from various sources

- Agricultural annual statistics are based on exhaustive census every 10 years



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- Specific surveys on agricultural practices
- Specific survey on fertilizer and limestone provision to farmers
- A few exotic sources to estimate to small sources (sugar scrums, histosols, etc.)

The methods applied for the different sub-categories are as follows:

- 3A. Enteric fermentation (country specific methodology : tier 2-3)
- 3B. Manure management (IPCC tier 2 methodology based on specific nitrogen excretion and solid volatile excretion)
- 3C. Rice cultivation (tier 1)
- 3D. Agricultural soils (tier 1-2)
- 3.F Burning of residues (tier 2)

The key message was: Stop planning the improvement of tiers, try to implement it. The presentation then focused on improving the tier methods (from tier 1 to tier 2/3) from the different sub-categories. Be aware that tier 2 will increase accuracy if and only if additional data are available with a sufficient quality. A long term vision is needed and real involvement from inventory team is needed.

Different methods of manure management were demonstrated. IPCC is strange on manure management because tier 1 for CH₄ is not based on manure management types although tier 1 for N₂O is based on manure management without any clear benefit (Emission Factors remain uncertain). The challenge is to conciliate many different references and statistics and to focus on consistency between enteric fermentation and excretions.

Spain: Beatriz Sanchez

QC checks will be done while compiling and estimating emission:

- Make notes as you work! References, assumptions, methods, etc.
- Collate information that can be used for reporting
- Log the information—provide evidence of QA/QC

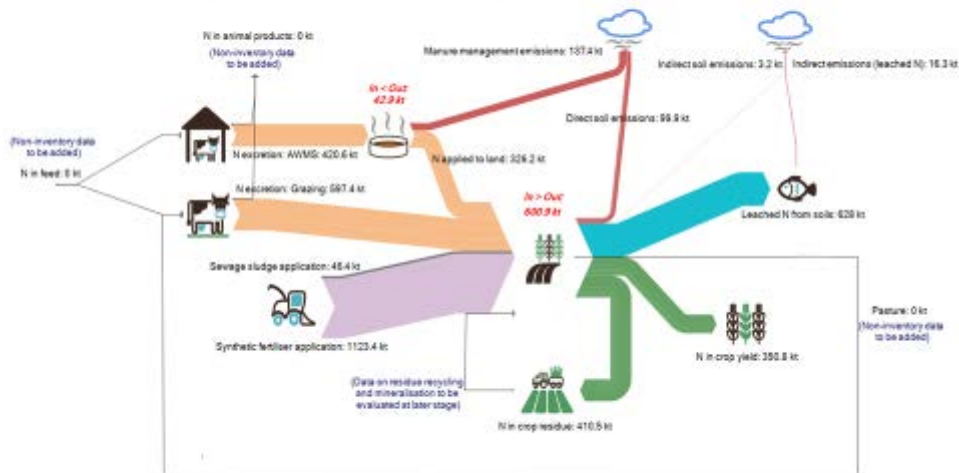
QA/QC may focus on calculation errors and transparency at the first stage, and grow gradually; QA/QC will support the improvement plan: actions ongoing or not done. A QA/QC list for agriculture estimates was presented. In addition examples were presented for the compilation of the GHG emissions from agriculture from Jamaica.

The nitrogen balance approach was outlined:



N Cycle

Evaluating the agriculture emissions inventory - nitrogen balance approach



Understanding the N cycle

To identify possible gaps



Ireland: Bernard Hyde

National total emissions = 58.3 Mt CO₂e. Agriculture = 18.75 Mt (31.0%).

- Agricultural CH₄ 88.3% of national CH₄ (cattle 90.6%)
- Agricultural N₂O 92.8% of national N₂O
- Agriculture are approximately one third of the key categories
- Uncertainty in national estimate is driven by N₂O from soils
- Grass based system (cattle, sheep, goats, horses): 61.6% of N excreted is at pasture
- Liquid system Agricultural Water Management system (AWMS) – Mink (recent years)
- Solid storage and dry lot AWMS – horses, mules, Mink (historically)
- Pit Storage AWMS – Dairy cattle, other cattle, pigs, Laying hens and ducks
- Deep Bedding AWMS – Dairy cattle, other cattle, sheep, goats, deer

Data are coming from the June and December livestock census; Central Statistics Office; AIM – Department of Agriculture; and Crop production statistics – Central Statistics Office/LPIS

Emission sources and gases

- Enteric Fermentation – CH₄ (Tier 2 model - cattle)
- Manure Management – CH₄ (Tier 2 model - cattle) & N₂O (Tier 2 CS data on AWMS)
- Agricultural Soils – N₂O (Tier 1)
 - Direct emissions – All forms of nitrogen
 - Indirect emissions – Atmospheric deposition of NH₃, leaching and runoff
- Urea Application – CO₂ (Tier 1)



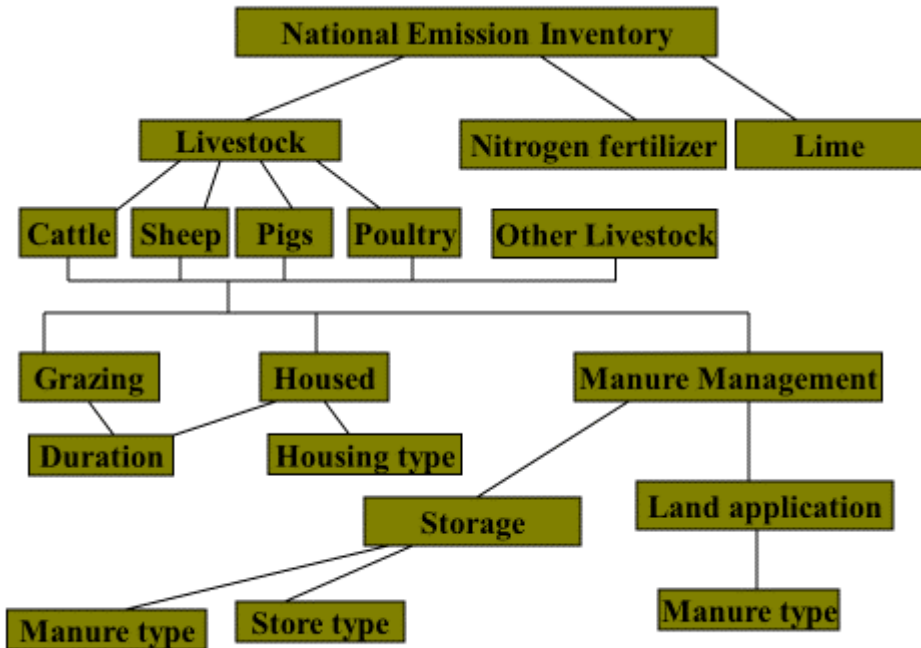
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- Lime Application – CO₂ (Tier 1)

The organogram below summarises the sub-categories in the inventory of the agricultural sector. The data sources and availability for the different sub-categories were outlined.



The current and future research activities were outlined (<http://agri-i.ie/>). These include amongst others feed evaluation for accurate nutrition; modelling of increased grazing management precision on Irish grassland farms; sustainable nitrogen fertilizer use and disaggregated emissions of nitrogen; measurement and abatement of agricultural ammonia emissions; carbon auditing of dairy and beef farms and review of National Emissions Factors for Methane Emissions associated with Agriculture and Livestock Management.

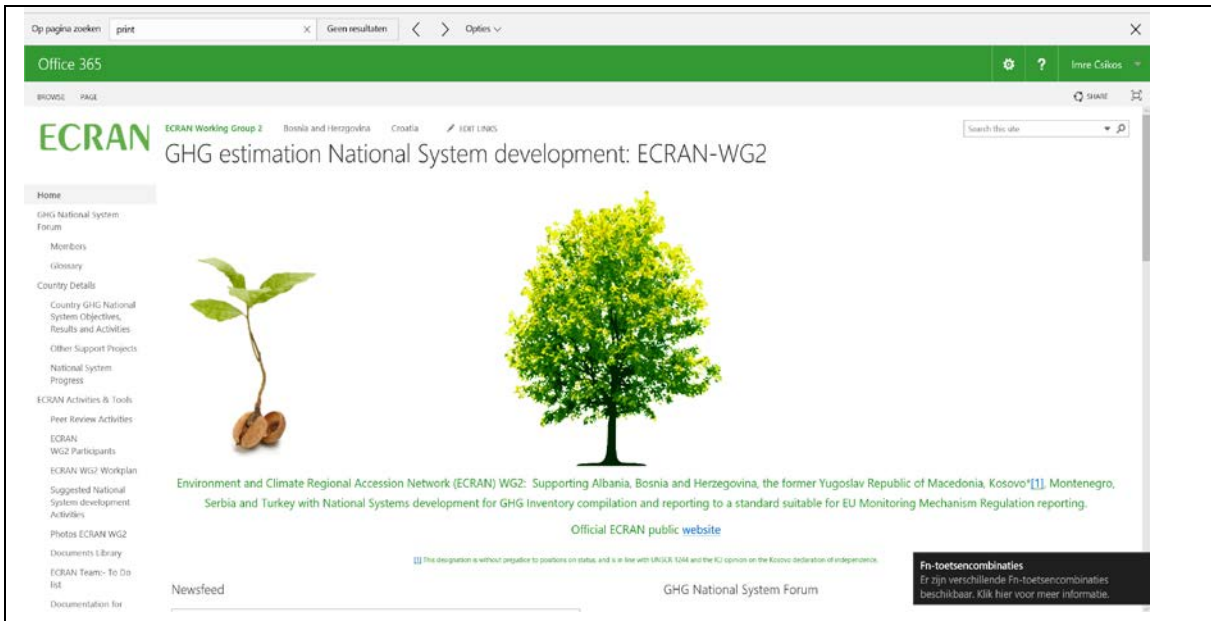
Highlights Day 2 – 22 June 2016

Day 2 – Hotel Panorama, Zagreb, Croatia, 22 June 2016

Introduction to Day 2 – Justin Goodwin

A presentation on the WG 2 sharing platform was given with a focus on agriculture.

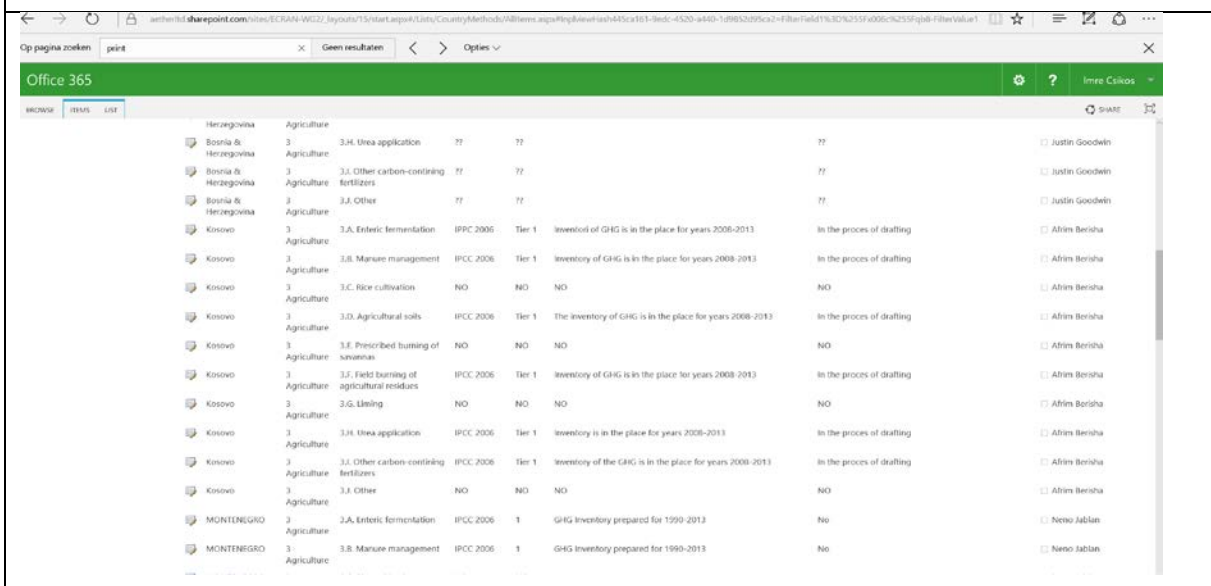




ECRAN - WG 2 Home page. The purpose of this knowledge sharing platform is to facilitate countries in building their national systems by providing access to information and knowledge exchange. The platform provides information on the country progress and provides concrete proposals for country improvements. The proposed improvements are presented in intervention logic style as to ensure identification of purposes, expected results and associated activities with these results, as well as indicators of achievement. Also it ensures direct migration into project planning documents of relevant donors active in the region.

In addition it provides sectoral information (Waste, energy, industrial processes and product use, agriculture, LULUCF) on country progress and key information on data availability and information flows.

A forum is active on the platform which has restricted membership for sharing information between relevant country actors. At this moment (June 2016), over 30 actors from the ECRAN beneficiaries, including Croatia as an EU Member State are actively engaged.



The National System Progress tab provides information for each ECRAN beneficiary on their progress in the different sectors, including agriculture. For each beneficiary the information also contains information for the IPPC/CRF sector 3 on the tiers applied, current situation, and planned improvements.

Agriculture estimation and reporting clinic

Three groups were formed to discuss the following key questions

1. *What key institutional arrangements are **needed**?*
2. *Where are **improvements needed** to methods, data sources and assumptions?*
3. *What can you improve now?*

Groups:

- Group 1: Serbia, Turkey (facilitators: Janka Szemesova, Beatriz Sanchez)
- Group 2: Montenegro, Albania, Kosovo* (facilitators: Kristina Tonhauser, Steen Gyldenkaerne, Bernard Hyde)
- Group 3: Bosnia and Herzegovina (facilitators: Etienne Matthias, Tatjana Obucina)

For **Serbia** the institutional arrangements were outlined for the agricultural sector. The arrangements are working to a large extent. In Serbia there is a lack of capacity in terms of human resources and expertise and there are issues with the availability of data. The IPCC 2006 software is used as the compilation software tool. Some Capacity building is required for implementing Tier 2 approached. Most data are available, so this is a real possibility. Serbia started some QA/QC checks of agricultural data. In terms of liming there is a data availability issue.

The afternoon session focused on technical issues/solution and tier methods for the source categories between MS experts and national experts.

For **Turkey** there is a possibility to improve tier methods for CRF sector 3A. The role of the inventory compiler and inventory coordinators is well established in the national system. Specific issues mentioned include:

For the Sector 3A: (Enteric fermentation), 3C (Rice cultivation) and 3D (Agricultural soils) and 3F (Field burning of agricultural residues) the tier 1 method under IPCC 2006 are used. TURKSTAT is estimating the emissions from these source categories and required data for calculations are gathered from the Agricultural Statistics Department of TURKSTAT. Sector 3G (Liming) is not estimated because of the lack of data.

Sector 3H (Urea application) was calculated and reported for the first time in the 2013 Inventory submitted in 2015 and there was no recalculation involved in emission estimates for this source category in this reporting year.

- Reporting on urea: N vs C: IPPU vs Agriculture: Avoid double counting
- Moving to Tier 2: Identification of key categories and significant subcategories: IPCC2006 trees.



- Tier 2 for agricultural soils: Focus on Activity Data, Country Specific Emission Factors are difficult to get.
- Simplified tier 2 for enteric fermentation, as a QA, T2 methodology for enteric fermentation
- QA fertiliser consumption vs IFA data: Procedures for these checks
- Moving to tier 2: deadlines, reasons, argumentation: Building blocks planning

For **Kosovo*** the priority is to start with the IPCC software tool. The strategy considered to improve cooperation with data suppliers is through the application of Memoranda of Understanding.

The census next year will include data on manure management systems, so this will improve data availability on this aspect. It is necessary to improve on all key categories.

The afternoon session focused on technical issues/solution and tier methods for the source categories between MS experts and national experts. Focus was on Category 3A (enteric fermentation), 3B (Manure management), 3D (Agricultural soils) and 3F (burning agricultural residues), 3H (urea application and 3I (other carbon containing fertilisers).

For **Albania** it is required to develop the legal framework first. MoUs can be established to improve data flow. As many of the work is dependent on outsourced work by UNDP, real capacity building within the administration is required.

For Sector 3 A: GHGs from Enteric fermentations are calculated for each animal category for the years 2000-2009 based on data provided by the INSTAT and Annual Yearbook of Ministry of Agriculture. In order to reduce uncertainty for GHGs emissions from the enteric fermentation and manure management is important to undertake studies about those emissions based on specific conditions of Albania (quality of pasture lands, diets, breeds, grazing activities etc.).

For 3B (Manure management) estimates are calculated for each animal category for the years 2000-2009 based on data provided by the INSTAT and Annual Yearbook of Ministry of Agriculture. In order to reduce uncertainty for GHGs emissions from the enteric fermentation and manure management it is important to undertake studies about those emissions based on specific conditions of Albania (quality of pasture lands, diets, breeds, grazing activities etc.).

In **Montenegro** considers to improve cooperation with data suppliers is through the application of Memoranda of Understanding.

The afternoon session focused on technical issues/solution and tier methods for the source categories between MS experts and national experts. Focus was on Category 3A (enteric fermentation), 3B (Manure management), 3D (Agricultural soils) and 3F (burning agricultural residues), 3H (urea application and 3I (other carbon containing fertilisers).

For **Bosnia and Herzegovina**, there are strong expectations as regards the development of the national arrangements. Currently there are two teams which cover most of the territory (however district Brcko is missing). Tier 1 is implemented for every category in agriculture. There are difficulties to mobilise expertise and data. Issues that are to be addressed include:

- further elaborating the national system:
- The need to develop legislation to define responsibilities
- The provision of data should be mandatory



- A way to improve data collection should be identified
- A focal point is needed
- Common official transparent statistics are needed.

Considering the two entities/two teams: Currently it seems that tools and methods are similar. But common rules to manage the work of the two teams are needed. Frequent exchanges between the teams must be planned. Coordination between the teams is expected.

Technical issues on key categories:

- Enteric fermentation: Tier 2 can be tried and developed on the basis of IPCC default (except milk yield)
- Manure Management: It was agreed that it is necessary to try to improve knowledge in this field and to go for higher tiers.
- Agricultural soils: Discussion on fertilisers (4 ways to estimate N)

There are difficulties to mobilise expertise and data. There is a strong demand for expertise (but financial aspects are a constraint in order to achieve this. There have been recurring demands to build surveys (but without success). It would be good to have a legal mandate to improve the situation.

On technical issues proposals to improve the estimates in the Agriculture sector were addressed. These included:

- Improvements on the currently applied calculation spreadsheets
- Tier 2 for livestock sources

Wrap up and next steps:

The workshop achieved the following:

- Simple assessment of Methods, Assumptions and Data Sources (QA) for source categories were discussed: Informal Conclusions and Recommendations
- Actual improvements/ideas for improvement were explored.
- Greater Understanding/Confidence
 - o People: (National Experts and MS “Mentors”).
 - o Priorities: (categories and gases)
- Renewed energy and ideas for future development projects.

Next steps: Using the Forum on the website: <https://aetherltd.sharepoint.com/sites/ECRAN-WG2>

- Ask questions, find solutions on Agriculture
- Look for other helpful solutions e.g. “MoU”



- Update on Agricultural Methods including ECRAN achievements & recommendations.

Next steps: Improving the national systems:

1. Build your own Capacity: Lottery, Bus and Births.
 - **Make a case nationally for strengthening of National Systems:** External (ECRAN) recommendations can help. Please ask. However, countries must make their own progress in assigning the appropriate staff and resources to the work. Draft some ideas and input them to sharepoint and to the Action Documents (see National System workshop 28-29 June Podgorica 2016).
 - **Look for funders to help start: There are funds available (IPA, GEF/Paris/CBIT, others).** The efforts should be “Country Lead”. Talk to countries and funding agencies. ECRAN experts can help refine this process. However countries should take the lead on specifying their needs and evaluating offers of support.
 - **Training and Learning:** Countries should submit their good experts onto the UNFCCC RoE. Experts should enrol for the UNFCCC review process and participate in the reviews. Integrate GHG MRV into national education and university activities to broaden the pool of experts available to do the work.
 - **Find mentors,** Countries should consider hiring/attracting mentors to support their National System development using funds from funders or elsewhere.
 - **Don't wait for lawyers!!** Build informal relationships on data supply early. Use these relationships to inform legal frameworks if they do not already exist.
 - **Data Management:** Consider how to manage data. Develop flexible systems making the best use out of spreadsheets and databases. Consider 3rd party software and systems which work with your Native and IPCC categorisation. Think about it. It can make a big difference to the efficiency of the NS.
2. National Systems improvement (see National System workshop 28-29 June Podgorica 2016)
 - Action plans/Projects
 - Informal Review process



IV. Evaluation

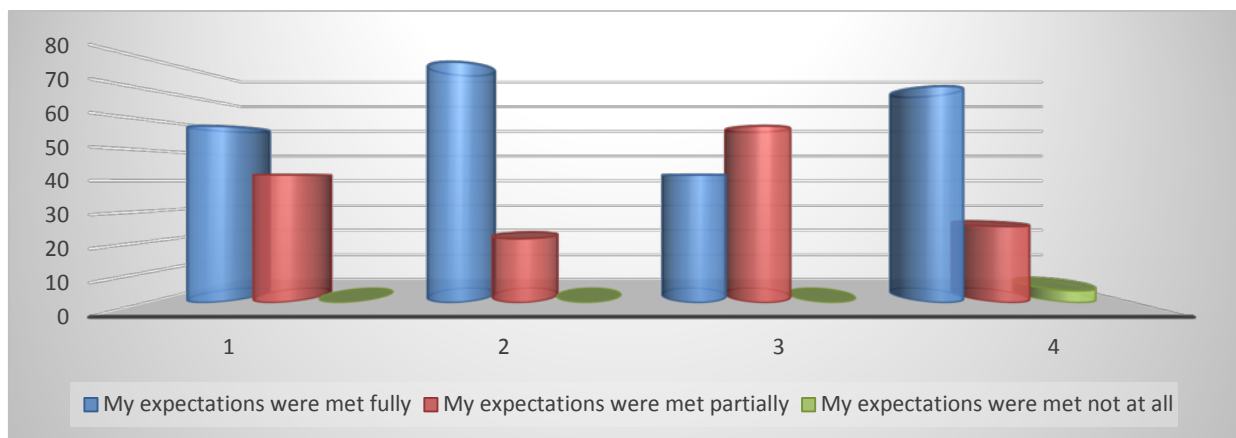
Reference is made to Annex IV for the detailed evaluation.

In the evaluation of the workshop **over two thirds** of participants indicated that their **expectations were fully met** in the areas of identifying activity data gaps and providing recommendations and guidance for gap filling. About 40% of the participants assessed that their own skills were fully improved in selecting emission factors and other calculation parameters in the agricultural sector, while 60% indicated that this was achieved partially.

Over 90% of the evaluation scores regarding the quality aspects of the workshop (such as achieved objectives, overall quality, practical work, presentations, facilitators) obtained the marks 'excellent' to 'good'. All participants indicated that they found the workshop 'time well spent'.

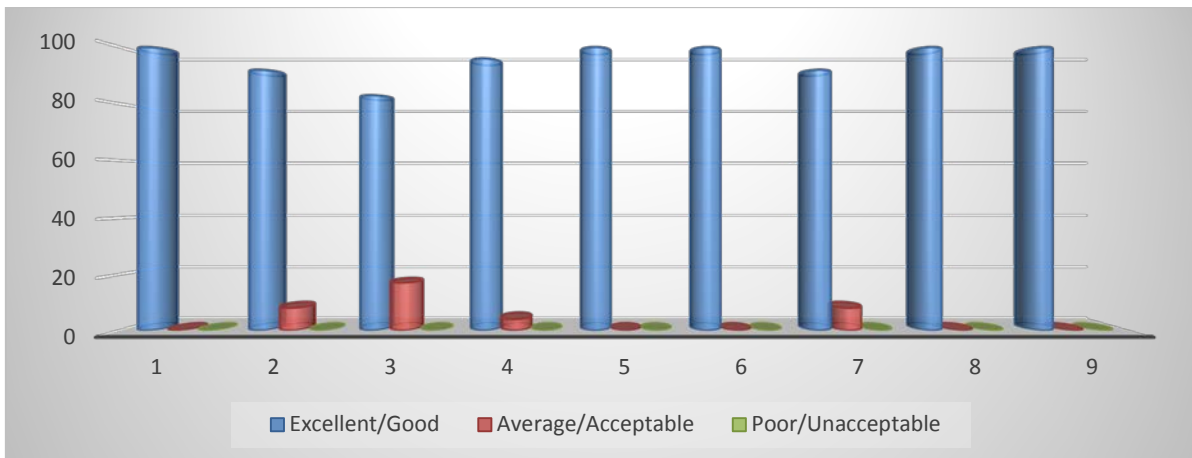
My Expectations

1. Quality control check of key categories with a focus on completeness and accuracy
2. Identification of activity data gaps and providing recommendations and guidance for gap filling
3. Improved skills in selecting emission factors and other calculation parameters in the agriculture sector
4. Setting priorities for country-specific short and long-term GHG inventory improvements.



Aspect of Workshop

1. The workshop achieved the objectives set
2. The quality of the workshop was of a high standard
3. The content of the workshop was well suited to my level of understanding and experience
4. The practical work was relevant and informative
5. The workshop was interactive
6. Facilitators were well prepared and knowledgeable on the subject matter
7. The duration of this workshop was neither too long nor too short
8. The logistical arrangements (venue, refreshments, equipment) were satisfactory
9. Attending this workshop was time well spent



ANNEX I – Agenda

Day 1 : 21 June 2016

Topic: Assessment of GHG Inventories in Agriculture				
Chair and Co-Chair: Imre Csikós, Justin Goodwin				
Experts: <u>Dr. Janka SZEMESOVA (Slovakia), Kristina TONHAUSER (Slovakia), Steen GYLDENKÆRNE (Denmark), Etienne MATHIAS (France), Beatriz SANCHEZ (Spain), Bernard Hyde (Ireland)</u>				
Venue: TBC				
Start	Finish	Topic	Speaker	Sub topic/Content
08:30	09:00	Registration		
09.00	09.15	Welcome	Imre Csikós, ECRAN	- Introduction of participants - Approval of the agenda
09.15	09.30	Introduction to Sub-task 2.2-A	Justin Goodwin, ECRAN	- Overview - Overall and specific goals of training seminar
09.30	10.00	Background & Technical objectives (30')	Justin Goodwin, ECRAN	- Overview of IPCC guidance and MMR reporting objectives. - Main categories of emissions - Introduction to CRF categories and parameters for agriculture. - National inventory report (NIR) - MMR reporting contents and detail for agriculture. - CRF.
10.00	11.00	Beneficiary status updates (Part 1): Progress and issues in beneficiary countries.	- Bosnia and Herzegovina - Albania - Montenegro - Kosovo*	Where have beneficiary countries got to with their estimates, national systems. What tools are being used, who are in the teams, what QA/QC is being used/done. E.g. <ul style="list-style-type: none"> • Overview of National system and who is compiling the GHG estimates. • Overall objective for the estimates. • Overview of relevant to categories of sources and removals in Agriculture sector (institutions, legislation, organization) • Completeness (years, gases) • Non-estimates (NEs)



				<ul style="list-style-type: none"> • Key categories • 3 most critical issues (AD, EF, method) • Progress made and planned/wanted improvements
11.00	11.15	Coffee Break (15')		
11.15	12.00	Beneficiary status updates (Part 2): Progress and issues in beneficiary countries. 15 min/country (45')	<ul style="list-style-type: none"> - Serbia - Turkey - Former Yugoslav Republic of Macedonia 	<p>Where have beneficiary countries got to with their estimates, national systems. What tools are being used, who are in the teams, what QA/QC is being used/done. E.g.</p> <ul style="list-style-type: none"> • Overview of National system and who is compiling the GHG estimates. • Overall objective for the estimates. • Overview of relevant to categories of sources and removals in Agriculture sector (institutions, legislation, organization) • Completeness (years, gases) • Non-estimates (NEs) • Key categories • 3 most critical issues (AD, EF, method) • Progress made and planned/wanted improvements
12.00	12.30	Croatian work and experiences on estimates on agriculture (30')	TBC	<ul style="list-style-type: none"> - Results Agriculture CRF National Inventory Report - Methods applied - Challenges encountered and improvements implemented and planned
12:30	13:00	Discussion on presentations.	Chair Justin Goodwin Experts	Chair discussion on country progress.
13.00	14.30	Lunch Break (90') Lunch and handling of administrative issues participants		
14:30	15:45	<i>Agriculture Good Practice examples and lessons learned from other</i>	International Experts presentations:	<p>Examples and lessons learned e.g.:</p> <ul style="list-style-type: none"> - Institutional arrangements, - planning, - Choosing methods, - preparation and archiving, - sectoral expertise,



		<i>countries and review.</i>	<u>Dr. Janka SZEMESOVA (Slovakia)</u> <u>Kristina (Slovakia)</u> <u>Steen Gyldenkærne (Denmark)</u> <u>Etienne MATHIAS (France)</u> <u>Bea Sanchez (Spain)</u> <u>Bernard Hyde (Ireland)</u>	<ul style="list-style-type: none"> - QA/QC, - Establishing regular data suppliers etc. - National Inventory reports. - Archiving. - Review and ICA experiences.
15:45	16:00	Coffee Break (15')		
16:00	16:30	Agriculture estimation and reporting clinics. Session 1.	Supported by International Experts	<ul style="list-style-type: none"> - Discussion on improvement ideas and solutions for Agricultural estimates and reporting. - Break into 3 or 4 groups. Groups facilitated by an international expert.
16.30	16.45	Update on progress and closing of Day 1 (15')	Justin Goodwin, ECRAN	



Day 2 : 22 June 2016

Topic: Assessment of GHG Inventories in Agriculture				
Chair and Co-Chairs: Imre Csikós, Justin Goodwin				
Venue: Zagreb				
Start	Finish	Topic	Speaker	Sub topic/Content
08:30	09:00	Registration		
09:00	09:15	Introduction to Day 2	Justin Goodwin, ECRAN	Reminder of topics and time to focus the daily work.
09:15	10:45	Agriculture estimation and reporting clinics. Session 2.	Supported by International Experts	<ul style="list-style-type: none"> - Discussion on improvement ideas and solutions for Agricultural estimates and reporting. - Break into 3 or 4 groups. Groups facilitated by an international expert.
10:45	11:00	Coffee Break (15')		
11:00	11:45	Plenary feedback on work, discussion and ad-hoc presentations on emerging solutions/tools/views	Justin Goodwin, ECRAN	<p>Feedback to plenary.</p> <p>Presentations by experts if appropriate.</p>
11:45	13:00	Agriculture estimation and reporting clinics. Session 3.	Supported by International Experts	<ul style="list-style-type: none"> - Discussion on improvement ideas and solutions for Agricultural estimates and reporting. - Break into 3 or 4 groups. Groups facilitated by an international expert.
13:00	14:00	Lunch Break (60')		
14:00	15:15	Agriculture estimation and reporting clinics. Session 4.	Supported by International Experts	<ul style="list-style-type: none"> - Discussion on improvement ideas and solutions for Agricultural estimates and reporting. - Break into 3 or 4 groups. Groups facilitated by an international expert.



15.15	15.30	Coffee Break (15')		
15:30	16:00	Reporting back (30')	Beneficiary country. ~ 5 min each.	- Presentations from beneficiary countries on their progress made.
16:00	16:30	wrap up summary of recommendations and actions	Justin Goodwin, ECRAN	- Conclusions workshop - Next workshop(s) - Workshop evaluation



ANNEX II – Participants

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Justin	Goodwin	ECRAN	United Kingdom	justin.goodwin@aether-uk.com



ANNEX III – Workshop materials (under separate cover)

Additional Workshop materials including presentations and exercises, can be downloaded from:

http://www.ecranetwork.org/Files/Workshop_Presentations_GHG_Agriculture_June_2016_Zagreb.zip



This Project is funded by the
European Union



A project implemented by
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ANNEX IV – Evaluation

Statistical information

1.1	Workshop Session	Activity 3.2.2 A – ECRAN workshop GHG inventory assessments in the sector Agriculture 21-22 June 2016, Zagreb, Croatia
1.2	Facilitators name	As per agenda
1.3	Name and Surname of Participants (evaluators) optional	As per participants' list

Your Expectations

Please indicate to what extent specific expectations were met, or not met:

My Expectations	My expectations were met		
	Fully	Partially	Not at all
1. Quality control check of key categories with a focus on completeness and accuracy	IIII IIIII IIII (58%)	IIII IIIII (42%)	0%
2. Identification of activity data gaps and providing recommendations and guidance for gap filling	IIII IIIII IIIII IIII (79%)	IIII (21%)	0%
3. Improved skills in selecting emission factors and other calculation parameters in the agriculture sector	IIII IIIII (42%)	IIII IIIII IIII (58%)	0%
4. Setting priorities for country-specific short and long-term GHG inventory improvements.	IIII IIIII IIIII II (71%)	IIII I (25%)	I (4%)



Workshop and Presentation

Please rate the following statements in respect of this training module:

Aspect of Workshop	Excellent	Good	Average	Acceptable	Poor	Unacceptable
1 The workshop achieved the objectives set		 				
2 The quality of the workshop was of a high standard		 				
3 The content of the workshop was well suited to my level of understanding and experience		 				
4 The practical work was relevant and informative						
5 The workshop was interactive	 					
6 Facilitators were well prepared and knowledgeable on the subject matter						
7 The duration of this workshop was neither too long nor too short						
8 The logistical arrangements (venue, refreshments, equipment) were satisfactory						
9 Attending this workshop was time well spent						

Comments and suggestions

I have the following comment and/or suggestions in addition to questions already answered:

Workshop Sessions:

- I really like this workshop. I met many people, it is very important to share information. Workshop is good for comparing the different inventories
- Agenda of the workshop should be sent much earlier (one month before the workshop)
- It was very well organised
- Excellent (4x)

Facilitators:

- They support us on understanding key data



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- They were very good and tried to help us (2x)
 - The expert from Denmark was practical and excellent
 - Working with the facilitators was very useful for us
 - Excellent
 - All facilitators are great
 - Well experienced, open for collaboration and support
-

Workshop level and content:

- Level and content was excellent
 - There was no information on LULUCF, only agriculture
 - We have benefited a lot from this workshop. It will be useful to have these kind of workshops organised more often than we had until now.
 - Excellent (3x)
 - Good
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