

ECRAN Agriculture Workshop

Day 1

Justin Goodwin, 2016



ECRAN/Workshop Objectives

- Expert assessment of estimates (Member State Participants).
 - Focus = key categories, Completeness, Accuracy
- Building confidence in developing Methods, Data sources and Assumptions.
- Identification of gaps and providing recommendations and guidance
- Setting priorities for country-specific short and long-term GHG inventory improvements.

MMR Requirements

- Annual reporting (January – March)
 - CRF + NIR
- Annual Quality Review
- Time series: 1990* – reporting yr -2
 - E.g. for 2016 = 1990 – 2014
- All mandatory categories & gases with 2006 IPCC methods
- At least Tier 1, Tier 2+ for Key Categories

ECRAN WG2 Framing

- Long Term Goal: Compliance with MMR
- Short term Goal: Permanent National System for GHG estimation and reporting.
- Desired **RESULTS** & improvement **ACTIVITIES**
 - 1: Functioning Institutional Arrangements:
 - 2: Building a team:
 - 3: Data Supply security:
 - 4: Delivering a quality and effective GHG inventory.
 - 5: Marketing the inventory:

Terminology 1 of 3: National System

- **National System (NS):** 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 its-self** (the National System) to fit with governance structures and data suppliers.
- **Institutional Arrangements:** Agreements, Laws, contracts, functions, roles and responsibilities in place in order for the NS to function.
- **Systems and processes:** Databases, servers, archives, files, workplans, milestones, templates that carry the GHG estimates and their documentation.

Terminology 2 of 3: National System Actors

Reporting, developing and retaining the resources, Institutional arrangements, skills, QA/QC & tools needed for a good quality GHG inventory.

Sector experts understand the data & emitting/removal processes. Strong links to national networks of technical experts and data sources for sector/category.

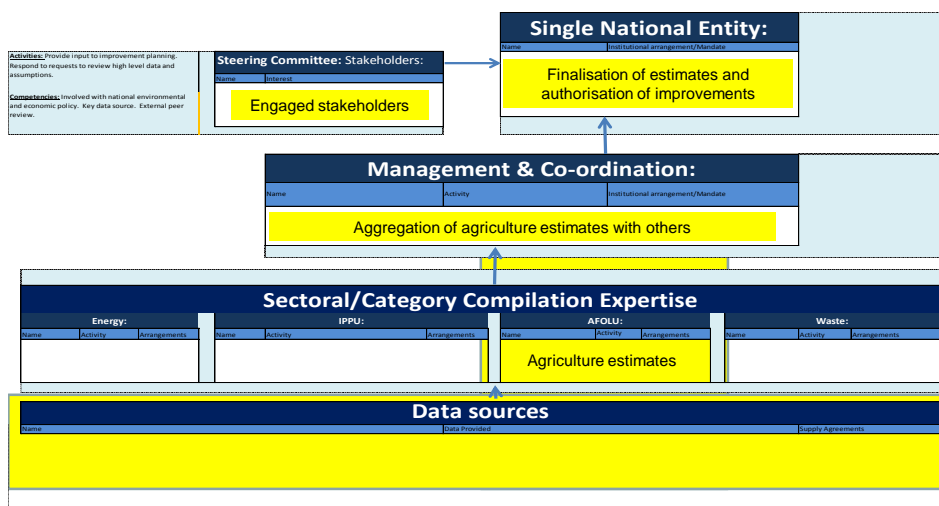
Data owners and suppliers National Statistics

- **Single National Entity (SNE):** responsible for the submission of the GHG inventory to UNFCCC and MMR. (Usually the “Ministry” or appointed “Environment Agency”).
- **Inventory Agency (InvAg):** responsible for co-ordinating the GHG inventory. Can have delegated responsibilities to submit to UNFCCC/MMR. Can include compilation experts.
- **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)..
- **Data Suppliers:** Organisations providing data used in the GHG estimates. (e.g. Agriculture statistics)
- **Stakeholders:** Organisations with an interest in the GHG estimates (including data suppliers). E.g. Agriculture Policy makers, NGOs, Industry representatives, research institutes.

Terminology 3 of 3: ECRAN/TAIEX support

- **ECRAN WG2 (MMR) Project facilitators:** Justin & Imre
- **Local Experts:** funded by ECRAN/TAIEX supporting National/Country Experts to improve the National System.
- **International Experts:** International experts funded by ECRAN/TAIEX supporting National and Local Experts to improve the National System.
 - Participating **Member State Experts**
 - International **ECRAN Experts**

National System: Institutional Arrangements



Day 1 : 21 June 2016

Topic: Assessment of GHG inventories in Agriculture

Chair and Co-Chair: Imre Csikós, Justin Goodwin

Experts: *Dr. Janka SZEMESOVA (Slovakia), Kristina TONHAUSER (Slovakia), Steen GYLDENKÆRNE (Denmark), Etienne MATHIAS (France), Bea SANCHEZ (Spain), Bernard Hyde (Ireland)*

Venue: TBC

Start	Finish	Topic	Speaker
08:30	09:00	Registration	
09:00	09:15	Welcome	Imre Csikós, ECRAN
09:15	09:30	Introduction to Sub-task 2.2-A (15')	Justin Goodwin, ECRAN
09:30	10:00	Background & Technical objectives (30')	Justin Goodwin, ECRAN
10:00	11:00	Beneficiary status updates (Part 1): Progress and issues in beneficiary countries. 15 min/country (60')	- Bosnia and Herzegovina - Albania - Montenegro - Kosovo*
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')	- Serbia - Turkey - Former Yugoslav Republic of Macedonia
12:00	12:30	Croatian work and experiences on estimates on agriculture (30')	Croatian Expert
12:30	13:00	Discussion on presentations.	Chair: Justin Goodwin Experts
13:00	14:30	Lunch Break (90') Lunch and handling of administrative issues participants	
14:30	15:45	Agriculture Good Practice examples and lessons learned from other countries and review.	International Experts presentations: <i>Dr. Janka SZEMESOVA (Slovakia), Kristina TONHAUSER (Slovakia), Steen GYLDENKÆRNE (Denmark), Etienne MATHIAS (France), Bea Sanchez (Spain), Bernard Hyde (Ireland)</i>
15:45	16:00	Coffee Break (15')	
16:00	16:30	Agriculture estimation and reporting clinics. Session 1.	Supported by International Experts
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
08:30	09:00	Registration	
09:00	09:15	Introduction to Day 2	Justin Goodwin, ECRAN
09:15	10:45	Agriculture estimation and reporting clinics. Session 2.	Supported by International Experts
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
11:45	13:00	Agriculture estimation and reporting clinics. Session 3.	Supported by International Experts
13:00	14:00	Lunch Break (60')	
14:00	15:15	Agriculture estimation and reporting clinics. Session 4.	Supported by International Experts
15:15	15:30	Coffee Break (15')	
15:30	16:00	Reporting back (30')	Beneficiary country. ~ 5 min each.
16:00	16:30	wrap up summary of recommendations and actions	Justin Goodwin, ECRAN

NS Knowledge Sharing Portal

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Environment and Climate Regional Accession Network (ECRAN) WG2: Supporting Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Kosovo^[1], Montenegro, Serbia and Turkey with National Systems development for GHG Inventory compilation and reporting to a standard suitable for EU Monitoring Mechanism Regulation reporting.

Official ECRAN public website

[1] This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ opinion on the Kosovo declaration of independence.

- <https://aetherltd.sharepoint.com/sites/ECRAN-WG2>

NS Knowledge Sharing Portal: Forum

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Croatia

ECR UNHS

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ECRAN Team: To Do list

Documentation for Presenters

Introduction:

Welcome to the forum for Greenhouse Gas Estimation and Reporting Knowledge exchange!
You can add content to this page by clicking Edit at the top of this page, add new pages by including the new page name in . Learn more about wiki libraries by clicking How To Use This Library.

This is a wiki for presenting specific guidance useful for developing GHG estimation and reporting National Systems.
ECRAN experts will add to this wiki any useful knowledge, tips, tools for sharing with countries. It will not repeat 2006 IPCC/GHG etc.

Questions and Solutions:

Post in the categories below to ask questions or add interesting information.

A-Z Z-A What's hot

0. About WG forum

1. General

2. Energy

3. Emissions

4. Agriculture

5. Land Use, Land-Use Change, and Forestry

6. Waste

7. Reporting, Review and Analysis ECRAN

Community tools

Manage discussions

Create categories

Create badges

Assign badges to members

Registration settings

Review reported posts

Community settings

What's happening

17 members

Most recent post was 23/04/2016 at 12:11

In 1, Waiting

Top contributors

Justin Goodwin

Imre Calkos

Sven Moneri

Tinut Pulles

- Ask Questions, share solutions.
- <https://aetherltd.sharepoint.com/sites/ECRAN-WG2/SitePages/GHG%20National%20System%20Forum.aspx>

NS Knowledge Sharing Portal: Country Plans

ECRAN Working Group 2 National System Country X ECR UNHS									
Country GHG National System Objectives and Target Results									
new item or edit this list									
Summary All items									
Find an item									
Item	Country	Item	Type	Description/Activity	Source of Information	Status	Owner/Project	Benefits of activity/Result	IPCC Category
1	ALBANIA	1.1 Key objective	1.1 Long term objective	To ensure compliance with the Marr establish through a fully functioning national system (5 – 10 years)	CR, NR, supplementary information.	Drafted	Unallocated		Core Cutting
2	ALBANIA	2.1 Immediate objective	2.1 Short term objective	A permanent national system 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 resulting of inventories and national inventory reports	Transparent national archive of information.	Drafted	Unallocated		
3	ALBANIA	Result 1: Functional institutional Arrangements	1.1 Result	Functional institutional arrangements: A set of short term institutional building blocks in place to allow future recurring reporting and continuous improvement on GHG mitigation inventories, projections and R&Ms.	WFP 2013-2020 https://www.integrini.gov.al/documents/instruments-creating-a-priori-concrete-plan-integrini-environ141518859310page=1	Drafted	Unallocated		
4	Albania	Result 1: Functional institutional Arrangements	1.1 Activity	Analysis of institutional arrangements and legal framework for national system.		Drafted	Unallocated		
5	Albania	Result 1: Functional institutional Arrangements	1.1 Activity	Improve legal framework and institutional arrangements.		Drafted	Unallocated		
6	ALBANIA	Result 2: Building a team	2.1 Result	Building a team: A team has been built and trained to fit the identified institutional arrangements	Law on Climate Change and the Government Order on establishing MRV system.	Drafted	Unallocated		
7	Albania	Result 2: Building a team	2.1 Activity	Finalisation of team roles and responsibilities and establish a team of experts with capacity to participate in their own review and checking processes. Presentation of proposals to managers with clear presentation of organisational benefits.		Drafted	Unallocated		
8	ALBANIA	Result 3: Data Supply security	3.1 Result	Data supply system developed	Government Order on establishing MRV, ECRAN support	Drafted	Unallocated		
9	Albania	Result 3: Data Supply security	3.1 Activity	Establish Data Supply Agreements or equivalent that can eventually be legally binding.		Drafted	Unallocated		
10	ALBANIA	Result 4: Defining a quality and effective GHG inventory	4.1 Result	A quality and effective GHG inventory timeseries, for year X to Y - 2	ECRAN support / training project and EU experts in our office	Drafted	Unallocated		
11	ALBANIA	Result 5: Marking the inventory	5.1 Result	Increased awareness on advantages and opportunities for the country of a strong inventory framework	workshops/bilateral meetings	Drafted	Unallocated		
12	Bosnia & Herzegovina	1.1 Key objective	1.1 Long term objective	To ensure compliance with the Marr establish through a fully functioning national system (5 – 10 years)	CR, NR, supplementary information.	Drafted	Unallocated		

Methods and Guidelines

Task Force on
National Greenhouse Gas Inventories

ipcc
INTERGOVERNMENTAL PANEL ON climate change

WHO
UNEP

IPCC web sites

Home IPCC

IPCC-TFI Home

Organization

Publications

Wetlands Supplement

KP Supplement

2006 IPCC Guidelines

GRG-LULUCF

Degradation of Forest

GPC2000

Revised 1996 IPCC Guidelines

Technical Bulletins

Presentations

Support to Inventory Compilers

Inventory Software


Meetings

FAQs

Links

Emission Factor Database (EFDG)

Electronic Discussion Group (EDG)



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2007 Nobel Peace Prize

Publications

2006 IPCC Guidelines for National Greenhouse Gas Inventories

2006 IPCC Guidelines Top

Vol.1 GGR

Vol.2 Energy

Vol.3 IPPU

Vol.4 AFOLU

Vol.5 Waste

2006 IPCC Guidelines for
National Greenhouse Gas Inventories
Volume 4
Agriculture, Forestry
and Other Land Use

Chapter	Chapter Name
-	Cover Page of Volume 4
1	Introduction
2	Generic Methodologies Applicable to Multiple Land-Use Categories
3	Consistent Representation of Lands
4	Forest Land
5	Cropland
6	Grassland
7	Wetlands
8	Settlements
9	Other Land
10	Emissions from Livestock and Manure Management
11	N2O Emissions from Managed Soils, and CO2 Emissions from Lime and Urea Application
12	Harvested Wood Products
	HWP Worksheet (Zipped MS-Excel file)
Annex 1	Worksheets
Annex 2	Summary of Equations
Appendix 1	CO2 Removals in Residual Combustion Products (Charcoal): Basis for Future Methodological Development
Appendix 2	Possible Approach for Estimating CO2 Emissions from Lands Converted to Permanently Flooded Lands: Basis for Future Methodological Development
Appendix 3	CH4 Emissions from Flooded Land: Basis for Future Methodological Development

2006 IPCC Guidelines for National Greenhouse Gas Inventories













- 2006 IPCC Guidelines Top

- Vol.1 GGR
- Vol.2 Energy
- Vol.3 IPPU
- Vol.4 AFOLU
- Vol.5 Waste

2006 IPCC Guidelines for National Greenhouse Gas Inventories

Volume 4

Agriculture, Forestry and Other Land Use

Chapter	Chapter Name
-	Cover Page of Volume 4 
1	Introduction 
2	Generic Methodologies Applicable to Multiple Land-Use Categories  *8
3	Consistent Representation of Lands 
4	Forest Land  *8
5	Cropland  *1
6	Grassland  *1
7	Wetlands  *6
8	Settlements 
9	Other Land 
10	Emissions from Livestock and Manure Management  *3 *7
11	N2O Emissions from Managed Soils, and CO2 Emissions from Lime and Urea Application  *1 *2 *6 *8

2006 IPCC

<http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html>

Environment and Climate
Regional Accession Network **ECRAN**

CRF

Agriculture CRF

Emissions Tables

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[Table3.As1](#)
[Table3.As2](#)
[Table3.B\(a\)s1](#)
[Table3.B\(a\)s2](#)
[Table3.B\(b\)](#)
[Table3.C](#)
[Table3.D](#)
[Table3.E](#)
[Table3.F](#)
[Table3.G-I](#)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOG
3. Total agriculture	487.8	276.2	12.0	322.5	36.10	0.0
A. Livestock	23.4	17.4	1.2			0.0
A.1. Cattle	23.4	17.4	1.2			0.0
Option A:						
Dairy cattle						
Non-dairy cattle						
Option B:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option C (country-specific):						
Drop-down list						
Other (as specified in table 3(i) A)						
Option D:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option E (country-specific):						
Drop-down list						
Other (as specified in table 3(i) A)						
B. Manure management	0.0	0.0	0.0			0.0
Option A:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option B:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option C (country-specific):						
Drop-down list						
Other (as specified in table 3(i) A)						
C. Fertiliser	0.0	0.0	0.0			0.0
Option A:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option B:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option C (country-specific):						
Drop-down list						
Other (as specified in table 3(i) A)						
D. Other greenhouse gas emissions	0.0	0.0	0.0			0.0
Option A:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option B:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option C (country-specific):						
Drop-down list						
Other (as specified in table 3(i) A)						
E. Indirect N₂O emissions	0.0	0.0	0.0			0.0
Option A:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option B:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option C (country-specific):						
Drop-down list						
Other (as specified in table 3(i) A)						

Background Tables

TABLE 3 SECTORAL REPORT FOR AGRICULTURE
(Sheet 1 of 2)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CH ₄	N ₂ O	NO _x	CO	NMVOG
3. Total agriculture						
A. Livestock						
A.1. Cattle						
Option A:						
Dairy cattle						
Non-dairy cattle						
Option B:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option C (country-specific):						
Drop-down list						
Other (as specified in table 3(i) A)						
Option D:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option E (country-specific):						
Drop-down list						
Other (as specified in table 3(i) A)						
B. Manure management						
Option A:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option B:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option C (country-specific):						
Drop-down list						
Other (as specified in table 3(i) A)						
C. Fertiliser						
Option A:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option B:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option C (country-specific):						
Drop-down list						
Other (as specified in table 3(i) A)						
D. Other greenhouse gas emissions						
Option A:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option B:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option C (country-specific):						
Drop-down list						
Other (as specified in table 3(i) A)						
E. Indirect N₂O emissions						
Option A:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option B:						
Dairy cattle						
Non-dairy cattle						
Other cattle (specify in table 3(i) A)						
Option C (country-specific):						
Drop-down list						
Other (as specified in table 3(i) A)						

TABLE 3 SECTORAL REPORT FOR AGRICULTURE
(Sheet 2 of 2)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO ₂	CH ₄	N ₂ O (kt)	NO _x	CO	NM VOC
C. Rice cultivation						
D. Agricultural soils ^{(2) (3) (4)}						
E. Prescribed burning of savannahs						
F. Field burning of agricultural residues						
G. Liming						
H. Urea application						
I. Other carbon-containing fertilizers						
J. Other (please specify)						

⁽¹⁾ The sum for cattle would be calculated on the basis of entries made under either option A (dairy and non-dairy cattle), option B (mature dairy cattle, other mature-cattle and growing-cattle) or option C (other disaggregation of cattle categories).

⁽²⁾ Categories reported under "Agricultural soils" are those reported under table 3.D.

⁽³⁾ Direct nitrous oxide (N₂O) emissions generated by manure in the system "Pasture, range and paddock" are to be reported under the category "Direct N₂O emissions from managed soils". See also section 10.5 of Volume 4 of the 2006 IPCC

⁽⁴⁾ Indirect N₂O emissions generated by manure in the system "Pasture, range and paddock" are to be reported under the category "Indirect N₂O emissions from managed soils". See also section 10.5 of Volume 4 of the 2006 IPCC Guidelines.

Note: The 2006 IPCC Guidelines do not provide methodologies for the calculation of methane (CH₄) emissions and CH₄ and N₂O removals from agricultural soils, or carbon dioxide (CO₂) emissions from prescribed burning of savannahs and field burning of agricultural residues. Parties that have estimated such emissions should provide, in the national inventory report (NIR), additional information (activity data and emission factors) used to derive these estimates and include a reference to the section of the NIR in the documentation box of the corresponding sectoral background data tables.

Documentation box:

* Parties should provide detailed explanations on the agriculture sector in chapter 5: Agriculture (CRF sector 3) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

* If estimates are reported under category 3.J Other, use this documentation box to provide information regarding activities covered under this category and to provide reference to the section in the NIR where background information can be found.

TABLE 3.A SECTORAL BACKGROUND DATA FOR AGRICULTURE
Enteric Fermentation
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION			IMPLIED EMISSION FACTORS	EMISSIONS
	Population size ⁽¹⁾ (1000s)	Average gross energy intake (GE) (MJ/head/day)	Average CH ₄ conversion rate (Y _m) ⁽²⁾ (%)	CH ₄ (kg CH ₄ /head/yr)	CH ₄ (kt)
1. Cattle					
Option A:					
Dairy cattle ⁽³⁾					
Non-dairy cattle					
Option B:					
Mature dairy cattle					
Other mature cattle					
Growing cattle					
Option C (country-specific): ⁽⁴⁾					
Drop-down list					
Other (please specify)					
2. Sheep					
Other (please specify)					
3. Swine					
Other (please specify)					
4. Other livestock ⁽⁵⁾					
Drop-down list					
Buffalo					
Camels					
Deer					
Goats					
Horses					
Mules and asses					
Poultry					
Other (please specify)					
Rabbit					
Reindeer					
Ostrich					
Fur-bearing animals ⁽⁶⁾					
Other					

Additional information (only for those livestock types for which tier 2 was used)

Disaggregated list of animals ⁽¹⁾		Dairy cattle	Non-dairy cattle	Other (specify)	
Indicators:					
Weight	(kg)				
Feeding situation ⁽⁴⁾					
Milk yield	(kg/day)				
Work	(hr/day)				
Pregnant	(%)				
Digestibility of feed	(%)				
Gross energy	MJ/day				

TABLE 3.6(a) SECTORAL BACKGROUND DATA FOR AGRICULTURE
CH₄ Emissions from Manure Management
(Sheet 1 of 1)

Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION						IMPLIED EMISSION FACTORS CH ₄ (kg CH ₄ /head/yr)	EMISSIONS CH ₄ (kt)	
	Population n size (1000s)	Allocation by climate regions ¹⁴			Typical animal mass (average) (kg)	YS ¹⁵ daily excretion (average) (kg dm/head/day)			CH ₄ producing potential (Bo) ¹⁶ (average) (m ³ CH ₄ /kg VS)
		Cool	Temper ate	Warm					
1. Cattle									
Option A:									
Dairy cattle ¹⁷									
Non-dairy cattle									
Option B:									
Mature dairy cattle									
Other mature cattle									
Growing cattle									
Option C (country-specific): ¹⁸									
Drop-down list									
Other (please specify)									
2. Sheep									
Other (please specify)									
3. Swine									
Other (please specify)									
4. Other livestock ¹⁹									
Drop-down list									
Buffalo									
Camels									
Deer									
Goats									
Horses									
Mules and Asses									
Poultry									
Other (please specify)									
Rabbit									
Reindeer									
Ostrich									
Fur-bearing animals ²⁰									
Other									

Additional information (for Tier 2) ¹⁴

Animal category		Indicator	Climate region	Manure Management Systems ¹⁴									
				Anaerobic digestion	Liquid system	Daily spread	Solid storage and dry lot	Pasture, range, and paddock	Composting	Digesters	Burned for fuel or as waste	Other	
Option A	Dairy cattle	Allocation (c)	Cool										
			Temperate										
		HCPI ¹⁴	Warm										
	Non-dairy cattle	Allocation (c)	Cool										
			Temperate										
		HCPI ¹⁴	Warm										
Option B	Dairy dairy cattle	Allocation (c)	Cool										
			Temperate										
		HCPI ¹⁴	Warm										
		Allocation (c)	Cool										
			Temperate										
		HCPI ¹⁴	Warm										
	Other mature cattle	Allocation (c)	Cool										
			Temperate										
		HCPI ¹⁴	Warm										
		Allocation (c)	Cool										
			Temperate										
		HCPI ¹⁴	Warm										
Option C	Growing cattle	Allocation (c)	Cool										
			Temperate										
		HCPI ¹⁴	Warm										
	Other (please spec)	Allocation (c)	Cool										
			Temperate										
		HCPI ¹⁴	Warm										
Option D	Horses	Allocation (c)	Cool										
			Temperate										
		HCPI ¹⁴	Warm										
	Other (please specify)	Allocation (c)	Cool										
			Temperate										
		HCPI ¹⁴	Warm										
Option E (country-specific)	Other (please specify)	Allocation (c)	Cool										
			Temperate										
		HCPI ¹⁴	Warm										
	Other (please specify)	Allocation (c)	Cool										
			Temperate										
		HCPI ¹⁴	Warm										

Environment and Climate
Regional Accession Network

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TABLE 3.B(b) SECTORAL BACKGROUND DATA FOR AGRICULTURE
N₂O Emissions from Manure Management
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION											IMPLIED EMISSION FACTORS (IEF)		EMISSIONS						
	Population size (1000s)	Nitrogen excretion rate (kg N/ head/yr)	Typical animal mass (average) (kg/ animal)	Nitrogen excretion per manure management system (MMS) (kg N/yr)								Total N excreted (kg N/yr)	Total N volatilized as NH ₃ and NO _x ⁽¹⁾ (kg N/yr)	N lost through leaching and run-off (kg N/yr)	Emission factor per animal		N ₂ O (kt)			
															Direct	Indirect		Direct		
																Indirect			Direct	
																Ammonia excretion from urine and feces				Ammonia excretion from urine and feces
1. Cattle																				
Option A:																				
Dairy cattle																				
Non-dairy cattle																				
Option B:																				
Mature dairy cattle																				
Other mature cattle																				
Growing cattle																				
Option C (country-specific) ⁽¹⁾																				
Drop-down list																				
Other (please specify)																				
2. Sheep																				
Other (please specify)																				
3. Swine																				
Other (please specify)																				
4. Other livestock ⁽²⁾																				
Drop-down list																				
Buffalo																				
Camels																				
Don																				
Goats																				
Horses																				
Mules and ponies																				
Poultry																				
Other (please specify)																				
Rabbits																				
Reindeer																				
Goats																				
Far-ranging animals ⁽³⁾																				
Other																				
5. Indirect N ₂ O emissions																				
Total N excreted per MMS (kg N/yr)																				
IEF direct N ₂ O (kg N ₂ O-N/kg N head/yr)																				
Direct N ₂ O emissions per MMS (kg/ha) N ₂ O																				

TABLE 3.C SECTORAL BACKGROUND DATA FOR AGRICULTURE
Rice Cultivation
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION			IMPLIED EMISSION FACTOR ¹⁴⁾ CH ₄ (g/m ²)	EMISSIONS CH ₄ (kt)
	Harvested area ¹²⁾ (10 ³ m ² /yr)	Organic amendments added ¹³⁾			
		type	(t/ha)		
1. Irrigated					
Continuous flooded					
Intermittently flooded					
Single variation					
Multiple variation					
2. Rain-fed					
Flood-prone					
Drought-prone					
3. Deep water					
Water depth 50-100 cm					
Water depth > 100 cm					
4. Other (please specify)					
Upland rice ¹⁴⁾					
Total ¹⁴⁾					

⁽¹⁾ The implied emission factor implicitly takes account of all relevant corrections for continuously flooded fields without organic amendment, the correction for the organic amendments and the effect of different soil characteristics, if considered in the calculation of methane (CH₄) emissions.

⁽²⁾ Harvested area is the cultivated area multiplied by the number of cropping seasons per year.

⁽³⁾ Specify dry weight or wet weight for organic amendments in the documentation box.

⁽⁴⁾ These rows are included to allow comparison with international statistics. CH₄ emissions from upland rice are assumed to be zero.

Documentation box:

• Parties should provide detailed explanations on the agriculture sector in chapter 5: Agriculture (CRF sector 3) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• When disaggregating by more than one region within a country, and/or by growing season, provide additional information on disaggregation and related data in the NIR and provide a reference to the relevant section in the NIR.

• Where available, provide activity data and scaling factors by soil type and rice cultivar in the NIR.

TABLE 3.D SECTORAL BACKGROUND DATA FOR AGRICULTURE
Direct and indirect N₂O emissions from agricultural soils
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION		IMPLIED EMISSION FACTORS	EMISSIONS
	Description	Value kg N/yr		
			kg N ₂ O-N/kg N ^{100%}	N ₂ O (kt)
a. Direct N₂O emissions from managed soils				
1. Inorganic N fertilizers ¹⁰	N input from application of inorganic fertilizers to cropland and grassland			
2. Organic N fertilizers ¹⁰	N input from organic N fertilizers to cropland and grassland			
a. Animal manure applied to soils	N input from manure applied to soils			
b. Sewage sludge applied to soils	N input from sewage sludge applied to soils			
c. Other organic fertilizers applied to soils	N input from application of other organic fertilizers			
3. Urine and dung deposited by grazing animals	N excretion on pasture, range and paddock			
4. Crop residues	N in crop residues returned to soils			
5. Mineralization/immobilization associated with loss/gain of soil organic matter ^{10(R)}	N in mineral soils that is mineralized/immobilized in association with loss of soil C			
6. Cultivation of organic soils (i.e. histosols) ¹⁰	Area of cultivated organic soils (ha/yr)			
7. Other				

b. Indirect N₂O Emissions from managed soils	
1. Atmospheric deposition ¹⁰	Volatilized N from agricultural inputs of N
2. Nitrogen leaching and run-off	N from fertilizers and other agricultural inputs that is lost through leaching and run-off

Additional information

Fraction 1-4	Description	Value
Frac _{CGASF}	Fraction of synthetic fertilizer N applied to soils that volatilizes as NH ₃ and NO _x	
Frac _{CGASH}	Fraction of livestock N excretion that volatilizes as NH ₃ and NO _x	
Frac _{LEACH-RN}	Fraction of N input to managed soils that is lost through leaching and run-off	
Other fractions (please specify)		

TABLE 3.E SECTORAL BACKGROUND DATA FOR AGRICULTURE
Prescribed burning of savannahs
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION					IMPLIED EMISSION		EMISSIONS ²	
	Area of savannah burned (kha/yr)	Average above-ground biomass density (t dm/ha)	Fraction of savannah burned	Biomass burned (kt dm)	Nitrogen fraction in biomass	CH ₄	N ₂ O	CH ₄	N ₂ O
						(kg/t dm)		(kt)	
Forest land (specify ecological zone) ¹⁰									
Grassland (specify ecological zone) ¹⁰									

¹⁰ If possible, fires on forest land and grassland defined as savannah should be separately identified and reported here. If it is not possible to separate those fires from other forest and grassland fires reported under category 4(I).A Biomass Burning, this should be clearly documented in the documentation box and in the national inventory report (NIR). Parties should avoid double counting with emissions reported in CRF table 4(V).

¹⁰ Parties who wish to do so could report CH₄ and N₂O emissions from burning of organic soils here. N₂O emissions from burning of organic soils could be included when higher tier methods are used.

Documentation box:

Parties should provide detailed explanations on the agriculture sector in chapter 5: Agriculture (CRF sector 3) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 3.F SECTORAL BACKGROUND DATA FOR AGRICULTURE
Field burning of agricultural residues
 (Sheet 1 of 1)

 Year
 Submission
 Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION				IMPLIED EMISSION FACTORS		EMISSIONS	
	Area burned (k ha/yr)	Biomass available ⁽¹⁾ (t dm/ha)	Combustion factor	Total biomass burned ⁽²⁾ (kt dm)	CH ₄ (kg/t dm)	N ₂ O (kg/t dm)	CH ₄ (kt)	N ₂ O (kt)
1. Cereals								
Wheat								
Barley								
Maize								
Other (please specify)								
2. Pulses								
Other (please specify)								
3. Tubers and roots								
Other (please specify)								
4. Sugar cane								
5. Other (please specify)								

Additional information				
	Wheat	Barley	Maize	Other (specify)
Crop production (t)				
Residue/crop ratio				
Dry matter (dm)				
Fraction burned in				
Fraction oxidized				

Livestock

Category	Tier	Parameter	Disaggregation 1	Disaggregation 2	Disaggregation 3
Enteric Fermentation	tier 2	Average CH ₄ conversion rate	by animal category		
		Average gross energy intake			
		Population			
		Digestibility of feed			
		Feeding situation			
		Gross energy			
		Milk yield			
		Pregnant			
		Weight			
		Work			
Manure management	tier 2	Allocation by climate region	by animal category	Anaerobic lagoon/Liquid system/Daily spread/Solid storage and dry lot/Pasture, range and paddock/Composting/Digesters/Burned for fuel or as waste/Other/	Cool/Temperate/Warm
		CH ₄ producing potential (average)			
		VS daily excretion (average)			
		Typical animal mass (average)			
		Methane conversion factor			Cool/Temperate/Warm
Manure management		Nitrogen excretion per MMS	by animal category	Anaerobic lagoon/Liquid system/Daily spread/Solid storage and dry lot/Pasture, range and paddock/Composting/Digesters/Burned for fuel or as waste/Other/	
		Nitrogen excretion rate			

Agricultural soils

Category	Tier	Parameter	Disaggregation 1	Disaggregation 2
Rice cultivation		Amount of Organic amendments added	Irrigated/Rain-fed/Deep water/Other	type
		Harvested area		
		Harvested area for Upland Rice		
Direct and indirect N ₂ O emissions		Area of cultivated organic soils		
		N excretion on pasture, range and paddock		
		N in crop residues returned to soils		
		N in mineral soils that is mineralized in association with loss of soil C		
		N input from application of other organic fertilizers		
		N input from manure applied to soils		
		N input from sewage sludge applied to soils		
Field Burning of Agricultural Residues		Other fractions		Cereals/Pulses/Tubers&Roots/Sugar cane/Other
		Total biomass burned		
		Area burned		
		Biomass available		
		Combustion factor		
		Crop production		
		Dry matter (dm) fraction of residue		
		Fraction burned in fields		
		Fraction oxidized		
Liming, urea application and other carbon-containing fertilizers		Amount applied	Dolomite	
			Limestone CaCO ₃	
			Other Carbon-containing Fertilizers	
			Urea Application	

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Writing Guidance for National Inventory Reports

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Writing Guidance

National Inventory Reports



February 2016

- See Forum item [here](#) on NIR...



Enviroment and Climate
Regional Accession Network **ECRAN**

Table 3: Example summary table for the Energy Sector.

Energy	GREENHOUSE GAS SOURCE AND SINK CATEGORIES	NCA Factor	Conversion (MCO)	Latest year total	2023 latest year total	Last 2 Y % change	Pre-transition Latest year	Pre-transition 2023	Methodology reference (NIR, Sector)
Total Energy					23%	-2%	-2%	-1%	
A. Fuel combustion activities (sectoral approach)					20%	2%	4%	-1%	
a. Other industries					25%	7%	-7%	0%	
a. Public electricity and heat production	2.6, 8.3, 9				-28%	-1%			MS1
a. Petroleum refining	2.6, 8.3, 9				-18%	3%			MS1
a. Manufacture of solid fuels and other energy industries	2.6, 8.3, 9				8%	-2%			MS2, MS1
b. Manufacturing industries and construction							-10%	-3%	
b. Iron and steel	7.9, 9.12				32%	22%			MS4
b. Non-ferrous metals	7.9, 9.12				48%	48%			MS3
b. Chemicals	7.9, 9.12				5%	11%			MS3
b. Pulp, paper and print	7.9, 9.12				18%	2%			MS3
b. Food processing, Beverages and tobacco	7.9, 9.12				41%	2%			MS3
b. Non-metallic minerals	7.9, 9.12				6%	7%			MS2
c. Other (please specify)	7.9, 9.12				30%	2%			MS3, MS21

Appendix A: Method Statement Template

A template for NIR Method Statements with notes given below the table

Method Title	MS
Relevant Categories, source names [1x4]	
Relevant Games [1x4]	
Relevant facts, activities [1x4]	
Background	
Data sources [1x4]	
Method approach [Text]	
Method Changes [Y/N]	
Assumptions & observations [1x4]	
Recalibration [yes/no]	
Recalibration justification & summary of change	
Improvements [list completed and planned]	
QA/QC processes	
Time series consistency issues [1x4]	
Uncertainties [describe key uncertainties]	
Verification	

NIR: Cross Cutting

Table 2: Guidance on suggested location for cross-cutting content in the NIR.

Key Elements	NIR Section			
	Chapter 1	Chapters 3-9 (Sectors)	Chapter 10	Annex or other document
Completeness	Overview statement on completeness.	Chapter paragraph highlighting missing sources or statement on completeness.	Not required.	Not required.
Method Assumptions & Data Sources	Simple overview of methods and data sources used. Reference to CRF for table on tiers used. National System/Methods and Data Sources section to list data sources (e.g. Table 1.7).	Details of method assumptions, data sources sector specific QA/QC, time series consistency, verification, uncertainties, improvements.	Not required.	Annex 3: emission factors, important parameters and further elaboration of data source references. Annex 4: information on energy balance and reference approach.
Key Category (KC) Analysis	Overview of method and the key categories. Inclusion of aggregated key category analysis.	Identification of KCs in a summary table.	Not required.	Detailed tables Annex 1.
Uncertainties	Overview of methods and the headline uncertainties. Reference Annex 2.	Method statement text explaining key uncertainties with reference to Annex 2 for numerical information.	Not required.	Detailed uncertainty tables in Annex 2.
QA/QC	Section 1.2 will include the general approach and management of QA/QC, and highlight the general QA/QC activities.	Method statement text explaining sector specific QA/QC.	Not required.	Separate documents: 1) Detailed internal QA/QC plan 2) Working files: evidence of documentation of QA/QC
Recalculations	Not required.	Method statement text on the rationale and impact of recalculations. Numerical information in Chapter 10 summary table.	Full detail of numerical information on recalculations. Overview of justification and reference to Chapters 3-9 method statements for detail.	Not required.
Improvement	Overview of the process for improvements in National System. Refer to Chapter 10 for details of improvements made.	Method statement text highlighting key improvements completed. Reference to Chapter 10 for full listing and list of planned improvements.	Detailed improvement plan and implementation highlighting origin of recommendations for improvements. Including details of recalculations.	Not required.

Country National System Progress

National System Progress: Agriculture

ECRAN ECRAN Working Group 2 Bosnia and Herzegovina Croatia EDIT LINKS

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	Sector	country	National System Element	Method	Tier
Country Details	3 Agriculture	Turkey	3.A. Enteric fermentation	2006 IPCC	Tier 1
Country GHG National System Objectives, Results and Activities	3 Agriculture	Turkey	3.B. Manure management	2006 IPCC	Tier 1
Other Support Projects	3 Agriculture	Turkey	3.C. Rice cultivation	2006 IPCC	Tier 1
National System Progress	3 Agriculture	Turkey	3.D. Agricultural soils	2006 IPCC	Tier 1
ECRAN Activities & Tools	3 Agriculture	Turkey	3.E. Prescribed burning of savannas	NO	NO
Peer Review Activities	3 Agriculture	Turkey	3.F. Field burning of agricultural residues	2006 IPCC	Tier 1
ECRAN WG2 Participants	3 Agriculture	Turkey	3.G. Liming	NE	NE
ECRAN WG2 Workplan	3 Agriculture	Turkey	3.H. Urea application	2006 IPCC	Tier 1
Suggested National System development Activities	3 Agriculture	Turkey	3.I. Other carbon-containing fertilizers	NE	NE
Photos ECRAN WG2	3 Agriculture	Turkey	3.J. Other	NO	NO
Documents Library	3 Agriculture	SERBIA	3.A. Enteric fermentation	IPCC 2006	Tier 1
ECRAN Team- To Do list	3 Agriculture	SERBIA	3.B. Manure management	IPCC 2006	Tier 1
Documentation for Presenters	3 Agriculture	SERBIA	3.C. Rice cultivation	NO	NO
Recent	3 Agriculture	SERBIA	3.D. Agricultural soils	IPCC 2006	Tier 1 and Tier 2
	3 Agriculture	SERBIA	3.E. Prescribed burning of savannas	NO	NO
	3 Agriculture	SERBIA	3.F. Field burning of agricultural residues	NO	NO
	3 Agriculture	SERBIA	3.G. Liming	NO	NO
	3 Agriculture	SERBIA	3.H. Urea application	IPCC 2006	Tier 1
	3 Agriculture	SERBIA	3.I. Other carbon-containing fertilizers	NO	NO
	3 Agriculture	SERBIA	3.J. Other	NO	NO

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Summary of NS Progress: Agriculture

	3.A. Enteric fermentation	3.B. Manure management	3.C. Rice cultivation	3.D. Agricultural soils	3.E. Prescribed burning of savannas	3.F. Field burning of agricultural residues	3.G. Liming	3.H. Urea application	3.I. Other carbon-containing fertilizers	3.J. Other
Albania	??	??	??	??	??	??	??	??	??	??
Bosnia & Herzegovina	??	??	??	??	??	??	??	??	??	??
Kosovo	2006 IPCC (T1)	2006 IPCC (T1)	NO	2006 IPCC (T1)	NO	2006 IPCC (T1)	NO	2006 IPCC (T1)	2006 IPCC (T1)	NO
Montenegro	2006 IPCC (T1)	2006 IPCC (T1)	NO	2006 IPCC (T1)	NO	2006 IPCC (T1)	NO	NO	NO	NO
Republic of Macedonia	2006 IPCC (T1)	2006 IPCC (T1)	2006 IPCC (T1)	??	NA	NA	??	2006 IPCC (T1)	NA	NA
Serbia	2006 IPCC (T1)	2006 IPCC (T1)	NO	2006 IPCC (T1 & T2)	NO	NO	NO	2006 IPCC (T1)	2006 IPCC (T1)	NO
Turkey	2006 IPCC (T1)	2006 IPCC (T1)	2006 IPCC (T1)	2006 IPCC (T1)	NO	2006 IPCC (T1)	NE	2006 IPCC (T1)	NE	NO

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Agriculture estimation and reporting clinics

Questions

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

Groups:

- Group 1: Janka, Beatriz: Croatia, Serbia, Turkey
- Group 2: Kristina, Steen: Montenegro, Albania, Kosovo
- Group 3: Bernard, Etienne : Bosnia and Herzegovina

Thank you

Day 2: Introduction

Day 2 : 22 June 2016

- Add Notes..

Topic: Assessment of GHG inventories in Agriculture			
Chair and Co-Chairs: Imre Csikós, Justin Goodwin			
Venue: Zagreb			
Start	Finish	Topic	Speaker
08:30	09:00	Registration	
09:00	09:15	Introduction to Day 2	Justin Goodwin, ECRAN
09:15	10:45	Agriculture estimation and reporting clinics. Session 2.	Supported by International Experts
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
11:45	13:00	Agriculture estimation and reporting clinics. Session 3.	Supported by International Experts
13:00	14:00	Lunch Break (60')	
14:00	15:15	Agriculture estimation and reporting clinics. Session 4.	Supported by International Experts
15:15	15:30	Coffee Break (15')	
15:30	16:00	Reporting back (30')	Beneficiary country. ~ 5 min each.
16:00	16:30	wrap up summary of recommendations and actions	Justin Goodwin, ECRAN

Wrap up summary of recommendations and actions

- Cross Cutting: All
 - 1
 - 2
 - 3
 - 4
- Countries:
 - Albania
 - Bosnia Herzegovinian
 - Kosovo
 - Serbia
 - Montenegro
 - Macedonia
 - Croatia
 - Turkey

Next Steps

Log-frame system

- 1_Long Term: Compliance with MMR
- 2_Short term: Permanent National System: Functioning Agriculture component
- 3_Results
 - Result 1: Functioning Institutional Arrangements:
 - 4_Activity 1: Target result, Description, Sequence, means, Benefit, Completion, Effort, External support needed, links.
 - 4_Activity 2
 - 4_Activity 3
 -
 - Result 2: Building a team:
 - 4_Activity 1
 - 4_Activity 2
 -
 - Result 3: Data Supply security:
 - Result 4: Delivering a quality and effective GHG inventory.
 - Result 5: Marketing the inventory:

4_Activity 1: Target result, Description, Sequence, Priority, means, Benefit, Completion, Effort, External support needed, links.

Key National System: Activities

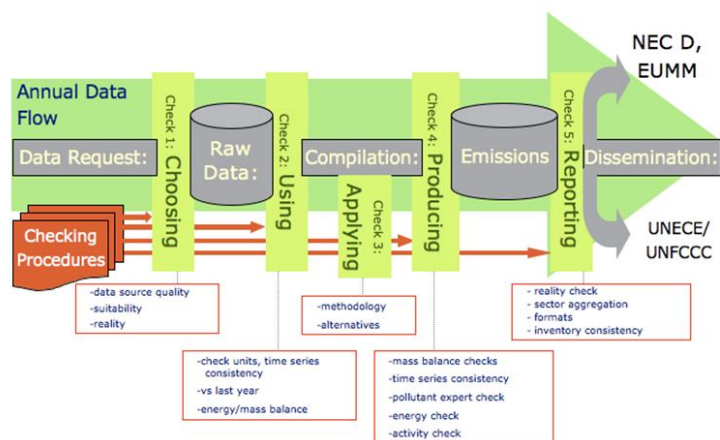


Figure 5 – NAEI Data Flow and QA/QC Checks

Result 1: Functioning Institutional Arrangements

- **Suggested Activities:**
 - Draw and consult on NS structure
 - Create a National System document.
 - Document and agree roles and responsibilities (including the support of NC, BUR and NDC).
 - List & engage with Stakeholders.
 - Create the mandate for the compilation and reporting with laws.
 - Supported Peer review of NS.
 - Legal arrangements for data supply and analysis

Result 2: Building a team:

- **Suggested Activities:**

- Assign team roles and responsibilities (Sector experts, co-ordinator, QA/QC, peer review).
- Recruitment, mentoring & training plan.
- Activity and management plans for a sustainable team.
- Approach to “buy-in” or use external support.

Result 3: Data Supply Security:

- **Suggested Activities:**

- List/Register of datasets and data supply stakeholders.
- Development of data supply agreements (DSAs) (including QA/QC and uncertainty elements).
- Laws to guarantee data supply for GHG estimation.
- Development of statistics or Country Specific data.
- Archiving system.

Result 4: Delivering a quality and effective GHG inventory:

- **Suggested Activities:**
 - Produce CRF tables (Excel/xml). Engage in a supported peer/bilateral review.
 - Produce an NIR or set of method statements.
 - Improve data management (e.g. database system).
 - Key 2006 IPCC method development & data collection (by sector).
 - Develop QA/QC tools and systems and processes.

Result 5: Marketing the inventory:

- **Suggested Activities:**
 - Outreach for use of GHG estimates by policy makers.
 - Publication of the data in user friendly forms.
 - Generate indicators and factsheets.
 - Actively engage with and support BUR, NC, NDC and Policies and Measures activities.