ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

CGIAR
RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security
CCAFS

COP 22 Side Event: Improving MRV for agricultural emission reductions in the livestock sector

7 November 2016, 16:45- 18:15 with cocktail following
Mediterranean Room

Food and Agriculture Organization of the United Nations

GLOBAL RESEARCH ALLIANCE
ON AGRICULTURAL GREENHOUSE GASES

Part 1:
Country experiences in improving MRV for mitigation in the livestock sector

CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security CCAFS

Speaker 1:
Walter Oyhantacabal, Ministry of Livestock, Agriculture and Fishery, Uruguay

MINISTERIO DE GANADERÍA
AGRICULTURA Y PESCA

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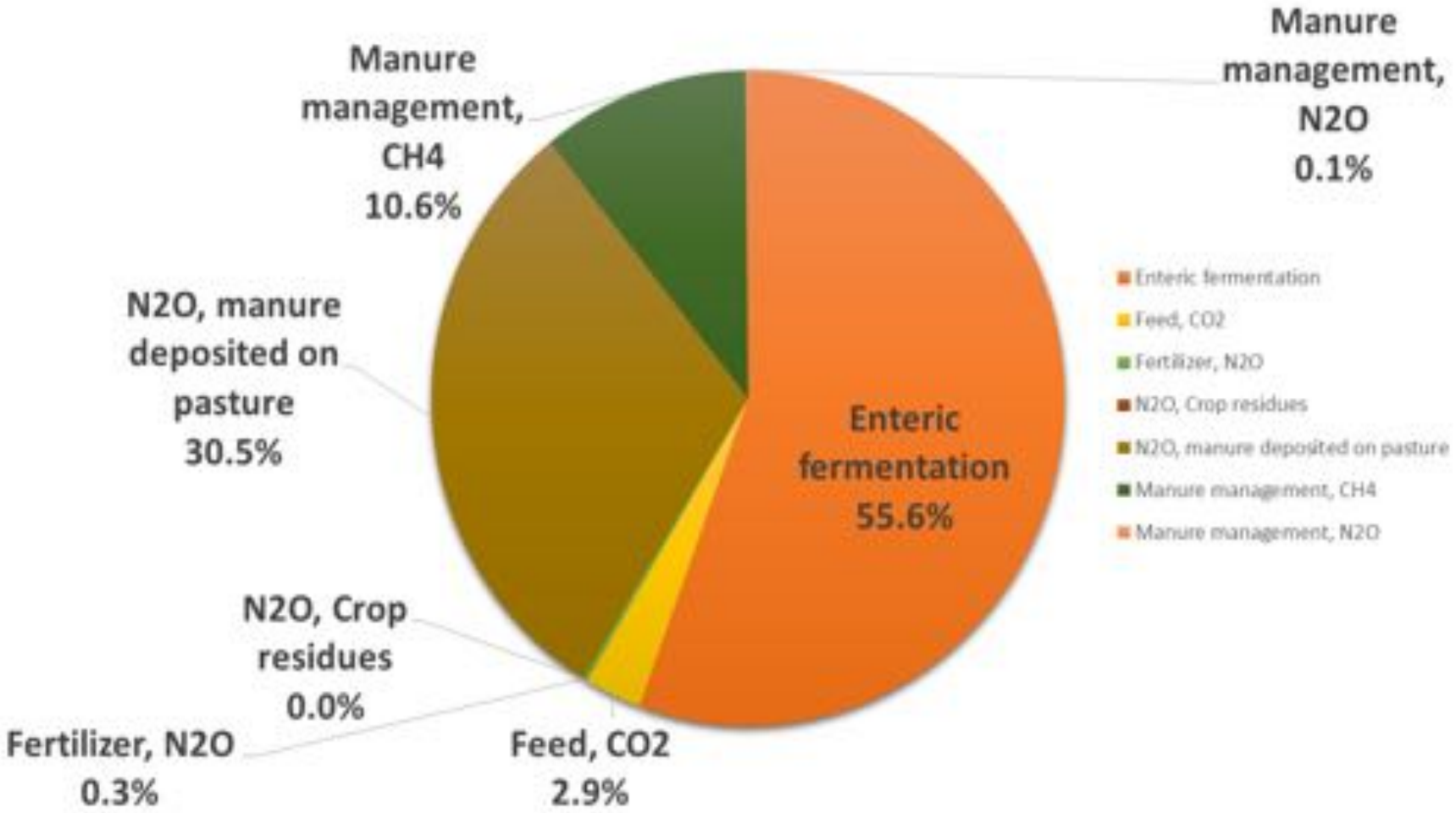
Low-carbon development of the beef cattle sector in Uruguay

CGIAR – CCAFS – ILRI
COP22 Side event:
November 7th, 2016

Walter Oyhantçabal
Director of the Sustainability and Climate Change Unit
Ministry of Livestock, Agriculture and Fishery - Uruguay

- Uruguay is a livestock country with an economy strongly based on the agricultural sector (70% of all exports).

75% of emissions in agriculture: main sources are…



Uruguay´s iNDC: proposed mitigation targets in terms of emissions intensity in the beef sector (per kg beef) compared to 1990

	2030 vs. 1990 own effort	2030 vs 1990 with MOI	2010 vs 1990
CH_4	**33% less**	**46% less**	23% less
N_2O	**31% less**	**41% less**	28% less

Q1: Uruguay experiences in improving activity data, emission factors and coordination to best capture mitigation impacts

National (digital) Livestock Information System

High quality livestock statistics system

100% traceability of the cattle herd, with electronic and visual tags

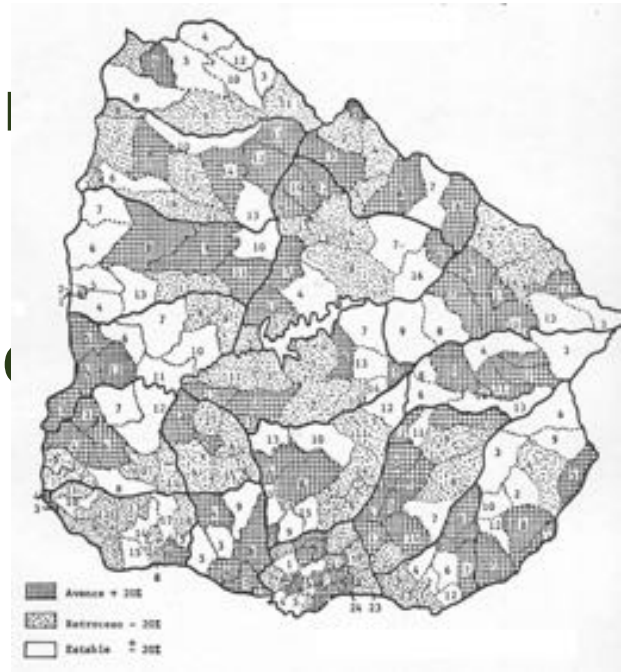
Annual electronic sword declararation by all farmers

- **Stock**: number of heads by category = **AD dissagregated by small local áreas.**
- **Land use** → Diet, as basis for estimating sub-national **EF**

Emissions = AD x EF

Q2: What innovations have you used to get emission factors for low emissions production systems?

- **Use of spatially disaggregated information on cattle herd by category and diet quality and composition.**
- **Tier 2** C-S EF for enteric fermentatio
  including Tier 2 MCF
- **Tier 2** N_2O from manure on grasslan
- Use of FAOSTAT tools for QA/QC
- GLEAM model under calibration

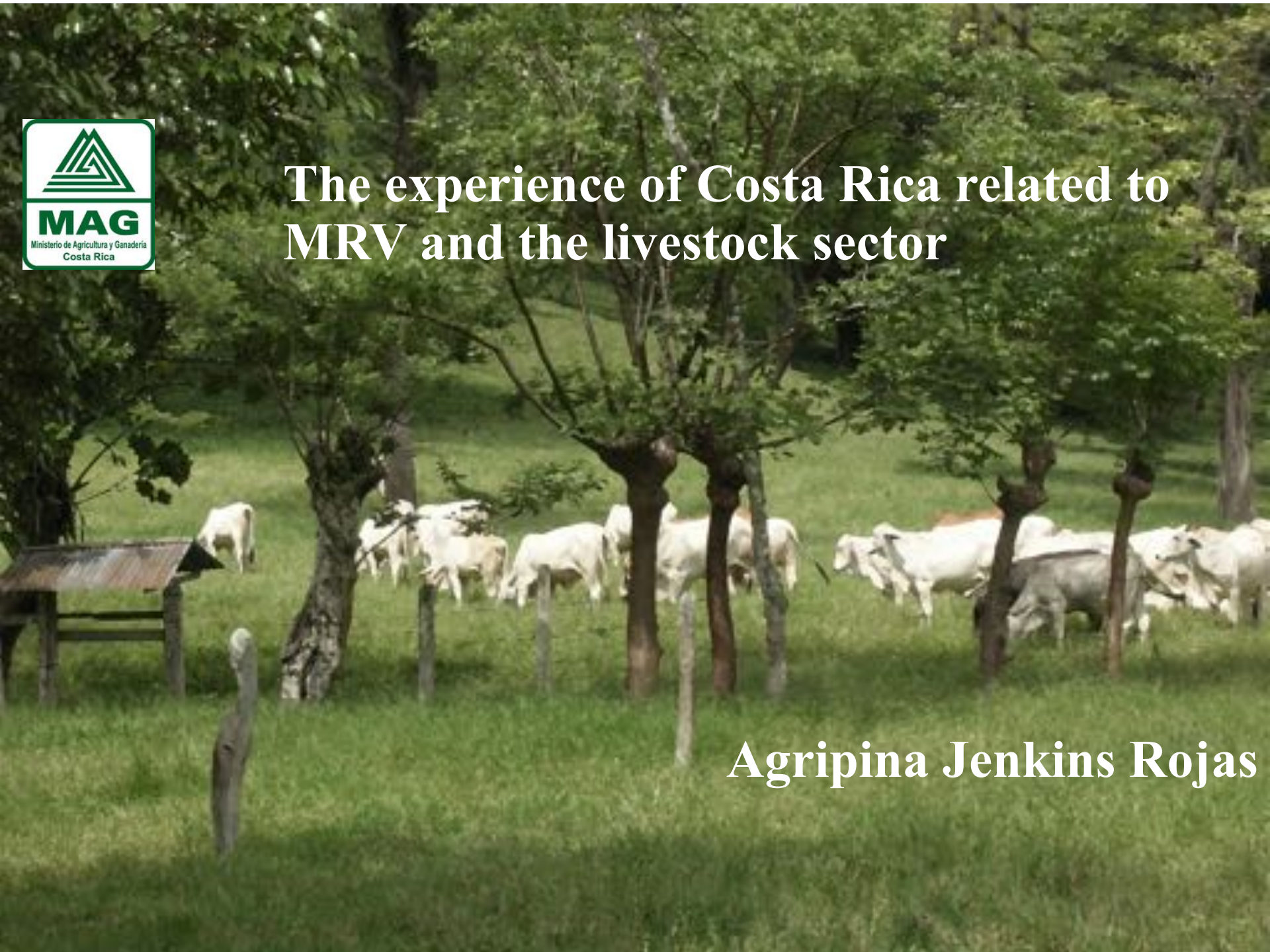


Q3: How does Uruguay coordinates collection of data?

- **Agriculture statistics** are a responsibility of the Ministry of Agriculture and cover 200 local area units.
- Agriculture and LULUCF **GHG inventories** are compiled in our Ministry.
- **EFs research** is coordinated with the National Agricultural Research Institute and the Faculty of Agronomy
- This facilitates the convergence and the support to the inventory as the pillar for **MRV of NDCs and NAMAs**

REDUCING ENTERIC METHANE EMISSIONS INTENSITY THROUGH IMPROVED PRODUCTION EFFICIENCY AND PRODUTIVITY OF CATTLE IN BEEF PRODUCTION SYSTEMS IN URUGUAY

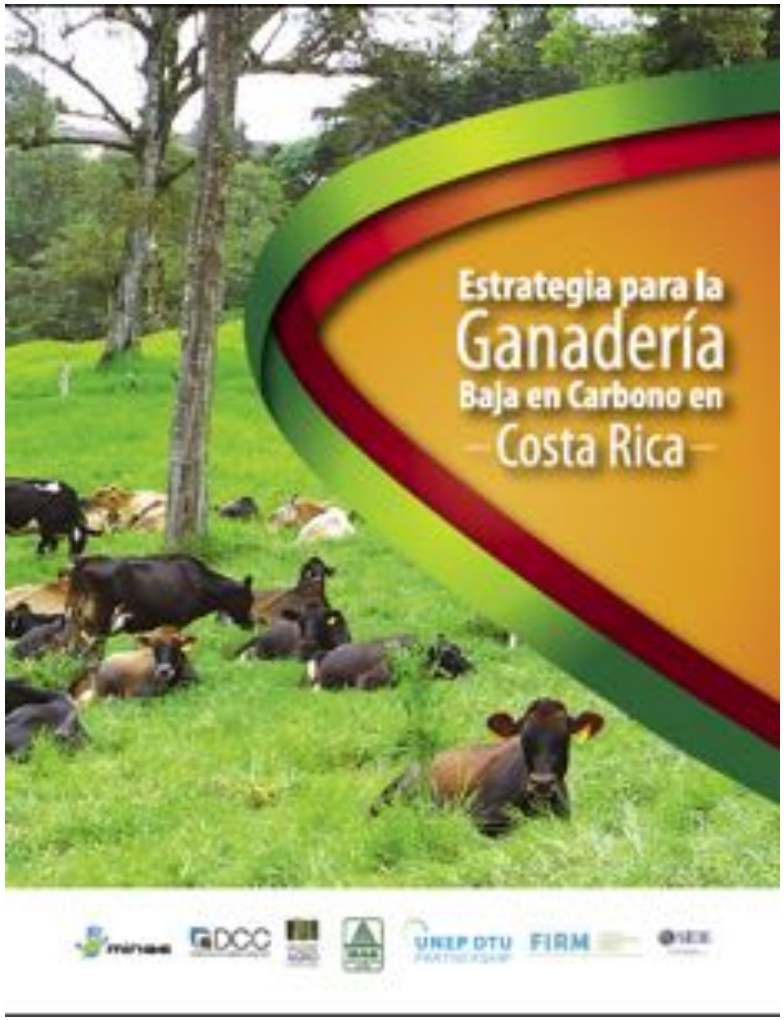
Speaker 2:
Agripina Jenkins, Ministry of Agriculture and Livestock, Costa Rica

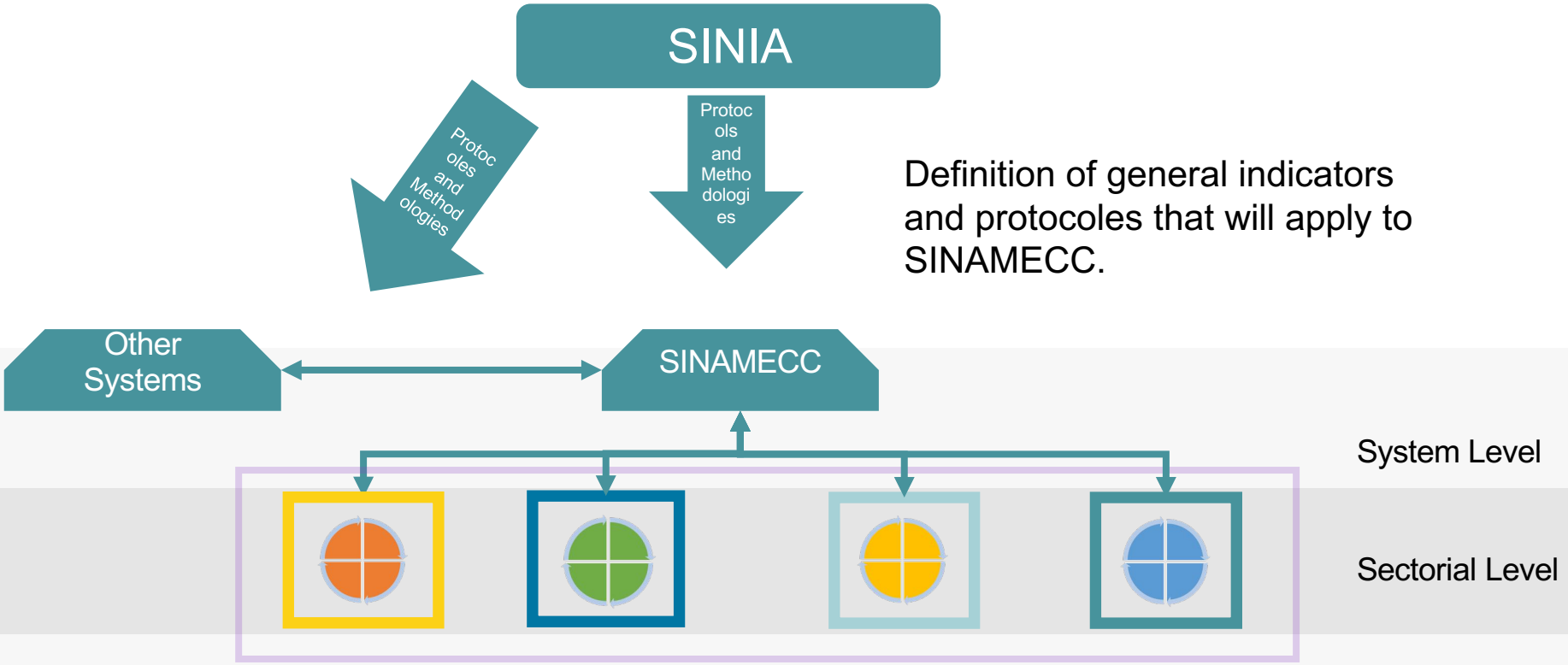


The experience of Costa Rica related to MRV and the livestock sector

Agripina Jenkins Rojas

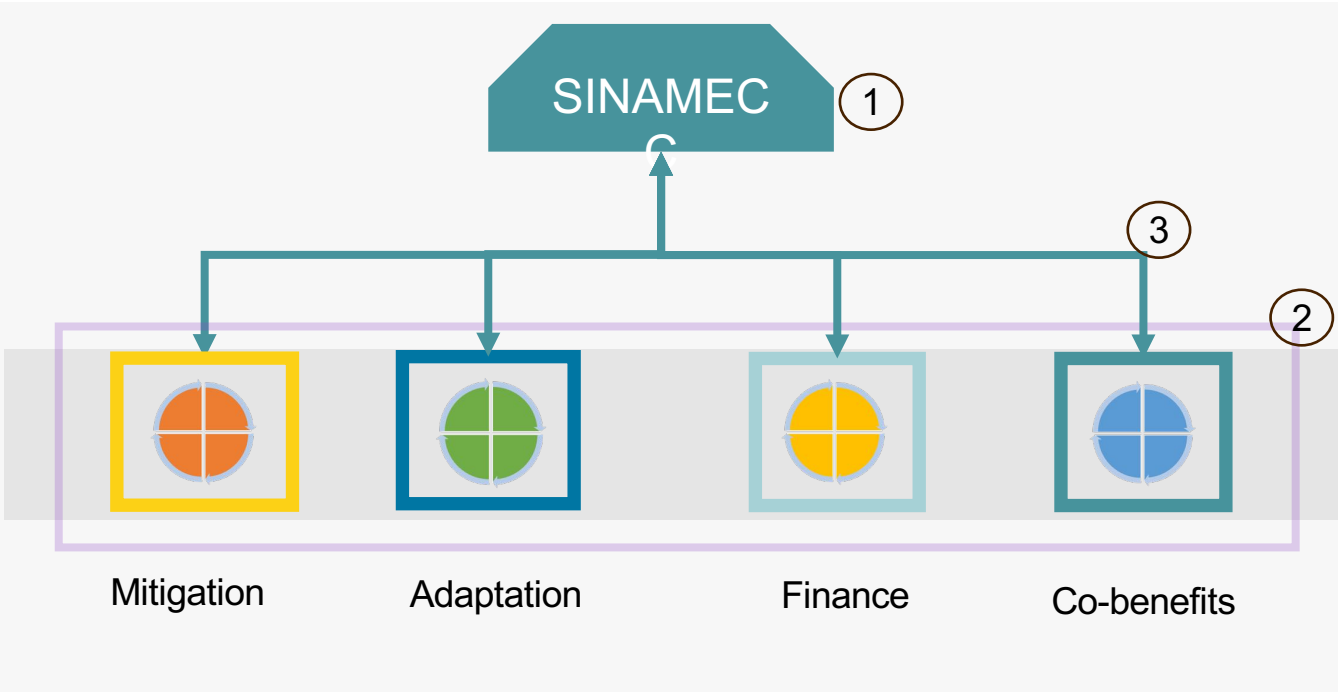
Costa Rica: livestock policy





Definition of general indicators and protocoles that will apply to SINAMECC.

System Level



1. Gobernance of SINAMECC
ICAT y RdC – Definition of responsabilities–

2. Habilitant Framework
ICAT: Creation of a habilitant framework that facilitates the stablishment of interintitutional arragments for information.

3. Plataform
PMR: development of the plataform that also seeks the necccesity of carbon registries

What we need to capture mitigation?

- **Activity data to capture mitigation**
  - **We need information related to grass extension (by grass specie according to production system)**
  - **Frequent data of cattle population**
  - **Data related to use of nitrogen fertilizer**
  - **Mitigation options**

Innovations to get emission factors

- **Static chambers to develop national emission factors (N2O)**
  - **Better grazing systems**

- **Implementation of a technique (sulfur hexafluoride, known as SF6) to measure directly the enteric methane emitted by livestock**

THANK YOU!

Agripina Jenkins Rojas

agripina.jenkins@gmail.com

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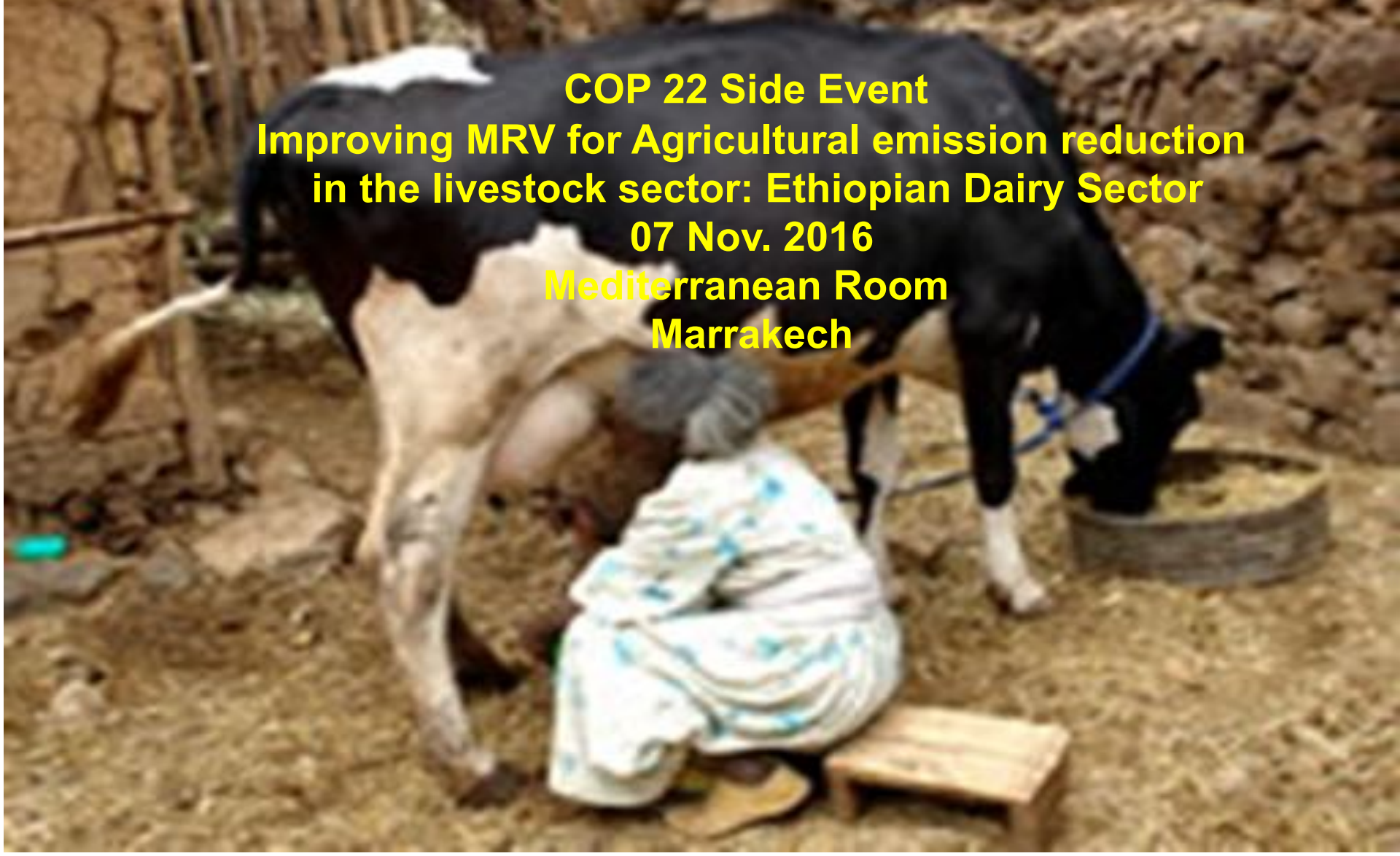
Speaker 3:
Zewdu Eshetu, Climate Science Center, Addis Ababa University, Ethiopia



COP 22 Side Event
Improving MRV for Agricultural emission reduction in the livestock sector: Ethiopian Dairy Sector
07 Nov. 2016
Mediterranean Room
Marrakech

Zewdu Eshetu CSC, AAU
Carolyn Opio, Livestock Policy Officer, FAO

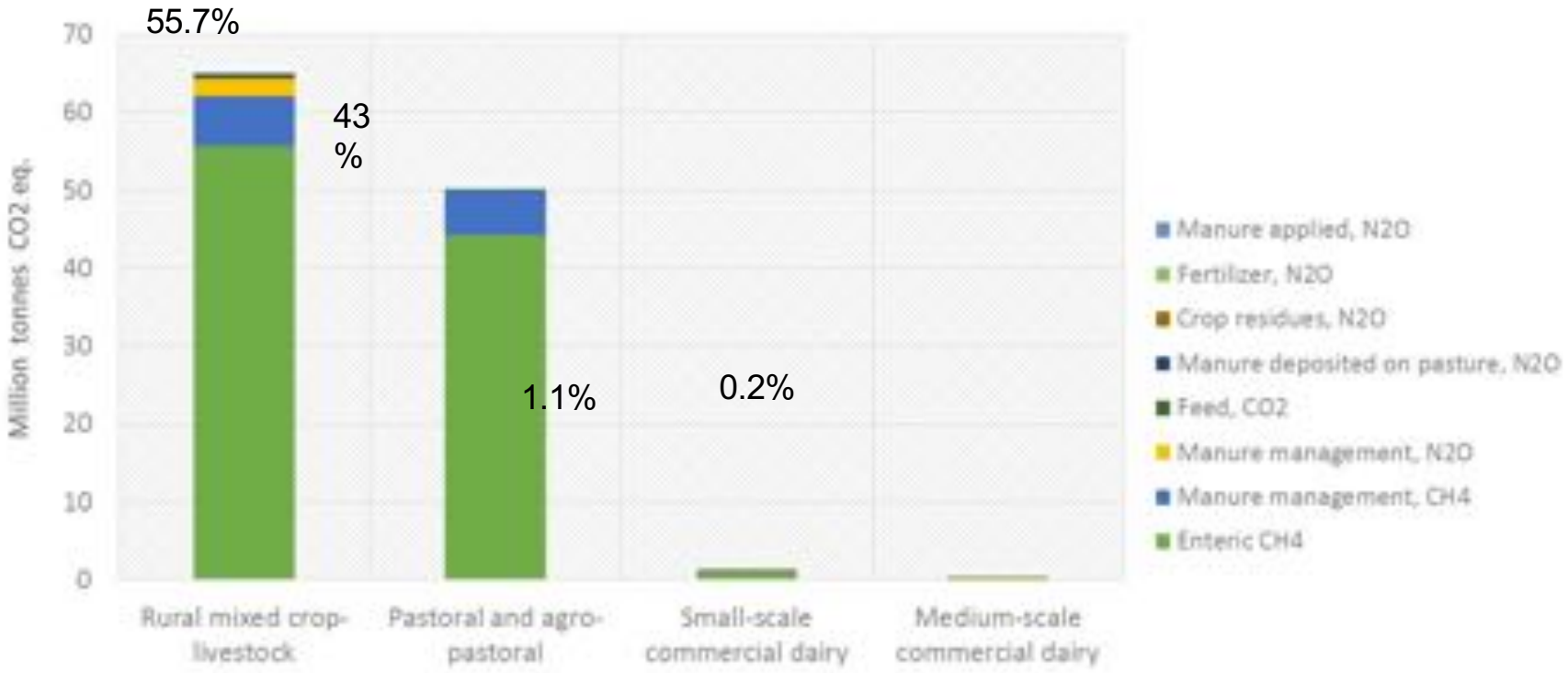
Food and Agriculture Organization of the United Nations

CSC

Agricultural GHG Research Center, New Zealand

Climate and Clean Air Coalition

CONTRIBUTION OF ETHIOPIAN DAIRY SECTOR TO EMISSIONS by production system:
161 MILLION TONNES CO2 eq. PER ANNUM



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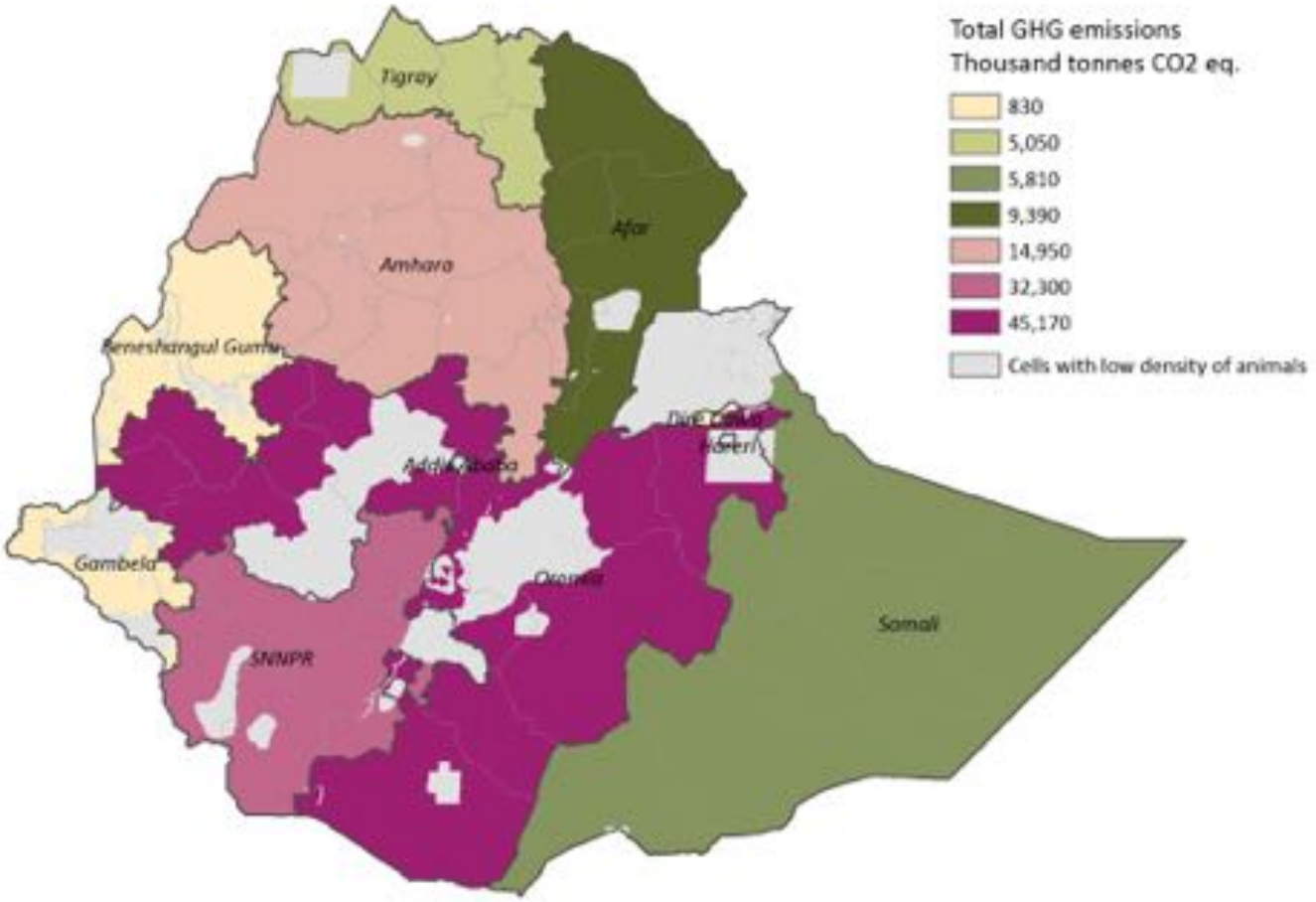
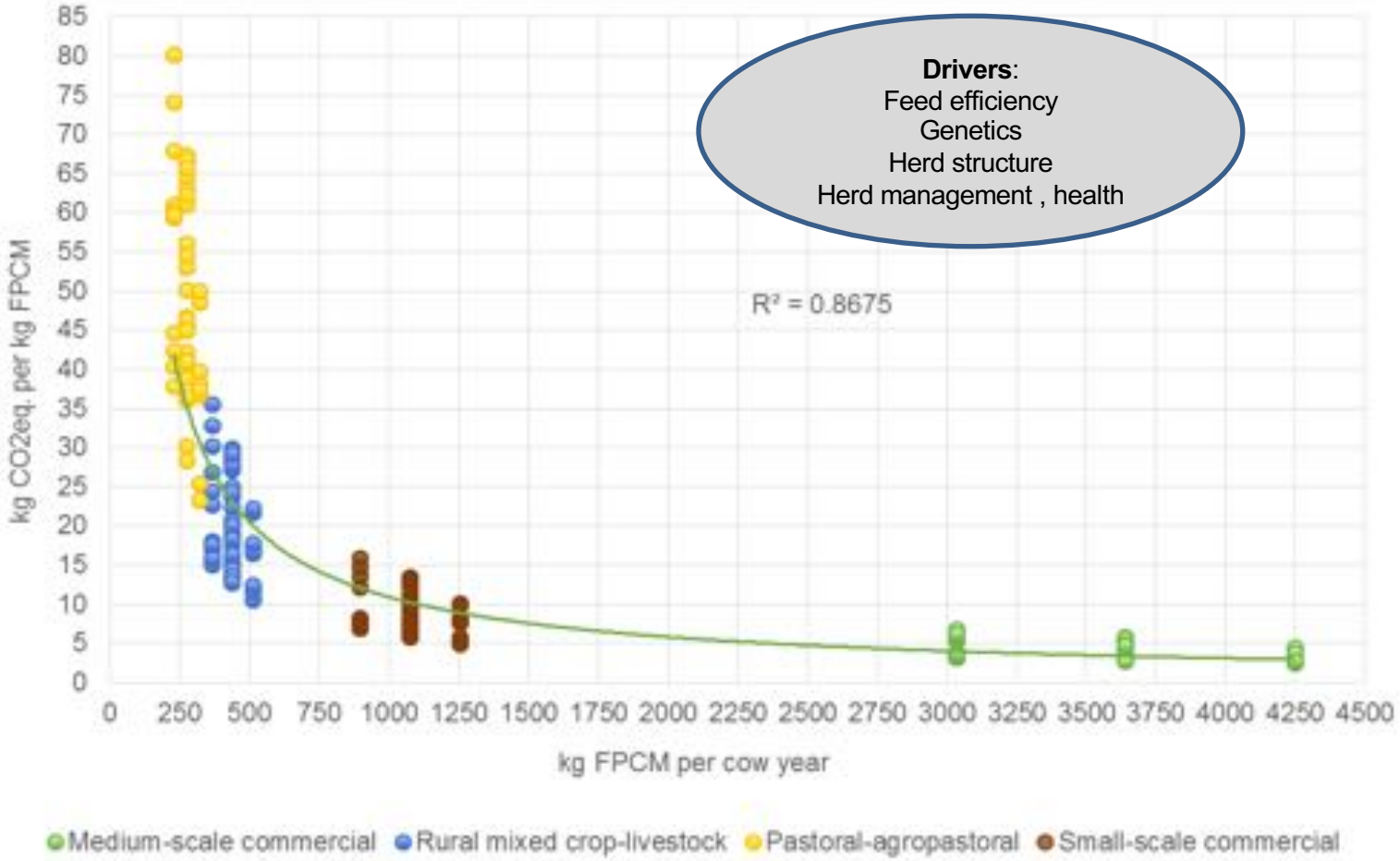


EFFICIENCY IN DAIRY SYSTEMS IN ETHIOPIA: EMISSION INTENSITY AND MILK YIELD



SELECTED TECHNICAL MITIGATION INTERVENTIONS

Practice	Benefits
1. Supplementation with leguminous shrubs	Improved animal and herd health Higher conception rates Improved weaning weights
2. Use of urea-molasses multi-nutrient blocks (UMMB)	Improved nutrition Increased intake
3. Use of urea-treated crop residues	Improved growth rates
4. Supplementation with low-cost high protein/energy concentrates	Improved nutrition Improved cow condition Improved reproductive performance Higher conception rates
5. Disease control (trypanosomiasis)	Reduction in mortality and morbidity Increase in animal productivity Improvements in reproductive performance (fertility, age at first calving)
6. Use of sexed semen	Better management of heifer replacement Reduction in cost for heifer purchase Genetically superior females
7. Conventional artificial insemination using superior genetics	Improved conception rates, calf survival Increased weaning weights Increased final weights

Activity data sources

- Multistage activity data set of primary and secondary
  - Total cattle and dairy population by production system
  - Feed basket by production system
  - Parameters of feed materials
    - digestibility and crude proteins
  - Manure management system (percent of manure burned, stored, slurry, solid, dried, spread over fields etc.)
  - Cattle herd parameters by production system
    - Bull to cow ration, death rate, replacement, live weight, daily weight gains, etc.
- **S**ources of activity data: CSA, Published, experts opinion, measured
- Constraints lack of uniformity in manure, feed and cattle management

Emission factors

GHG = A X Ef

Emission factors are derived from multistage approach

i. Methane production per milk cow production

ii. Methane production per meat bull production

Constraints:

Methane production is affected by:

Livestock health

Feed quality

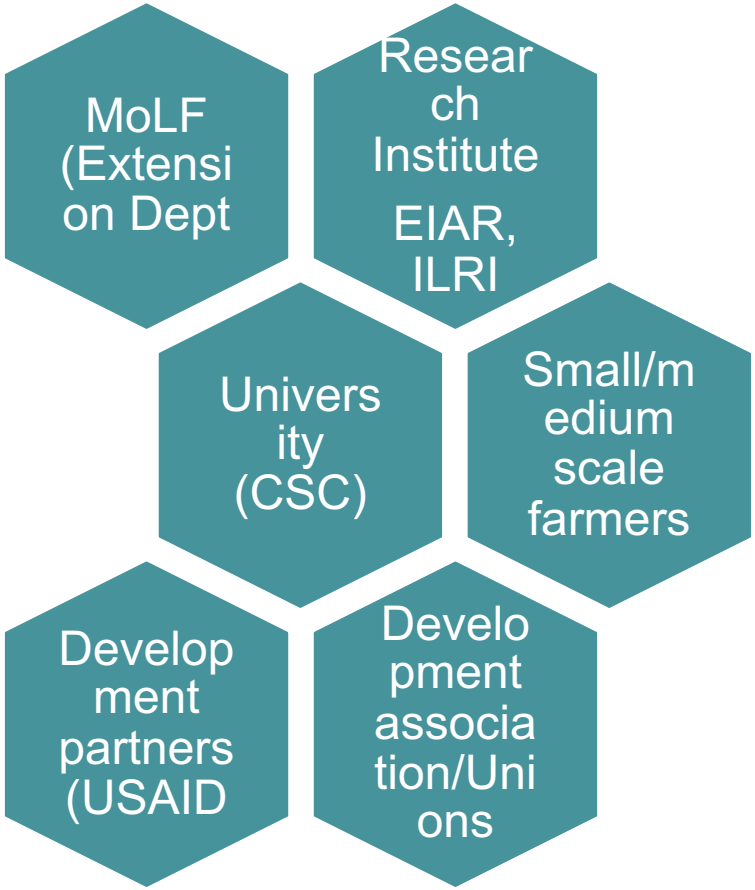
Management

Milk productivity

i. for low emissions production systems?

- Or problems that you face, e.g. we know from ILRI that IPCC efs probably don't reflect emissions of animals on submaintenance diets

Institutional coordination



THANK YOU

Speaker 4:
Bess Tiesnamurti, Indonesian Center for Animal Husbandry Research and Development

Indonesia's Approach in Improving its Livestock Emissions Inventory

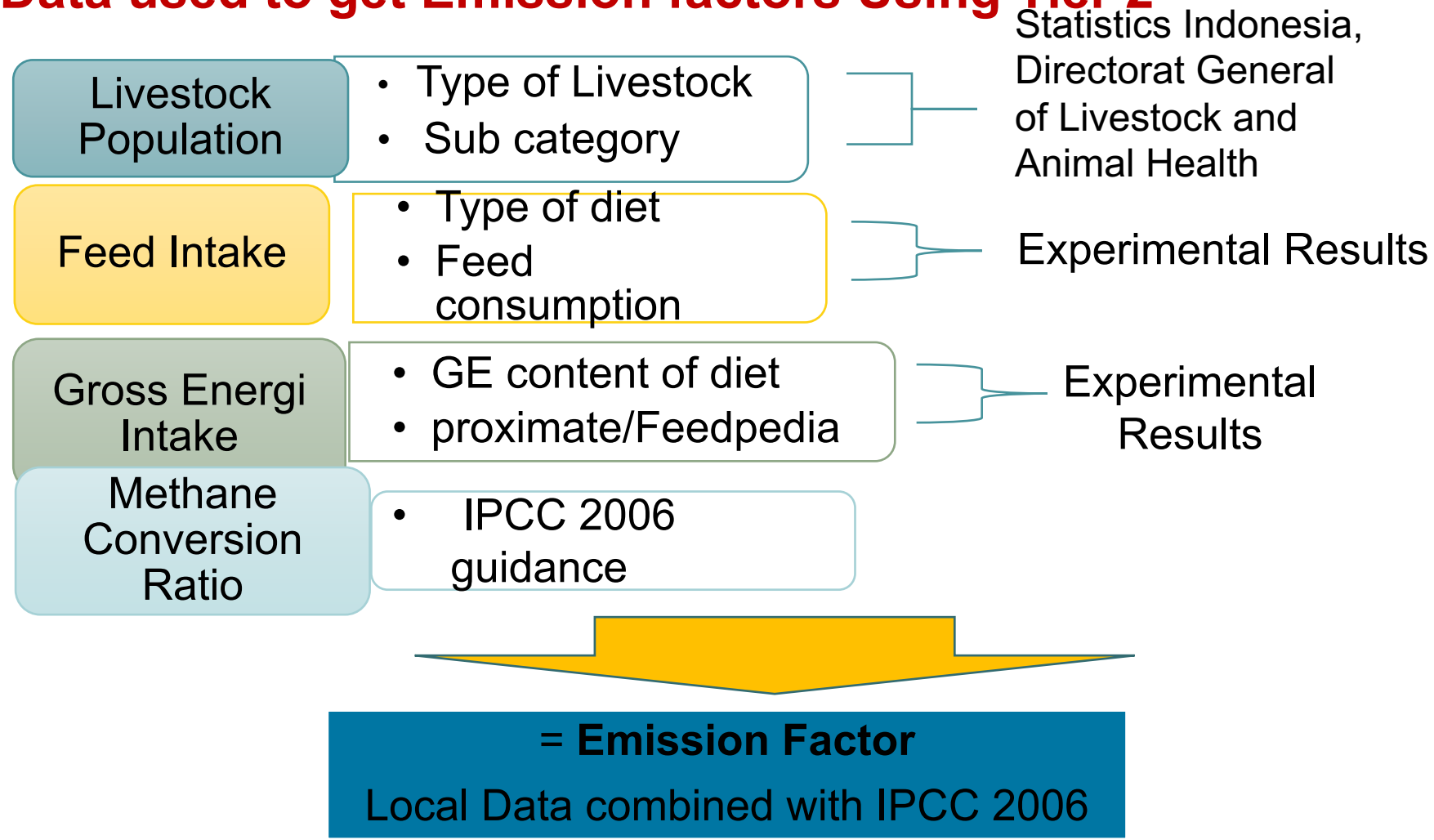
Dr. Bess Tiesnamurti

Director of
Indonesian Centre for Animal Research and Development

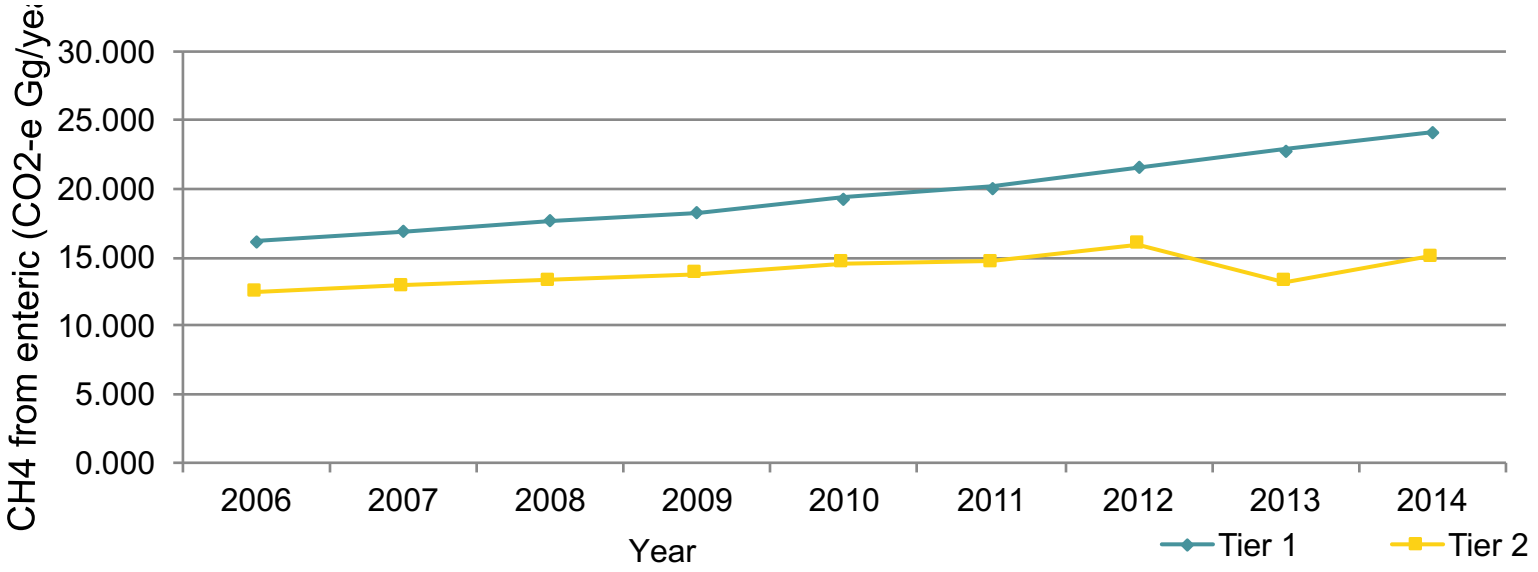
Improving MRV for Agricultural Emission Reductions in the Livestock Sector
7 November 2016

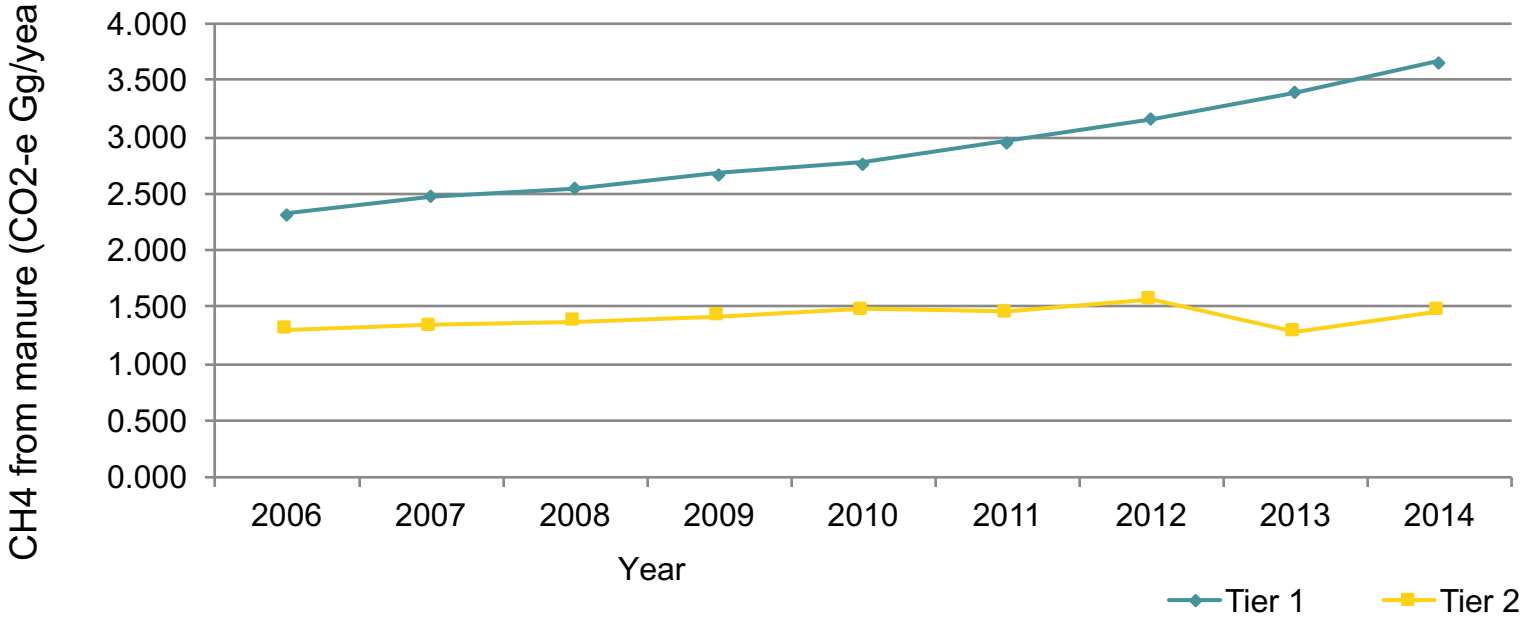
II.Progress to date for Livestock Emission factor using Tier 2

Data used to get Emission factors Using Tier 2



Trend of CH4 from enteric fermentation year 2006 to 2016 (Tier 1 vs Tier 2)





Mitigation technologies for enteric methane

A. Feed Processing: Ensilage , ammoniation, fermentation
B. Feed Supplement: Leguminouse leaves, balance ration
C. Feed Additives:
    1. Saponin (Lerak /Sapindus lerak)
    2. Tannin (Acasia, Calliandra)
    3. Probiotic (*Acetoanaerobium noterae* and A. *woodii*)
    4. Complete rumen modifier (CRM)

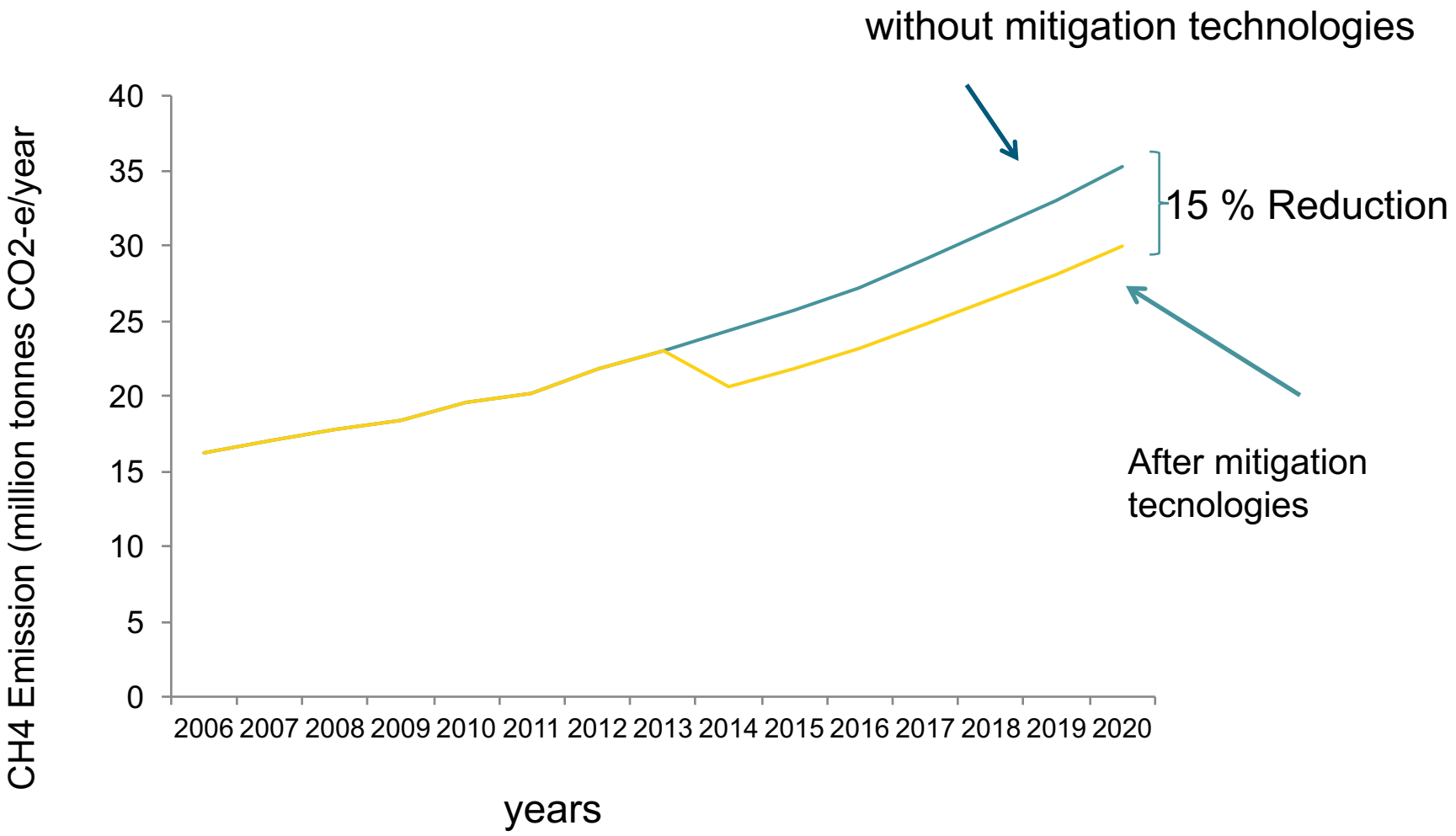
Feed Additives

Extract saponin from *Sapindus rarak*

NO	Animal	PARAMETER	Results
1	Beef cattle [1)]	Average daily gain	20 % ⇧
2	Sheep[2)]	Average daily gain	40 – 44 % ⇧
		Feed Conversion Ratio	20 % ⇧
		CH4 enteric emmited	31 % ⇩

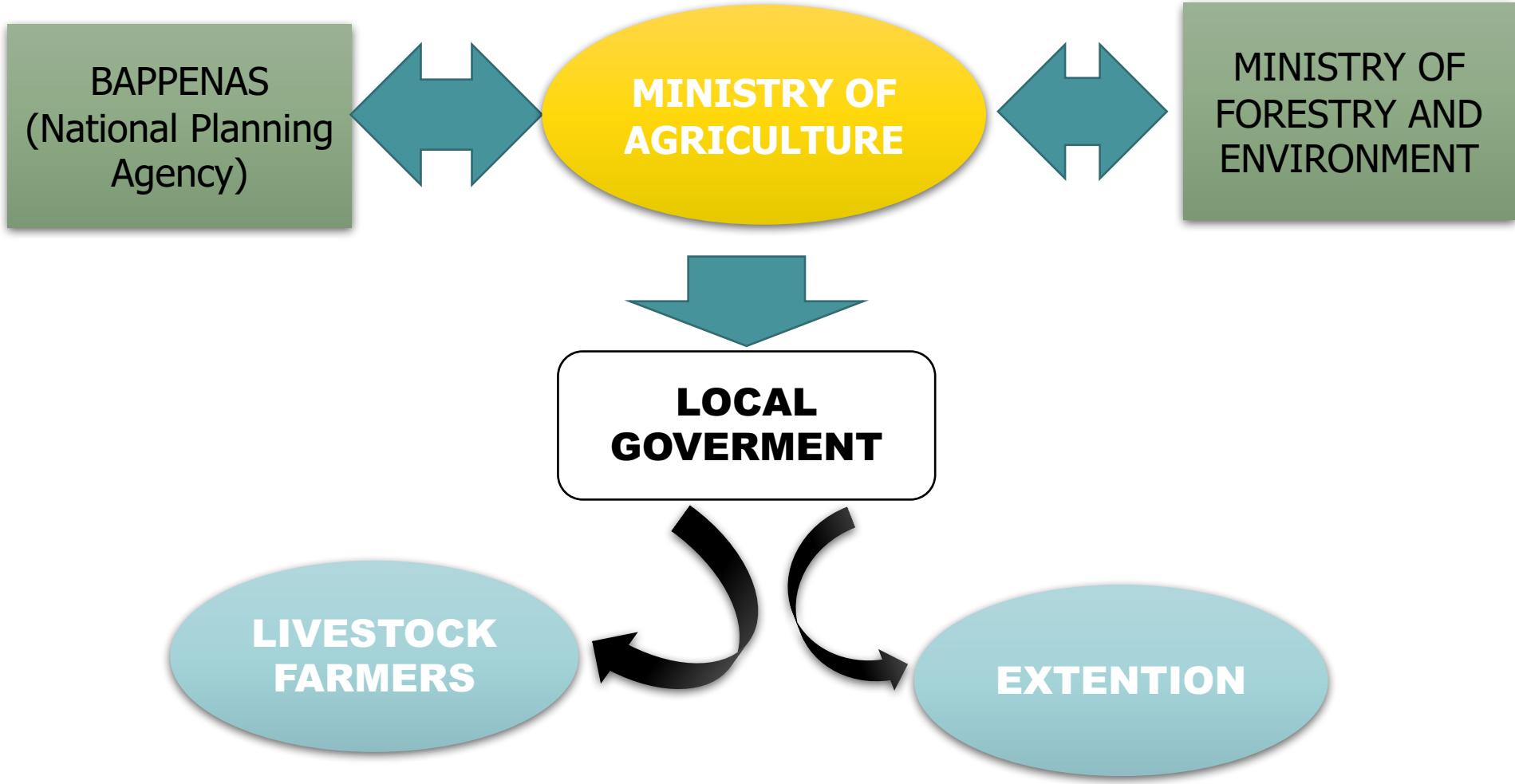
1) Astuti *et al*., 2007.
2) Amlius, 2004

Estimation of methane reduction after tecnologies mitigation were applied.

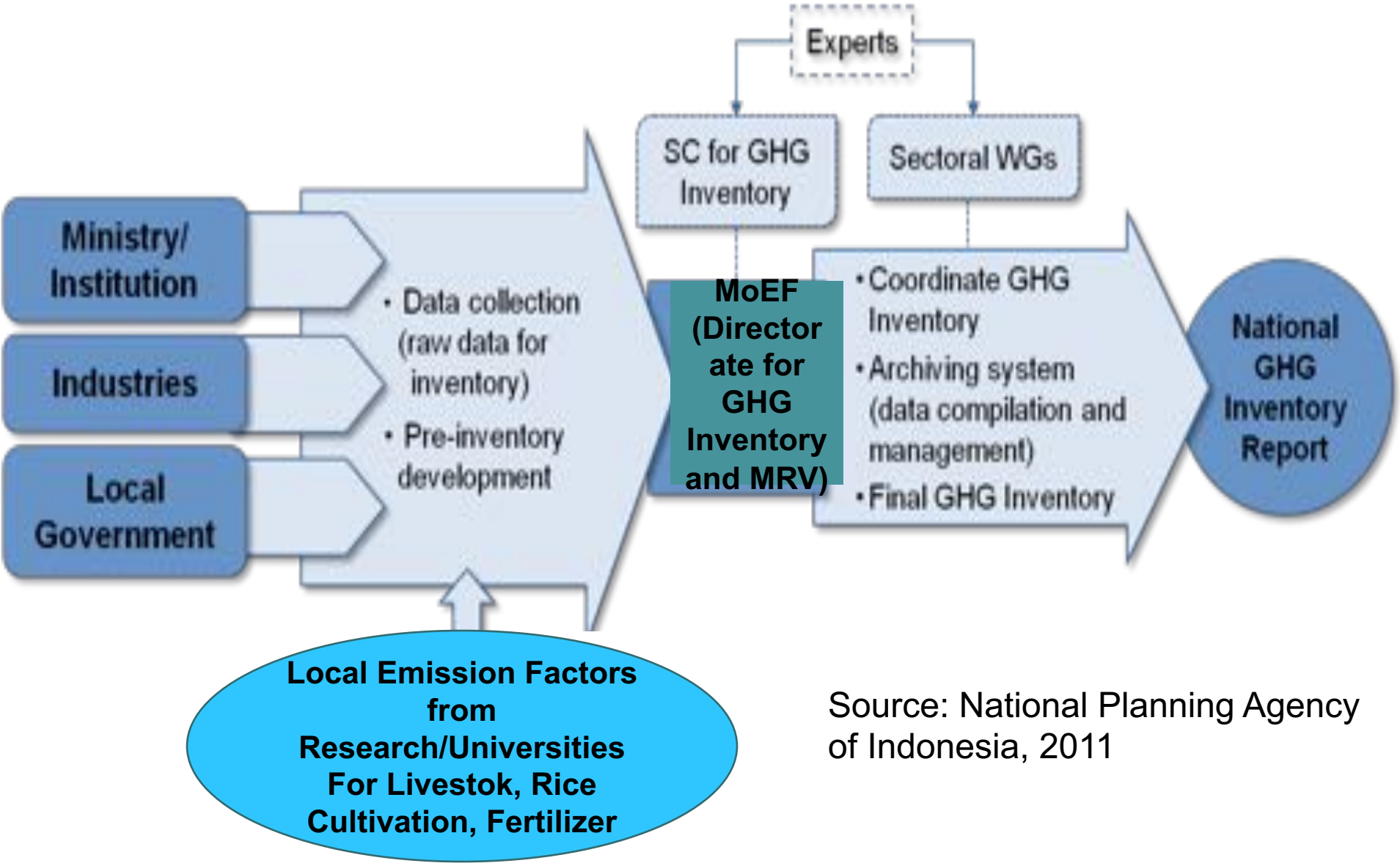


III. COORDINATION AMONG AGENCIES

Coordination to collect data



Institutional Arrangement for GHG Inventory in Indonesia



Source: National Planning Agency of Indonesia, 2011

THANK YOU

FOR YOUR ATTENTION

Speaker 5:
Alexandre Berndt, Brazilian Agriculture Research Corporation (EMBRAPA)

Improving MRV for agricultural emission reductions in the livestock sector: A perspective from Brazil

Alexandre Berndt
November 07, 2016

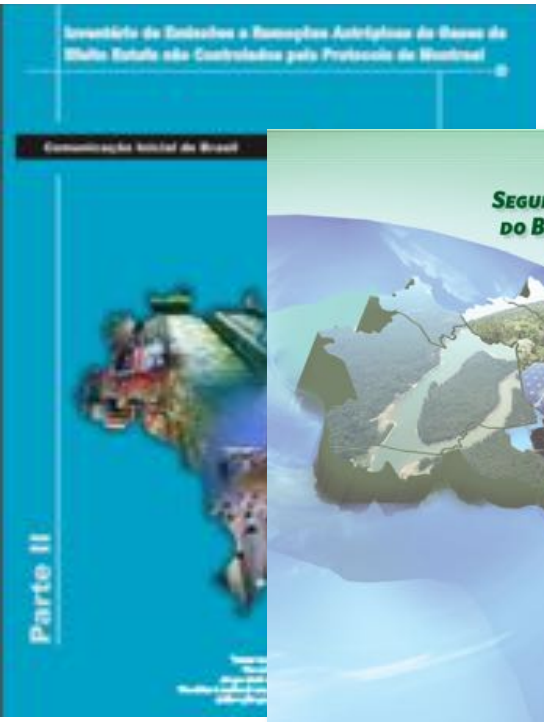
PECUÁRIA SUSTENTÁVEL

PECUS

Activity data: Brazilian statistics IBGE – National Census.

Emission factors:
IPCC Tier 2 + Local EF.

MCTI- National Inventories:



(MCT, 2006)

(MCT, 2010)

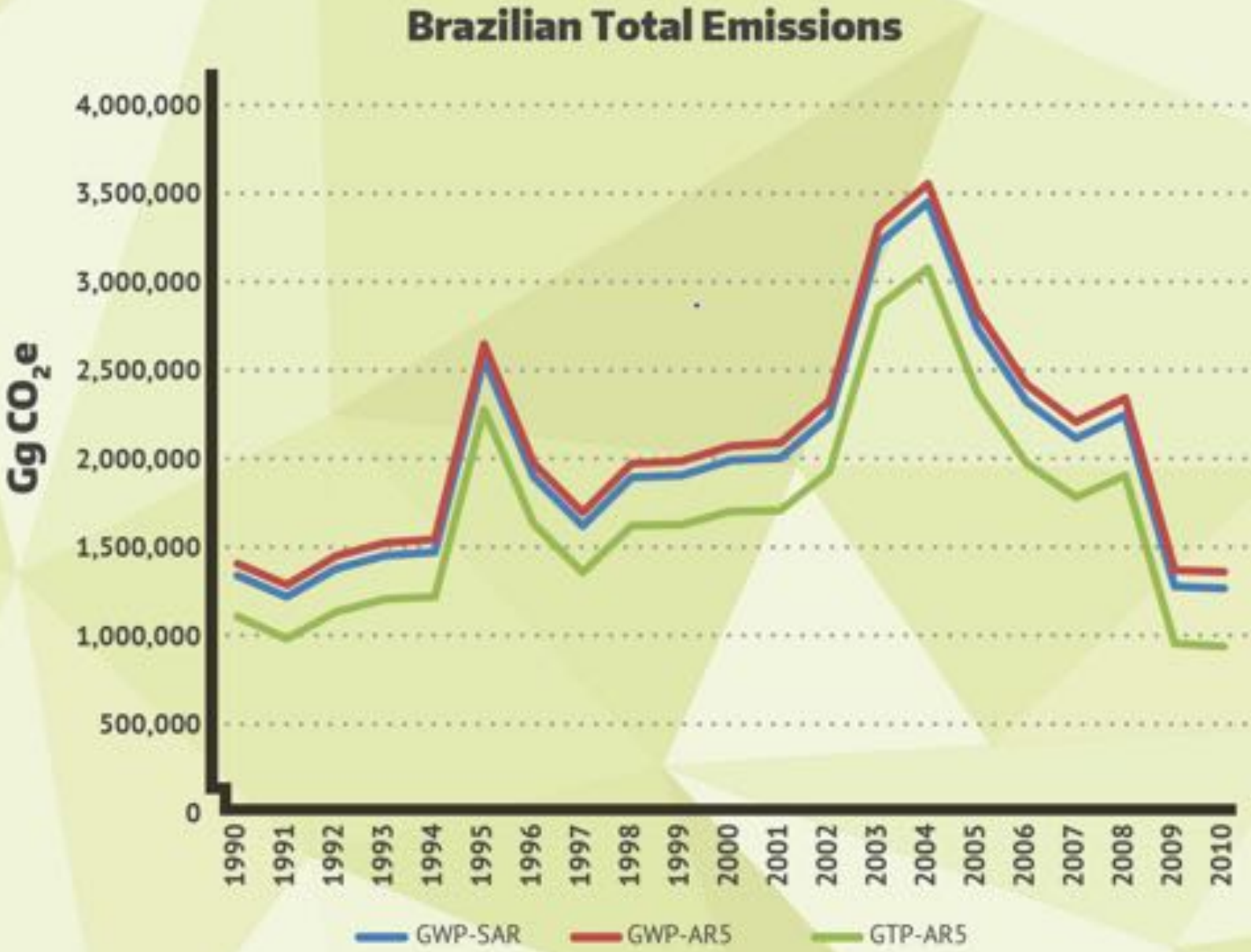
(MCTI, 2013)

(MCTI, 2014)

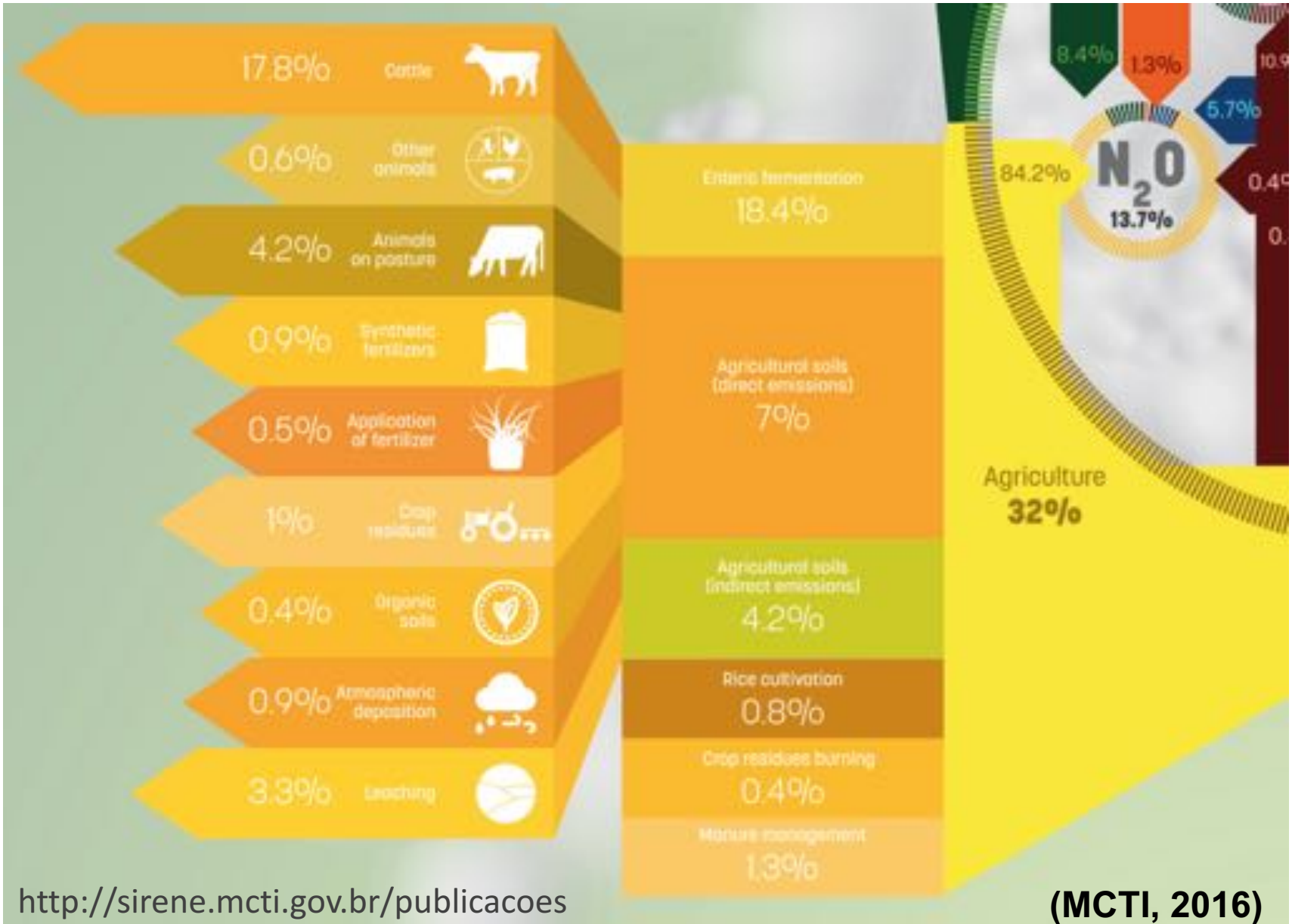
(MCTI, 2016)

FIGURE I

Evolution of CO_2e emissions by different metrics, 1990 to 2010



Agriculture emissions



http://sirene.mcti.gov.br/publicacoes

(MCTI, 2016)

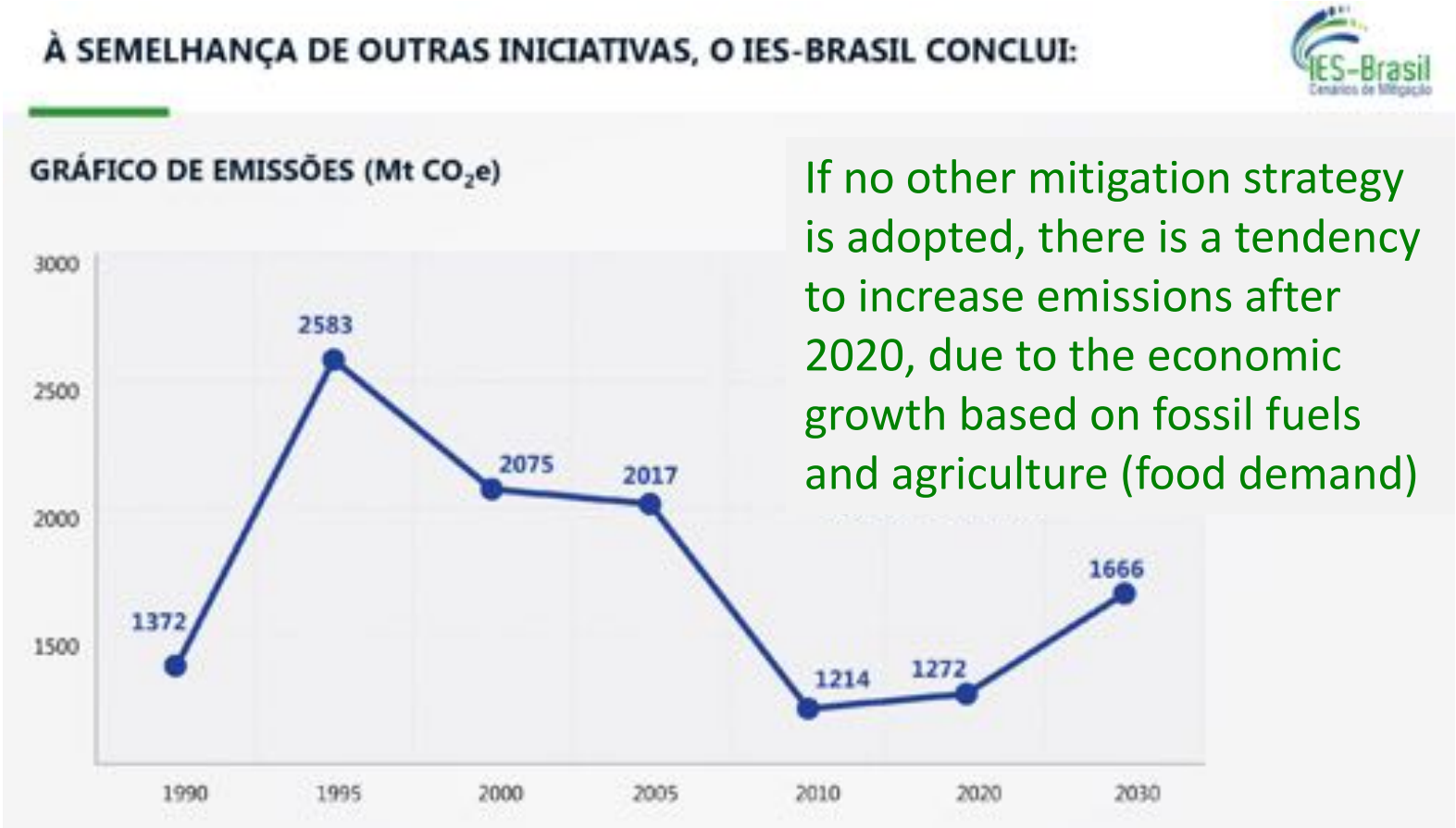
Coordinated efforts

- National Policy on Climate Change;
  - Brazilian Forum on Climate Change (FBMC);
  - Brazilian Research Network on Global Climate Change (*Rede CLIMA*);
- Ministry of Science, Technology and Innovation (MCTI)
- Sectoral Plan for the Mitigation and Adaptation to Climate Change for a Low Carbon Emission Agriculture (ABC Plan);
  - Special line of credit; Financial support for mitigation actions;

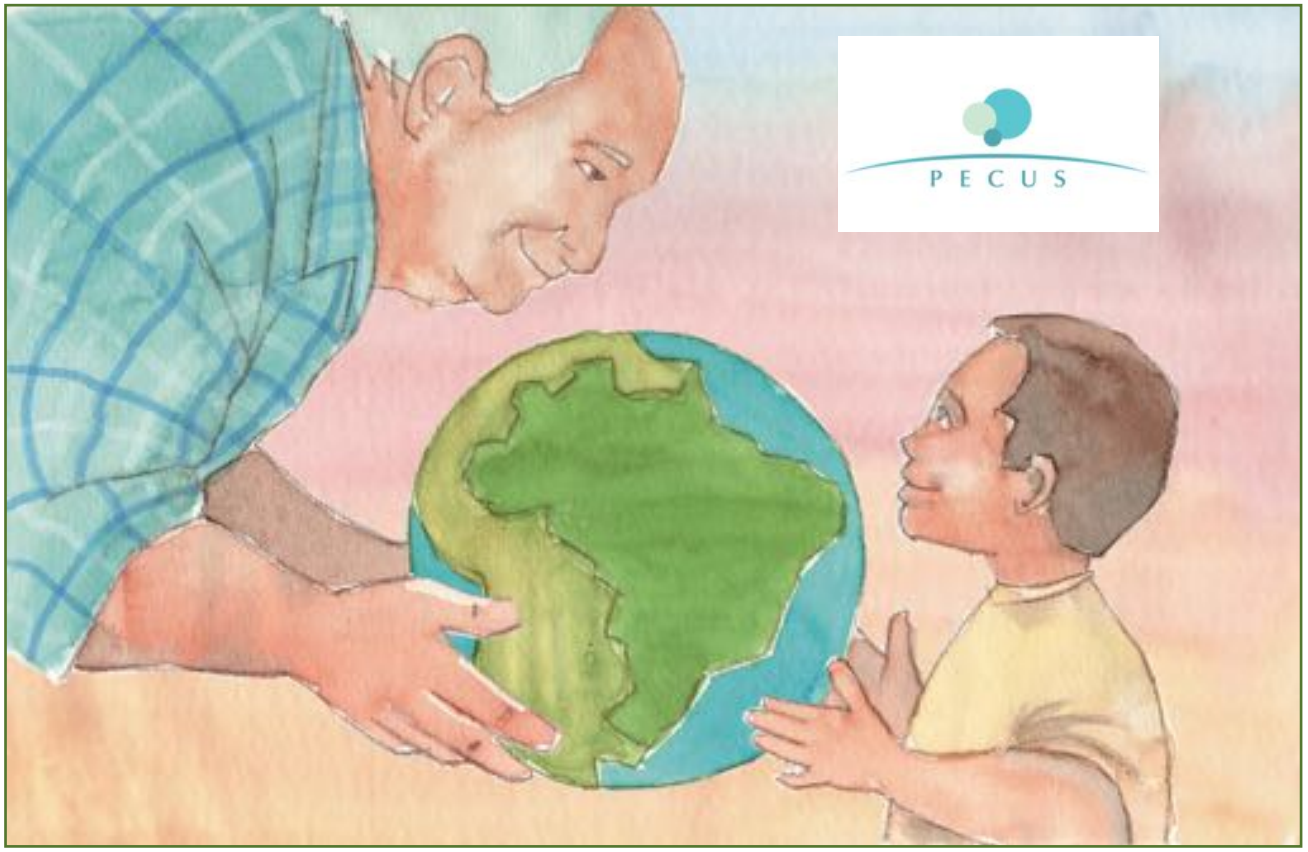
- ABC PLATFORM;
  - Converge data on GHG emissions from Agriculture;
  - Estimate the overall impact of the ABC PLAN
- Global Environment Facility (GEF);
- United Nations Development Programme (UNDP)

Motivation to measure GHG:

- INDC* presented at COP21 in Paris - Brazilian target for GHG reduction



*Intended Nationally Determined Contribution



Thank you!

alexandre.berndt@embrapa.br

Brazilian Agricultural Research Corporation
Ministry of Agriculture, Livestock and Food Supply

Part 1: Clarifying questions

Part 2:
Chat show with audience and country panelists: moderated questions and discussion

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More information:

https://ccafs.cgiar.org/themes/low-emissions-agriculture

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