Indonesia's Approach in Improving its Livestock Emissions Inventory

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Improving MRV for Agricultural Emission Reductions in the Livestock Sector
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OUTLINE OF PRESENTATION

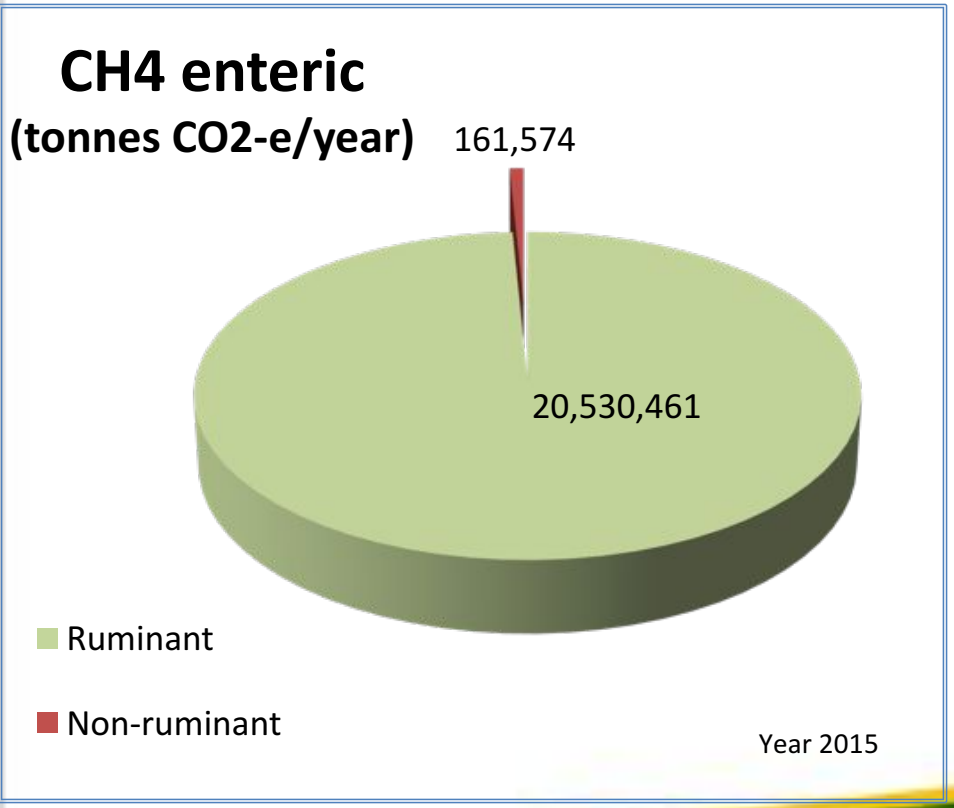
I. Activity Data

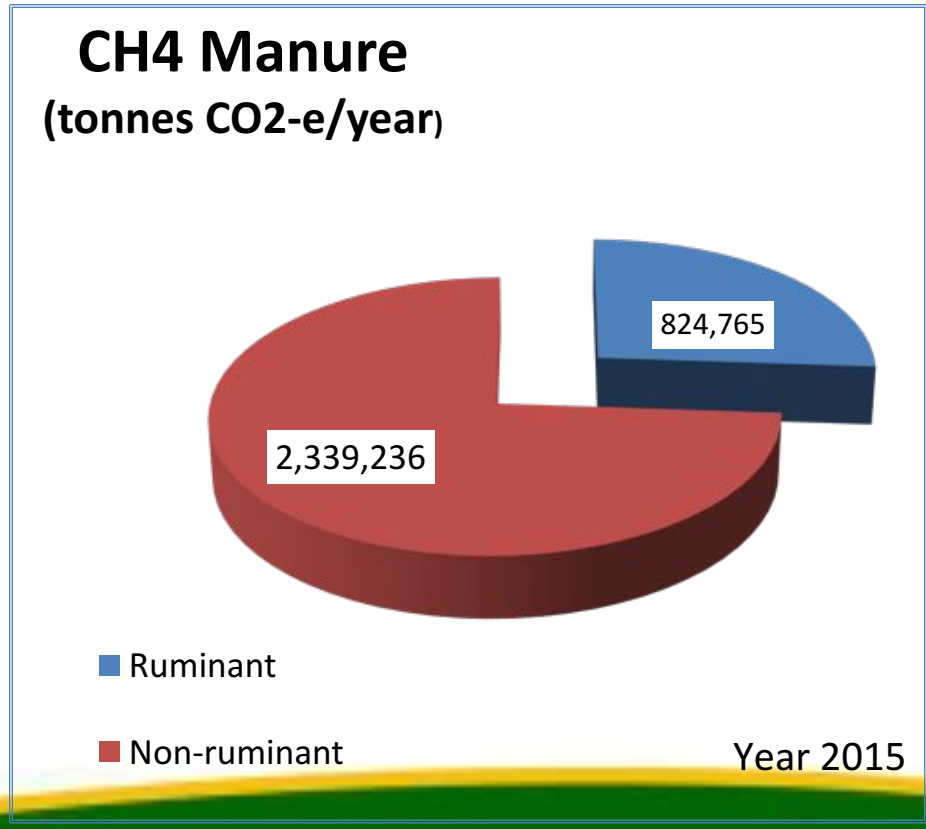
II. Progress to date for Livestock Emission factor using Tier 2

III. Coordination of agencies

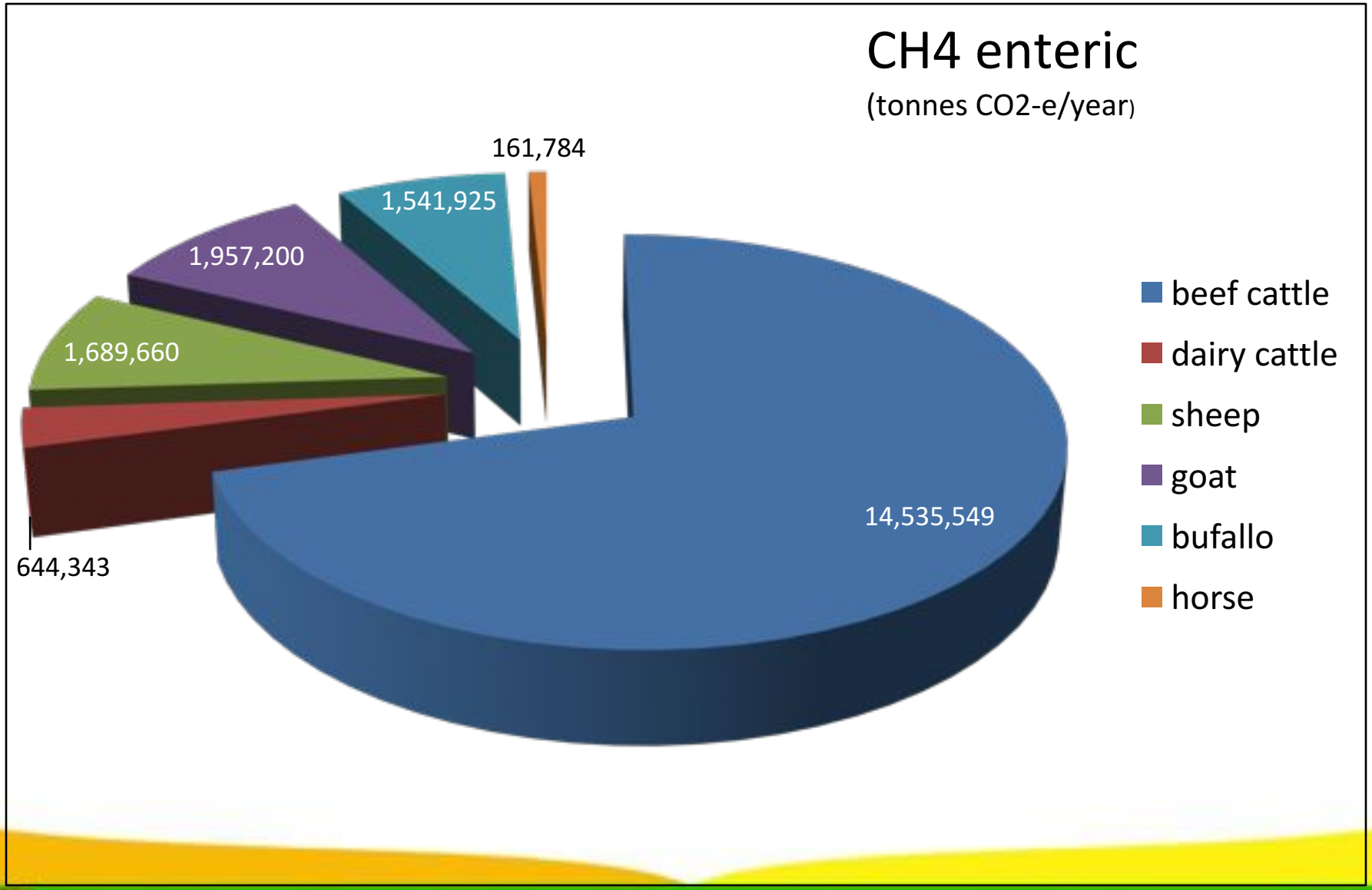
I. ACTIVITY DATA

- GHG emission from livestock using Tier 1.
- Data animal population from Statistics Indonesia
- Emission factor using IPCC default factor (IPCC 2006)

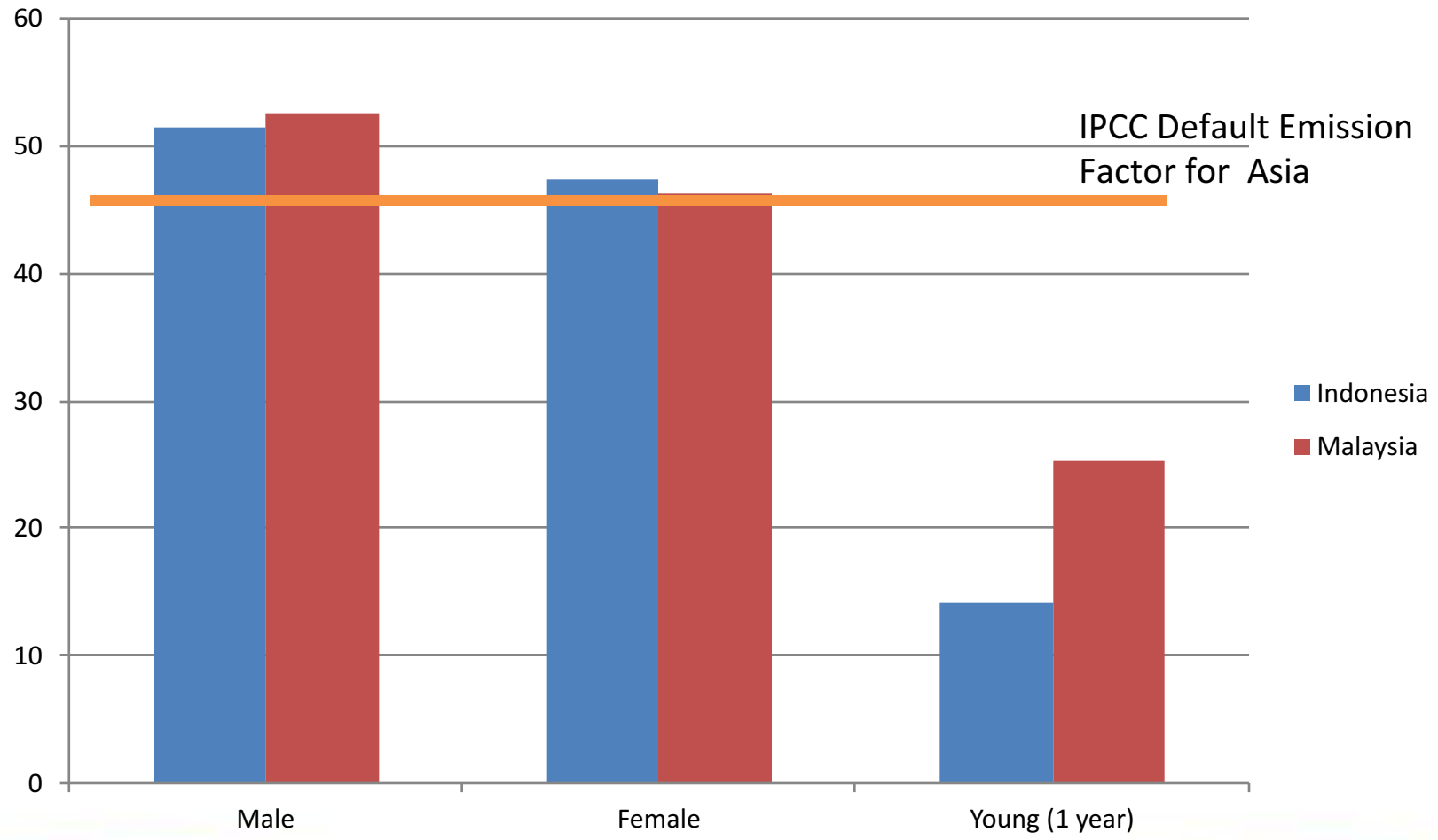




Contribution of methane among ruminant using Tier 1



Actual calculated emission factors for beef cattle for Indonesia and Malaysia relative to the default IPCC emission factors (Adjusted Tier 1)



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

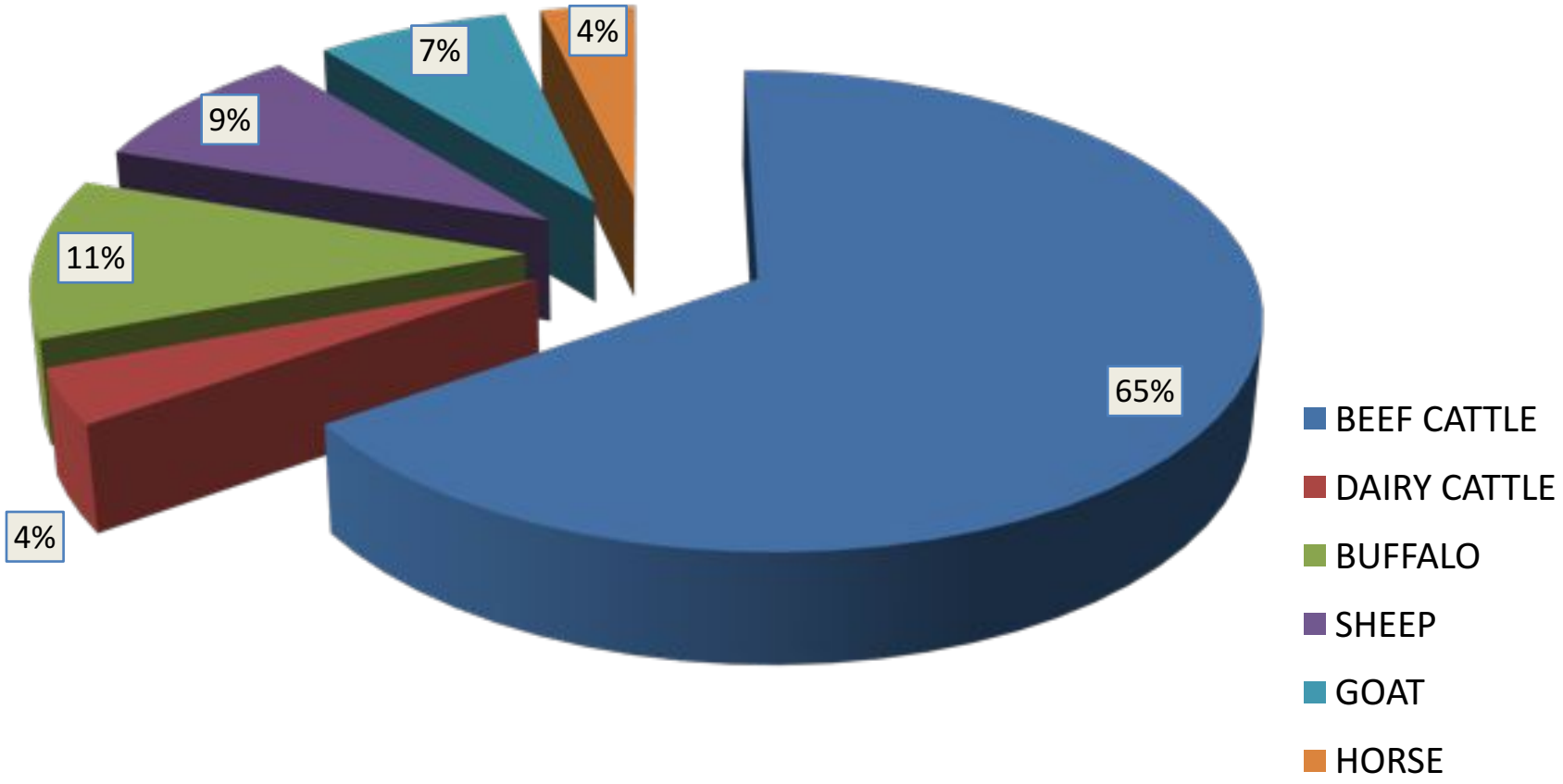
Data used to get Emission factors Using Tier 2

Livestock Population	• Type of Livestock • Sub category	Statistics Indonesia, Directorat General of Livestock and Animal Health
Feed Intake	• Type of diet • Feed consumption	Experimental Results
Gross Energi Intake	• GE content of diet • proximate/Feedpedia	Experimental Results
Methane Conversion Ratio	• IPCC 2006 guidance	

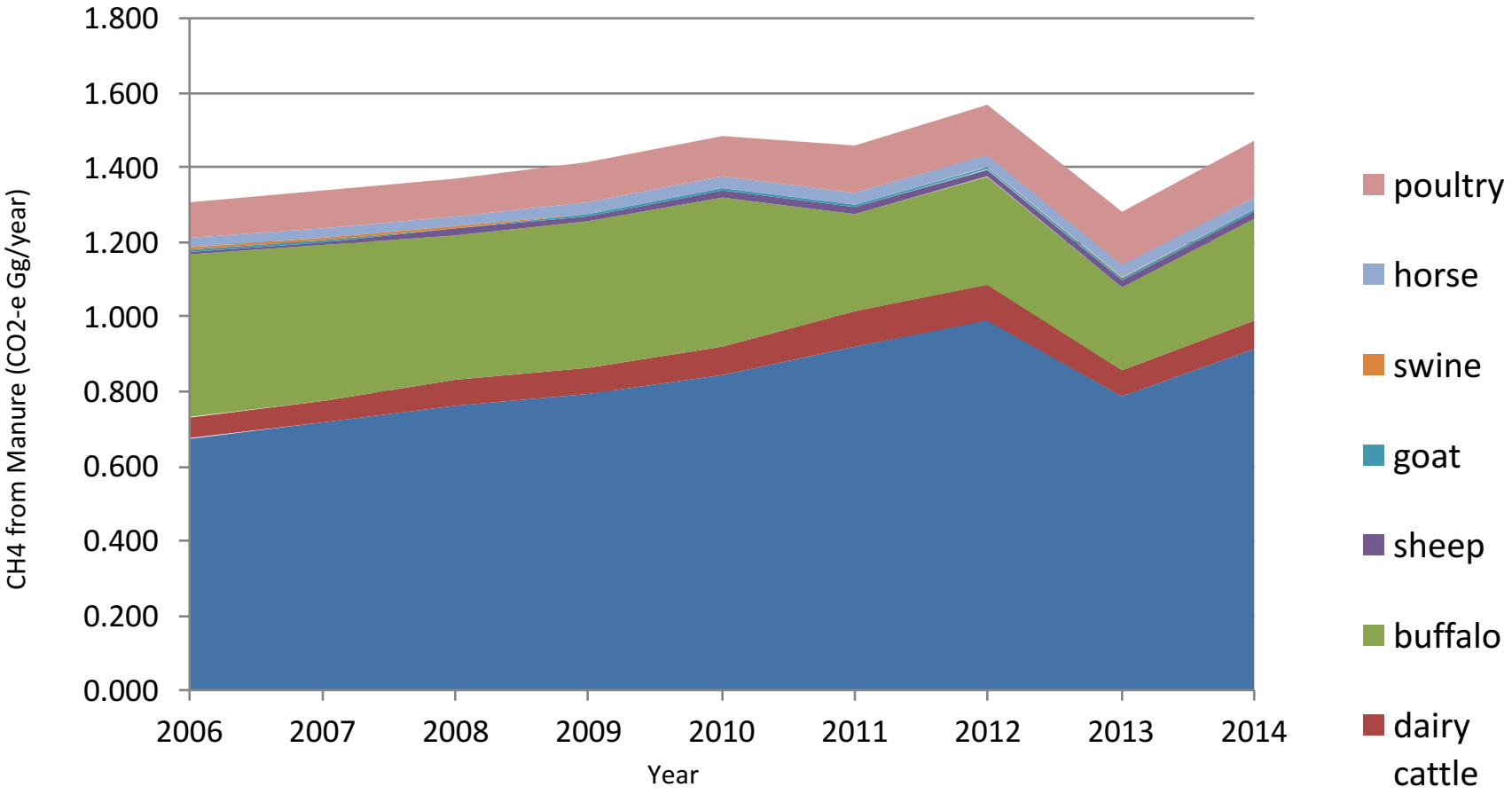
= **Emission Factor**

Local Data combined with IPCC 2006

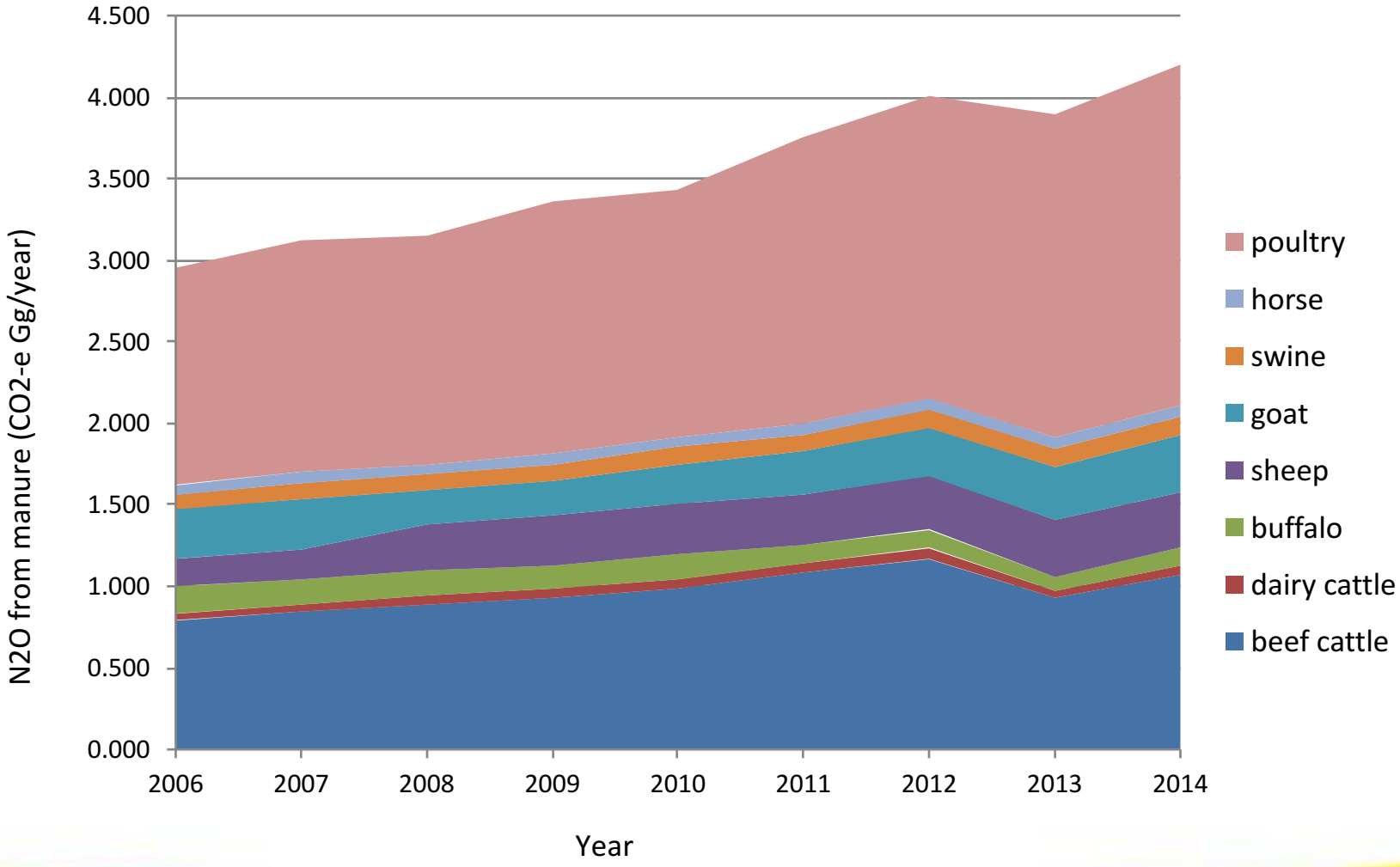
Contribution of methane from enteric fermentation from each species of livestock in year 2014 using Tier 2



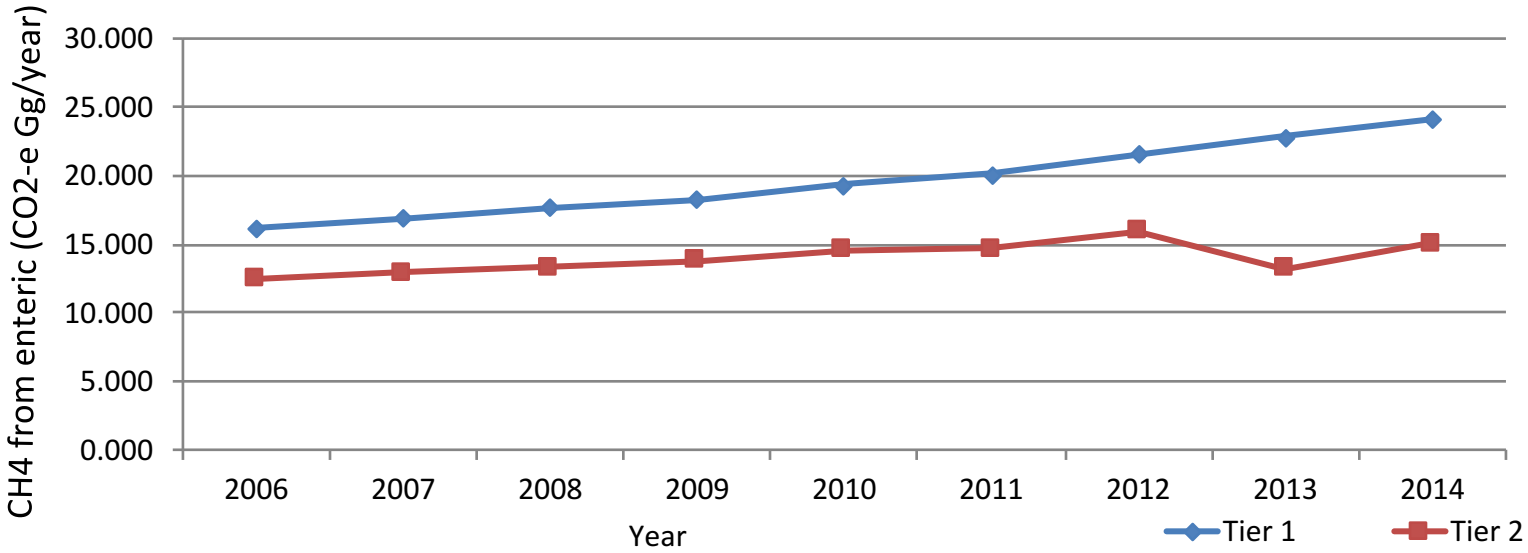
Methane from Manure management in year 2014 using Tier 2

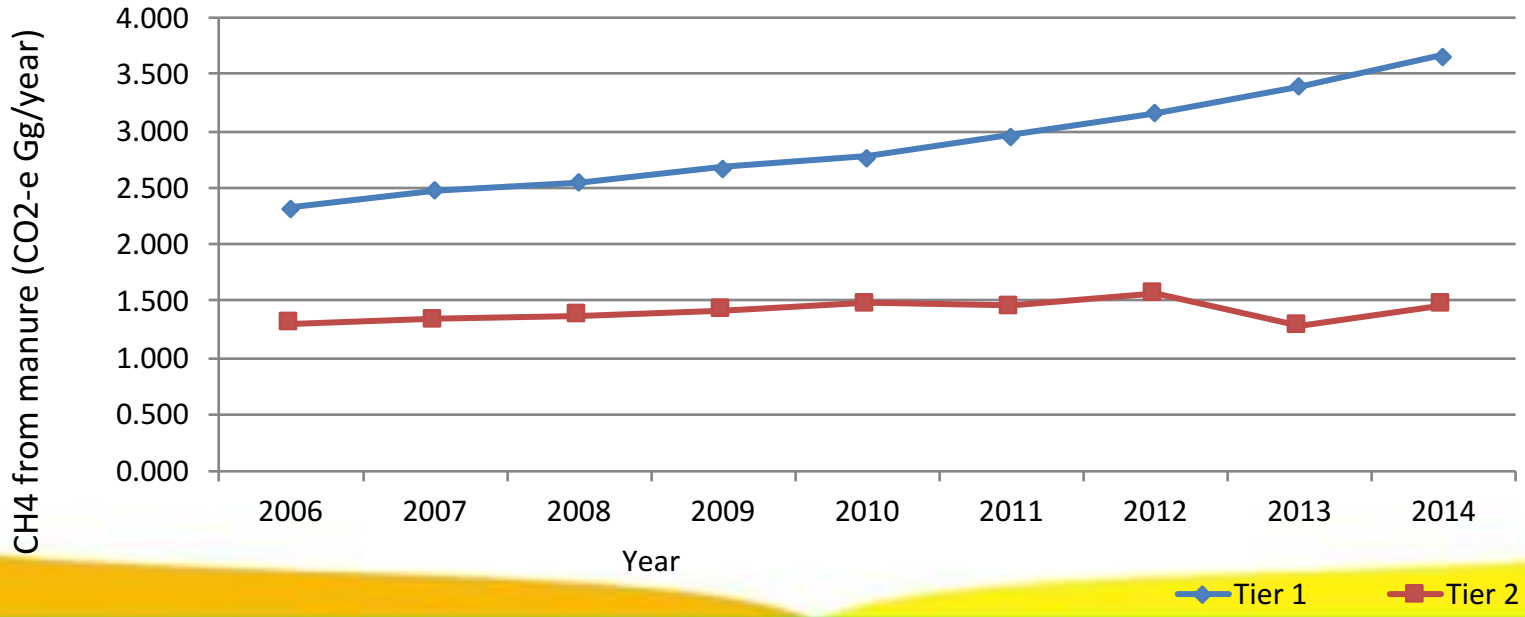


N2O from Manure management in year 2014 using Tier 2



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





Innovation Technologies for Adaptation

Selected breed that adapt to climate change

- Sheep (6 breeds: St Croix Sheep, Local Sumatera Sheep, Local Garut Sheep, Composit Sumatera Sheep, Composit Garut Sheep, dan Barbados Cross Sheep).
- Dairy Goat (4 breeds: Etawah Crossbred, Sapera Crossbred, Anpera (Anglo Nubian x PE) dan Anglo Nubian)
- Goat (3 breeds: Kacang, Boer, Boerka)

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

Effect of addition of probiotics *Acetoanaerobium noterae* ***and*** *Acetoanaerobium* ***woodii*****) on enteric methane emmited**

NO	Animal	PARAMETER	Methane enteric emmited
1	*A. Wodii*	CH4 from enteric	9.4 % ⇩
2	*A. Wodii* + saponin	CH4 from enteric	12.4 % ⇩
3	*A. Noterae*	CH4 from enteric	11.6 % ⇩
4	*A. Noterae* + saponin	CH4 from enteric	19.1 % ⇩

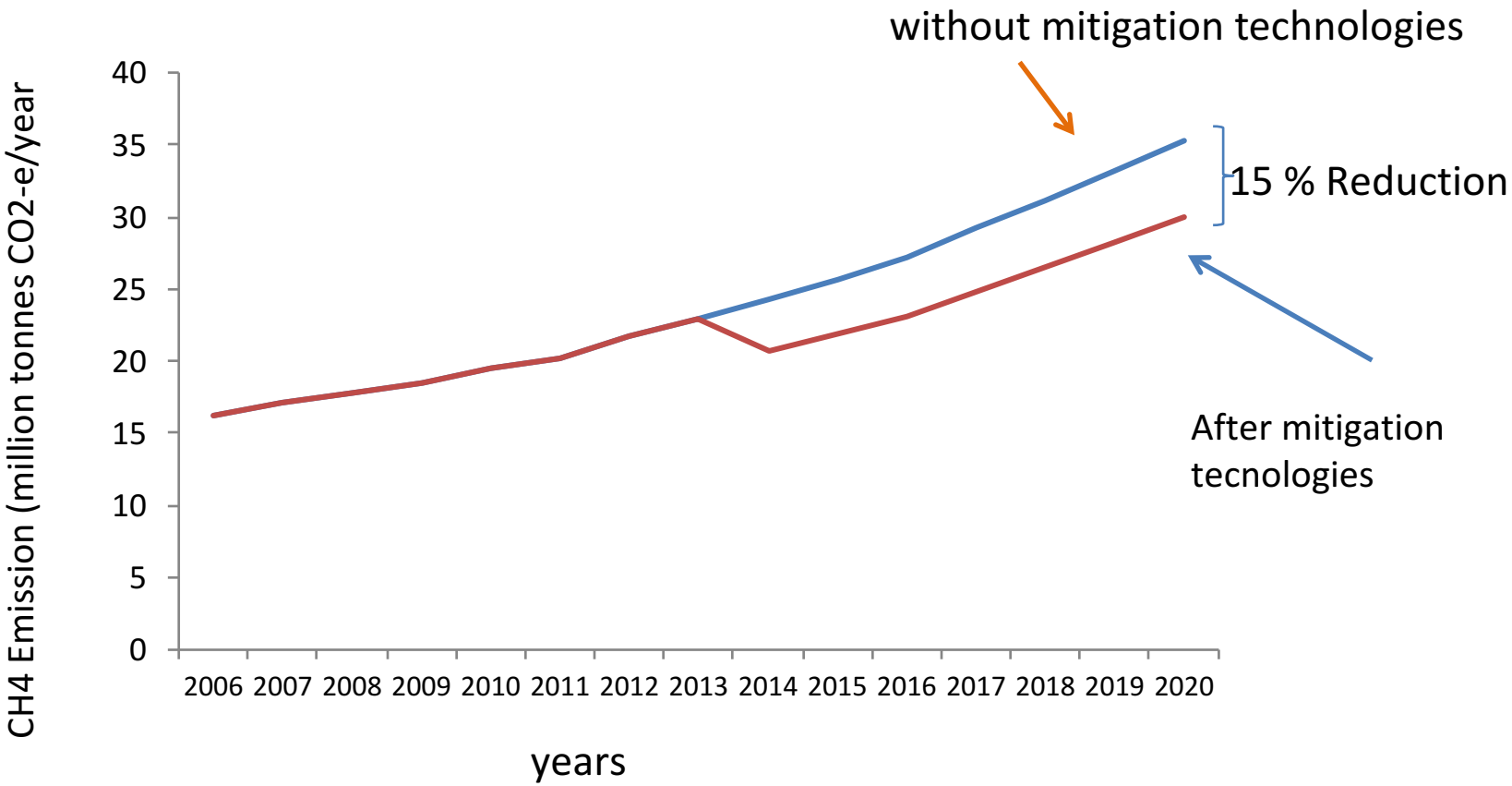
Amlius, 2008

Addition of Complete Rumen Modifier (CRM) on sheep

NO	PARAMETER	RESULT
1	Average daily gain	30 – 47 % ⇧
2	Feed Conversion Ratio	18 % ⇧
3	Feed efficiency	38 % ⇧
4	CH4 production from enteric	21 – 40 % ⇩

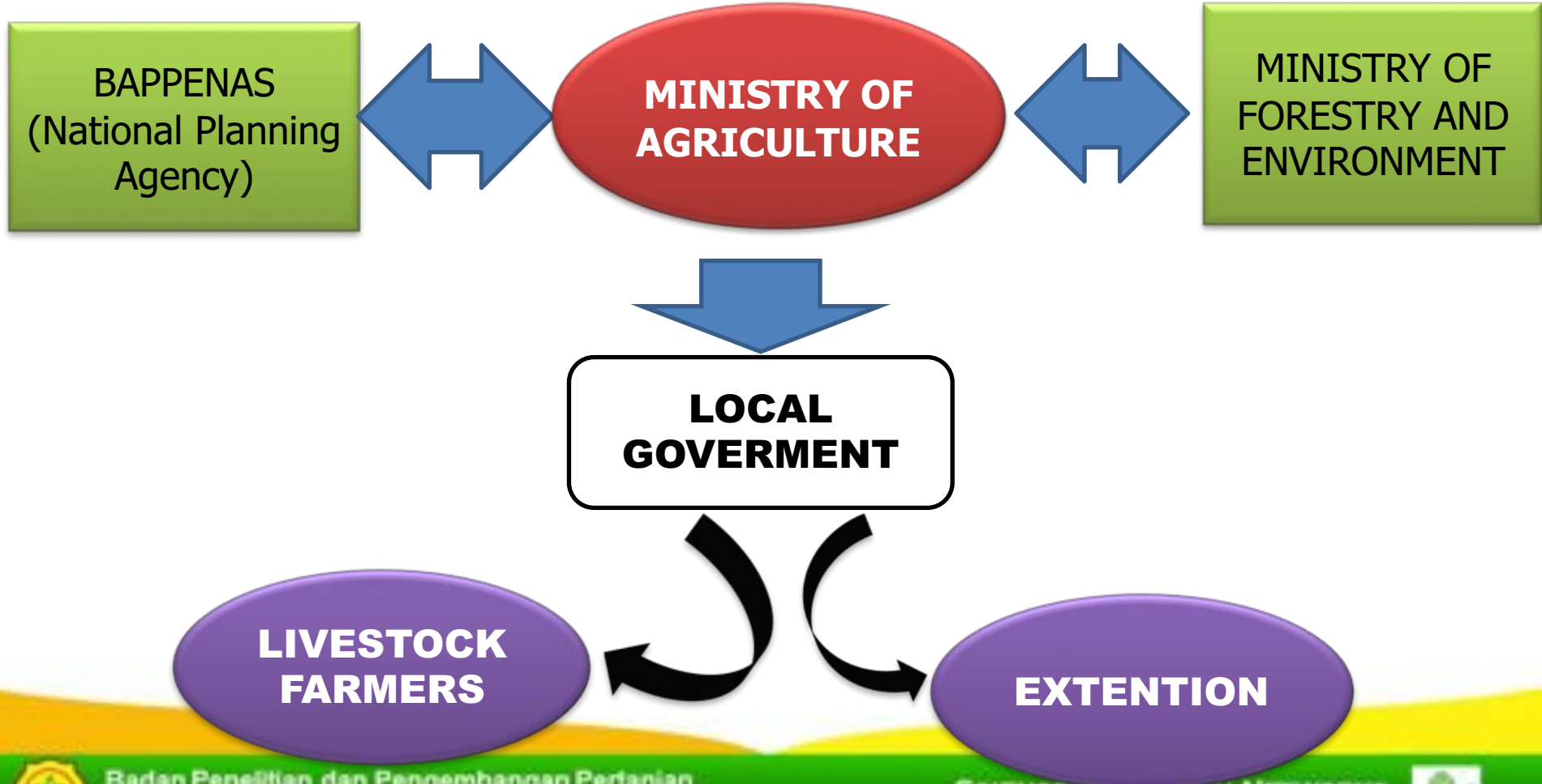
Thalib *et al*., 2011

Estimation of methane reduction after tecnologies mitigation were applied.

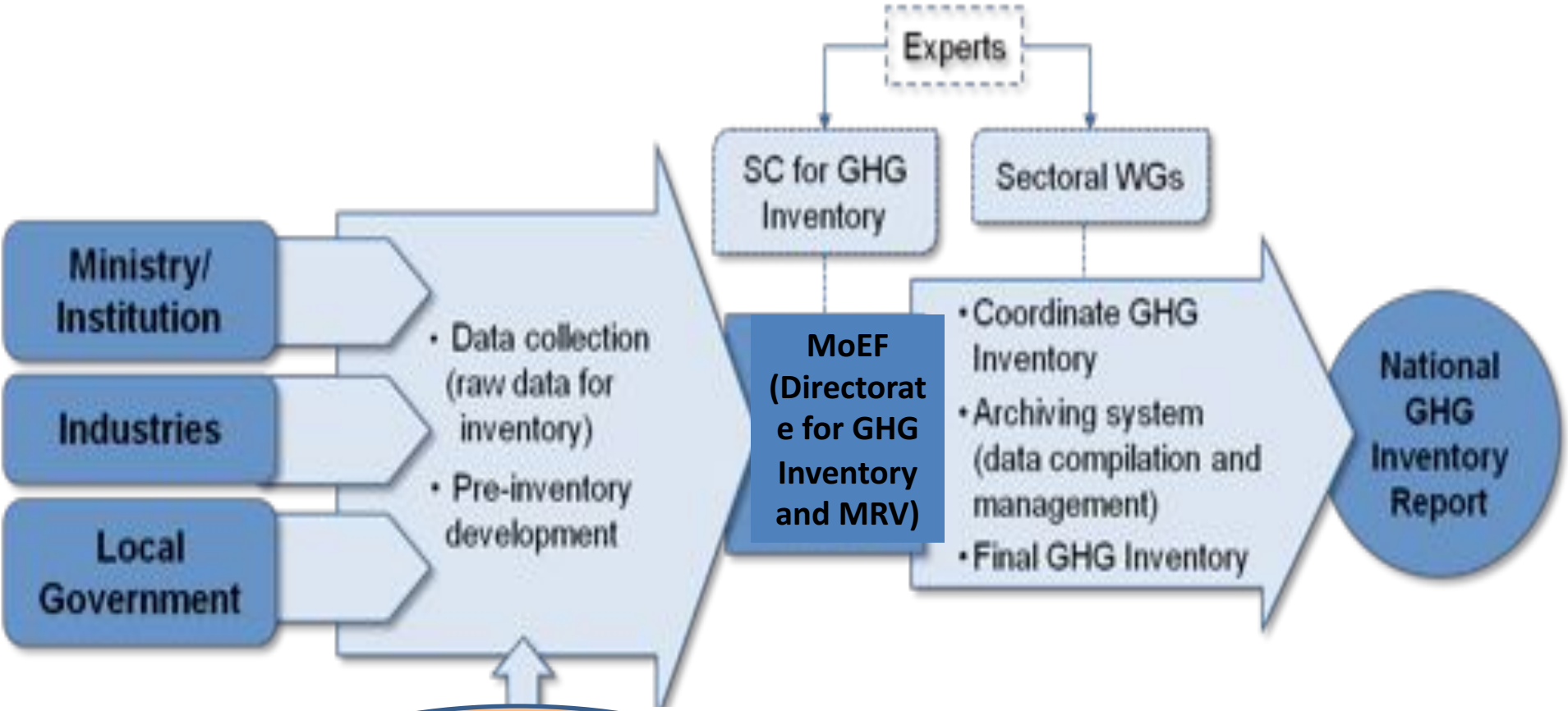


III. COORDINATION AMONG AGENCIES

Coordination to collect data



Institutional Arrangement for GHG Inventory in Indonesia



Source: National Planning Agency of Indonesia, 2011

INDONESIA'S POLICIES TO SUPPORT ACTION PLAN ON CLIMATE CHANGE

1. *President Decree 61 (2011) :*

...Indonesia commits to reduce (its GHG emission) by 26% from BAU level by 2030 and 41% with International assistance…

NAP-GHG: Dual approach for allocating mitigation efforts

Sectoral
Agriculture, forestry & land use, energy, waste

Regional
Develop local mitigation action plans (Regional Action Plan on GHG Emissions Reduction/RAP-GHG) at provincial and district level

2. *NAP-GHG, 2014*

Presidential Regulation No.61 Year 2011 : ***NAP-GHG (National Action Plan on GHG Emissions Reduction)***

THANK YOU

FOR YOUR ATTENTION