

# **Developing a Tier 2 inventory in Indonesia**

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(presented by Sinead Leahy on behalf  
of Dr. Widiawati)**

**17/05/18  
Vietnam**



In building a Tier2 inventory, Indonesia has undergone the process in several stages. This has taken a long time. Indonesia has attended several GRA supported activities which have been helpful.

## 1<sup>st</sup> Step

Indonesia realised that improvement of the inventory method from Tier 1 to Tier 2 was important, after attending the 2-day workshop *on measurement and mitigation of greenhouse gases in South-East Asian livestock systems* (Bangkok, 14-15 March 2012). This workshop was hosted by the Thailand Government and supported by the GRA.



## 2<sup>nd</sup> step

Workshop : *South-East Regional Capability Building Project*, hosted by GRA New Zealand  
(Hanoi, 6-7 September 2012)



A Proposal funded by the New Zealand Government:

**IMPROVED INVENTORY AND MITIGATION OF GREENHOUSE GASES IN LIVESTOCK  
PRODUCTION IN SOUTH EAST ASIA**

(ICARD–Indonesia; MARDI-Malaysia; IAS-Viet Nam; and Dep. of  
Livestock Development- Thailand)

## 3<sup>rd</sup> step

Attended the GRA supported technical training course in NZ:

### **“METHODS OF MEASUREMENT OF METHANE EMISSIONS FROM FORAGE-FED RUMINANTS”**

13 January – 1 February 2013

AgResearch Grasslands, Palmerston North, New Zealand



## 4<sup>th</sup> step

Built facilities and undertook direct measurement of CH<sub>4</sub> from enteric fermentation (2014-2016) both in the laboratory and field

- In 7 locations at 7 different provinces (Indonesia has 34 provinces)
- Using head box – portable respiratory chamber
- Three different breeds: Onggole cross breed cattle, Indonesia local cattle (Bali Cattle) and Imported cattle (Limousin)
- 3 different feed type (mixed diet based on: grass, food crop by-product, and plantation by-product)



# Direct Measurement for enteric fermentation (2014-2016) (Laboratory and Field)

At Local Research Institute in West Java



## Farmer group (Yogyakarta Province)





## Private sector (Jambi Province – Sumatera)



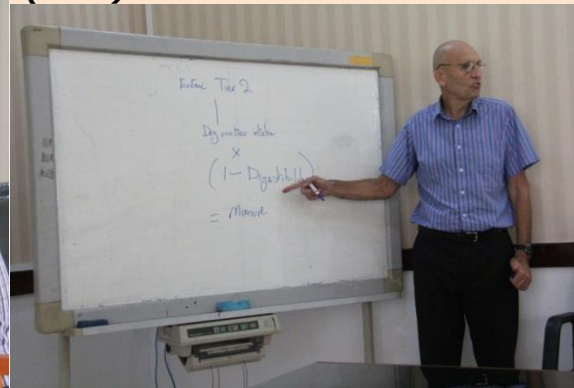


## PROBLEMS

- \* **Large variation** on the results (based on results from 7 provinces)
- \* **High cost** to measure (Indonesia consisted of 34 provinces)
- \* **Time** will be spent (7 provinces = 3 years / How long for 34 provinces?)
- \* **Human resources** and equipments (not available in each province)
- \* **Distance** between islands (there is large distance among the islands, also Indonesia has >13000 island grouped into 34 provinces)

## 5<sup>th</sup> step

**Requested expert GRA support - Workshop In Indonesia (April 2016)** to Invite Expert From New Zealand : *Dr Harry Clark and Dr Greg Lambert (NZ)*



# Results of The Workshop

- ❑ Changing the calculation methods from Tier-1 to Tier-2 could be done by inserting only one or two elements, such as livestock composition or the quality and amount of feed consumed
- ❑ Emission factor (EF) did not need to be obtained from direct GHG measurements in livestock with respiratory chamber (large cost and long time → see the diversity present in Indonesia)
- ❑ Sources of data could be obtained from data released by official institutions, research results and agreements among scientists.
- ❑ Simple structure for data inventory based on national data availability was proposed and developed



6<sup>th</sup> step

Coordination with related agencies in data collection

BAPPENAS  
(National Planning  
Agency)

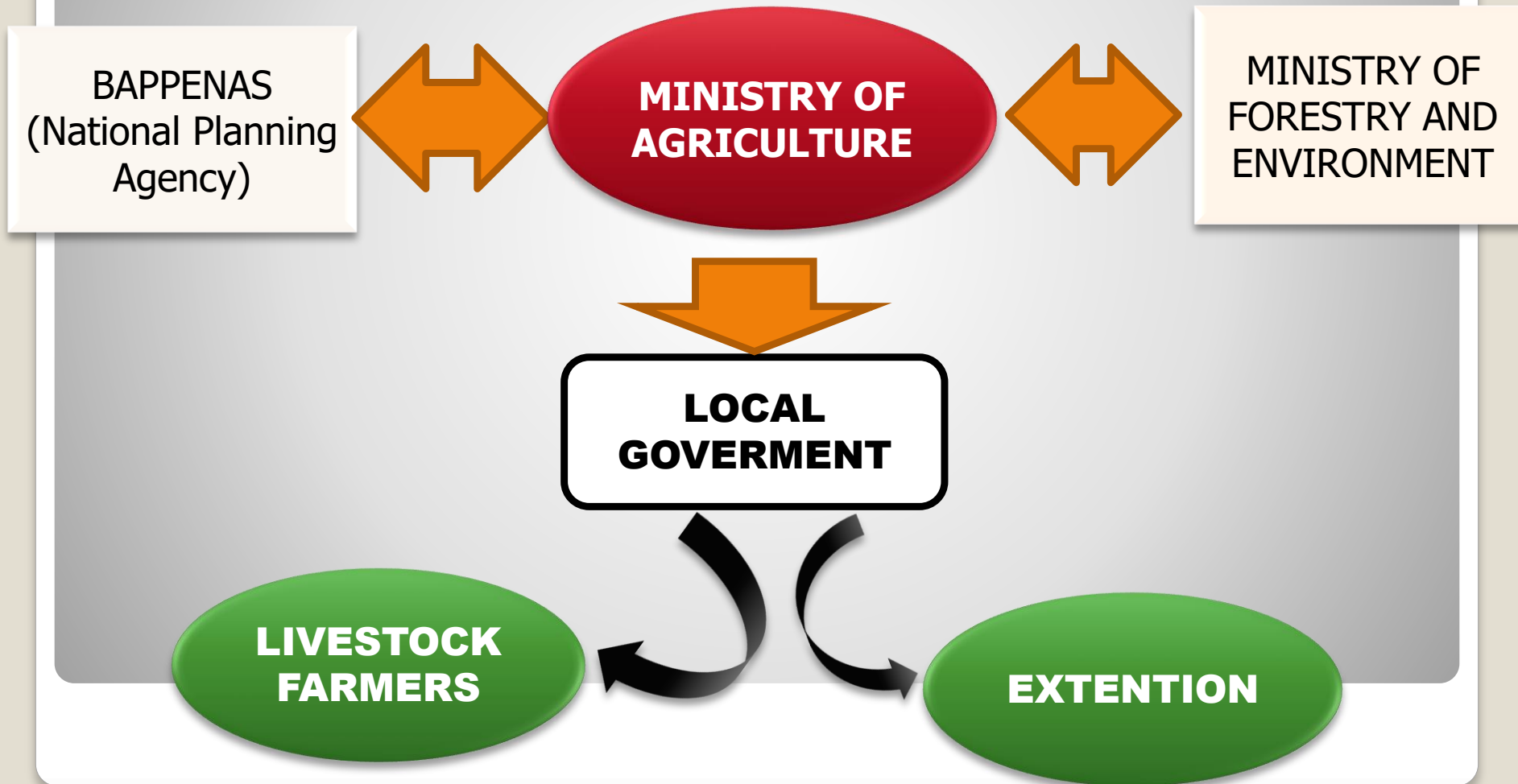
**MINISTRY OF  
AGRICULTURE**

MINISTRY OF  
FORESTRY AND  
ENVIRONMENT

**LOCAL  
GOVERNMENT**

**LIVESTOCK  
FARMERS**

**EXTENTION**



## Developed a national team consisted of some Research Institutions and Universities

**Ministry of  
Agriculture**



**IAARD Cq.  
ICARD**



1. Indonesian Research for Animal Production
2. Environmental Research Institute
3. Assesment Institute for Agricultural Technology
4. Cattle Research Station
5. Goat Research Station

**Minister Of  
Research And  
Higher Education**



1. BPPT
2. Universities
3. National Atomic Agency

## 7<sup>th</sup> step

Report on national Tier-2 Inventory produced end of year 2016, reviewed by:

- ✓ **Internal reviewers** (National – Expert from Universities)
- ✓ **External reviewers** (International – Asking expert from New Zealand)



### **Input from external reviewer :**

- To have a local Ym based on some different feed types by measuring at the laboratory scale (controlled experiment).
- Improve the QA/QC and archive systems and documentation



# 8<sup>th</sup> step – in progress

**Invited by the New Zealand government in support of the objectives of the GRA to develop a proposal, Palmerston North, November 2017**

## Institutional strengthening in Indonesia for mitigating livestock methane emissions

### Theme 1: Development of the inventory structure and sourcing of data

- Training in the use of the ALU software (involves Indonesian and regional representatives)
- Setting up the inventory structure in the ALU tool
- Obtaining and compiling data from existing/new sources (see Appendix 1)
- Assessing data gaps and developing plans and the resources needed for collection of additional data
- Entering 'best available' data into the ALU tool so that a 'prototype' inventory has been developed by the end of the first year of the project
- Use the 'prototype' inventory to demonstrate the benefits of a Tier 2 inventory by analysing the impact of changed practice on current and future CH<sub>4</sub> emissions from beef (demonstrate locally and at the regional scale)
- Comprehensive documentation and development of Standard Operating Procedures

### Theme 2: Development of regionally relevant enteric CH<sub>4</sub> emissions factors (Ym)

- Collate results from existing Indonesian experiments and relevant literature to establish preliminary Ym values and identify data gaps
- Examine operation and performance of existing Indonesian CH<sub>4</sub> measurement facilities and undertake within and between facility validation exercise; modify existing facilities if deemed necessary
- Increase capacity to obtain more CH<sub>4</sub> emissions data that has local and regional utility by purchasing and installing integrated Greenfeed automated CH<sub>4</sub> and feed intake measurement equipment
- Training in the use of the Greenfeed system and in the handling and analysis of data (local and regional science and technical staff)
- Cross-validation of the Greenfeed facility with existing measurement systems
- Undertake experiments to obtain updated Ym values for priority feeding regimes (9 additional experiments)

### Theme 3: Additional capability and ancillary activities

- General GHG inventory training for a minimum of two Indonesian staff members (will comprise distance learning and a residential course in New Zealand)
- Co-development of funding applications for further work
- Promotion and demonstrating benefit of the approach at regional and international for a
- Project evaluation and lessons learned, plans for replicating the approach

