GOVERNMENT ACTION TO REDUCE METHANE FROM THE LIVESTOCK SECTOR

7 October 2021
13:00-14:30 CEST (UTC+2)
AGENDA

- **Opening remarks:** Alice Alpert, US State Department (on behalf of CCAC Co-Chair)

- **Introduction:** Nathan Borgford-Parnell, CCAC Secretariat

- **Country Presentations:**
  - Indonesia: Dr. Agus Susanto, Director, Indonesian Centre for Animal Research and Development
  - Uruguay: Felipe Garcia, Deputy Coordinator Climate-Smart Livestock Production and Land Restoration in the Uruguayan Rangelands Project, FAO

- **NDC Enhancement through the Livestock Sector:** Martial Bernoux, FAO

- **Panel Discussion:** All speakers
Q&A

1. Click ⋯ → Q&A

2. Choose Ask:
   1. Select All Panelists
   2. Check your questions and responses under My Q&A

Type your question in the text window and press Enter to send
RAISE YOUR HAND

1. Open Participant list

2. Hover over your name. A Raise Hand icon will appear.

3. Click on the Raise Hand button to indicate that you want to speak.

3. Click on the Lower Hand button to withdraw the request.

NOTE:
This feature is only available on the desktop (not browser-based) apps.
OPENING REMARKS

Dr. Alice Alpert
Foreign affairs officer, U.S. Department of State
U.S. CCAC focal point since 2018
INTRODUCTION: GLOBAL METHANE ASSESSMENT

Reducing methane emissions by 45% means

0.3°C warming avoided by 2040

Preventing every year:

- 255,000 deaths from respiratory and cardiovascular diseases
- 26 million tonnes of staple crop losses
- 775,000 asthma-related hospital visits
- 73 billion lost work hours to heat exposure

NATHAN BORGFORD-PARNELL
CCAC Secretariat
INTRODUCTION: METHANE & LIVESTOCK

<table>
<thead>
<tr>
<th></th>
<th>Avoided warming (C) 2040-2070</th>
<th>Avoided deaths ozone (per year)</th>
<th>Avoided asthma-related ER visits (per year)</th>
<th>Avoided crop losses (Mt/yr)</th>
<th>Lost work hours avoided (billion hrs/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRICULTURE</td>
<td>0.04</td>
<td>40 000</td>
<td>120 000</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>WASTE</td>
<td>0.05</td>
<td>45 000</td>
<td>135 000</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>FOSSIL FUELS</td>
<td>0.09</td>
<td>80 000</td>
<td>250 000</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>ADDITIONAL</td>
<td>0.10</td>
<td>90 000</td>
<td>270 000</td>
<td>9</td>
<td>25</td>
</tr>
<tr>
<td>TOTAL</td>
<td>0.28</td>
<td>255 000</td>
<td>775 000</td>
<td>26</td>
<td>73</td>
</tr>
</tbody>
</table>

- Remaining global anthropogenic methane emissions
- Range of methane mitigation consistent with the IPCC 1.5°C pathways

Year
- 2020
- 2030

1.5°C consistent mitigation
INTRODUCTION: METHANE & LIVESTOCK

Available At: http://shindellgroup.rc.duke.edu/apps/methane/
Dr. Agus Susanto
Indonesian Centre for Animal Research and Development, Indonesian Agency for Agricultural Research and Development, Ministry of Agriculture, Republic of Indonesia

Director

cxaccoalition.org
LIVESTOCK EMISSION CALCULATION USING TIER 2 SINCE 2014

Data used to get Emission factors Using Tier 2

Livestock Population
- Type of Livestock Subcategory

Feed Intake
- Type of diet
- Feed consumption

Gross Energy Intake
- GE content of diet
- proximate/Feedpedia

Methane Conversion Ratio
- IPCC 2006 guidance

Statistics Indonesia, Directorat General of Livestock and Animal Health
Experimental Results
Experimental Results

Tier 2 Refinement is on progress

= Emission Factor
Local Data combined with IPCC 2006
The largest methane emission comes from beef cattle.

CONTRIBUTION OF METHANE FROM ENTERIC FERMENTATION FROM EACH SPECIES OF LIVESTOCK IN YEAR 2014 USING TIER 2 (BY USING LOCAL INDONESIA’S EFS)

- BEEF CATTLE: 65%
- DAIRY CATTLE: 9%
- BUFFALO: 11%
- Other: 7%
## DIETARY STRATEGIES TO MITIGATE ENTERIC METHANE EMISSION

### Nutrition and feed utilization
- Enhance nutritive value of feed,
- Improving rumen formulation process,
- Rumen manipulation

<table>
<thead>
<tr>
<th>EXAMPLES</th>
<th>IMPROVE FORAGE QUALITY AND MANAGEMENT</th>
<th>FEED PROCESSING</th>
<th>FEEDING CONCENTRATE</th>
<th>NUTRIENT BALANCING</th>
<th>FEED ADDITIVE: PLANT EXTRACT</th>
<th>DIETARY LIPID</th>
<th>PROBIOTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass, Legume (Caliandra, <em>Gliricidia sepium</em>, <em>L. leucocephala</em>, indigofera, acacia)</td>
<td>Enhances forage digestibility and containing plant extract</td>
<td>Enhance digestibility</td>
<td>( \uparrow ) propionate ( \downarrow ) acetate</td>
<td>Available of essential nutrient</td>
<td>( \downarrow ) protozoa and archaea; H2 sink</td>
<td>Vegetable/animals oil: fish oil, copra oil, sunflower oil, zaitun oil, linseed</td>
<td><em>Lactobacillus bulgaricus</em>; <em>Enterococcus faecium</em>; <em>Propionibacterium freudenreichii</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MODE OF ACTION</th>
<th>PRODUCTIVITY IMPACT</th>
<th>CH₄ REDUCTION</th>
<th>COST</th>
<th>APLICABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhances forage digestibility and containing plant extract</td>
<td>( \uparrow )</td>
<td>( \uparrow )</td>
<td>( \uparrow \uparrow )</td>
<td>( $ )</td>
</tr>
<tr>
<td>Enhance digestibility</td>
<td>( \uparrow )</td>
<td>( \uparrow )</td>
<td>( \uparrow )</td>
<td>( $$$ )</td>
</tr>
<tr>
<td>( \uparrow ) propionate ( \downarrow ) acetate</td>
<td>( \uparrow )</td>
<td>( \uparrow \uparrow )</td>
<td>( $$$ )</td>
<td>Mainly confined system</td>
</tr>
<tr>
<td>Available of essential nutrient</td>
<td>( \uparrow )</td>
<td>( \uparrow )</td>
<td>( $ )</td>
<td>Confined animals</td>
</tr>
<tr>
<td>( \downarrow ) protozoa and archaea; H2 sink</td>
<td>( \uparrow )</td>
<td>( \uparrow \uparrow )</td>
<td>( $$$ )</td>
<td>Confined animals</td>
</tr>
<tr>
<td>Excess: ( \downarrow ) DMI (compromises productivity)</td>
<td>( \uparrow )</td>
<td>( \uparrow \uparrow )</td>
<td>( $$$ )</td>
<td>Confined animals</td>
</tr>
<tr>
<td>Excess: ( \downarrow ) DMI (compromises productivity)</td>
<td>( \uparrow )</td>
<td>( \uparrow \uparrow )</td>
<td>( $$$ )</td>
<td>Confined animals</td>
</tr>
</tbody>
</table>

*CH₄ REDUCTION*:
- \( \uparrow \uparrow \uparrow \uparrow \) Methane reduction

*PRODUCTIVITY IMPACT*:
- \( \uparrow \uparrow \uparrow \uparrow \) Productivity increase

*COST*:
- \( \$ \)
- \( \$\$ \)
- \( \$\$\$ \)
- \( \$\$\$ \)

*APPLICABILITY*:
- All system
- Mainly confined system
- Confined animals
Mitigating practice in smallholder farmer have done a lot even though they didn’t realize.

Utilization of legumes such as calliandra (*Calliandra calothyrsus*), gamal (*Gliricidia sepium*), lamtoro (*Leucaena leucocephala*), *Indigofera sp.*, as a source of protein in the ration (to create a balanced diet) and a source of feed additives rich in tannins, saponins or other chemical compounds that play important role in reducing methane emissions.

Similarly, the activity of supplementation of grass and other forage basal feed such as agricultural by product as a source of carbohydrates. The material commonly used is palm kernel meal, copra meal, rice bran, cassava leaves and others. These ingredients are easy to find in Indonesian.

Component of diet feed, especially type of carbohydrate, are important for methane production. They are able to influence the ruminal pH and alter the microbiota.
Activity of methane mitigation in Indonesia can be carried out by increasing feed efficiency through the use of local high-nutrient feed ingredients or directly through rumen manipulation using bioactive components contained in forage/leguminous.
### Composition and microbe population in the rumen influence CH4 emission due to feed digestibility. Based on the feed digestibility and rumen microbe, Ongole crossbred have the potential to be developed as low-emission cattle.
1. Replicate the national program of improved pasture, introduce legumes varieties adapted to different microclimates (saline land, dry land, acid land)

2. Utilization of agriculture by-products rich in protein content to reduce the CH4 emission

3. Boosting extension and educate farmers how to utilize agriculture by-products

4. Support research to explore other local ingredient rich in protein and other secondary compounds
From our experiences, Indonesia welcomes further collaboration related to mitigate methane emission from the livestock sector.
Felipe Garcia
FAO Uruguay

Deputy Coordinator of the Livestock and Climate project: Climate-smart Livestock Production and Land Restoration in the Uruguayan Rangelands
most of the country is part of Pampas grasslands biome, 65% is grazing land. Livestock GHG emissions are 62% of total national emissions. Therefore, livestock is a key sector for mitigation. It is a great win-win opportunity with economic, social and other environmental cobenefits.
PROGRESS TOWARDS NATIONAL NDC GOALS - 2021

Energía | IPPU | AFOLU | Desechos
---|---|---|---

**CH₄/PBI**
Reducir 57% la intensidad de emisiones de CH₄ por unidad de PBI

Valor meta: 57%
Último valor disponible: 54%
Avance: 95%

**N₂O/PBI**
Reducir 48% la intensidad de emisiones de N₂O por unidad de PBI

Valor meta: 48%
Último valor disponible: 46%
Avance: 96%

**CO₂/PBI**
Reducir 24% la intensidad de emisiones de CO₂ por unidad de PBI

Valor meta: 24%
Último valor disponible: 27%
Avance: 113%

--------------------------------------------------------

CH₄/Producción de Carne
Reducir 32% la intensidad de emisiones de CH₄ por unidad de producto (kg de carne vacuna en peso vivo)

Valor meta: 32%
Último valor disponible: 28%
Avance: 88%

N₂O/Producción de Carne
Reducir 34% la intensidad de emisiones de N₂O por unidad de producto (kg de carne vacuna en peso vivo)

Valor meta: 34%
Último valor disponible: 28%
Avance: 82%

Pastizales
Evitar las emisiones de CO₂ del COS en el 10% de la superficie de pastizales (1,000,000 ha)

Valor meta: 1,000,000 ha
Último valor disponible: 652,455 ha
Avance: 65%

Source: Uruguay’s NDC MRV

ccacoalition.org
The project
OBJECTIVE

To mitigate climate change and to restore degraded lands through the promotion of climate smart practices in the livestock sector

WIN-WIN OPPORTUNITY

Technical assistance and promotion of good practices show to improve:

- productivity
- net income
- climate resilience
- work time and management capacities in farmers
- grass growth
- natural grasslands (main ecosystem)
- emissions intensity per unit of product (in a BAU scenario of increasing production)
- predicts soil carbon sequestration in models

ccacoalition.org
COMPONENT 1

Works on institutional strengthening and articulation to capture and develop this sustainable beef chain strategy and design a national sustainable beef strategy including aspects at for instance economic policy and international commerce. Develop a NAMA and a national MRV to measure mitigation results.

PROJECT TARGETS

35,000 ha of directed project intervention (and 400,000 ha of indirect project impact)

A range of 100,000 to 300,000 tons CO2eq tons of GHG directly mitigated, and ca. 1 to 3 million tons CO2 equivalent indirectly mitigated

COMPONENT 2

Works together along farmers to redesign practices and management and intensively monitors productive, economic, environmental (emissions and soil carbon content) and social indicators in pilot farms which implement the practice changes.
ON FARMS AND REGIONS
Co-innovation approach
Piloting, monitoring, learning and building capacity at the local level

CLIMATE SMART PRACTICES AND PERFORMANCE GOALS
Manage and improve grass growth and supply
Synchronize annual grass growth peak with animal feeding requirements
Manage body fat reserves, improve body condition, weaning, growth speed, reproduction, fattening rates and slaughter age.
Systemic and strategic planning of management

MONITOR AND RECORD
Grass height, growth and quality, diet quality (through manure), diet methane potential
GHG emissions
Soil carbon content in pools
Other environmental, productive, economic and social variables
PRELIMINARY RESULTS – FIRST YEAR OF FIELD WORK

- Severe drought in spring and summer
- Average stocking rate was reduced 18% (not a goal)
- Beef production increased 6% and sheep production 15%
- 60% of 60 farms increased at least 50% of net income against baseline
- In a preliminary small subset where we already have data:
  - Emissions intensity per unit of product was reduced 27 %
  - Gross emissions were reduced in 17%, we can project 10% at the end of transitions
- We are detecting only stocks and energy requirements by IPCC GL
- We are not detecting diet effects (digestibility, species mix, selection) nor soil carbon sequestration yet
THANK YOU!
Martial Bernoux,
FAO, CCAC Agriculture Initiative Lead Partner

Natural Resources Officer for Climate Change Mitigation at FAO

Krystal Crumpler, Aimable Uwizeye
THE AGRICULTURE SECTORS IN THE NDCS

Guidelines/Methodologies

Regional analysis: Gaps and opportunities for the agriculture sector


ccacoalition.org
THE AGRICULTURE SECTORS IN THE NEW/UPDATED NDCS

Mitigation ambition slightly increased in the livestock sector

Over half of all new/updated NDC include improved livestock and grassland management practices amongst their adaptation strategies

Opportunity for mitigation co-benefits

ccacoalition.org
MITIGATIONS ACTIONS IN LIVESTOCK AND GRASSLANDS
(categorized by IPCC GHG reporting categories)

% OF NEW/UPDATED NDCS

- Biomass burning on Grassland
- Cropland (perennial agroforestry)*

ALL: 1% Biomass burning on Grassland, 8% Cropland (perennial agroforestry)*
AFRICA: 0% Biomass burning on Grassland, 0% Cropland (perennial agroforestry)*
ASIA & PACIFIC: 0% Biomass burning on Grassland, 4% Cropland (perennial agroforestry)*
EUROPE & CENTRAL ASIA: 0% Biomass burning on Grassland, 0% Cropland (perennial agroforestry)*
LATIN AMERICA & CARIBBEAN: 0% Biomass burning on Grassland, 7% Cropland (perennial agroforestry)*
NEAR EAST & NORTH AFRICA: 0% Biomass burning on Grassland, 6% Cropland (perennial agroforestry)*

*includes sylvopastoralism
THE LIVESTOCK SECTOR IN THE CLIMATE FINANCE: A MAJOR GAP

HOW TO FULLY CONSIDER THE LIVESTOCK POTENTIAL IN NDCS
AN EXAMPLE OF POLICY SUPPORT BY FAO: RWANDA

- Review Rwanda updated NDCs and identify livestock-related commitments (holistic approach including mitigation, adaptation, co-benefits)
- Examine the link between livestock-related NDC commitments and national climate change policies, strategies, laws and regulations
- Assess policy and identify technical and policy gaps for NDC implementation and monitoring
- Conduct stakeholder consultations (Public, private sector, NGOs, CVOs) to validate methods and results of the policy analysis
- Update the GHG emission profile using Tier 2 – GLEAM model
- Activities are ongoing and will be completed by March 2022.

FAO is identifying how Rwanda can be supported in raising their ambitions on climate action in their NDCs and policies by integrating livestock-specific interventions.
PANEL DISCUSSION

Felipe Garcia

Moderator: Martial Bernoux

Dr. Agus Susanto

Nathan Borgford-Parnell