GOVERNMENT ACTION TO REDUCE METHANE FROM THE RICE SECTOR

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

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

- Introduction: Prof. Drew Shindell, CCAC Special Advisor for Action on Methane

- Country Presentations:
  - Viet Nam: Dr. Tran Dai Nghia, Director, Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD)
  - Bangladesh: Dr. S.M. Mofijul Islam, Senior Scientific Officer and Head, Bangladesh Rice Research Institute (BRRI)

- MRV of Rice Methane for GHG Inventories under UNFCCC requirements: Marci Baranski, UNEP Regional Office for Asia and the Pacific

- Panel Discussion
Q&A

1. Click → Q&A

2. Choose Ask:

1. Select All Panelists

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

2. Check your questions and responses under My Q&A
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

Alice Alpert

Dr. Alpert is a foreign affairs officer at the U.S. Department of State and has served as the U.S. CCAC focal point since 2018.
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
INTRODUCTION: METHANE & RICE PRODUCTION

- Current methane emissions from rice: 
  ~30 Mt/yr (24-40 Mt/yr range)

- Abatement potential by 2030 for rice:
  6-9 Mt/yr across multiple analyses

- Cutting methane by 45% by 2030 would avoid rice losses of about 6 Mt/yr.
VIET NAM

DR. TRAN DAI NGHIA
Director of the Department of Natural Resources and Environmental Economics Studies
Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD) of Viet Nam
VIET NAM: PRACTICE-CHANGE SOLUTIONS IN THE FIELD

Policy development and country experience

- Background information: Methane emissions in AFOLU and rice sector
- Methane mitigation in Vietnam’s NDC 2020: Measures and potentials
- Key policy/planning direction towards methane emission reduction in AFOLU and in rice sector
- Ways forward
INTRODUCTION: AGRICULTURE & CLIMATE CHANGE

Total agricultural imports of total merchandise imports 30.9 billions USD

- Vegetables 1.2 b USD
- Corn 2.3 b USD
- Wood & wood products 2.5 b USD
- Fodder 3.9 b USD
- Silk, fiber, fabric 16 b USD
- Fishery 8.3 b USD

96.2 M people 69% of farmers are smallholders
- 65.6% of pop. live in rural areas
- 36.5% are employed in agriculture
(Source: GSO, 2019)

14.85% of GDP 2020 comes

Total agricultural exports of total merchandise export 41.2 billion USD
(Source: GSO & MARD, 2021)

Key crop yield

- Rice (paddy) 5.8t/ha
- Maize 4.8t/ha
(Source: GSO, 2021)
TOTAL CH4 EMISSION OF VIETNAM IN 2016 = 106.84 MT CO2-EQ (MONRE 2020)

Methane emission of Vietnam in 2016:
- 17.95; 17% - Energy Industries
- 22.35; 21% - AFOLU
- 66.54; 62% - Waste
Total CH4 emission of Vietnam AFOLU sector, 2016 = 66.5 Mt CO2-eq (MONRE 2020)
### NDC TARGETS BY SECTOR OF VIETNAM

<table>
<thead>
<tr>
<th>Sector</th>
<th>Contribution with domestic resources</th>
<th>Contribution with international support</th>
<th>Total contribution with both domestic resources and international support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compared to BAU scenario (%)</td>
<td>Reduction amount (Mil. tonnes of CO$_{2eq}$)</td>
<td>Compared to BAU scenario (%)</td>
</tr>
<tr>
<td>Energy</td>
<td>5.5</td>
<td>51.5</td>
<td>11.2</td>
</tr>
<tr>
<td>Agriculture</td>
<td>0.7</td>
<td>6.8</td>
<td>2.8</td>
</tr>
<tr>
<td>LULUCF*</td>
<td>1.0</td>
<td>9.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Waste</td>
<td>1.0</td>
<td>9.1</td>
<td>2.6</td>
</tr>
<tr>
<td>IP</td>
<td>0.8</td>
<td>7.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Total</td>
<td>9.0</td>
<td>83.9</td>
<td>18.0</td>
</tr>
</tbody>
</table>

*Note (*): increase in GHGs sequestration*
AFOLU SECTOR OF VIETNAM NATIONAL PLANNING CONTEXT

SDO of ARD sector for (Value added & CC resilience) period 2021-2030 vision 2045
CCR-AP (CCM & CCA) 2021-2030 vision 2050

National-subnational, ecological regions (7) subsectors (07)

NDC update 2020 (7286/QD-BNN)

AP-CCR; PIPA (891/QD-BNN)

GHG Mitigation
Decree on GHG mitigation and Ozone protection

GHG Mitigation
CCA
Co-benefits; DRM (Covid-19 or other external risks)

Compliance to GoV Development master plans/strategies
Specifies the policy priorities and measures & being integrated those into:
- Subsectors strategies
- Subsectors’ planning & budgeting frameworks
- Subnational planning
- Local SEDPs
- Investment, trade promotion
- Resource mobilization and PPP

National CC strategy
Food system transformation

AFOLU SECTOR OF VIETNAM NATIONAL PLANNING CONTEXT

ccacoalition.org

IPARD

CLIMATE & CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS
Responsive/responsible to climate change, (ii) Economy, (iii) Society, (iv) Environment, (v) Institutions and multiple stakeholders/private sectors, inclusive

- Feasibility for MRV
- National/subnational and value chain level

- Co-benefits

- Economic feasibility

- Technical feasibility

- Scalability

- Territorial scenarios

- PPP/participation

- Cost effectiveness (CBA/MACC): Scale, Required upfront, Breakeven point and payment period
- Conditional/unconditional

- HH/small holders
- Farms / cooperative scale (medium scale)
- Enterprise scale (large scale).
- Ecological/natural based solutions
METHANE REDUCTION MEASURE IN AFOLU SECTOR OF VIET NAM

AFOLU

LULUCF

SFM
- Agro-forestry
  - Forest Fire Savannah burning

Crop production

Rice cultivation
- AWD
- SRI
- 1M5R
- MSD
- Rice-Shrimp/ fish
- Straw management

Residues treatment
- Savannah burning

Livestock production
- Manure Management
  - Biogas digesters
  - Composting
  - Rumen digestion

Feed mix
WAY FORWARD

- Develop a new ARD sector strategy to achieve sustainable agriculture in line with Paris Agreement goals, towards CO2 neutralization and SDGs;
- Possibility of joining EU-US new Methane reduction Pledge
- MARD endorsed the CCAC´s 2030 Strategy at its High Level Working Group in December 2020 paving the way to implement its methane reduction commitment
WAY FORWARD

- Transforming agro-food system towards climate resilient and responsible, environmentally friendly agro-eco food systems
- Policies to incentivize private sectors in contributing to NDC implementation, and methane reduction in particular
DR. S.M. MOFIJUL ISLAM
Senior Scientific Officer and Head
Bangladesh Rice Research Institute (BRRI)
Mitigating Greenhouse Gas Emissions from Rice-based Cropping Systems through Efficient Fertilizer and Water Management
Alternate Wetting and Drying (AWD)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Check (NiPnCa)</td>
</tr>
<tr>
<td>T2</td>
<td>UB (NiPnCa)</td>
</tr>
<tr>
<td>T3</td>
<td>Pu by applicator (NiPnCa)</td>
</tr>
<tr>
<td>T4</td>
<td>PU (NiPnCa)</td>
</tr>
<tr>
<td>T5</td>
<td>Pu (NiPnCa)</td>
</tr>
<tr>
<td>T6</td>
<td>Pu x Grid with GC (NiPnCa)</td>
</tr>
<tr>
<td>T7</td>
<td>UB x Grid with GC (NiPnCa)</td>
</tr>
<tr>
<td>T8</td>
<td>PU x Grid with PL (NiPnCa)</td>
</tr>
</tbody>
</table>

For more information on the experimental setup and data collection, please refer to the attached PDFs or contact the research team at ccacoalition.org.
INTRODUCTION

Staple food

Rice and greenhouse gases (GHG)

Agriculture contribute ca. 14% of total anthropogenic GHG emissions globally (IPCC, 2014)

Rice cultivation alone contribute 10% of all agricultural GHG emissions globally
Bangladesh National Action Plan (NAP), 2014
- Large scale dissemination of AWD for reducing carbon emissions

Nationally determined contributions (NDC)
- Expected to reduce CH4 emissions by 17% in 2030 than BAU scenarios

Bangladesh delta plan 2100
- Committed to reducing GHG emissions through promoting improved technologies, improved rice parboiling system to reduce C emissions and ensure energy efficiency.
Environment-friendly technology

- Encourage and motivate each and everyone to use environment-friendly technology for sustainable production (8.2.1.1)

Conservation of environment and NRM

- Ensure environmental protection and soil health through introduction of fertilizer application deeper (UDP) into the soil (8.2.2.14)

Irrigation efficiency and water productivity

- Increase irrigation efficiency (AWD) for the development water utility and productivity (5.4.1.2).

Conservation agriculture (CA)

- Strengthen the efficiency and effectiveness of CA (10.5.1)
MITIGATION STRATEGIES OF CH₄ EMISSIONS

- Water management
- Fertilizer management
- CA/Direct seeded rice
- Improvement of existing CP
- Rice varieties

Irrigation regimes on CH₄ emissions

AWD (alternate wetting and drying) reduced CH₄ emissions by 37% compared to CF (continuous flooding) during Boro (dry) season

Mitigation potential of AWD for 4.8M ha

<table>
<thead>
<tr>
<th>Area (%)</th>
<th>GWP (MT CO₂ eq/Boro)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>9</td>
</tr>
<tr>
<td>75%</td>
<td>7</td>
</tr>
<tr>
<td>50%</td>
<td>4</td>
</tr>
<tr>
<td>25%</td>
<td>2</td>
</tr>
</tbody>
</table>
UDP (urea deep placement) significantly reduced cumulative CH\textsubscript{4} emissions by 9% and 15% under AWD irrigation, and 9% and 11% under CF condition compared to PU (prilled urea) and IPNS (integrated plan nutrient system) treatments, respectively.
In Boro, BRRI dhan28 reduced by 32% compared to BRRI dhan29 under CF conditions.

In Aman, BRRI dhan75 reduced by 22% and 16% compared to BR11 and BRRI dhan49 under AWD, respectively.

Mitigation potential of SRV for 11.6M ha

<table>
<thead>
<tr>
<th>Area (%)</th>
<th>100%</th>
<th>75%</th>
<th>50%</th>
<th>25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.6 M ha</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

GWP (Million ton CO₂ eq)
# IMPROVEMENT OF EXISTING CP ON CH4 EMISSIONS

<table>
<thead>
<tr>
<th>Cropping pattern</th>
<th>Yield (t/ha)</th>
<th>REY (t/ha)</th>
<th>GHG emiss (CO₂ eq kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing Pattern (FP)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRRI dhan49/BR11-Fallow-BRRI dhan28</td>
<td>4.26, Fallow, 5.49</td>
<td>9.75</td>
<td>7469</td>
</tr>
<tr>
<td><strong>Improved Pattern (CSA)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRRI dhan75-Mustard-BRRI dhan81</td>
<td>5.11, 1.02, 6.24</td>
<td>13.37</td>
<td>6061</td>
</tr>
</tbody>
</table>

Price (Tk./kg): Paddy=20, Mustard (BARI Sarisha-14) =50

ccacoalition.org
FARMER INVOLVEMENT IN AWD PRACTICE

• Public sector, private and NGO introduced AWD as a pilot program in Northern and Southern part of Bangladesh, Mymensingh, Rangpur, Rajshahi, Chittagong region

• They organize farmers training, FGD, Field day, National workshop, stakeholder meeting etc.
FARMERS’ PERCEPTION ABOUT AWD

- Yield increase about 15 to 20%
- It saves 4-5 number of irrigation
- It has no side effects

Suggestions offered by the farmers

- Water pricing
- Knowledge gap/Training
- Media coverage
- Government interfere
FARMERS TRAINING, FIELD DAY, FIELD VISIT & WORKSHOP
FUTURE RESEARCH

- Modified N fertilizers like neem coated urea for increasing nutrient use efficiency and mitigation of GHG emissions from rice fields
- Quantify methane emission under varied soil conditions both in Boro and T. Aman crops
- Screening of high yielding rice varieties with low emitted methane emissions
- Use of household biomass ash and biochar to mitigate methane emission from rice field
ACHIEVEMENTS

Effects of water management on greenhouse gas emissions from farmers’ rice fields in Bangladesh

Page 7.98

ccacoalition.org
MRV FOR UNFCCC PROCESSES

Marci Baranski
UNEP Regional Office for Asia and the Pacific
MRV FOR UNFCCC PROCESSES

“Transparency helps to build trust and lets us gauge whether we are achieving our objectives.”

• **M**: measure the specific effects of national mitigation actions and provide this in a national inventory report.

• **R**: report through national communications and BURs

• **V**: verification through international review of BURs
CONCLUDING POINTS

• Strengthen institutional arrangements for MRV

• Collaborate with other countries and external experts to improve MRV

• An inventory is never perfect—improvements over time are expected
PANEL DISCUSSION

Dr. Tran Dai Nghia

Marci Baranski

James Lomax

Dr. S.M. Mofijul Islam

Moderator: Drew Shindell

ccacoalition.org