International climate finance: Measures to adapt to climate change and reduce greenhouse gas emissions in the agriculture sector of the Philippines

February 20-22, 2018
Bangkok, Thailand
Climate change and agriculture

GHG emissions from agriculture in the Philippines

Rice cultivation in the Philippines accounts for about 64% of emissions from the agriculture sector, or 21% of the total national emissions.
Climate change and agriculture

Why CDM was not efficient to address GHG emissions in agriculture, especially in rice cultivation?

Involves too many participants for implementation

Involves large-scale social change

CDM monitoring is very complex
What is alternate wetting and drying (AWD)?

AWD is a water management technology that uses a simple tool to determine the right time to irrigate and the right amount of water to apply;

The simple tool is a perforated 10 cm x 25 cm polyvinyl chloride (PVC) tube that is inserted 15 cm to the ground during the dry season and 20 cm during the wet season;

The AWD scheme is implemented at about 20 days after transplanting or sowing for direct seeded rice;

When AWD is applied, the number of irrigation events in a season ranges from 4-6 times only;
Program concept

Adaptation and mitigation measures to adapt to climate change and reduce greenhouse gas emissions in the agriculture sector of the Philippines

Provision of financial incentives to rice farmers to encourage them to switch from continuous flooding to Alternate Wetting and Drying (AWD) practices.

Initially focused on an area of 110,000 hectares in the Upper Pampanga River Integrated Irrigation System (UPRIIS),

- Followed by Central Luzon (190,000 ha) and the MRIIS (90,000 ha).
- As additional resources are mobilized, the program can be scaled even further up to include other regions in the Philippines.

Expected Results:

- GHG emission reduction potential estimated at 23 million tons per year
- Increased food security
- Improved water management
- Resilient rice production
- Increase in irrigated areas
- Increase in rice yield
- Reduction of conflicts among farmers
Implementation Partners

Submission to the Transformative Carbon Asset Facility (TCAF) of the World Bank

**United Nations Development Program (UNDP)**
- Sustainable Development Goal (SDG) impact assessment
- Documenting best practice case studies for possible policy level interventions and dissemination – workshop, study tours etc.
- International exchange of experience and facilitating replication in other potential areas/regionally in other countries in the Asian region
- Linking renewables to water management (solar pumping etc.), even if not part of the project yet, it might be an option if we can identify a business case.
- Imparting skills for producing the PVC equipment/enterprise development for potential scale up through irrigation services

**Philippine Rice Research Institute (PhilRice)**
- Overall program implementation and management
- Engagement of individual farmers to participate in the program
- Management of payments under the ERPA
- Raise any other finance needed for program implementation

**Climate Mundial**
- Advising PhilRice on the Emission Reduction Purchase Agreement (ERPA)
- Preparation and execution of the program financial model
- Arrangement of carbon finance including carbon receivable finance
- Arrangement of other finance for program implementation
- Joint program design and preparation of documentation
- Arrangement of on-going monitoring and verification of mitigation outcomes

**Deloitte Tohmatsu Financial Advisory LLC**
- Joint program design and preparation of documentation
- Seeking all necessary approvals and arrangement of stakeholder consultation
- Support of the monitoring and verification of mitigation outcomes
- Support to Climate Mundial in the preparation and execution of the program financial model

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Adaptation and mitigation measures to adapt to climate change and reduce greenhouse gas emissions in the agriculture sector of the Philippines

Limiting the average global surface temperature increase

• Financial incentives to rice farmers to encourage them to practice AWD;

Promote climate smart agriculture in the Philippines

• Information dissemination campaigns and introducing AWD as the “new” and “appropriate” way of irrigating the rice crop or managing irrigation water at the farmers’ field;

Align with national priorities on climate actions in agricultural sector

• Design and implement Training Programs and special training manual for NIA/BSWM field officers;

• Regular knowledge updates (brush-up) seminars;

• Hotline service to provide field officers and farmers constant support in implementing AWD;

• Develop database of issues encountered by farmers and field officers to expedite smooth transformation;
GHG Emission Reductions

Adaptation and mitigation measures to adapt to climate change and reduce greenhouse gas emissions in the agriculture sector of the Philippines

<table>
<thead>
<tr>
<th>Year</th>
<th>Baseline (tCO2e)</th>
<th>Emissions (tCO2e)</th>
<th>Emission Reductions (tCO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sector</td>
<td>Region</td>
<td>Sector</td>
</tr>
<tr>
<td>2020</td>
<td>59,141,072</td>
<td>13,624,223</td>
<td>58,546,990</td>
</tr>
<tr>
<td>2021</td>
<td>60,430,669</td>
<td>13,957,966</td>
<td>59,242,504</td>
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<tr>
<td>2022</td>
<td>61,747,348</td>
<td>14,298,718</td>
<td>60,960,821</td>
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<tr>
<td>2023</td>
<td>63,091,677</td>
<td>14,646,626</td>
<td>63,037,547</td>
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<tr>
<td>2024</td>
<td>64,464,237</td>
<td>15,001,840</td>
<td>64,119,752</td>
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<tr>
<td>2025</td>
<td>65,865,620</td>
<td>15,364,513</td>
<td>65,232,003</td>
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<tr>
<td>2026</td>
<td>67,296,433</td>
<td>15,734,802</td>
<td>67,472,503</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

The program will continue beyond the duration of TCAF support as practices will be entrenched by the end of seven years. The emission reductions for the entire period, including the years 2027-2030, shall be as follows:

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<th>Baseline (tCO2e)</th>
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<tr>
<td></td>
<td>Sector</td>
<td>Region</td>
<td>Sector</td>
</tr>
<tr>
<td>2027</td>
<td>68,757,293</td>
<td>16,112,868</td>
<td>65,232,003</td>
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<td>2028</td>
<td>70,248,830</td>
<td>16,498,873</td>
<td>65,994,439</td>
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<td>2029</td>
<td>71,771,690</td>
<td>16,892,984</td>
<td>66,788,198</td>
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<tr>
<td>2030</td>
<td>73,326,530</td>
<td>17,295,371</td>
<td>67,472,503</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
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</table>
**Simple and conservative GHG emissions MRV approach**

### Table 1. Specific emission factors for baseline, project and emission reductions (kgCH4/ha/season) for Dry Season

<table>
<thead>
<tr>
<th>For regions where double cropping is practiced</th>
<th>EF&lt;sub&gt;c&lt;/sub&gt;</th>
<th>SF&lt;sub&gt;BL,w&lt;/sub&gt;</th>
<th>SF&lt;sub&gt;BL,p&lt;/sub&gt;</th>
<th>SF&lt;sub&gt;BL,o&lt;/sub&gt;</th>
<th>Emission Factor (EF&lt;sub&gt;BL&lt;/sub&gt;)</th>
<th>Project Scenarios</th>
<th>SF&lt;sub&gt;P,w&lt;/sub&gt;</th>
<th>SF&lt;sub&gt;P,p&lt;/sub&gt;</th>
<th>SF&lt;sub&gt;P,o&lt;/sub&gt;</th>
<th>Emission Factor (EF&lt;sub&gt;P&lt;/sub&gt;)</th>
<th>Emission Reduction Factor (EF&lt;sub&gt;ER&lt;/sub&gt;)</th>
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<tbody>
<tr>
<td>171.40</td>
<td>1.00</td>
<td>1.00</td>
<td>2.88</td>
<td>493.63</td>
<td></td>
<td>Scenario 1: change the water regime from continuously to intermittent flooded conditions (single aeration)</td>
<td>0.60</td>
<td>1.00</td>
<td>2.88</td>
<td>296.18</td>
<td>197.45</td>
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<td>Scenario 2: change the water regime from continuously to intermittent flooded conditions (multiple aeration)</td>
<td>0.52</td>
<td>1.00</td>
<td>2.88</td>
<td>256.69</td>
<td>236.94</td>
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<tr>
<td>For regions where single cropping is practiced</td>
<td>171.40</td>
<td>1.00</td>
<td>0.68</td>
<td>1.70</td>
<td>198.14</td>
<td>Scenario 1: change the water regime from continuously to intermittent flooded conditions (single aeration)</td>
<td>0.60</td>
<td>0.68</td>
<td>1.70</td>
<td>118.88</td>
<td>79.26</td>
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<td>Scenario 2: change the water regime from continuously to intermittent flooded conditions (multiple aeration)</td>
<td>0.52</td>
<td>0.68</td>
<td>1.70</td>
<td>103.03</td>
<td>95.11</td>
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### Table 2. Specific emission factors for baseline, project and emission reductions (kgCH4/ha/season) for Wet Season

<table>
<thead>
<tr>
<th>For regions where double cropping is practiced</th>
<th>EF&lt;sub&gt;c&lt;/sub&gt;</th>
<th>SF&lt;sub&gt;BL,w&lt;/sub&gt;</th>
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<th>Emission Reduction Factor (EF&lt;sub&gt;ER&lt;/sub&gt;)</th>
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<tr>
<td>297.42</td>
<td>1.00</td>
<td>1.00</td>
<td>2.88</td>
<td>856.56</td>
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<td>Scenario 1: change the water regime from continuously to intermittent flooded conditions (single aeration)</td>
<td>0.60</td>
<td>1.00</td>
<td>2.88</td>
<td>513.94</td>
<td>342.62</td>
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<td>Scenario 2: change the water regime from continuously to intermittent flooded conditions (multiple aeration)</td>
<td>0.52</td>
<td>1.00</td>
<td>2.88</td>
<td>445.41</td>
<td>411.15</td>
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<td>343.81</td>
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<td>0.52</td>
<td>0.68</td>
<td>1.70</td>
<td>178.78</td>
<td>165.03</td>
</tr>
</tbody>
</table>
# SDG Impacts

Real, measurable and verifiable

<table>
<thead>
<tr>
<th>SDGs</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No Poverty</td>
<td>✓ Increased food security through increase in total irrigated areas and increase in yield</td>
</tr>
<tr>
<td>2. Zero Hunger</td>
<td>✓ Increased resilience in rice production</td>
</tr>
<tr>
<td>3. Good Health and Well-being</td>
<td>✓ Increased number of farmers having access to reliable irrigation services</td>
</tr>
<tr>
<td>8. Decent Work and Economic Growth</td>
<td>✓ New jobs created</td>
</tr>
<tr>
<td>10. Reduced Inequalities</td>
<td>✓ Decreased conflicts among farmers</td>
</tr>
<tr>
<td>13. Climate Action</td>
<td>✓ Reduced GHG emissions</td>
</tr>
<tr>
<td>17. Partnerships for the Goals</td>
<td>✓ Promotes dissemination and diffusion of environmentally sound technologies through international partnerships</td>
</tr>
</tbody>
</table>
Financing proposal

Bridging the carbon markets gap and increasing NDC ambition

Government of the Philippines

37.5%

Program Implementation and Administration

TCAF

62.5%

ERPA Payments

USD XX per tonne

Financial Incentive to Farmers

USD YY per tonne

First-Loss Equity

USD ZZ per tonne

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Another possible approach:
Direct Green Technology Incentive (DGTI) Fund

The DGTI Fund is a blended-finance mechanism providing performance based grants to de-risk private capital and facilitate the rapid uptake of clean technologies.
International climate finance:
Measures to adapt to climate change and reduce greenhouse gas emissions in the agriculture sector of the Philippines

Thank you!