# How Mitigation Actions Can Be Measured through the Use of the CDM: Case Study on Standardized Baseline for Rice Cultivation

Asia and Pacific Regional Workshop on Promoting the CDM and the Market Mechanisms for Post-2020 29<sup>th</sup> September 2015



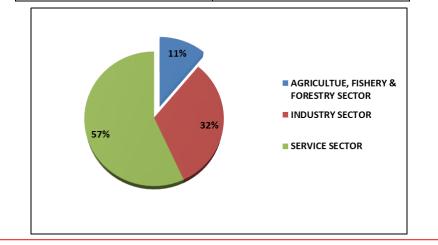




- Developed under UNDP MDG Carbon
- Rice cultivation contributes to 13% of GHG emissions in the Philippines (or 16,437 GgCO2e), while agriculture as a whole to 29% of the overall GHG emissions in the country.
- Development of a Standardized Baseline for Rice Cultivation (2013 – 2015)
  - Approved in February 2015 as ASB0008
- NAMA Study for the Water Management in Rice Production (January – August 2014)
  - Study Completed
- Development of an AMIA (Adaptation and Mitigation Activities in Agriculture) for Rice Cultivation (September 2014 – March 2015)

## **Role of Agriculture in the Philippines**

<u>Country</u>	<u>Rice Production</u> (million tons)
China	206.0
India	153.0
Indonesia	69.0
Viet Nam	43.7
Thailand	37.8
Bangladesh	33.9
Myanmar	33.0
The Philippines	18.0
Brazil	11.5
Japan	10.7



<u>Country</u>	<u>Rice Import</u>
	<u>(million tons)</u>
Nigeria	2.7
China	2.4
Iran	1.7
The Philippines	1.5
Iraq	1.45
Saudi Arabia	1.225
Ivory Coast	1.115
Malaysia	1.105
Senegal	1.0
South Africa	0.95



- AMS-III.AU. "Methane emission reductions by adjusted water management practice in rice cultivation" ver. 03.0
- Standardization of methane emission factors for rice cultivation using country specific data for the Philippines. (Measurements for the period 1994 – 1997, dry and wet season)
- Deviation from the approved CDM methodology, AMS-III.AU., ver. 03.0 and adoption of AMS-III.AU., ver. 04.0
- Submission to the UNFCCC: 29 May 2014
- Approved as ASB0008: Standardized Baseline for Methane Emissions from Rice Cultivation in the Republic of the Philippines (20 February 2015, EB82)



#### tCO2e/ha/season

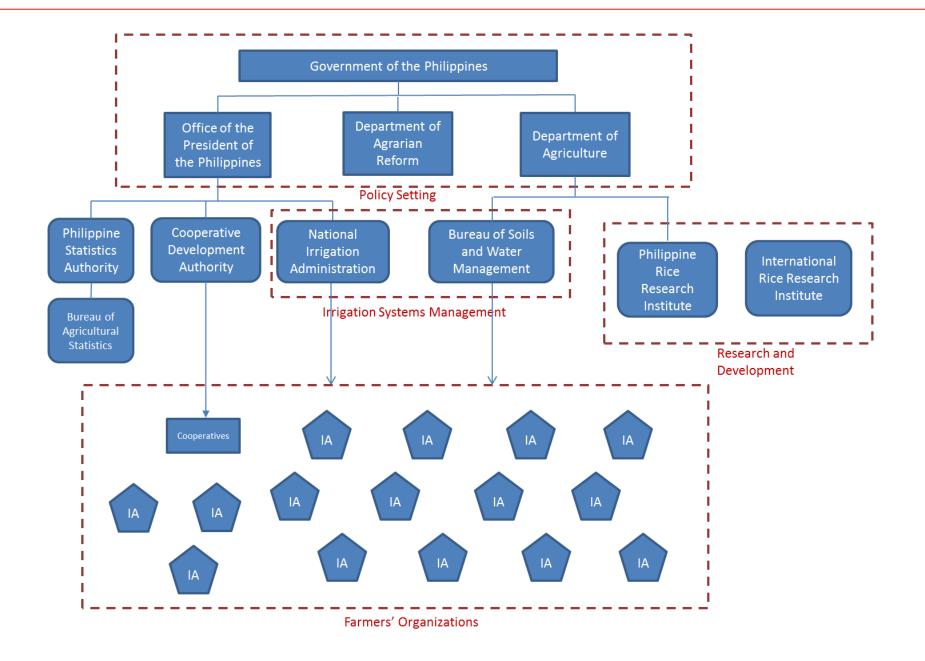
	Baseline			Project							
Dry Season	EF	$SF_{BL,w}$	SF <sub>BL,p</sub>	SF <sub>BL,o</sub>	Emission Factor (EF <sub>BL</sub> )	Project Scenarios	SF <sub>P,w</sub>	SF <sub>P,p</sub>	SF <sub>P,o</sub>	Emission Factor (EF <sub>p</sub> )	Emission Reduction Factor (EF <sub>ER</sub> )
For regions where double cropping is practiced	171.40	1.00	1.00	2.88	493.63	Scenario 1: change the water regime from continuously to intermittent flooded conditions (single aeration)	0.60	1.00	2.88	296.18	197.45
						Scenario 2: change the water regime from continuously to intermittent flooded conditions (multiple aeration)	0.52	1.00	2.88	256.69	236.94
For regions where single cropping is practiced	171.40	1.00	0.68	1.70	198.14	Scenario 1: change the water regime from continuously to intermittent flooded conditions (single aeration)	0.60	0.68	1.70	118.88	79.26
						Scenario 2: change the water regime from continuously to intermittent flooded conditions (multiple aeration)	0.52	0.68	1.70	103.03	95.11

### **Standardized Baseline (3)**

#### tCO2e/ha/season

		Baseline			Pr	oject		Emission			
Wet Season	EF	SF <sub>BL,w</sub>	SF <sub>BL,p</sub>	SF <sub>BL,o</sub>	Emission Factor (EF <sub>BL</sub> )	Project Scenarios	SF <sub>P,w</sub>	SF <sub>P,P</sub>	SF <sub>P,0</sub>	Emission Factor (EF <sub>P</sub> )	Reduction Factor (EF <sub>ER</sub> )
For regions where double cropping is practiced	297.42	1.00	1.00	2.88	856.56	Scenario 1: change the water regime from continuously to intermittent flooded conditions (single aeration)	0.60	1.00	2.88	513.94	342.62
						Scenario 2: change the water regime from continuously to intermittent flooded conditions (multiple aeration)	0.52	1.00	2.88	445.41	411.15
For regions where single cropping is practiced	297.42	1.00	0.68	1.70	343.81	Scenario 1: change the water regime from continuously to intermittent flooded conditions (single aeration)	0.60	0.68	1.70	206.29	137.53
						Scenario 2: change the water regime from continuously to intermittent flooded conditions (multiple aeration)	0.52	0.68	1.70	178.78	165.03

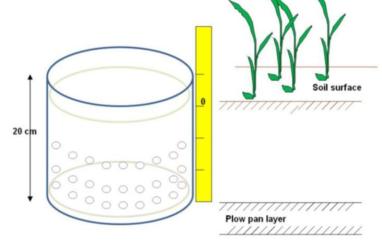
### **Organization of the Sector**



- Increase yield and improve food security
- Achieve self sufficiency in rice production (2013)
- Improve irrigation services
- Promote irrigation water savings
- Promote fuel savings/sustainable energy
- Improve livelihood and human security of rice farmers
- Diversify agricultural production (*Palayamanan* concept)
- Improve the resilience of the rice sector
- Reduce the impact of climate change
- Create climate-friendly agricultural industries

Mitsubishi UFJ Morgan Stanley 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;

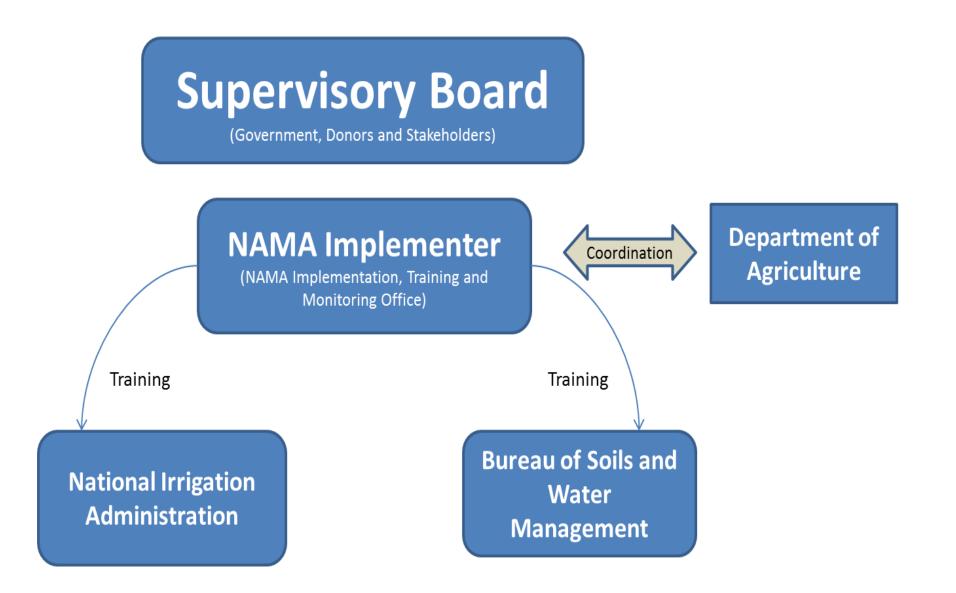


- **Philippines**: successful examples in pump and gravity irrigation systems
  - Pump systems: direct savings from reduced diesel consumption
  - Gravity systems: little direct incentives, yet increased yield, increased irrigable area and reduced conflicts among farmers
  - Only 8 % of all irrigated rice fields use AWD
- Viet Nam
  - AWD integrated in the "Three reductions, three gains" program ('Ba Giam, Ba Tang')
  - Approximately 5,000 farmers adopted AWD
- Myanmar
  - Demonstration projects
- Indonesia
  - Demonstration projects
- China

- Introduction of AWD applied on 750,000 ha
- This is expected to result in:
  - Improved water management;
  - Resilient rice production;
  - Increase in irrigated areas;
  - Increase in rice yield;
  - Reduction of conflicts among farmers;
  - Increased irrigation service fee payments due to increased cultivation area and increased willingness to pay

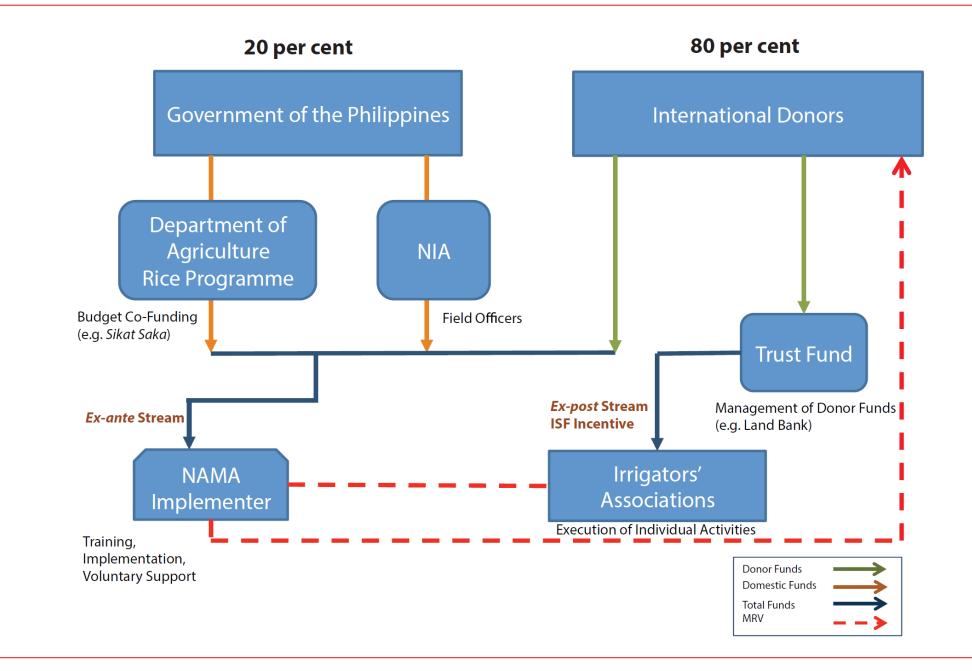


- The AMIA implementation involves uprooting of deeply entrenched cultural practices
- The success of the AMIA is possible only with a combination of training and incentive mechanisms
- Incentive mechanism: Reduction in the ISF for farmers adopting AWD
- The incentive mechanisms may help increase the farmers' willingness to pay and increase ISF collection rate by the NIA



- Actual activities under the AMIA are implemented in coordination with Irrigation Associations
- The NAMA Implementer will be in charge of training and technical advisory
- Funds are channeled through the DA in addition to existing programs (i.e. National Rice Program)

#### **NAMA Financial Structure**



- Initial funding for training and knowledge dissemination
- Ex-post results based funding to cover the decreased ISF
- Establishment of a trust fund within an existing government bank (e.g. Landbank) for disbursement of donor funds
- Development of financing facilities in addition to existing agricultural credit line to guarantee the sustainability of the mechanism.

Particulars	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Total Cost of NAMA Training and Management (US\$)	2,199,993	2,739,958	2,767,358	2,767,358	2,767,358	2,767,358	16,009,383
Donor Coverage (US\$)	2,199,993	2,739,958	1,383,679	830,207	0	0	7,153,838
Local Coverage (US\$)	0		1,383,679	1,937,151	2,767,358	2,767,358	8,855,545
Donor Payment for Reduction in the Irrigation Service Fee (US\$)	0	0	2,965,116	5,930,233	4,447,674	2,372,093	15,715,116

## **NAMA Expected Outcomes**

Expected Outcomes	Values	Indicator/ Unit	Means of Verification
GHG Emission Reductions in Rice Cultivation	12,151,688	tCO <sub>2</sub> e	Through the MRV system described in Chapter 8
Annual Rice Production in the Philippines	20,382,000	tons	Data from the Bureau of Agricultural Statistics, Philippine Statistics Authority
Irrigated Land Area	1,925,000	ha	Data from the Bureau of Agricultural Statistics, Philippine Statistics Authority
Trained Irrigation Officers	150	persons	Reports by NAMA Implementer
Trained Farmers/ IAs (in land area managed)	750,000	ha	Reports by NAMA Implementer
ISF Collection Rate	100	per cent	Data from NIA

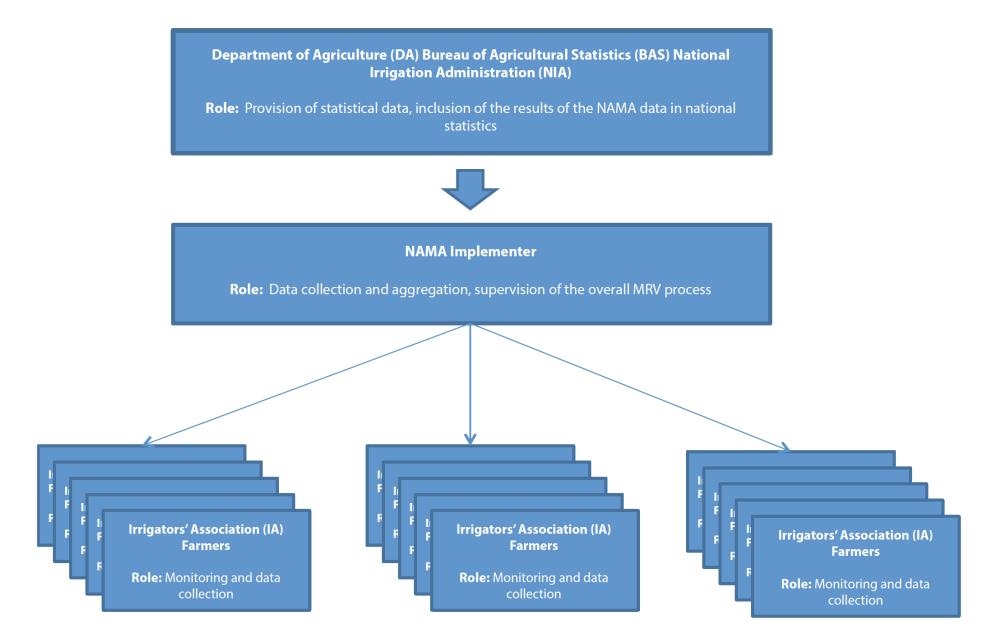
MRV System for SD benefits based on UNDP NAMA SD Tool

Co-Benefits	Parameter	Data Source								
Food Security Benefits	Rice production (ton)	Using data from the BAS database								
	Area of irrigated land (ha)	Using data from the BAS database								
Adaptation Benefits	Number of farmers having access to reliable irrigation services	Data provided to NIA and IAs								
	Water usage (m <sup>3</sup> )	Data provided by NIA and IAs								
Social Benefits	New jobs created	Data based on labor statistics								
Knowhow Transfer	Share of irrigated rice fields that have adopted AWD (%)	Using data from the BAS database								
Other Benefits	Reported decrease in conflicts (survey based)	Survey								
	Improved satisfaction with irrigation services (survey based)	Survey								
	Share of ISF collection	Using data of NIA								

#### Table 8: Monitoring of Nationally Appropriate Improvements

# **Monitoring and Reporting Structure**





## **NAMA Implementation**

Intervention	Specific deliverables	Requ	Year 0					Year 2				Year 3				Year 4				Year 5				
1. Provision of FFS Manual on Water Management	Updating of FFS Manual to highlight AWD implementation (measurement and monitoring of water level or moisture adequacy, possible effects on pests and diseases, nutrient management, mechanization, micro climates, etc.)	14 subject matter specialists and 4 support/ writeshop staff	Writeshop for 4 days; allocation for lodging, meals and honaria; cost of layouting and proofreading of the final draft; cost of printing of 500 copies of the manual	Q1-4 5 working days	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4												
2. Training of 150 Field Officers	150 persons trained for work in the field for five years	Trainers/ resource persons, training facilities	Training for two months to incorporate AWD principles with respect to the PalayCheck system	44 working days	)																			
3. Conduct of Fieldwork	Fieldwork conducted for one year for each IA	Each RSO/ AEW to handle four IAs per season	To cover all the IAs under the NIS, IS (under NIA) and SWISA (under BSWM) (150 field officers x 4 IAs per year x 250 ha per IA x 5 years = 750,000 ha)			Batch	1			Batch	12			Batch	3			Batch	4			Batch	15	

- The proposed approach is easy to replicate thanks to the use of the CDM standardized baseline
- Significant knowledge and experience has been accumulated
- A holistic approach to the improvement of irrigation services is required, including:
  - Training
  - Information dissemination and advocacy
  - Creation of economic incentives for farmers
  - Creation of additional incentives
- The proposed approach is cost efficient, less than 1 USD/tCO<sub>2</sub>e
- Significant adaptation and mitigation benefits, as well as improvement of food security

# Thank you for your attention!

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