



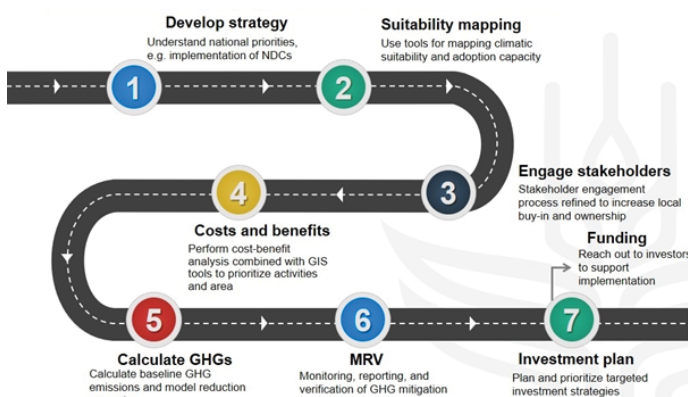
## Supporting the development and implementation of Vietnam's Nationally-Determined Contribution (NDC) in the agriculture sector

**R**ice is a dominant and important crop for Vietnam, but traditional paddy rice production also emits a significant amount of greenhouse gases (GHG), accounts for 50% of the country's agriculture emissions, and 15% of its total greenhouse gas emissions. In order to fulfil the Nationally Determined Contribution (NDC) targets, Vietnam has committed to cutting 8-25% of GHG emissions, including agricultural emissions, by 2030.

The Vietnamese government is making efforts to move to low-carbon rice production as part of its NDC. Supporting this process, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and the International Rice Research Institute (IRRI), with support from the Climate and Clean Air Coalition (CCAC) work to help the government assess mitigation options, develop a plan for implementation, and measure impacts.

### WHAT WE'RE DOING

IRRI and CCAFS have developed and supported the implementation of alternate wetting and drying irrigation technology (AWD) as a climate-smart rice production technique in Vietnam to reduce methane emissions from rice production in line with its NDC. The results of our work will facilitate decisions in designing, financing and implementing the expansion of the AWD technique throughout the country.



Vietnam project roadmap. Source: CCAFS

Activities under this initiative include:

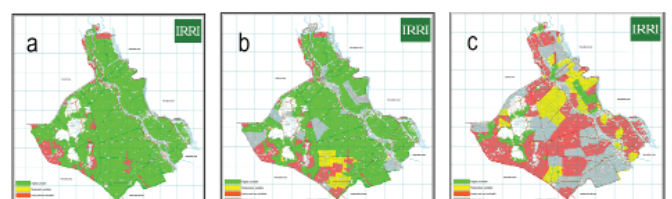
#### Suitability mapping

CCAFS, IRRI, and Vietnamese partners assessed the suitability for AWD application in the An Giang province in four steps:

1. *Climatic suitability maps*: A map of rice areas per season was generated based on statistical data, cropping calendars and remote sensing images. The map takes into account the climatic factors such as rainfall, potential evapotranspiration, and soil percolation rate of rice land to assess the water balance. As a result, the map shows rice land in three levels of suitability for AWD adoption: highly suitable, moderately suitable, and lowly or not suitable.

2. *Adoption Capacity Maps*: Five factors that influence the adoption capacity for AWD were evaluated. These include the topography of the area, canal irrigation infrastructure, drainage capability, farmer awareness of the technology, and cooperative authority. Based on the results, AWD adoption capacity maps were developed, showing rice areas under three categories: high, moderate and low capacity.

3. *Overall AWD Suitability Maps*: Seasonal climatic suitability maps and adoption capacity maps were combined to generate overall suitability maps.



Climatic suitability maps for a) winter-spring season, b) summer-autumn season, and c) autumn-winter season.

4. *Participatory verification*: Overall AWD suitability maps were verified through a participatory feedback process conducted with the participation of provincial and district officials of Vietnam's Ministry of Agriculture and Rural Development (MARD).

To date, these maps are the best reference to support AWD implementation plans in An Giang province. The suitability mapping process can now be applied to other provinces in Vietnam as well as in other countries.



AWD suitability mapping in An Giang province.

### Cost-Benefit Analysis (CBA)

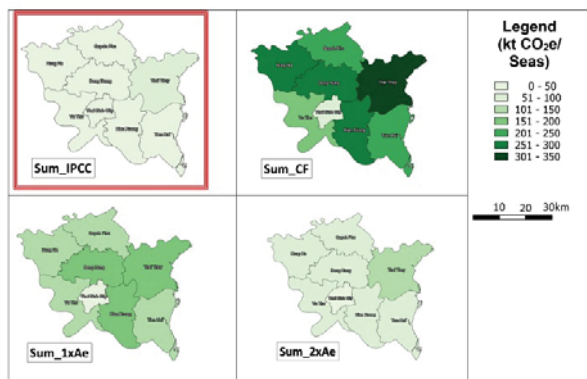
IRRI, CCAFS and CCAC conducted the review of Vietnam's NDC actions for the rice sector.

Research applying the marginal abatement cost curve (MACC) method was used to compare different technologies based on mitigation potential and cost effectiveness in Vietnam. AWD as a strategy is both cost effective and offers high mitigation potential.

### Emissions calculations

The Source-selective and Emission-adjusted GHG Calculator (SECTOR) tool for Cropland, developed by IRRI through funding from the CCAC and CCAFS, has been used to conduct GHG emissions for the Thai Rice NAMA and provides baseline GHG emissions data for Vietnam.

Below: a case study for rice production in Thai Binh province (Vietnam) created using the SECTOR tool showing the impact of different levels of technology adoption.



GHG emissions in Thai Binh Province from rice calculated using different emission factors – a) the IPCC default value, b) empirical data for continuous flooding (CF), c) single aeration (1xAe), and d) multiple aeration (2xAe). Source : Wassman et al. 2019.

### MRV - Measurement, Reporting and Verification

IRRI, CCAFS, and CCAC have started the development of a normative Monitoring, Reporting and Verification (MRV) framework and support tools for Vietnam's rice sector to help countries meet the reporting requirements for NAMAs and NDCs.

This framework will improve the basis of information and the monitoring of rice-related mitigation actions, coordinate individual mitigation activities, and track emission reductions.

### Investment plan

Building on the tools for suitability mapping of mitigation options and the CBA, CCAFS, CCAC and IRRI developed an investment plan which identifies potential sources to finance NDC-related activities. This is the most advanced document to guide public investors and will be further strengthened to meet the needs of banks and other private investors.



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