



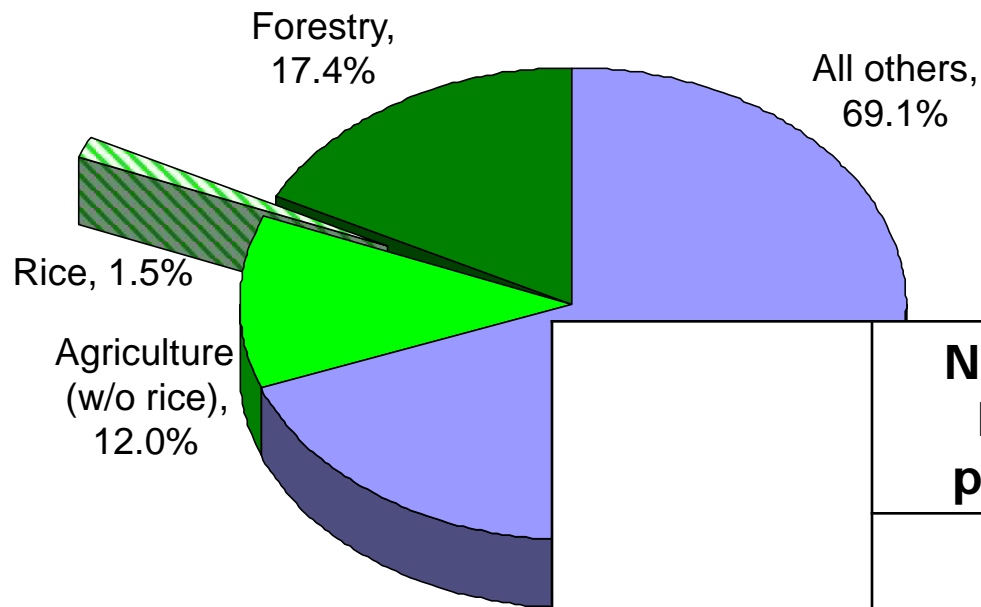
Adaptation and Mitigation in Rice Production: Research-based Solutions for Sustainable Development at Landscape Scale



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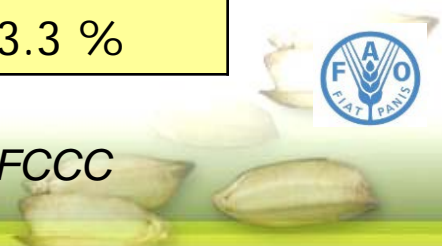
Significance of Rice Fields for GHG budgets



(IPCC 4th AR, 2007)

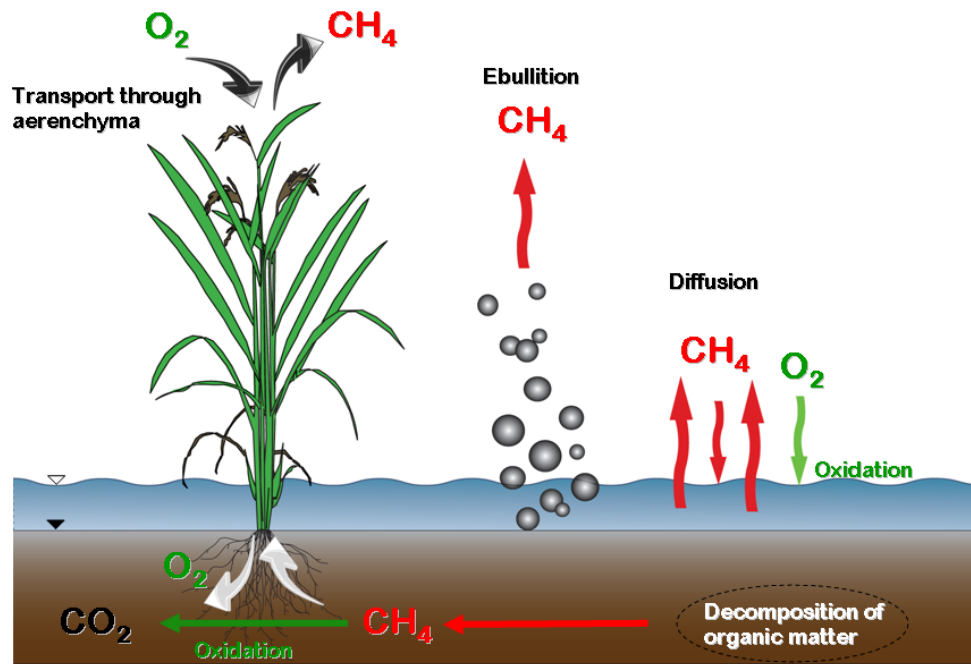
National Scale in Asia: Emissions from rice production (selected)		
Country	(Mt CO ₂ eq)	Perc. of total
Viet Nam	38.199	17.8 %
Thailand	29.940	13.0 %
Philippines	13.364	13.3 %

Data from the most recent National Communication submitted to UNFCCC



Greenhouse Gases Emissions from Rice Production – Methane

- Produced by bacteria in anaerobic soils
- Stimulated by Continuous Flooding:
 - ~ 2.5–5 t CO₂eq seas⁻¹
 - ~ 1-2 kg CO₂eq kg_{rice}
- Emission highly dependent on water management and organic amendment (e.g. manure, straw)

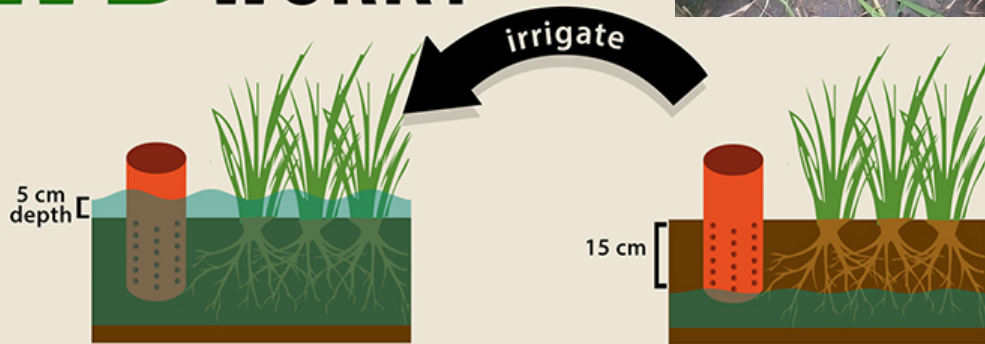


Alternate Wetting and Drying

HOW DOES AWD WORK?



Perforated tube for observing water level in the soil



1 Flooded field is left to dry out

2 When water level drops to a threshold (15cm below soil surface), the field is irrigated again

AWD saves up to 30% of irrigation water and reduces GHG emissions by ~50%

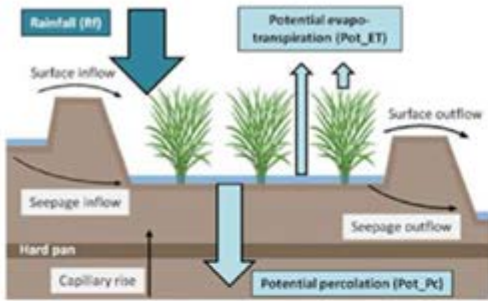


Tasks of a Research Partner in SLR Initiative

1) Selecting suitable CSA technologies



Climatic suitability for AWD: Vietnam

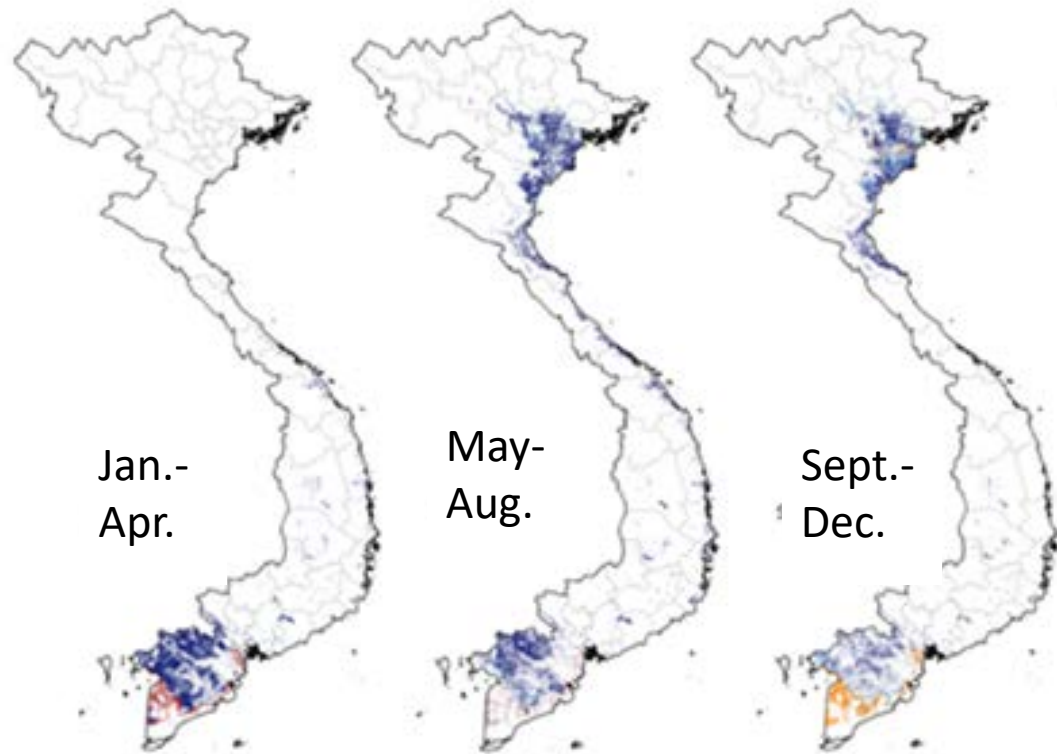


Methodology: Nelson et al., 2015

- Based on cropping calendar, rice extent and water balance
- Considering biophysical factors only (soil texture / percolation, rainfall, temperature, solar radiation)

Legend

- Not suitable
- Low suitability
- Moderate suitab.
- High suitability



Sander et al., manuscript in preparation



Small water



giz



Assessing Practical Applicability of AWD at Landscape Scale





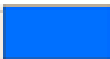
Approach:

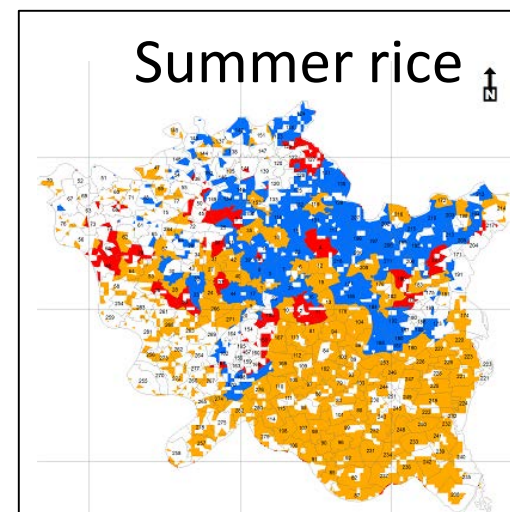
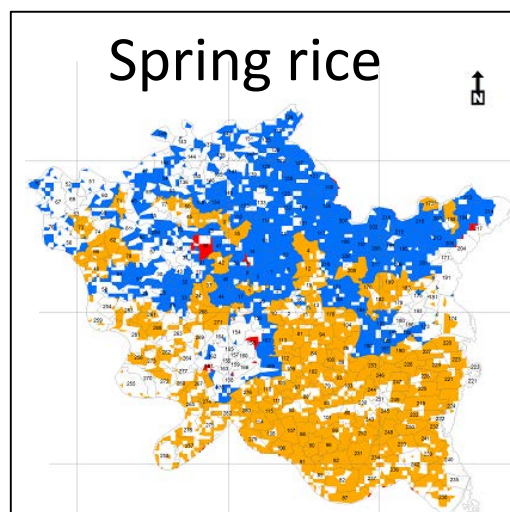
Local extension staff and other stakeholders rate various factors, e.g. irrigation facilities, topography etc



Case study:
Thai Binh Prov.,
N. Vietnam

Legend

-  Low suitability
-  Moderate suitab.
-  High suitability



Sander et al., manuscript in preparation



Tasks of a Research Partner in SLR Initiative

1) Selecting suitable CSA technologies

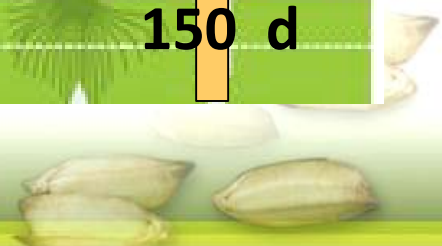
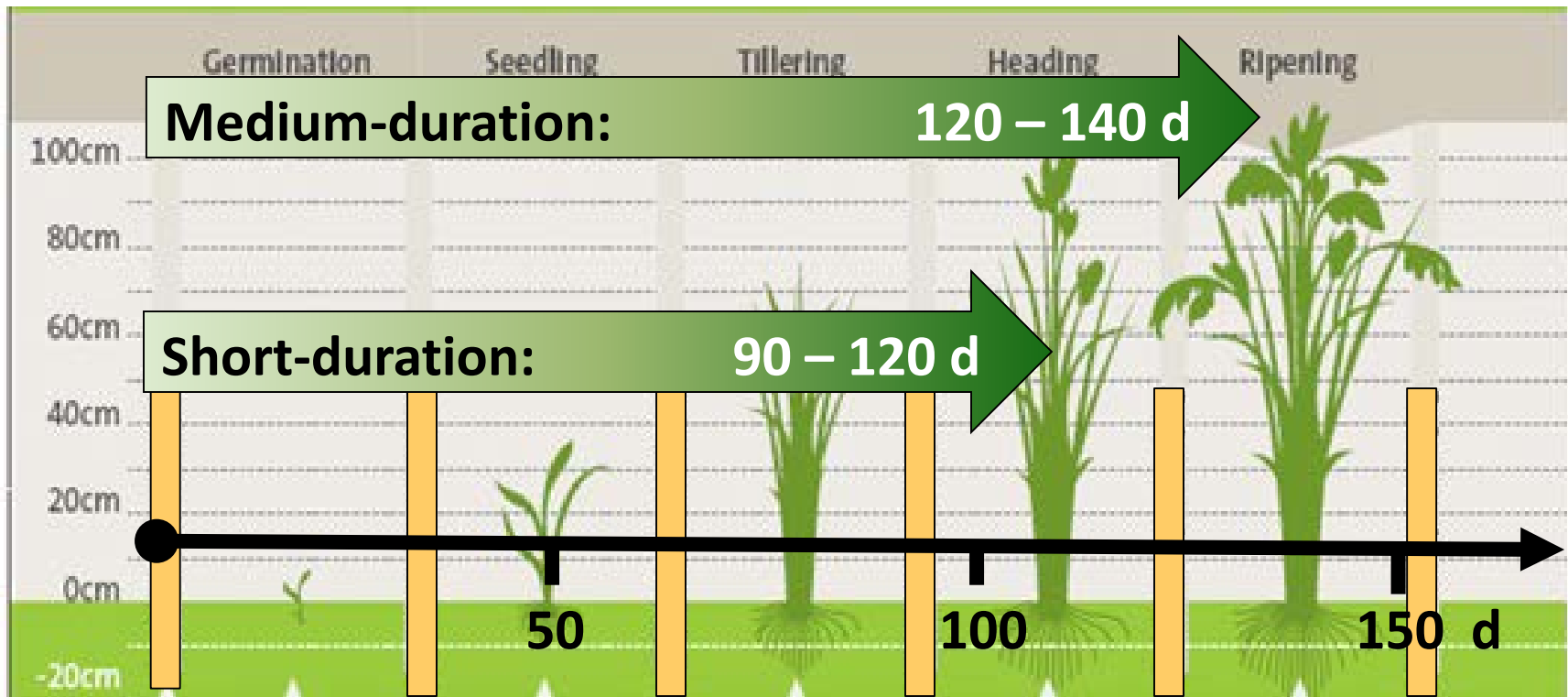
2) Decision support



Traditional vs. Short-duration Rice Varieties

Traditional:

140 – 160 d



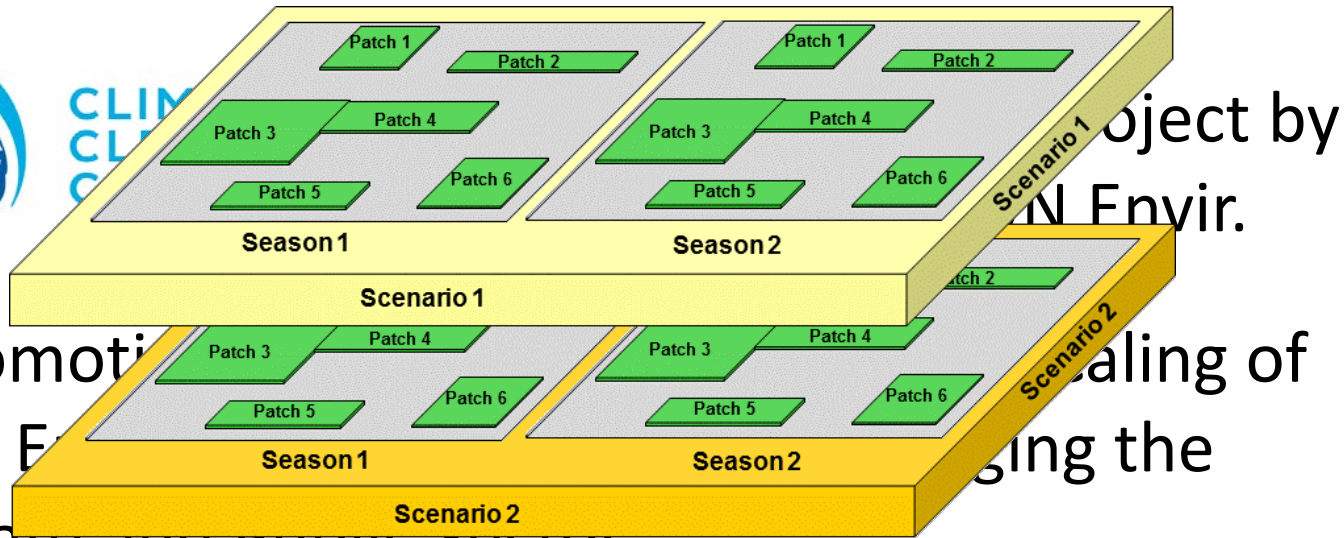
New GHG Calculator for Rice and other Crops



Source-selective and Emission-adjusted GHG Calculator for Cropland (SECTOR)



CLIMATE



“Promoting Low Emission Private and Public Sector

Project by
Ministry of Environ.

Scaling of
Using the

Journal Publication in Carbon Management:

→ **“Private Sector
Mitigation Kit”**
Wassmann et al (in press)



Tasks of a Research Partner in SLR Initiative

- 1) Selecting suitable CSA technologies
- 2) Decision support
- 3) Assembling a comprehensive portfolio of interventions



Trees in Rice Landscapes



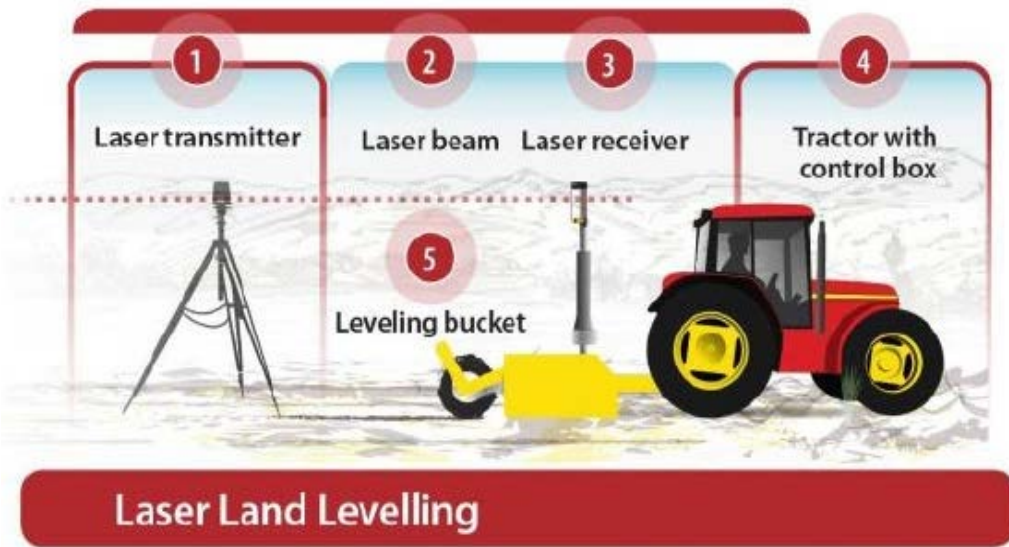
on Agricultural Land:
Global and national



- In 2010, 42% of all agricultural land globally had at least 10% tree cover
- Tree cover increased from 2000-2010
 - Indonesia
 - Myanmar



Laser Land Levelling (LLL)



Improved resource use efficiencies:
Fertilizer, Pesticides and Water

=> Additional GHG mitigation under AWD



Tasks of a Research Partner in SLR Initiative

- 1) Selecting suitable CSA technologies
- 2) Decision support
- 3) Assembling a comprehensive portfolio of interventions
- 4) Measurement, Reporting, Verification



Thai Rice NAMA Project (2018 – 2022)



- Partners:
 - * Thai Rice Department
 - * GIZ/ BRIA (Better Rice Initiative for Asia)
 - * IRRI
 - * Bank for Agriculture and Agricultural Co-operatives (BAAC)
- Promoting AWD in combination with LLL aiming at 100,000 farmers to reduce emissions by 1.7 Mt CO₂eq
- Project receives 15 Mio EUR from NAMA Facility and is expected to generate at least equal amount from Thai Government and private sector



Tasks of a Research Partner in SLR Initiative

- 1) Selecting suitable CSA technologies
- 2) Decision support
- 3) Assembling a comprehensive portfolio of interventions
- 4) Measurement, Reporting, Verification
- 5) Capacity Building and Networking



IRRI Training in VnSAT Project



Budget:

>100 M\$ for transforming rice sector in Mekong Delta

Target:

30 districts in 8 provinces with large rice production

IRRI organizes regular Training Workshops with provincial staff and other stakeholders



Thank you

Rice
Science
for a Better
World

