

Climate change and SRI @ AIT



Dr. Abha Mishra

Senior Research Specialist-cum-Affiliated Faculty

Agricultural Systems and Engineering

School of Environment Resources and Development

Asian Institute of Technology, Thailand

E-mail: abhamishra@ait.ac.th





Agriculture for climate change mitigation and adaptation

1. Greenhouse gas mitigation mechanism in agriculture

1. Reduction in emission of GHG

- a) Efficient management flow of C & N in agro-ecosystems
- b) Management of livestock and their feed
- c) Nutrient and water management in rice

2. Enhancing removal of atmospheric GHG

- a) By C sequestration – 90% mitigation by sink enlargement
- b) By increasing photosynthetic input of C in agro-ecosystem
- c) By oxidation of methane from agricultural lands.

3. Avoiding emission

- a) Converting greenhouse gas to fuels such as phenol and bio fuels.

C- sequestration

- Increase soil organic carbon in agriculture system (apply organic matter): improves c sequestration potential; lower CH₄ and N₂O emission; conserve farming energy; store more water, increases soil quality and fertility, better soil structure and water availability

SRI principle



Apply compost as much as possible

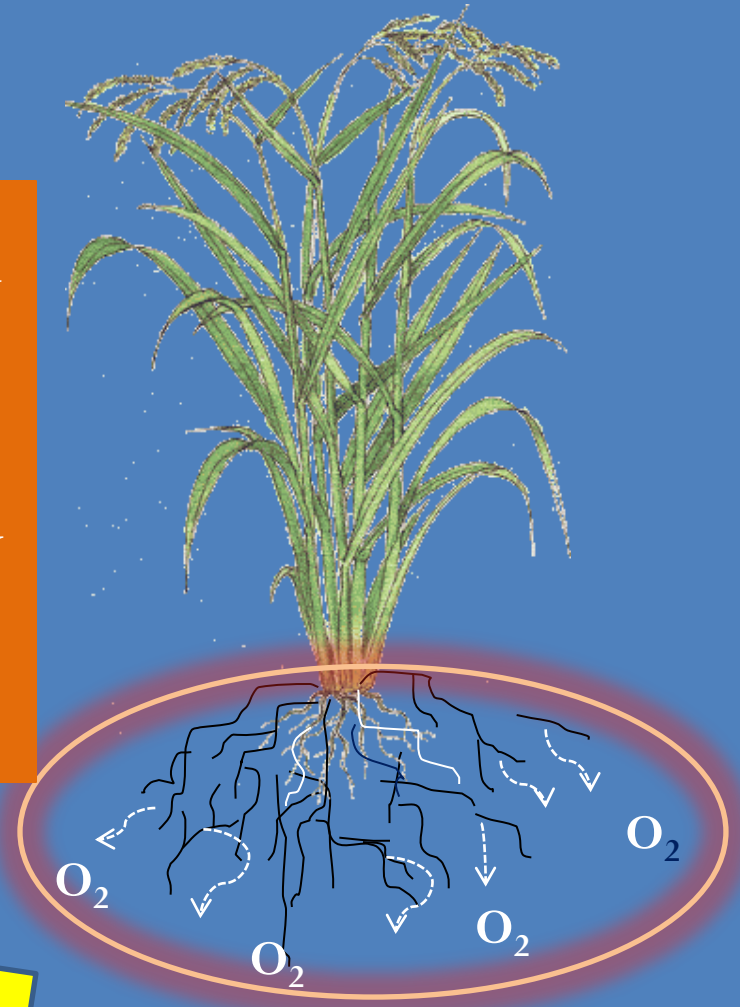
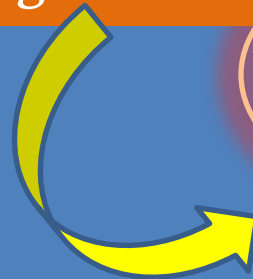
CH₄ and N₂O mitigation

- Intermittent irrigation/mid-season drainage/non-flooded soil condition reduces methane 70-90%.
- Use of compost + aerobic soil condition reduces methane emission
- Aerobic rice rhizosphere can oxidize methane 19-90%
- Avoiding continuous soil saturation reduces methane emissions from rice fields without generating offsetting nitrous oxide emissions.

SRI principles: intermittent irrigation/ non-flooded soil condition, single seedlings transplant, transplanting with wider spacing and use of compost



Higher root length density and prolong root activity could be maintained by micro-environment management



Larger oxygenated rhizosphere

Mitigation options that encourage efficient use of fertilizers, maintain soil C and sustain agricultural production are likely to have greatest synergy with sustainable development



2. Climate change adaptation and SRI

The challenge of climate change adaptation is to
(i) Produce more food, (ii) more efficiently, (iii)
under more volatile production conditions

- Those practices that confer tolerance to drought – SRI
- Early maturation in order to shorten the growing season and reduce farmers' exposure to risk of extreme weather events – SRI
- Tolerance to pest and diseases – SRI
- Less economic loss

AIT

**Center of Excellence for Sustainable Development in the context of
Climate Change (SDCC)**

- **Vulnerability, resilience and disaster preparedness**
- **Low carbon societies and renewable energy**
- **Water resources and coastal adaptation strategies**
- **Urban and rural sustainability**
- **Agriculture, forestry and land use**
- **Cleaner production and climate change**



AIT's SDCC initiatives: Roi-Et province, Northeast Thailand)



Evaluating legumes as cover crops and then as a green manure for enhancing water use efficiency and soil fertility status using FFS approach



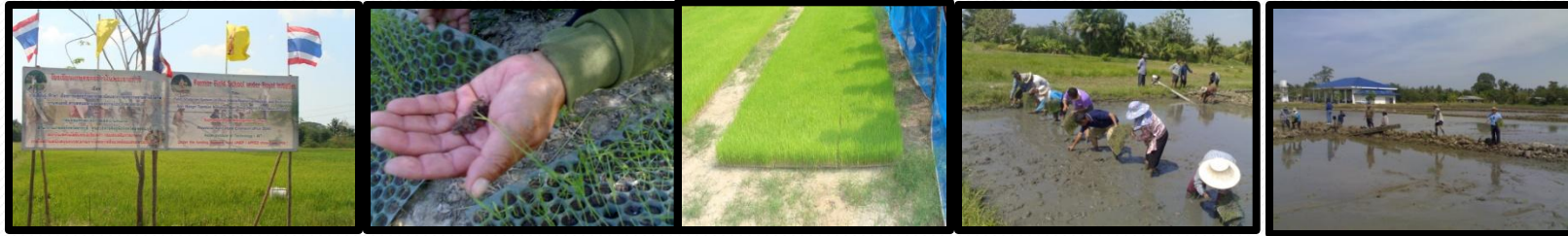
AIT's SDCC initiatives: Surin province, Northeast Thailand)



Rejuvenating soil with bentonite + legumes for enhancing water use efficiency and soil fertility status using FFS approach



AIT's SDCC initiatives: Ratchaburi province, Central Thailand)



Community preparedness for climate change and increased water use efficiency for rice cultivation using principles of System of Rice Intensification (SRI) in Central Thailand



<http://www.ait.ac.th/news-and-events/2010/news/climate-friendly-rice-production-demonstrated-in-central-thailand/view>



AIT's Future Plan

INITIATIVES IN THE PIPE LINE

1. Dedicated post doctoral to strengthen research groups by young post doctoral fellows
2. Internal seed support to form close interdisciplinary teams
3. Start Masters course in Climate Change (CCSD)
4. Implementation of research outcome



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AIT's Future Plan and SRI

Quantification through in-depth collaborative scientific studies

- **water productivity benefit**
- **disease-resistance mechanisms in SRI plants, and**
- **methane emission reduction from SRI fields.**

International collaboration

N-S partnership

Regional innovation platform

Regional innovation platform

Regional innovation platform

S-S partnership

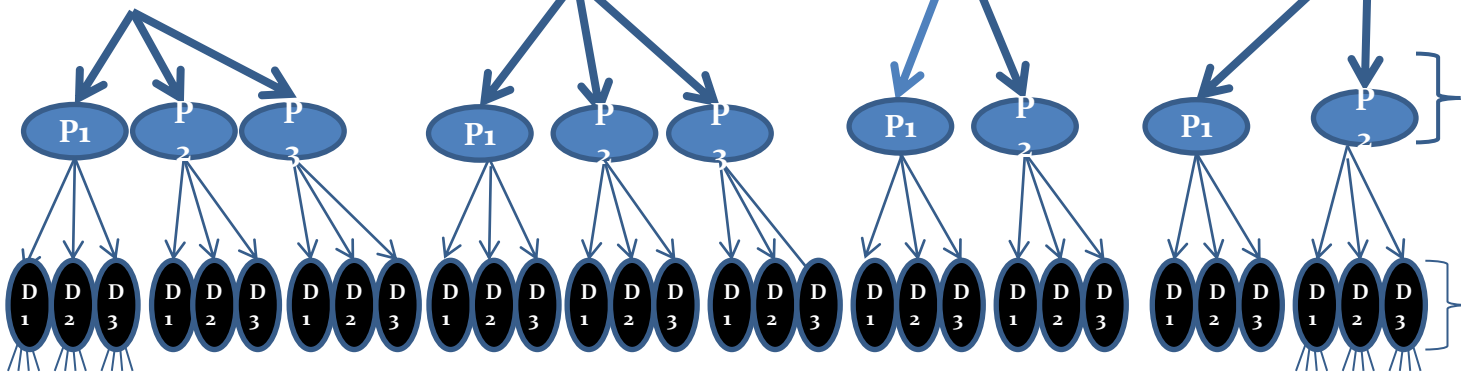
National innovation platform

National innovation platform

National Innovation

National innovation platform

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Thank you for your attention

Contact for more information:

Dr. Abha Mishra

ASE/SERD

Asian Institute of Technology

PO Box 4 Klong Luang

Pathumthani 12120

Thailand

Email: abhamishra@ait.asia



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