

Measuring Alternative Wetting and Drying (AWD) Adoption in Vietnam: A Remote Sensing Approach

Jenny Lovell

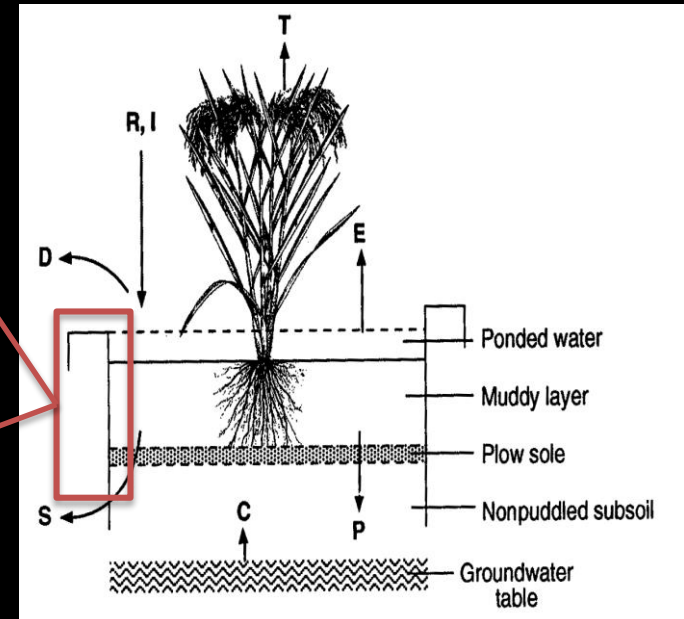
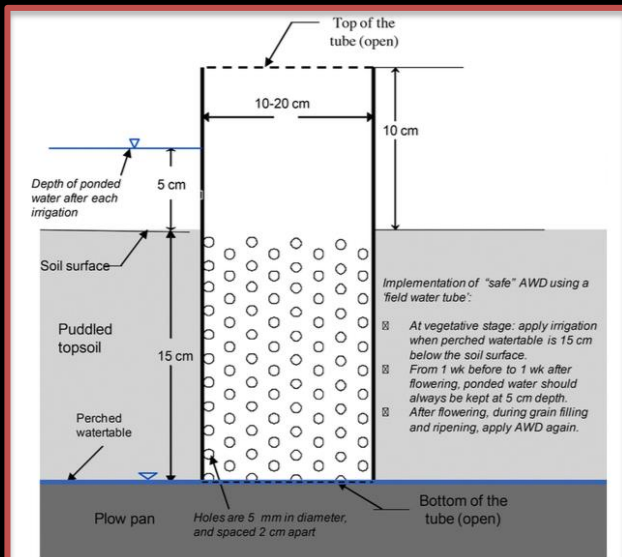
Innovative Methods for Measuring Adoption of Agricultural Technologies

Boston, August 3, 2016

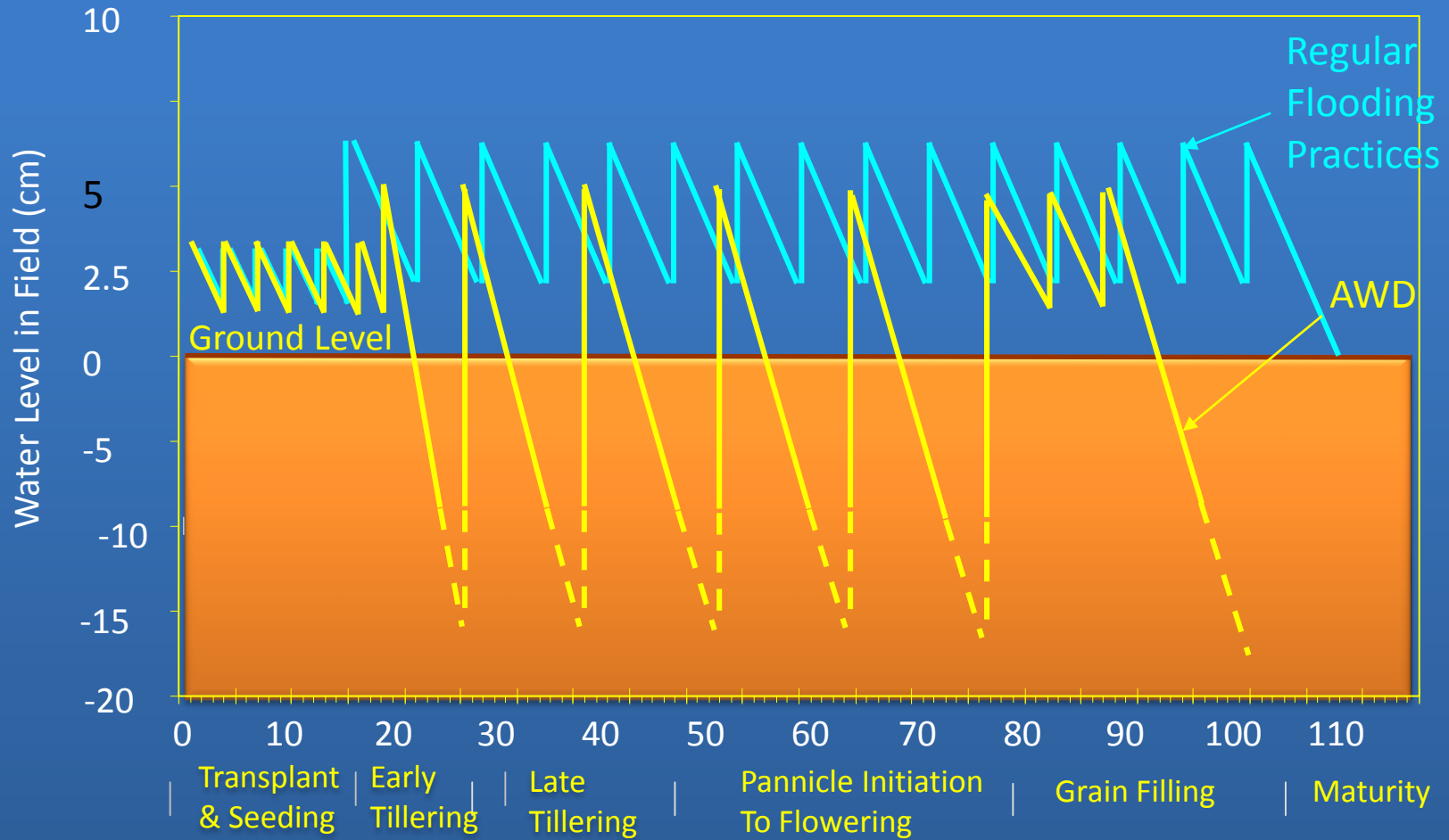
Outline

- Motivation for AWD study
- Methods
- Timeline and expected results
- Limitations

What is AWD?



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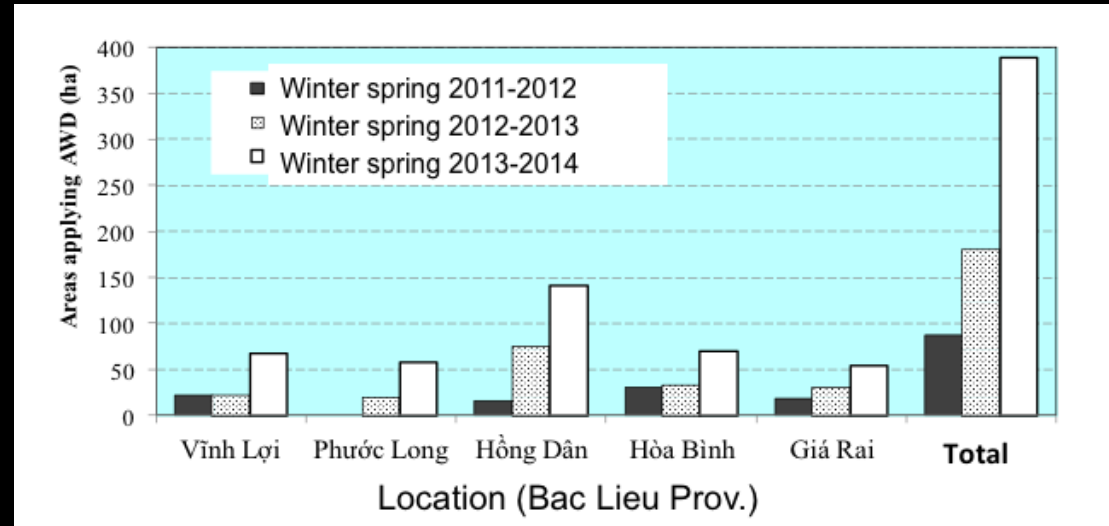


Motivation #1: AWD Definition

- Basic
 - 1) Is the monitoring pipe installed correctly?
 - 2) Are there enough monitoring pipes in each field?
 - 3) Does the farmer allow the water to drop “enough?”
- More complex
 - 1) Self-reporting exact irrigation times
 - 2) Scoring AWD on a scale (not ‘yes’ or ‘no’)
 - 3) Remote sensing – modeling AWD across space

Motivation #2: AWD Measurement

- Impact path analysis (Lampayan et al. 2015)
- IRRC, IRRI, and other partners reporting adoption (household surveys)
- Agricultural Extension offices/agents (Bangladesh, e.g.)
- Private companies promoting technology (Syngenta)
- Government departments (Ministry of Agriculture, Vietnam)



Motivation #3: Estimated Adoption

- Vietnam (40,000 estimated by Ministry of Agriculture)
- Bangladesh (50,000 targeted by Syngenta)
- Philippines (82,000 farmers/93,000 ha)
(Lampayan 2014)



Methods

Motivation	Method
AWD Definition	Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs)
AWD Measurement	Remote Sensing Classification System
AWD Adoption Estimates	Validate/Calibrate with Soil Moisture Sensors

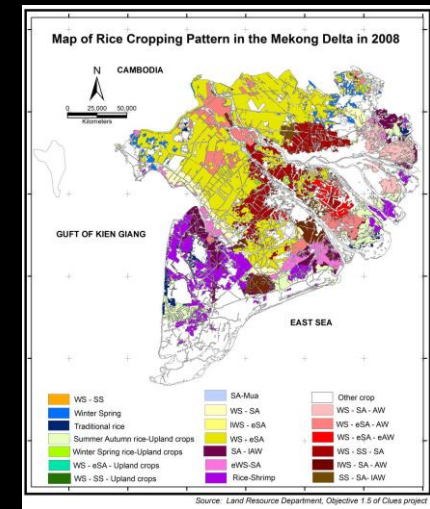
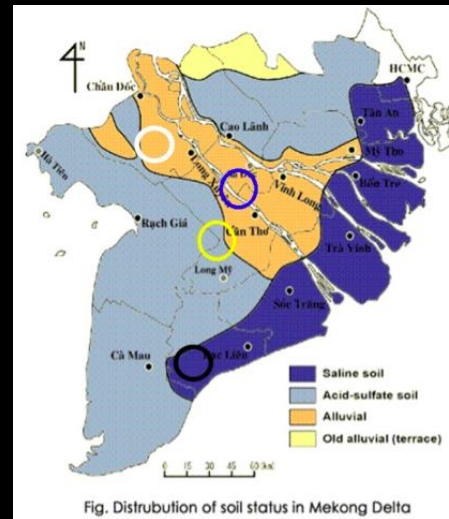
Focus Group Discussions and Key Informant Interviews

- 1) Different potential approaches for characterizing AWD (FGDs and KIIs)
- 2) Common practices on the “spectrum” (FGDs)
- 3) Provinces/locations with large number of adopters (KIIs)

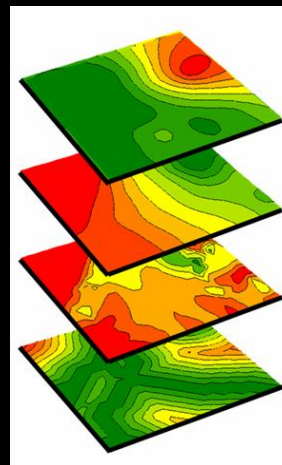
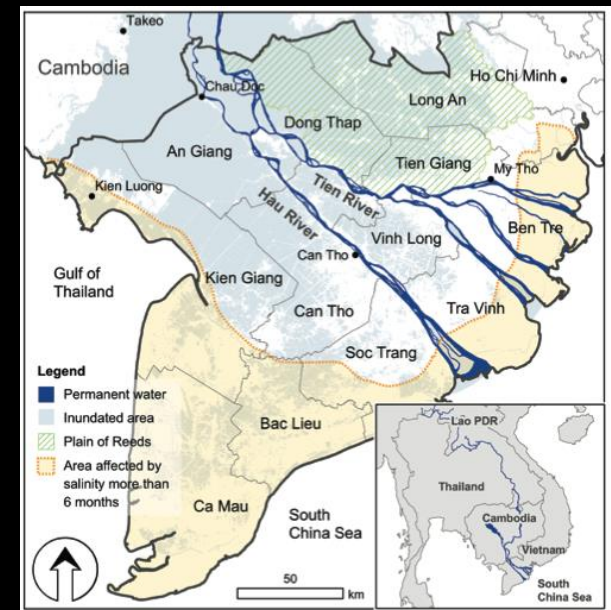


AWD Classification Work Flow

- 1) Establish production zones
- 2) Establish meaningful “farm units”
- 3) Neighborhood analysis
- 4) Temporal lag and autocorrelation analysis
- 5) Classification system



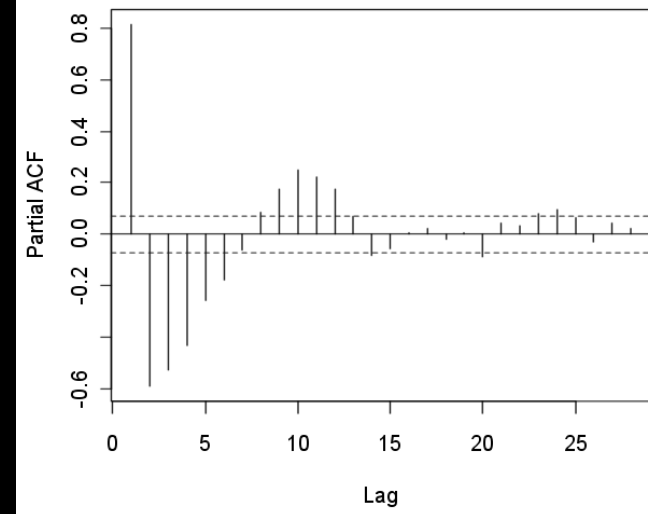
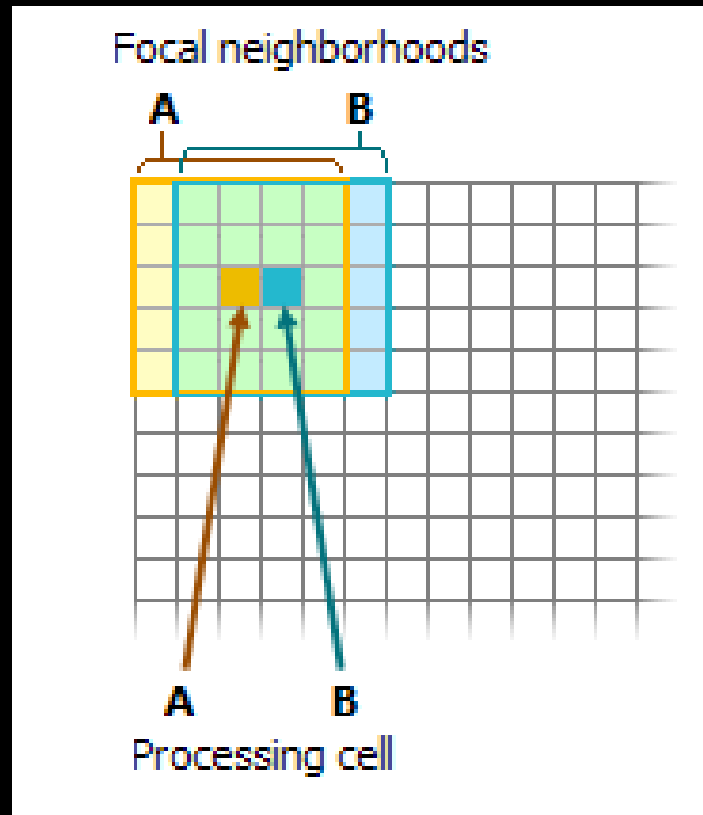
Source: CLUES 2008



AWD Classification

Work Flow

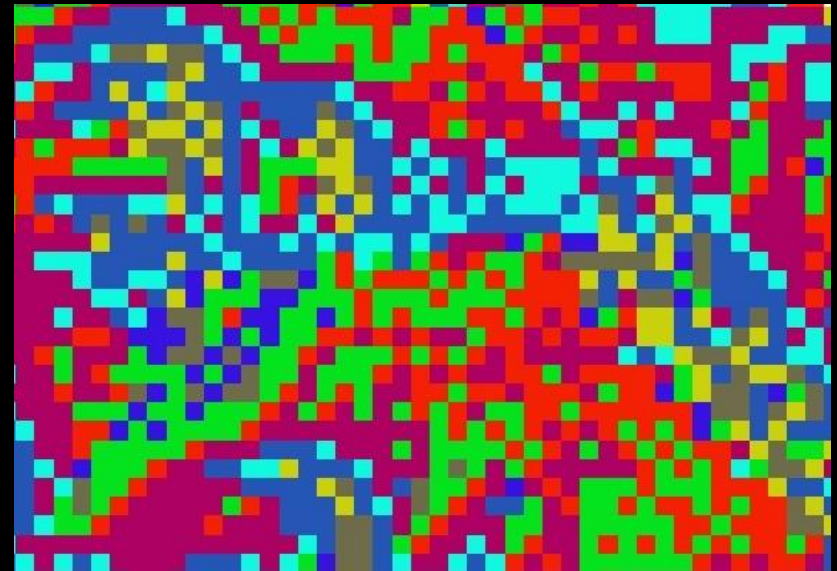
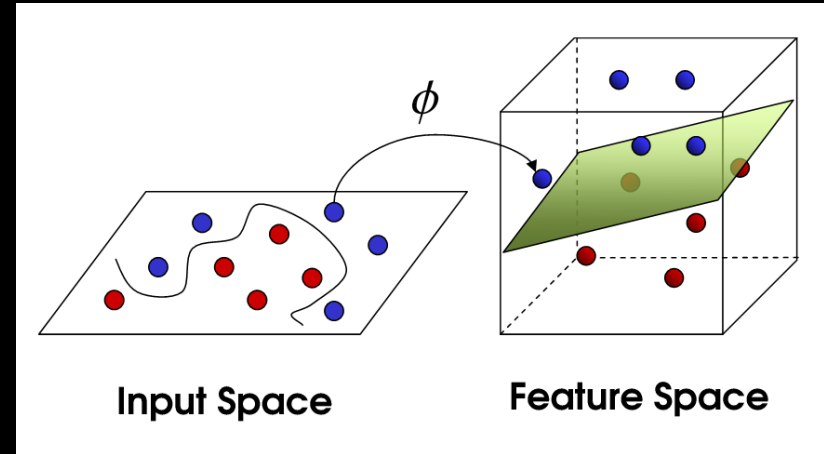
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AWD Classification

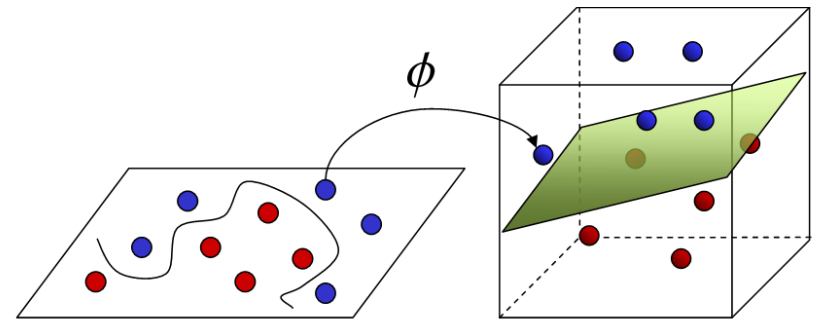
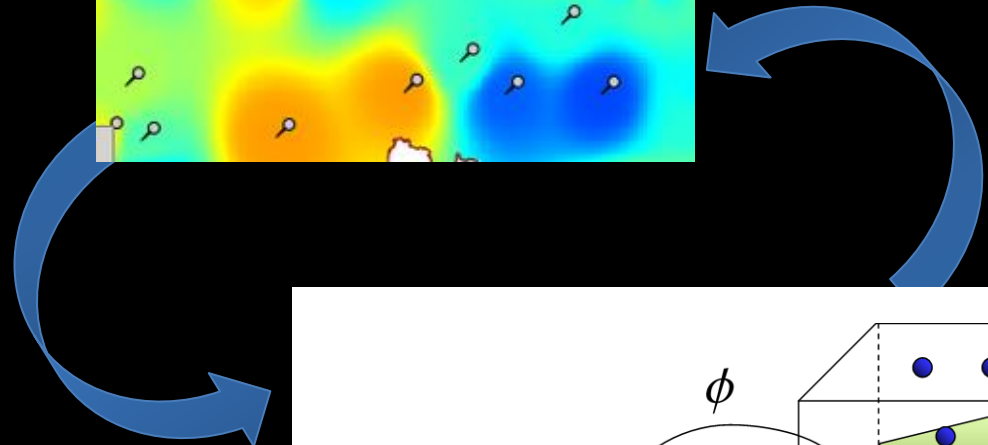
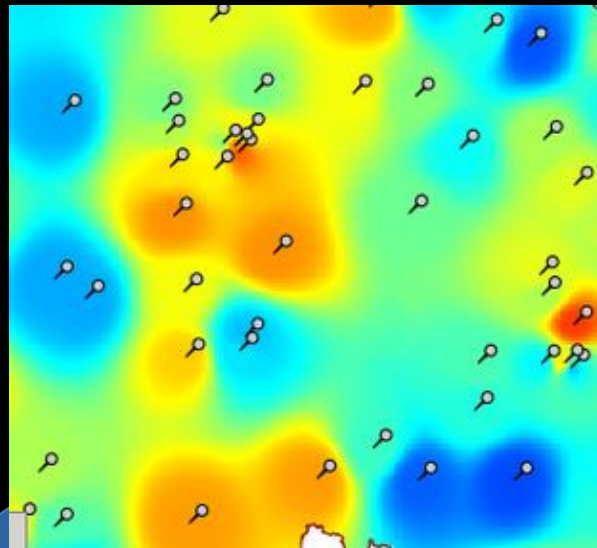
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Soil Moisture Sensor Work Flow

- 1) Classification system
- 2) Choose AWD adopter and non-adopter test farms in each soil type
- 3) Install soil moisture sensors during dry season
- 4) Retrieve and compare moisture data with model output



Input Space

Feature Space

Timeline

Timeline

July-August

➤ Literature review

September-October

➤ FDGs/KIIs

September-December

➤ Model building: ASTER/SMOS data

January-February

➤ Soil moisture sensor data input

March-June

➤ Final model calibration and report preparation

Limitations

- SMOS vs. ASTER
- Other practices could simulate false positives (System of Rice Intensification)
- Assumptions behind model limit accuracy