Adoption of sustainable rice farming practices in Vietnam: Perceptions of 'One Must Do, Five Reductions' technologies

Helena Wehmeyer ^{1,2}, Le Anh Tuan ³, Annalyn H. de Guia ¹, and Melanie Connor ¹

Background

Input overuse, stagnating yields, and environmental degradation are major challenges in Vietnam's rice agriculture.

- The 'One Must Do, Five Reductions' (1M5R) national policy program promotes sustainable rice farming by using certified seeds (1M) in combination with five reductions: seed rate, fertilizer, pesticide, water, and postharvest losses (5R)
- The program has been introduced to farmers in the Mekong River Delta since 2008 and has been widely adopted.
- The objective of this study was to determine farmers' perceptions of change due to the adoption of 1M5R recommended technologies and evaluate the impact of the program on farmers' agricultural profitability.

Methodology

- Adoption was assessed cross sectionally in two provinces of the Mekong River Delta (An Giang and Can Tho, n=465).
- Agronomic changes were evaluated through household surveys (1 baseline + 1 endline) using RCT with an adopter and non-adopter group in one province (Can Tho, n=135).
- Data were collected using the CommCare application for tabletbased survey questionnaires.
- Data were analyzed using uni- and multivariate statistics.

Châu Phú Long Xuyên Selected districts

Results

- Adoption rate was very high for AWD, drum seeder, combine harvester, and high-yielding varieties (HYV).
- Perceived agronomic benefits of 1M5R adoption were less labor (95.6 % of farmers), lower input cost (79.3 %), better yield (65.9 %), and better crop stand (57.8 %).
- 1M5R technologies were "easy to apply" (rated 5.75 out of 6), "fits my cropping pattern" (5.56/6), and "satisfies my preferences" (5.52/6).
- Farmers increased rice yields significantly to 6.6 t/ha while reducing inputs, especially fertilizer (-12.5 %).
- Highest input savings achieved for seeds (66.5 % of farmers), fertilizer (54.4 %), and pesticides (63.8 %). Farmers saved on average 25.8 % of input cost.

High yield Assured buyer for grains High income **Environment improved** Fits my cropping pattern Satisfies my Plants die less preferences Technology suitable for Replaced different my field conditions technology(ies) Technology easily Less lodging available Weather conditions More free time allowed use Fewer damages from Labor hours lower drought Fewer damages from Labor costs lower Fewer damages from Labor shortage insects Fewer damages from rats Fewer damages from Easy to apply Fewer damages from weeds ── HYV AWD Combine harvester Drum seeder

Farmer group

-0.12 (-0.12) **

Profitability

NPK fertilizer Farmers are highly satisfied with 1M5R and its technologies Pesticide cost -0.40 (-0.40) *** due to positive agronomic, economic, and social changes.

Seed rate

Irrigation cost

Power cost

Labor cost

Impact of 1M5R: Profitability and nutrient use efficiency improved, farmers' environmental footprint enhanced, increased human and social capital
Overall greater sustainable rice agriculture due to long-term adoption.



Conclusions





¹ International Rice Research Institute (IRRI), DAPO Box 7777, Metro Manila 1301, Philippines

² Institute of Human Geography/Urban and Regional Studies, Department of Environmental Sciences, University of Basel, Basel 4056, Switzerland

³ Consultant, International Rice Research Institute (IRRI), Ho Chi Minh City, Vietnam