

# **Drivers and Pathways of Changing Rice Production Systems in Luzon, Philippines**

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## Introduction

- Recently implemented Rice Trade Liberalization Law permits cheap rice imports and reduces rice prices for domestic producers in the Philippines.
- At the same time, the costs for agrochemicals have nearly doubled since the start of the Ukraine war.
- Rice farmers are accordingly doubly charged with lower income and higher production costs

## **Key findings**



Figure 1: Dry season cultivation in rice fields: (A) drought effects in dry season rice; (B) dry season rice has been replaced with upland cereals (rural settings); or (C) by high-value vegetables (peri-urban settings). (D) Climate change and high input cost affect local farmers.

## **Materials and Methods**

- Diachronic analysis (years 2018 vs. 2022) done to assess changes in production practices and performance attributes.
- Sites are four main rice-producing provinces in Luzon, Philippines representing either rainfed or irrigated systems.
- Surveys administered to 600 rice farmers were complemented by focus group discussions.

### **Research questions**

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- 1. How do farmers cope with this double charge in different rice-producing regions of Luzon?
- 2. What are responses in production practices?
- 3. Which measures may be required to avoid current negative change trends?





Figure 2: The four main riceproducing provinces in Luzon, Philippines (Aurora, Bulacan, Nueva Ecija, and Pangasinan)

### **Results** Variable Bulacan Aurora Nueva Ecija Pangasinan % change % change 2018 vs. 2022 % change % change and/or P and /or P and/or P and/or P 20% ↓ \*\* **Production Area** 22% ↓ \*\* 2% ↓ Area ns

## Conclusion

Farmers in different provinces responded differentially to the recent double squeeze (higher costs, lower prices).

		•	•	•	•	
Crop Establishment Method	Direct seeding (WS)	0% ns	<b>48%</b> ↑ *	1392% ↑ ***	90% ↑ **	Changes include the area cultivated (less), crop diversification (more), and production practices (more labor- and input-saving strategies).
	Direct seeding (DS)	20% ↑ *	145% ↑ **	198% ↑ **	179% ↑ ***	
Pest Control	Weeding frequency (WS)	15% ↑ ns	17% ↑	160% ↑	42% ↑	
	Weeding frequency (DS)	24% ↑ *	9% ↑	205% ↑	89% ↑	
Fertilizer Management	N fertilizer use (DS) in kg/ha	7% ↑ *	28% ↓ **	11% ↓ *	25% ↑ ns	
	N fertilizer use (WS) in kg/ha	6%↓*	13% ↑ ns	1% † ns	11% ↓ **	
Crop Diversification	Other crops (WS)	121% ↑ ***	22% ↓	<b>796%</b> ↑	1451% ↑	production area and grain yield
	Other crops (DS)	133% ↑ ***	44% ↓	<b>647%</b> ↑	1295% ↑	the Philippines.
Rice yield	Grain yield (WS) in t/ha	12% ↓ *	57% ↑ ***	22% ↓ **	8% ↓ ns	
	Grain yield (DS) in t/ha	24% ↓ *	18% ↑ *	24% ↓ ***	54% ↑ *	<ul> <li>Provision for more input subsidie</li> </ul>
Table 1: Recent change2022)	e trends in rice production	strategies in	four province	es of the Phi	lippines (2018 vs.	may counteract current trends.
<b>DPSIR before RTL</b>						
Drivers	Pressures	States		Impa	cts	Response
<ol> <li>Typhoon</li> <li>Climate Change</li> <li>Farm input cost</li> </ol>	<ol> <li>Harvest destroyed by typhoon</li> <li>Straw burning</li> <li>Yield</li> </ol>	<ol> <li>Adoption of labor-saving technologies (e.g. combine harvester)</li> <li>Higher GHG emissions</li> <li>Higher fertilizer rate (from 1x to 2.5x)</li> </ol>			aved time and more quality arvests ought/stronger typhoon ower income	<ol> <li>More provision for technological advancement</li> <li>Environmental policy</li> <li>Crop diversity/shift-out of rice</li> </ol>
<b>DPSIR after RTL</b>						
Drivers	Pressures	States		Impa	acts	Response
<ol> <li>Climate change</li> <li>External war (e.g. Ukraine vs. Russia)</li> <li>Rice Trade Liberalization Law</li> </ol>	<ol> <li>Higher agrochemical use (from 1x to 3x)</li> <li>Fertilizer and fuel demand</li> <li>Low price of palay (freshly harvested rice)</li> </ol>	<ol> <li>Pollution (</li> <li>200% pric fertilizer at</li> <li>Influx of cl</li> </ol>	Pollution (e.g. water reservoir) 200% price increase for fertilizer and fuel Influx of cheap, imported rice		ealth and environmental sues ow to no income come deficit	<ol> <li>Environmental policy</li> <li>Farm inputs subsidy</li> <li>Farm inputs subsidy</li> </ol>
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