



Australian Government

Australian Centre for  
International Agricultural Research

# Addressing On-Farm Risks for Resilient Food and Nutrition Systems

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# Addressing on-farm risks makes food and nutrition systems more resilient

- Farmers' ability to **mitigate simultaneous risks** has compounding effects on food system resilience and economic stability
- Smallholders make **critical contributions** to global food security and economic and political stability

# Farmers face simultaneous risks

- Production, price/market, financial, institutional, and human risk
- Outcomes of risks have compounding effects
- On-farm outcomes cascade beyond the farm and affect global food systems



# Risk and vulnerability

Smallholders typically have less capacity to manage risks

- Food-insecure
- Less capital (including human)
- Poor infrastructure
- Land tenure
- Informal markets/institutions
- Little market power
- Poor information
- Poor social safety nets



# Global change as a risk multiplier



## Climate

Changing climate/weather patterns

More variable & volatile weather events/shocks

New pests and diseases

Water quality and quantity



## Economic volatility

Conflict

Globalisation and trade



## Urbanisation

Labour shifts

Off-farm income

Gender

Food demand changes



## Individual circumstances matter

### Determined by

- Resource endowment
- National economy
- Political economy
- History and culture

### Compounded by

- Gender
- Ethnicity
- Education...



### Options for smallholders

- Stepping up
- Hanging in
- Stepping out
- Stepping in

# How can research and capacity building contribute?

Management tools to **mitigate** risk and build **resilience** for the family farm

Options to **adapt** the family farm business to changing circumstances





## **Reducing production variability** (yield and quality)

- **Small holder irrigation schemes** – Maize in southern Africa
- **Pests and diseases** – Wheat blast in Bangladesh, Coffee Berry Borer in PNG
- **Farming systems** – Conservation agriculture in the Eastern Gangetic Plains
- **Sustainable intensification** – Africa and the Pacific



# Diversifying options



Products



Resources



Technologies



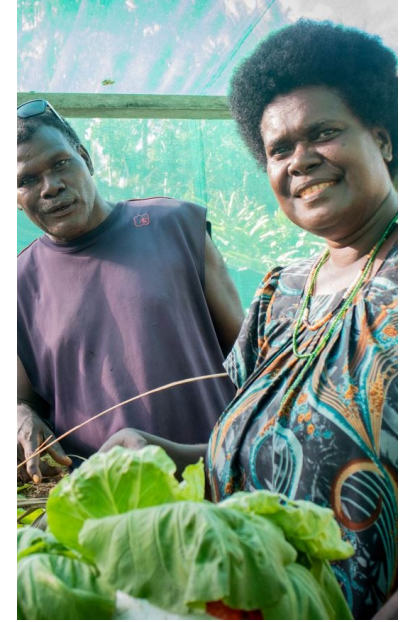
Markets



Policies



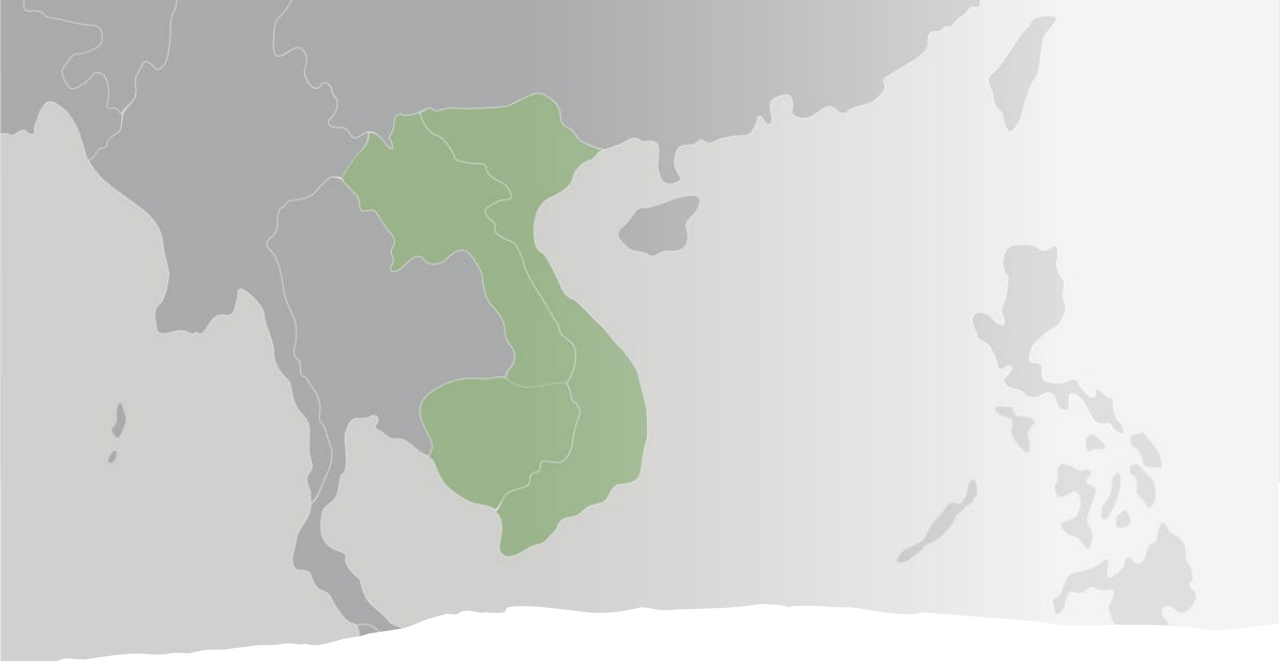
Business Models



# Addressing constraints to building resilience

- **Information**  
IndoDairy milk quality
- **Expertise**  
Plant Doctors
- **Capital**  
Mobile financing in Cambodia
- **Labour**  
Mechanisation
- **Natural capital**  
Restoring coral reefs, fishways on the Mekong





## System change and global shocks – from risk to uncertainty

Can a smallholder farmer in the Mekong Delta risk-manage their way out of being under water?

### The problem:

- Most of **40,000 km<sup>2</sup>** Mekong Delta less than **2m** above sea level
- Globally significant exporter of rice, shrimp and fruit
- Home to **18 million** people
- **40%** of Mekong Delta may be under **1m** of sea water in a matter of decades

A man in a light-colored shirt and dark pants is crouching next to a blue water container, filling it. The container is connected to a solar-powered water pump system. The pump has a solar panel mounted on a metal frame and a control box. The background shows a lush green field with tall trees and a clear sky.

# Beyond business as usual?

**Big challenges for agriculture:** climate, water, food, nutrition, energy, gender, resource competition, biosecurity, One Health, social license

**Innovation system** requires integration of research, technology development, private sector value chains, extension, education and governance

**What** do we invest in?

**Where** do we invest?

**Who** do we work with?

**How** do we partner differently?