Transforming Agriculture through Adoption of Climate Resilient Practices

Moises Neil V. Seriño, PhD

College of Management and Economics
Visayas State University

Challenge

- By 2050 the world's population will reach 9.1 billion, 34 percent higher than today. Nearly all of this population increase will occur in developing countries
- In order to feed this larger, food production must increase by 70 percent.

Climate Risk

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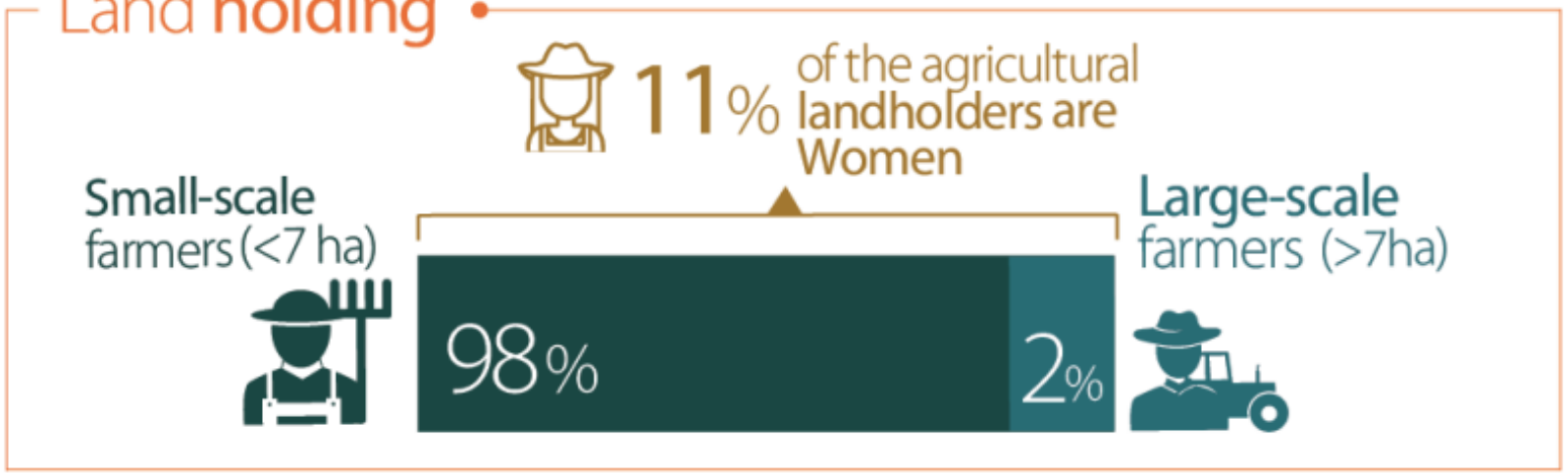
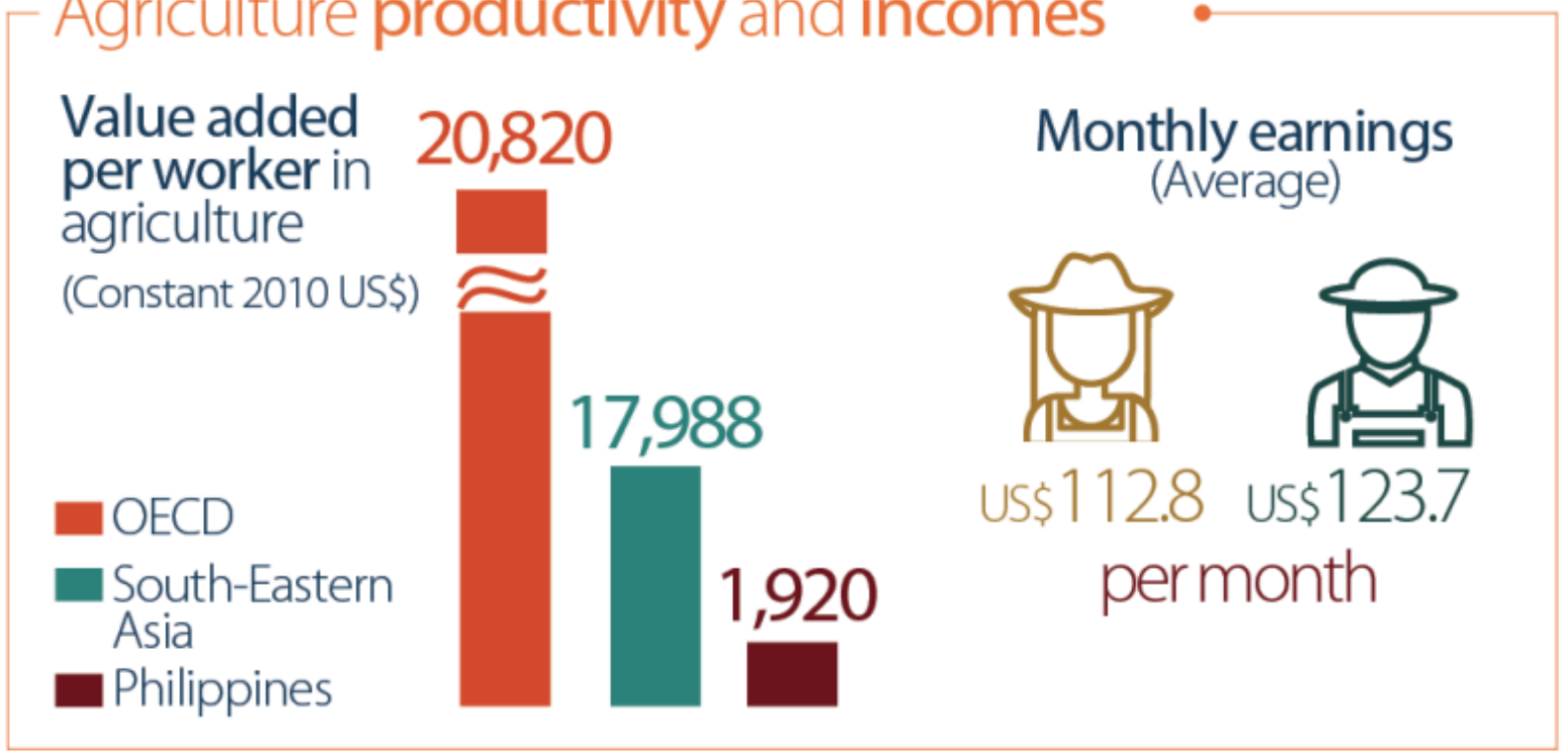
- The Philippines is among the top five countries most affected by extreme weather events (Global Climate Risk Index 2020).
- Agriculture bears the brunt of natural disasters, accounting for 62.7 percent or Php290 billion of the damage from 2010-2019 (Philippine Statistics Authority).

Philippine Agricultural Profile

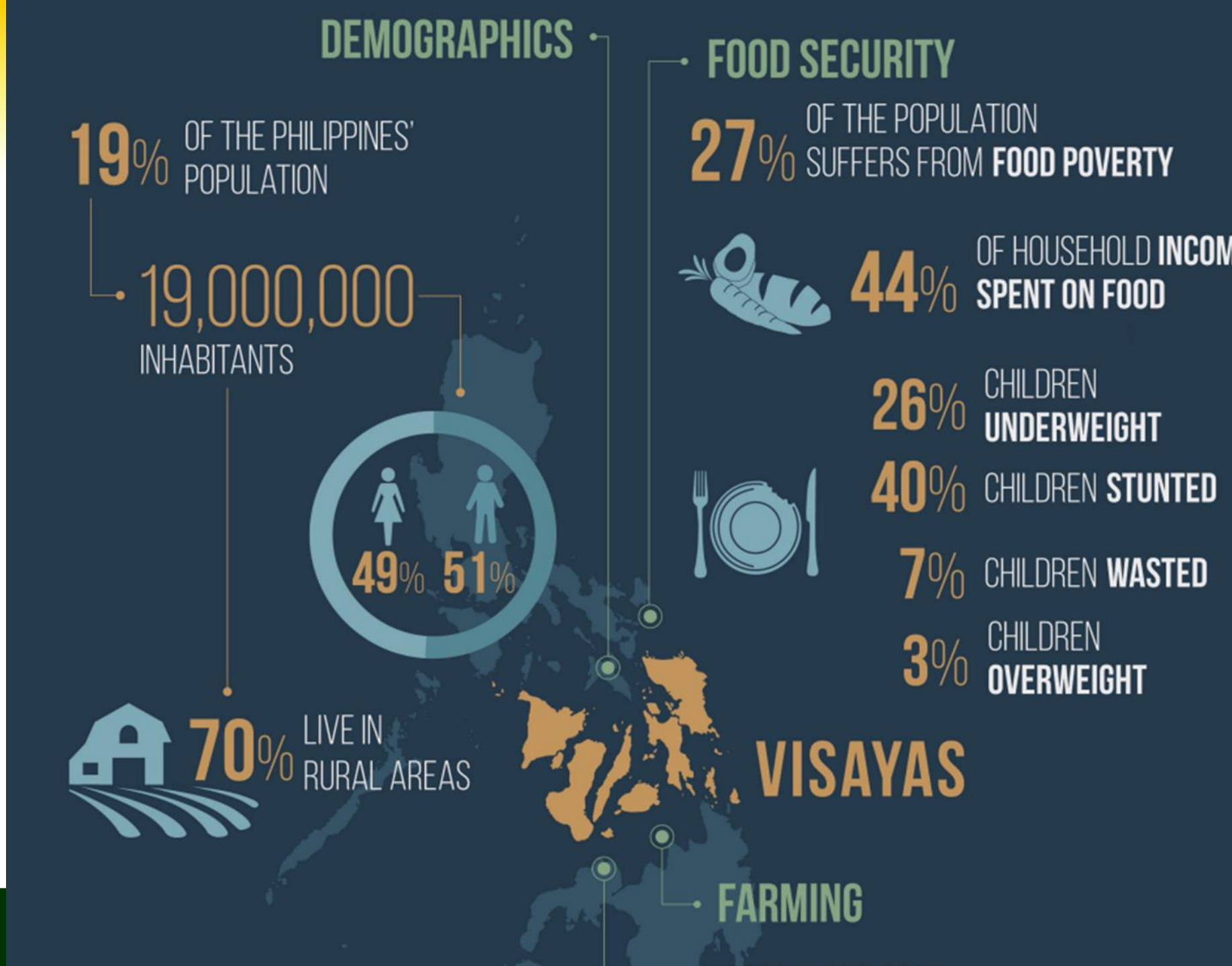
- Philippine agricultural is dominantly scale or subsistence level
- Farmers remain the group most affected by poverty with low productivity





Visayas Agricultural Profile

- Food security is also a challenge, with food poverty impacting 27% of the Visayan population



Small Scale Agriculture

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- Small scale farmers face challenges on increasing production because of occurrence of extreme weather events and changing climatic conditions.

Opportunity

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- Climate-resilient agriculture practices can help farmers better understand weather and climate impacts on agricultural systems so they can better prepare and make informed decisions.
- The adoption of climate-resilient agricultural practices and the use of climate information will minimize the risk of crop losses due to climate variability and climate change.

Climate Resilient Agriculture

Pillars of climate resilient agriculture

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A broad set of practices that sustainably (CGIAR, 2014):

- increases agricultural productivity and farm income (Productivity)
- reduces and/or removes greenhouse gas emissions where possible (Mitigation)
- enhances the achievement of food security and development goals (Adaptation)

Pillars of climate resilient agriculture (CRA)

CRA is agriculture that sustainably…

Productivity
…increases the **productivity** and agricultural **incomes**

Adaptation
…enhances agricultural resilience (Climate Change **Adaptation**)

Mitigation
…reduces / removes GHGs emissions where possible **(Mitigation)**

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Research Question

What are the climate-resilient production practices adopted by small-scale farmers in the Visayas and are these practices profitable enough to be scaled up?

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Research Activities

1. Conducted farmers survey in the Visayas area and documented CRA practices in Leyte, Bohol, Cebu, Negros
2. Analyzed the costs and benefits of conventional farming and climate resilient agricultural practices

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Bohol

	CRA Practices in Rice Production
1	Non-burning of rice straw
2	Rice crop manager
3	Different cropping systems
4	Agroforestry
5	Crop-animal integration
6	Traditional varieties
7	Crop switching or rotation
8	Water harvesting
9	Vermi-compost application
10	Use organic pesticides

Cebu

	CRA Practices in Vegetable Prod
1	Crop-Animal Integration
2	Different cropping system
3	Vermi-Compost Application
4	Indigenous crop species
5	Intercropping
6	Protective Cultivation
7	Crop Switching or Rotation
8	Microbial Technology
9	Organic Farming
10	Mulching

Leyte

	CRA Practices in Vegetable Prod
1	Different cropping system
2	Farm manure application
3	Crop animal integration
4	Agroforestry
5	Crop switching or rotation
6	Indigenous crop species
7	Intercropping
8	Protected cultivation
9	Organic Farming
10	Mulching

Vegetable protected cultivation

PRODUCTIVITY

ADAPTATION

MITIGATION

- Protected cultivation improves on the conventional practice by providing opportunity for farmers to produce off-season vegetables during rainy seasons. Farmers income will be higher with protected cultivation
- Can continue production even during excessive rainfall, reduces the risk of water logging and reduces incidence of pest and diseases
- Contributes to curbing carbon emissions and improving quality of ground water because of controlled use of pesticides and fertilizers

Gross margin analysis

Items	Protected Cultivation	Open Field
Yield (kg/30m^2)	1,029.96	818.40
Price/kg (PHP)	40	40
A. Gross Returns (PHP)	*41,198.40*	*32,736.00*
Materials and Input	13,987.50	11,861.50
Labor and Transport	11,960.00	12,080.00
B. Variable Cost (PHP)	*25,947.50*	*23,941.50*
C. Gross Margin (A-B) per 30m^2 (PHP)	**15,250.90**	**8,794.50**

CBA Results: Vegetable protected cultivation

Investment cost: PhP 40,000

Payback Period: 2 years

NPV
PhP 43,526.98

IRR
60.42%

Environmental NPV
PhP 62,556.23

Environmental IRR
70.45%

Remarks on CRA

- The shift from conventional to CRA practice generates positive incremental benefits because of higher yield and reduce input use.
- For 10-year period, financial indicators such as NPV and IRR indicates financial soundness of this investment

List the externalities identified:

- The adoption of protected cultivation has a positive externality manifested through (i) improve water quality of ground water due to reduced chemical run-off from pesticide and insecticide use and (ii) reduced carbon emissions

Policy Support

- Provision of technical assistance or capacity building to farmers to shift to CRA practices
- DA can come with a list of CRA practices
- Provision of incentives or financial assistance to adopt conservation management practices

/www.nrcs.usda.gov/sites/default/files/2022-10/Conservation%20Incentive%20Contracts

w | Read aloud | Ask Copilot

FY2022 EQIP-CIC Eligible Practices

CODE	ASSET
328	Conservation Crop Rotation
329	Residue and Tillage Management, No Till
333	Amending Soil Properties with Gypsum Products
338	Prescribed Burning
340	Cover Crop
345	Residue and Tillage Management, Reduced Till
368	Emergency Animal Mortality Management
373	Dust Control on Unpaved Roads and Surfaces
375	Dust Management for Pen Surfaces
376	Field Operations Emissions Reduction
399	Fishpond Management
400	Bivalve Aquaculture Gear and Biofouling Control
449	Irrigation Water Management
450	Anionic Polyacrylamide (PAM) Application
484	Mulching
511	Forage Harvest Management
528	Prescribed Grazing

CRA

Categories

- Soil health
- Nutrient management
- Livestock integration
- Energy
- Irrigation
- Emissions
- Etc..

USDA Natural Resources Conservation Service
U.S. DEPARTMENT OF AGRICULTURE

Climate-Smart Agriculture and Forestry (CSAF) Mitigation Activities List for FY2024

Highlighted activities have been added to the list in FY2024.
*Noted activities are added to the list as "provisional."[1]

Mitigation Categories [5]	Code	Conservation Practice Standard Name[2] [3] (practice unit)	Code	Conservation Stewardship Program (CSP) Enhancement Activities
Soil Health	327	Conservation Cover (acres)	E327A	Conservation cover for pollinators and beneficial insects[2]
			E327B	Establish Monarch butterfly habitat
	328	Conservation Crop Rotation (acres)	E328A	Resource conserving crop rotation
			E328B	Improved resource conserving crop rotation
			E328E	Soil health crop rotation
			E328F	Modifications to improve soil health and increase soil organic matter
			E328N	Intercropping to improve soil health
			E328O	Perennial grain crop conservation rotation
	329	Residue and Tillage Management, No Till (acres)	E329A	No till to reduce soil erosion
			E329B	No till to reduce tillage induced particulate matter
			E329C	No till to increase plant-available moisture
			E329D	No till system to increase soil health and soil organic matter content
			E329E	No till to reduce energy

Can We Transition?

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- Farmers are experiencing firsthand the adverse effects of climate change
- Farmer can contribute to addressing climate change issues by adopting climate resilient practices
- To facilitate adoption, government should provide funding or incentives
- Climate change finance plays a key role, however there is limited number of financial instruments available to support CRA activities in the country

Thank you very much for your attention

Email: moisesneil.serino@vsu.edu.ph