

Policy Brief

Institutionalization of Climate Resilient Agriculture: Foresight Modelling to Develop Policy Options for Building Long-Term Resilience in Agri-Food Value Chains in the Philippines May 2024¹

Introduction

Agriculture is pivotal to food security, income, and livelihood, particularly in the context of post-pandemic economic recovery. However, climate change poses significant threats to productivity and sustainability. The impacts of climate change and water scarcity on Philippine agriculture can be substantial, estimated to be around US\$690 million annually. Using Foresight Modelling, this policy brief outlines strategic investment and policy recommendations to enhance long-term sector resilience and sustainability, ensuring its continued contribution to economic growth and food security.

Methodology

A suite of biophysical and economic models was calibrated for Philippines and implemented to comprehensively estimate the impacts of climate change on the agriculture sector and to the entire economy. The models include: (a) global hydrology, water allocation, and water-stress modules; (b) DSSAT Model as crop module; (c) a spatial production allocation model (SPAM); and (d) general circulation.

Climate-Growth Nexus

The western and southern regions of the country are projected to be hottest by 2050, with maximum average temperature increase of 4.3 °C, and minimum temperature decrease of 0.4°C – and mean average temperature of 2.3°C. In the Philippines, average mean rainfall is to decline by 47.2 mm/month, with average maximum increase in rainfall of 529.7. The eastern corridor of Visayas and Mindanao can be the relatively wetter part of the country by 2050.

Based on modelling, potential climate change effects by Year 2050 were quantified vis-à-vis the following parameters: crop productivity; yield of food commodities; food production; trade of food; caloric intake and food consumption; and welfare of society. Three major challenges are highlighted in the study:

- **Climate Change Impacts:** Projected increases in temperature and variability in rainfall by 2050 threaten crop yields and agricultural productivity. Corn and sugar yields could decrease by up to 23% and 11%, respectively.
- **Economic Vulnerability:** The agricultural sector faces significant climate change risks, potentially costing \$690 million annually.
- **Resource Limitations:** Land and water scarcity exacerbate the impacts of climate change, reducing the availability of fertile land and water for irrigation.

Policy and Investment Scenarios

To address these challenges, the following policy and investment strategies are recommended, along with a calculation of the projected effects of each policy option on production and trade; and projected impacts on crop and livestock yields, food production, consumer prices, food trade, and food security.

1. Comprehensive Policy and Investment Framework

- Adoption of **AMIA Enterprise Investment Strategy** integrates technological, infrastructural, and market responses to climate change. It focuses on mobilizing rural communities and strengthening agriculture-based organizations and institutions, aiming to achieve productivity, livelihood improvement, and sustainability.
- Enhanced **research and development (R&D) investment in agriculture for climate-smart technologies**, including crop and livestock adaptation, improving soil fertility management, developing resilient crop varieties, and enhancing water-use efficiency.

2. Infrastructure Development

- Invest in **expanding irrigation** systems to cover more agricultural areas, enhancing water productivity, and ensuring stable water supply for crops.
- Develop **post-harvest infrastructure** for processing, storage, and transportation to reduce post-harvest losses and improve food quality and shelf life. This can minimize waste and increase food supply efficiency.

3. Institutional and Market Mechanisms

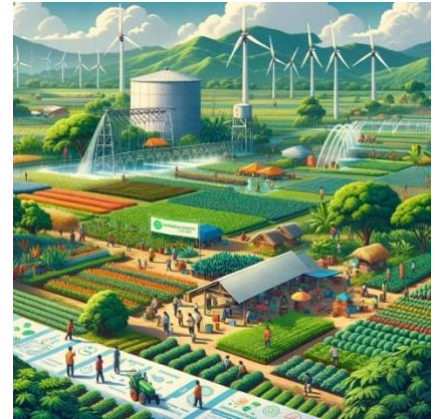
- **Market and value chain improvements** focusing on strengthening market structures to reduce food supply chain costs, minimize losses, and enhance the efficiency of food distribution systems.
- Support the development of **community-owned rural enterprises** that can improve the economic resilience of smallholder farmers by providing better access to markets and financial resources.

4. Detailed Implementation Roadmap

- Develop a comprehensive and detailed roadmap for implementing the AMIA Plus and AMIA Enterprise investment frameworks. This roadmap should include coordinated planning by government departments, collaboration with international donors, and integration into national and local development plans.

Conclusion

Proactive measures and strategic investments are crucial to safeguard the Philippine agriculture sector against the impacts of climate change. By adopting a comprehensive policy framework and investing in resilient technologies and infrastructure, the Philippines can enhance agricultural productivity, ensure food security, and promote sustainable economic growth.



¹ Prepared by the TRTA Consultant under ADB TA-10009 PHI: Accelerating Climate Resilience in Agriculture, Natural Resources, and the Environment - 01TA Consulting Firm (55268-002). The full study can be accessed through this [link](#)