The Impact on Crop Production and Yield of Farmers in Bugallon, Pangasinan

An Undergraduate Thesis Presented to the Faculty
Members of the Economics Department
Pangasinan State University
Lingayen Campus
Lingayen, Pangasinan

In Partial Fulfillment of the
Requirements for the Degree
Bachelor of Arts in Economics

Supangan, Merry Angel M.
III-B BA Economics

February 2025

CHAPTER 1

INTRODUCTION

This chapter outlines the preliminary part of the study. It provides an overview of the background of the study, statement of the problem, research hypothesis, significance of the study, scope and delimitation, and the definition of terms.

Background of the Study

Flooding is a significant concern for farmers in Bugallon, Pangasinan, reducing crop productivity and yield. It harms crops, depletes soil quality, and causes financial losses. This study investigates the scope of these effects and how farmers adjust to periodic floods. The findings will be used to build strategies for improving agricultural resilience in the area.

On a global scale, flooding continues to be a major threat to agriculture. According to the Food and Agriculture Organization (FAO), disasters—including floods—have caused an estimated $3.8 trillion in losses to crop and livestock production over the past 30 years, averaging $123 billion annually (Zaidi, 2023). These disasters lead to reduced agricultural productivity, soil degradation, and food insecurity (Zaidi, 2023). Between 2008 and 2018, floods accounted for 19% of total agricultural losses in Least Developed Countries (LDCs) and Low- and Middle-Income Countries (LMICs), resulting in $21 billion in damages to crop and livestock production (FAO, 2023; Anderson & O'Brien, 2023). The submersion of farmlands leads to oxygen depletion in soil, nutrient leaching, and increased susceptibility to pests and diseases, significantly reducing crop yields (FAO, 2023).

In the United States, floods have repeatedly disrupted agricultural activities. Prolonged waterlogging negatively affects plant root systems, reducing their ability to absorb nutrients and leading to stunted growth and lower yields (Pioneer, 2024; Johnson, 2024). A recent example is the 2024 Hurricane Helene, which triggered extreme flooding in Tennessee and North Carolina, devastating farmland and causing substantial yield losses (Sulnit, 2024). These global cases

highlight how flooding disrupts crop production and yield, making it crucial for farmers and policymakers to develop adaptive strategies to mitigate its effects.

Several barangays in Bugallon, Pangasinan, are extremely prone to floods, making it difficult for local farmers. Farmlands become swamped during the rainy season and following heavy typhoons, resulting in crop destruction, lower yields, and financial losses. Many farmers in these locations struggle to recover their seed, fertilizer, and labor expenditures because extended water exposure reduces soil quality and plant development.

The Flooding in Bugallon problem is exacerbated by poor drainage systems, overflowing rivers, and the effects of climate change, which increase the frequency and severity of heavy rainfall. Farmers frequently experience lower profitability or even complete losses, which affect not just their livelihoods but also the local economy and food supplies. Understanding the scope of these difficulties is critical for establishing mitigation methods and support mechanisms to assist farmers in adapting to changing environmental conditions and maintaining agricultural productivity in Bugallon.

Statement of the Problem

The purpose of this study is to determine the impact of flooding on crop production and yield of farmers in Bugallon, Pangasinan. Specifically, the study aims to answer the following:

1. What is the profile of the farmer respondents in terms of:

a. Age;

b. Sex;

c. Civil Status;

d. Highest Educational Attainment

e. Years of Farming Experience

f. Farm Size and Location

g. Type of Crops Cultivated

h. Frequency of Flooding Experienced

i. Access to Government Support and Assistance

2. What is the extent of flooding experienced by farmers in Pangasinan in terms of;

a. Crop Production

b. Yield

c. Income

3. Is there a significant difference between the profile of farmers and the extent of flooding's impact on their crop production and yield?

Research Hypothesis

The Null Hypothesis is:

Ho: There is no significant difference between impact of flooding on crop production and yield of farmers among the farmers in Pangasinan.

Significance of the Study

The present study aims to analyze how flooding has an effect on crop production and farmers income in Bugallon, Pangasinan. The results will be beneficial to the following:

Farmers. This study provides farmers with an understanding of the flood-related damage to their crops and income. They may be provided with insights on loss mitigation measures to keep them advanced in their agriculture under the changing weather patterns.

Local communities. Since many farming communities in Bugallon are dependent on agriculture, this research could further assist those communities in preparing for the effects of flooding. A stable livelihood and food supply for the people residing locally mean a stronger and more resilient agricultural sector.

Future Researchers. Referencing this study may help in all future agriculture, climate change, and disaster-resilience research. It may also help to unearth solutions that could be applied to minimize the impact of the floods on farmers.

Scope and Delimitation of the Study

This study focuses on how flooding affects the crop production and yield of farmers in Bugallon, Pangasinan, especially in areas highly hit by typhoons within the municipality. It examines how floods damage crops and impact farmers overall livelihood. The study primarily gathers data through surveys conducted among selected farmers to understand their experiences, losses, and coping mechanisms. However, this study is limited to selected farmers in the area and does not cover other factors such as government assistance, market conditions, or the effects of other natural disasters.

Definition of Terms

Flood. A natural disaster, caused by excessive precipitation, river overflow and poor drainage device which makes water surface above ground elevation.

Farmers. People who cultivate crops and rear livestock as their primary means of production and living (FAO, 2019). For the purpose of this study, farmers refer to agricultural workers in Bugallon, Pangasinan who depend on crop production as the basis for their livelihood and are directly affected by flooding.

Crop Yield. The measure of agricultural output per unit of land, usually expressed in metric tons per hectare. As an indicator demonstrating how productive a farm is at producing food (World Bank, 2021). For this study, crop yield refers to the amount harvested crops per hectare of land among farmers in Bugallon, Pangasin and how this is affected by flood occurrences.

Agricultural Livelihood. The way of life that is derived from farming, including cultivation, livestock production and related rural business (UNDP, 2022). In the context of this study, agricultural livelihood refers to the income and living conditions of farmers in Bugallon, Pangasinan, which is affected by disruptions caused by flooding.

References

Food and Agriculture Organization (FAO). (2023). *Disasters in agriculture interactive report.* Retrieved from https://www.fao.org/interactive/disasters-in-agriculture/en

Sulnit, R. (2024, October 4). Hurricane Helene: A humanitarian crisis and climate disaster. *The Guardian*. Retrieved from https://www.theguardian.com/commentisfree/2024/oct/04/hurricane-helene humanitarian-crisis-climate-disaster

Zaidi, Z. (2023, October). Disasters have cost $3.8 trillion in crop losses over the past 30 years, FAO reports. *Phys.org.* Retrieved from https://phys.org/news/2023-10-disasters-tn-crop-years-fao.html

Brewin, P. (2012). Somerset Levels flooding. *ADA Gazette, Summer 2012*(p. 18). Association of Drainage Authorities. Retrieved from http://www.ada.org.uk/gazette.html

Shrestha, B. B., Perera, E. D. P., Kudo, S., et al. (2019). Assessing flood disaster impacts in agriculture under climate change in the river basins of Southeast Asia. *Natural Hazards, 97*, 157–192. Retrieved from https://doi.org/10.1007/s11069-019-03632-1

Israel, D. C., & Briones, R. M. (2012). *Impact of natural disasters on agriculture, food security, and natural resources and environment in the Philippines (PIDS Discussion Paper Series No. 2012-36).* Philippine Institute for Development Studies. Retrieved from https://hdl.handle.net/10419/126912

Lesk, C., Rowhani, P., & Ramankutty, N. (2016). Influence of extreme weather disasters on global crop production*. Nature, 529*(7584), 84–87. https://doi.org/10.1038/nature16467

Sivakumar, M. V. (2005). Impacts of natural disasters in agriculture, rangeland and forestry: An overview. In Sivakumar, M. V., Motha, R. P., & Das, H. P. (Eds.), *Natural disasters and extreme events in agriculture* (pp. 1–22). Springer. Retrieved from https://doi.org/10.1007/3-540-28307-2_1

Weerasekara, S., Wilson, C., Lee, B., & Hoang, V. N. (2021). Impact of natural disasters on the efficiency of agricultural production: An exemplar from rice farming in Sri Lanka. *Climate and Development, 14*(2), 133–146. Retrieved from https://doi.org/10.1080/17565529.2021.1893635