Protected Cultivation of High Value Vegetables

Protected cropping system utilizes permanent structures covered in plastic to achieve year-round production of high value vegetables such as cauliflower, lettuce and sweet pepper. Complementing the system with drip irrigation made up of 3 pieces of drip irrigation hose, metal pipes, and 1 plastic barrel water tank allows the farmer to use water more efficiently as little water is lost due to evaporation or runoff. In the study site, a typical permanent structure stands 3.5 meters tall, is fabricated of an aluminum frame and has an effective cultivation area of 100sq.m. It allows farmers to plant vegetables up to five times a year. The structure can last for 10 years but the drip irrigation hose and the covering materials made of fine mesh requires replacement every 5 years.

Aside from crop damage caused by heavy rainfall and strong winds, farmers also encounter problems of pest infestation and heavy rainfall and strong winds, thereby, protecting farmers from incurring losses.

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- Region VIII: Eastern Visayas
  - Any Crop Crop-Drying for Rice in Samar
  - Protected Vegetable Cultivation in Samar

**TECHNICAL BRIEF on Climate-Resilient Agriculture (CRA) Eastern Visayas (Region VIII)**

Protected cultivation of high value vegetables such as cauliflower, lettuce and sweet pepper is a CRA practice that makes use of permanent structures covered in plastic with drip irrigation systems installed. This system enables the production of high value vegetables year-round. Compared to open field cultivation, farmers adopting the CRA practice can increase yield and income while producing clean and safe vegetables. Protected cultivation technology can result to reduced nutrient leaching and fertilizer and pesticide use.

**References**


About the Authors

The authors would like to acknowledge the active participation of our farmer respondents, the local counterparts from the Local Government and the Department of Agriculture Regional Field Office VIII and the financial support provided by the DA-Bureau of Agricultural Research (DA-BAR) and DA-AMIA.

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Financial Analysis

Yield & Prices

**Without CRA**
- **Plant**: Cauliflower, lettuce, sweet pepper
- **Average annual farm yield**: 83 kg/100sqm/yr, 16 kg/100sqm/yr, 0 kg/100sqm/yr
- **Price per kg**: PhP 135, PhP 300, PhP 115

**With CRA**
- **Plant**: Cauliflower, lettuce, sweet pepper
- **Average annual farm yield**: 112 kg/100sqm/yr, 176 kg/100sqm/yr, 102 kg/100sqm/yr
- **Price per kg**: PhP 135, PhP 300, PhP 115

**Sensitivity Analysis**

The CRA practice will still be more profitable than non-CRA practice even when:
- Yield of cauliflower, lettuce and sweet pepper decrease by 55%

**Aggregate Impact**

- **Total number of structures**: 2,200
- **Aggregate NPV**: PhP 66.2 million

**Recommendations**

- **Protected cultivation of high value vegetables is profitable year-round in the province of Samar, especially in the vegetable-producing areas.**
- **Aside from growing cauliflower, lettuce and sweet pepper, farmers adopting the CRA practice can also plant other vegetables like chili pepper and tomato.**
- **Farmers engaged in vegetable production are encouraged to invest in the practice.**

**Cost & Benefit**

- **Initial Investment**: PhP 113,500
- **Payback Period**: 2 years
- **Estimated Additional Annual Profit/100sq.m.**
  - **Without CRA**: PhP 58,450 (USD 1,139)
  - **With CRA**: PhP 58,450 (USD 1,139)

**Cost of Adopting CRA**

- **Initial Investment**: PhP 113,500
- **Installation costs (Year 1)**: PhP 7,000
- **Structure & Equipment**: PhP 100,500
- **Inputs**: PhP 6,000
- **Maintenance Annual costs (Years 2-10)**: PhP 18,500
- **Operations irregular/ non-permanent costs**: PhP 27,000

**Study Site**

**Samar Province**

**Data Gathering**

1. Analysis of experiences of 2 case farms in the municipality of Sta. Rita, Samar
2. Validation of KIIs using results of field trials in the region by the Yamang Lupa Program (YLP)
3. Conduct of Experts’ Workshop with experts from the academe (Visayas State University) and the government (Department of Agriculture Region 8) pooling knowledge and insights on emerging climate resilient farm practices
4. Conduct of workshop with Municipal Agricultural Officers (MAO) to validate and add to results from Experts’ Workshop and case farms
5. Review and synthesis of secondary information

**The CIAT CBA Methodology**

Cost-Benefit Analysis (CBA) is used to determine the relative profitability of alternative cropping practices, involving the comparison of the annual flows of incremental benefits with that of incremental costs. The CIAT CBA Online Tool analyzes the full benefits and costs of identified practices and adoption response at both individual farmer level and at aggregate level for a particular area.

Specifically, the tool can:
1. Quantify economic and some environmental trade-offs of adopting CRA practices.
2. Provide sensitivity analysis
3. Estimate the level of peak adoption

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