



Climate-Smart Agriculture Practices Investment Prioritization

Investment Prioritization for Region III: Crop Rotation- Zero Tillage Combination

Overview

Region III is located in the central plains of Luzon with a total land area of 2,147,036 ha spread in seven provinces, 14 cities and 116 municipalities (PSA, 2015).

The region contributes almost 10% of the National Gross Domestic Product. The agricultural sector gives 17% of the regional output, employing 22% of the labor force (DA RFO III).

The province of Tarlac has a total population of 1,366,000, composed of 280,382 households. Tarlac City is the most populous while Anao is the least populous (PSA, 2015).

Out of the 305,345 ha of land in the province, 54.37% are utilized in agriculture. Rice, corn, and rootcrops are the main crops cultivated in the province (Provincial Agricultural Office, 2015).

The province is frequently visited by typhoon and floods. Likewise, limited access to water is a concern in areas without irrigation facilities (Philippine Rural Development Project Provincial Commodity Investment Plan, 2015). The effect of these calamities on agricultural lands is a major concern.

Prioritized CRA Practice

Some areas in the province suffer flooding during rainy season and drought during dry season. These extreme conditions greatly affect the practices of farmers. Under both conditions climate smart varieties/lines for both rice and corn were favored because of its high yield and capacity to withstand adverse weather conditions. This practice is selected considering farmers' income and food security.

Improved varieties of corn, the BtGt (*Bacillus thuringiensis Gt*) is high in yield, resistant to corn borer, and tolerant to glyphosate/herbicide making it environment-friendly because of less pesticide usage.

To take advantage of the residual moisture after rice harvest, zero tillage is practiced for corn planting, a soil conservation technology that does not require conventional land preparation. It only requires a planting guide: plastic strings and a simple tool.

Data Gathering and Methodology

The use of multi-stress varieties in rice and corn was prioritized among the CRA practices identified during a series of Focus group discussion with seventy one (71) farmer leaders, agricultural technologists and city/municipal agriculturists. This was further validated in an interview with farmers using





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conventional and improved varieties of rice and corn, both applying a combination of organic and inorganic fertilizer.

Farmers in the municipalities of San Manuel, Moncada and Paniqui and other municipalities of Tarlac in the north plant either corn or sweetpotato after rice. Corn production in the province supports ___ feed mills located in the province while sweetpotato provides the growing demand for the product for food and feed

The Municipal Agricultural Officer of San Manuel, Tarlac recommends both conventional and climate smart practices for corn. The difference lies on the price of seed inputs, amount of organic fertilizer, application of micronutrients, the use of insecticide, and labor requirement.

Results

Farmers using the CSA practice requires an investment in the planting guide for the zero tillage. It also requires 20 man-days in planting to substitute the land preparation services in the conventional practice.

The high price of seeds of the CSA variety is compensated for by its positive impact to the environment by not applying pesticides. Additional 9kg input of micronutrients from the organic fertilizer

helps in the development of the bushel making it bigger and heavier.

Based from current prices, results of field trials and past experiences of key informants, the use of CSA variety of corn in combination with zero tillage is privately profitable at 15% discount rate with \$4,571.63 NPV and an IRR of 126%. With an initial investment of \$663.92, the payback period of investment is 2 years.

From the point of view of the society as a whole, the eventual use of CSA varieties seems to be more attractive with \$9,370 SNPV.

Recommendations

Apart from the use of CSA varieties, rotating rice with either corn, sweetpotato, or mungbean is also recommended. The application of organic fertilizer is likewise recommended in areas with rice-corn-corn cropping pattern since corn consumes large amount of nutrients from the soil.

It is also recommended that Rice-Corn-Mungbean or Rice-Corn-Sweetpotato cropping pattern instead of Rice-Corn-Corn to lessen the use of inorganic fertilizer and maintain the productivity of the soil.



Summary of Results

CBA tool summary Farm (1 ha) results	Net present value (NPV)	Internal rate of return (IRR)	Payback Period	Initial investment	Social NPV	Social IRR	Scenario in the analysis (10 years)	
Unit	US\$	%	Years	US\$	US\$	%	Before	After
Value	4,571.63	126	2	663.92	9,370	-	Bt variety	BtGt variety
Aggregate analysis CBA tool summary	Total area of corn	Current adoption rate	<i>Adoption rate</i>	<i>Aggregated NPV</i>			Period	
	14,588	2%	5%	83,091.71			10	