



Climate Resilient Agriculture Practices Investment Prioritization

Investment Prioritization for Region X: Northern Mindanao on Corn-Banana Crop Diversification

Overview

The agriculture sector in Northern Mindanao employs 40 percent of the region's labor force.^[1] Climatic condition and natural resources of the region make the production of its major crops possible. Pineapple, banana, and corn are the region's major crops, ranking first, second and third, respectively, by volume of production in the Philippines.^[2]

The province of Bukidnon leads in the production of most agricultural commodities in the region. It contributed 67 percent of regional supply for corn in 2014. Corn sufficiency level in the province, however, is still at 75 percent.

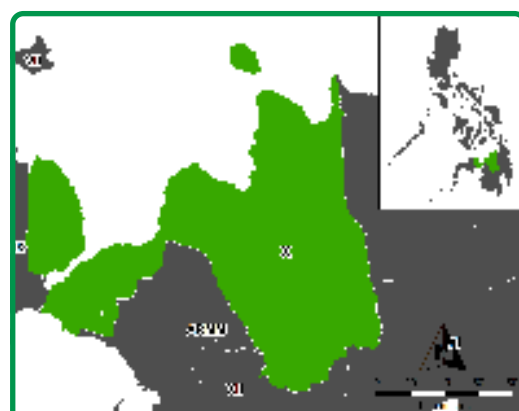
In the face of agricultural productivity, the region is not exempted from climate hazards like typhoon, drought, soil erosion, and flooding. The long dry spell from February to late May 2016 brought the region in a state of calamity. Loss of agricultural investment was estimated at Php793M with losses in corn at Php615M.^[3] In Bukidnon, the municipalities of Damulog and Kitaotao were found highly vulnerable to climate change due to low adaptive capacity and high sensitivity to climate hazards. These experiences reflect the growing vulnerability of the agriculture-dependent economy towards climate change.

Prioritized Climate Resilient Agriculture (CRA) Practice

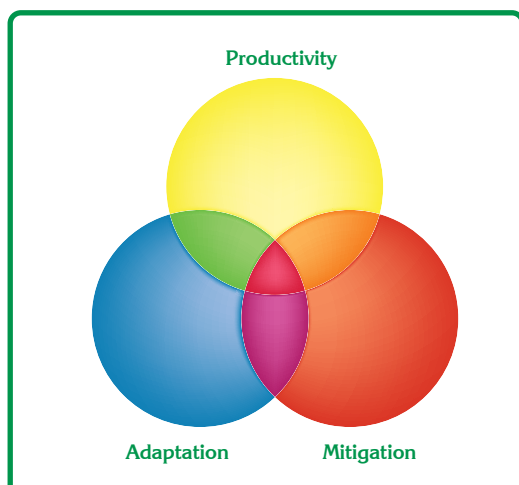
Crop diversification is a practice of planting two or more crops in the same area of land at the same time. The practice provides alternate on-farm income and maximizes the use of resources.

In this CRA, corn is planted together with banana at the peripheries as hedge grow or contour crop in slight to medium-sloped areas. Corn is planted as the main crop for commercial and family consumption. Banana is produced to augment farm income before corn is harvested or during low production seasons. The Cardaba banana cultivar, as part of the local diet, is prepared as snack or as substitute to the staple corn and rice. Local demand utilization include processing into snack foods, banana paste, and sauce.

Economic analysis was conducted in the pilot area of San Jose, Malaybalay City, province of Bukidnon. Crop suitability of corn, responsiveness of local government workers, and presence of functional farmer's organization were considered in selecting the area.



Geologically a combination of plains, mountains, rolling hills and coastal areas, Northern Mindanao is composed of the provinces of Bukidnon, Camiguin, Lanao del Norte, Misamis Occidental and Misamis Oriental.



Practices are considered CRA if they enhance productivity and at least one other objective of CRA (adaptation and/or mitigation). The CRA pillar (diagram shown) was used as basis for the prioritization of the CRA practices in all regions.

Data Gathering Methodology

Eight Key Informant Interviews (KII) of local farmers cross verified the result of FGD. Data gathered was on the cropping year 2016 and calculated in per hectare analysis. Secondary data from statistical reports and scientific literatures completed the data requirements in the Cost-Benefit Analysis (CBA) tool prescribed by the International Center for Tropical Agriculture (CIAT). Analysis was limited to the estimations produced in the CBA tool.

Results

Initial investment in diversifying from pure corn to corn-banana production is Php32,219 (USD 661). Majority of the investment is directed to additional material inputs and farm equipment/tools during installation. Sloping land terrains necessitates investment on draft animal. Observed higher operation cost is associated with monthly labor and transport cost in harvesting and marketing banana. Higher farm cost is expected in the first year of implementation. Financial benefit, specifically with banana, starts after the second year and reaches maximum on the third year.

Given the current prices, actual difference in yield, and discount rate of 12 percent, present value of future net cash flows from investment is positive at Php37,809 per hectare (USD 776). Estimated internal rate of return (IRR) is 30 percent making the CRA practice less risky for farmers to adopt. Full recovery of investment, however, takes six years. Increasing farm yield and better management practices for banana may shorten the payback period. Base from literature, diversified farming contributes positive impact ecologically through increased rainfall infiltration^[4] and decreased soil erosion^[5]. Incorporating the identified environmental benefits, this CRA practice seem more attractive with social net present value (NPV) of around Php116,845 (USD 2,398). Out scaling the analysis to total corn production areas in the community, at estimated 57 percent adoption rate, results to aggregate present value of benefits at Php103M (USD 2,117,273).

Recommendations

Benefits from corn-banana production exceeds its costs, therefore investment is feasible.

Further, in order to reduce the degree of uncertainty in the evaluation of CRA impacts, it is recommended to allocate funds to finance further researches toward gaining more information on environmental externalities.

CBA Tool Summary Results

Farm-level Analysis	Net present value (NPV)	Social and Environmental NPV	Internal Rate of Return (IRR)	Social IRR	Payback Period	Initial Investment	Scenario in the Analysis	
	USD 776*	USD 2,398	30%	65%	6 years	USD 661	WITHOUT CRA: Conventional Corn Production	WITH CRA: Corn-Banana Crop Diversification
Aggregate analysis	Total area of corn	Current adoption rate	Adoption rate	Aggregate NPV		Period		
	855ha**	7%	57%	USD 2,117,273		10 years		

*USD 1 = Php48.73

**Cultivated corn area in San Jose (pilot area)

References

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- ^[2] Philippine Statistics Authority (2015). Selected statistics on Agriculture 2015. Retrieved from <https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202015.pdf>
- ^[3] Mascarinas, E. (2016, February 26). Drought costs Northern Mindanao agriculture almost P800M. Interaksyon. Retrieved from <http://interaksyon.com/article/126/drought-costs-northern-mindanaoagriculture-almost-p800m>
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