



Climate Resilient Agriculture Practices Investment Prioritization

Investment Prioritization for Region I: Ilocos Region on Rice-Tomato Rotation

Overview

Region 1 has a Type I climate characterized by distinct wet and dry season with an average rainfall of 2,837.57 mm. Ilocos Norte is the wettest (3,133.77 mm average rainfall) while Ilocos Sur is the driest (2,305.50 mm average rainfall). The region is vulnerable to typhoons, floods, droughts, insect and disease infestations, and salt intrusion in the coastal areas.

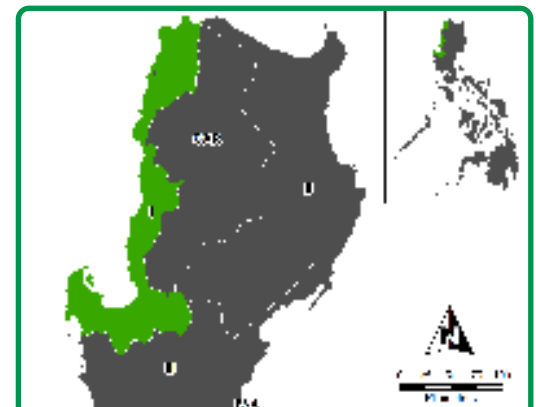
Rice-based cropping system is commonly practiced in the region especially in the rainfed areas. Rice is planted during the wet season while tomato, corn, tobacco, pepper, eggplant, and other vegetables are planted during the dry season. Judicious amounts of synthetic fertilizers and pesticides^[1] are applied to obtain high yields. As a result, degradation of soil and groundwater qualities are now evident.

Prioritized Climate Resilient Agriculture (CRA) Practice

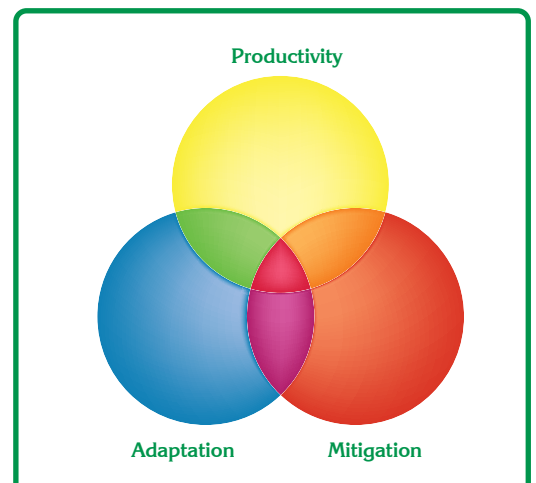
In order to abate the effect of climate change and the worsening degradation of soil in the area, the use of climate-smart varieties and technologies that are cost-efficient and sustainable is imperative. Thus, the rice-tomato rotation in combination with climate-smart varieties and application of Bio-N and organic fertilizer are promoted to help farmers adapt and become resilient.

For rice, planting NSIC Rc 480, a variety that was developed for drought-, flood-, and saline-prone areas, and low fertilizer input will ensure farmers to obtain high yields. In addition, reducing the application of synthetic fertilizer by 35-50 percent using Bio-N and organic fertilizer will increase and sustain farmers' productivity. Application of organic fertilizer and Bio-N will increase soil biodiversity and ultimately improve soil fertility.

The use of improved variety of tomato (V9), which was primarily developed for tomato paste can withstand infestation of tomato leaf blight which is common in the area. Ilocos Red, the common variety planted, is susceptible to the said disease. Thus, this practice ensures abundant supply of tomato to sustain the production of the tomato paste industry in the region through the National Food Corporation. The use of Mycorrhiza provides different benefits to the crops and to the soil. It allows plants to efficiently absorb phosphorous and water from the soil. It also increases plant tolerance to different environmental stresses resulting to more vigorous and healthy plants.



Encompassing the northwestern coast of Luzon Island, Ilocos Region is composed of the provinces of Ilocos Norte, Ilocos Sur, La Union, and Pangasinan.



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

Initial interview through Focus Group Discussion (FGD) was made to determine CRA practices by the farmers. Farmers from each of the six municipalities were interviewed to gather information on their CRA and conventional practices. Information gathered were validated by the experts consisting of researchers and agricultural technicians.

Data gathered were collated and analyzed using the Cost-Benefit Analysis (CBA) Tool developed by the International Center for Tropical Agriculture (CIAT) to compare the profitability and sustainability of the CRA practice over the conventional practice.

Results

Based on current and predicted real prices and assuming an increasing productivity of rice, the CRA practice is marginally profitable from the private point of view, with a potential net present value (NPV) of Php159,887.03 (USD 3,281.08). And considering the much lower investment on CRA practice compared to conventional, it does not need an internal rate of return (IRR) and payback period. This makes the CRA practice somehow profitable for the farmers to adopt.

Moreover, from the point of view of the society as a whole, the eventual incorporation of the CRA practice seems to be more attractive with a potential NPV of Php489,562.05 (USD 10,046.42). With the current estimated adoption rate of 5 percent, it is estimated that 43.31% percent of the total area planted with rice will be planted following the CRA practice after ten years generating an aggregated benefit of Php3,340,390.82 (USD 68,548.96) at the community level.

Recommendations

It is recommended that the government promote the adoption of the CRA practice. At the same time, in order to reduce the degree of uncertainty in the evaluation of the impacts of the CRA practice it is recommended to allocate funds to finance research processes aimed to gain more information on GSR 8 rice variety and V9 tomato variety.

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 3,281.08*	USD 10,046.42	NA**	NA	NA	USD -13.02	WITHOUT CRA: Rice (Farmers' Variety) Tomato (Ilocos Red)	WITH CRA: Rice (NSIC Rc 480) Tomato (V9)
Aggregate analysis	Total area of rice	Current adoption rate	Adoption rate	Aggregate NPV		Period		
	22,934.7 ha	5%	43.31%	USD 68,548.96		10 years		

*USD 1 = Php48.73

**NA = not applicable

References

^[1] Laborte et al., 2009

PSA, 2016. Databases, Country STAT Philippines, Metadata.

Photo source: <https://aichannel.wordpress.com/2011/09/02/bring-your-tomatoes-to-the-ilocos-sur-tomato-paste-plant/>

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