



# Climate Resilient Agriculture Practices Investment Prioritization

Investment Prioritization for Region I: Ilocos Region on Rice-Corn 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.

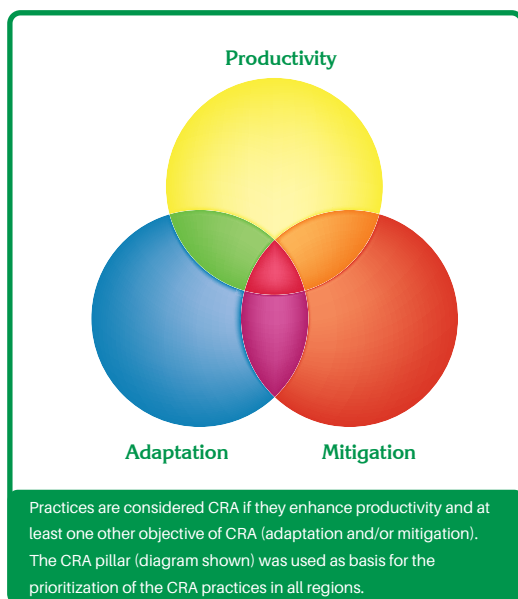
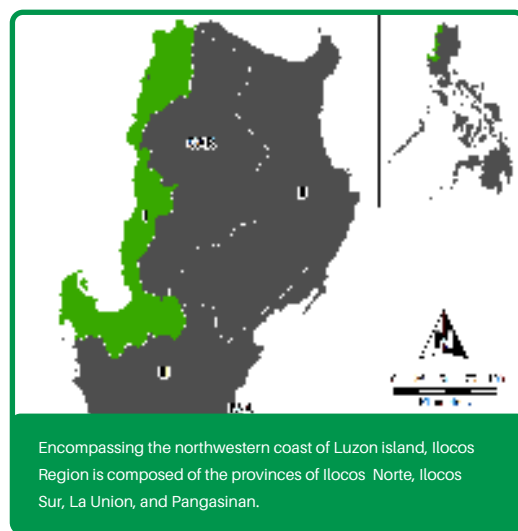
Rice-based cropping system is commonly practiced in the region especially in the rainfed areas. Rice is planted during the wet season while tomato, corn, tobacco, pepper, eggplant, and other vegetables are planted during the dry season. Judicious amounts of synthetic fertilizers and pesticides<sup>[1]</sup> 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 should be done. Thus, the rice-corn rotation in combination with climate-smart varieties and application of Bio-N and organic fertilizer are promoted to help farmers adapt and become resilient.

Planting NSIC Rc 480, a rice variety that was developed for drought-, flood-, and saline-prone areas and low fertilizer input will ensure that farmers will 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, improve soil fertility, and reduce nitrous oxide emission which is the most potent greenhouse gas.

The quality of seed materials is the key to achieve high yield in corn. New varieties of hybrid corn are known for their tolerance to pests and diseases. The use of RR corn hybrid is recommended due to its round up-ready characteristic. In addition, the use of Trichogramma cards is highly endorsed which is essential in controlling moth species attacking corn ears and affecting kernel quality. Trichogramma are tiny parasitic wasps that lay their eggs in and feed on eggs or larval stage of moths and butterflies. Through this practice, pesticide use is being reduced and environmental soundness is being promoted.



## Data Gathering Methodology

Initial interview through Focus Group Discussion (FGD) was made to determine the CRA practices by the farmers. Ten farmers from each of the six municipalities were interviewed to gather information on their CRA and conventional practices. Information gathered was 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 Php155,873.14 (USD 3,198.71).

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 Php471,667.90 (USD 9,679.21). With the current estimated adoption rate of 5 percent, it is estimated that 39.31 percent of the total area planted with rice will be planted following the CRA practice after ten years generating an aggregated benefit of Php3,802,136.81 (USD 78,024.56) at the community level.

## Recommendations

From the reasons discussed, 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 at gaining more information on GSR 8 rice variety and hybrid RR corn 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 3,198.71*	USD 9,679.21	NA**	NA	NA	USD -195.56	WITHOUT CRA: Rice (Farmers' Variety) Corn (Yellow OPV)	WITH CRA: Rice (NSIC Rc 480) Corn (Hybrid RR)
Aggregate analysis	Total area of rice	Current adoption rate	Adoption rate	Aggregate NPV			Period	
	22,934.7 ha	5%	39.31%	USD 78,024.56			10 years	

\*USD 1 = Php48.73

\*\*NA = not applicable

## References

<sup>[1]</sup> Laborte et al., 2009

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

Photo source: <https://s-media-cache-ak0.pinimg.com/originals/8c/d-c/1b/8cdc1bb653bb1ba2f56df89848a67be8.jpg>

## About the authors

This investment brief was authored by the team from Mariano Marcos State University (MMSU), CIAT-AMIA's partner SUC for the CRA-DS project in Ilocos Region.

**Dr. Nathaniel R. Alibuyog:** Project Leader, Mariano Marcos State University  
natzalibuyog@yahoo.com

**Dr. Dionisio S. Bucao:** Agri-systems Specialist, Mariano Marcos State University  
dsbucao@yahoo.com; dionisiobucao@gmail.com

**Constante B. Julian:** Socio-Economist, Mariano Marcos State University  
tricarkat\_351@yahoo.com

**Engr. Rodel T. Utrera:** GIS Specialist, Mariano Marcos State University  
rodel\_utrera@yahoo.com

