



# Climate Resilient Agriculture Practices Investment Prioritization

Investment Prioritization for Region XVIII: Negros Island Region on The Use of Submergence-Tolerant Rice Variety

## Overview

Negros Island Region (NIR) is considered as the Sugar Bowl of the Philippines. However, due to the volatility of the sugar industry, the region has resorted to diversification of commodities. Rice is among the region's current top five commodities. It ranks second to sugarcane in terms of area planted. NIR has a total land area of 1,335,074 ha, 49% of which is devoted to crop production.

The province of Negros Occidental occupies about 796,521 ha, 56 percent of which is devoted to crop production, contributing to about 88 percent of the region's rice production. In 2014, 615,000 MT of rice was produced from 167,421 ha crop area. Irrigated farms constituted about two-thirds of the area harvested.

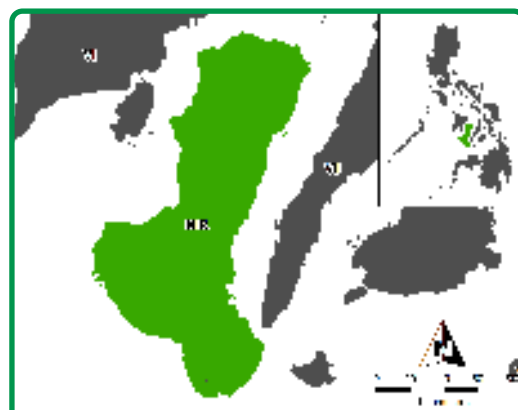
Negros Occidental is subjected to a number of climate-related hazards. These include flooding, rain-induced landslides, surges, typhoons, and droughts. More than 59,000 ha are highly prone to flooding while 133,700 ha are susceptible to rain-induced landslide. Pontevedra is one of the top five highly vulnerable municipalities in the province. It has an estimated 1,822 ha rice area, of which 11 percent is flooded.

## Prioritized Climate Resilient Agriculture (CRA) Practice

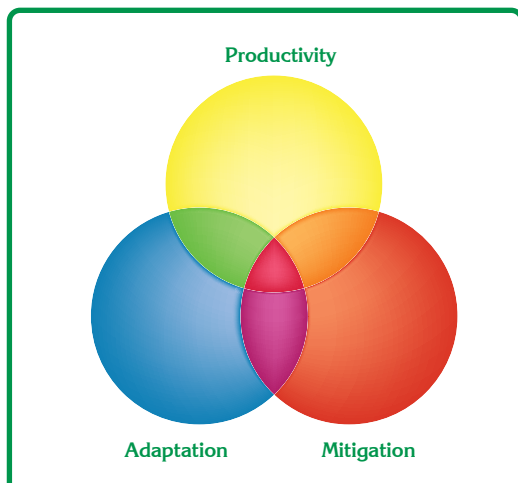
The International Rice Research Institute has developed rice varieties aimed at addressing the impacts of climate change. These include flood- or submergence-tolerant, drought-tolerant and saline-tolerant rice varieties.

One of the submergence-tolerant rice varieties is IRRI 154 or NSIC Rc222 (Tubigan 18). On average, this variety can yield 6.1 tons per ha. It is also early maturing at 114 and 106 days when transplanted and direct seeded, respectively. It has long and slender grains with an intermediate amylose rating. Moreover, this variety has good milling and head rice recoveries of 68.5 percent and 44.7 percent, respectively. Furthermore, it has moderate resistance to against brown plant hopper, green leaf hopper and yellow stem borer.

Aside from organic rice production, the use of climate-resilient varieties like submergence-tolerant varieties has been unanimously recommended by the Municipal and City Agriculture Officers and validated with the Regional Director of DA as well as the Regional Rice Focal Person. However, despite being high-yielding, some farmers are hesitant to use these varieties due to lesser superior eating quality compared with the conventional varieties.



Negros Island Region (NIR) is composed of only two provinces, Negros Occidental and Negros 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

The CRA practice was identified through a Consultation Meeting with 28 out of 30 MAOs/CAOs in Negros Occidental. Input-output data from the Rice-Based Farm Households Survey 2011–2012 of the Socioeconomics Division, Philippine Rice Research Institute Central Experiment Station were used in the analysis. Additional secondary data on the level and value of externalities, local interest rate, and foreign exchange rate were gathered. The profitability of the CRA was determined using the Cost-Benefit Analysis (CBA) Tool prescribed by the International Center for Tropical Agriculture (CIAT).

## Results

The CRA practice requires a minimal initial investment of only Php4,300 (USD 88) per hectare. Incremental costs are incurred for seeds, fertilizers, hired labor, and power. The estimated annual net incremental benefit is about Php4,800 (USD 99).

Based on current yield, price, and 15 percent discount rate, shifting to the CRA can be a worthwhile investment. It has a potential private net present value (NPV) of Php19,300 (USD 400) and an internal rate of return (IRR) of 102 percent. Given the pilot area, the current adoption of the CRA can rise to 32 percent. This can generate total benefits of about Php1.7M (USD 35,985).

## Recommendations

It is recommended that the government promote the adoption of the CRA practice.

However, in order to reduce the degree of uncertainty in the evaluation of its impacts, it is recommended to allocate funds to finance research programs to gain more information on yield and environmental externalities as well as improved quality of the said rice 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 4,001*		102%		2 years	USD 88	WITHOUT CRA: Use of Conventional Rice Variety	WITH CRA: Use of Submergence-Tolerant Rice Variety
Aggregate analysis	Total area of rice	Current adoption rate	Adoption rate	Aggregate NPV			Period	
	200 ha**	10%	32%	USD 35,985			10 years	

\*USD 1 = Php48.73

\*\*Estimated Flooded Rice Area in the Pilot Site

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Photo source: <http://irri.org/news/hot-topics/sharing-rice-genetic-diversity-responsibly>

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