



Climate Resilient Agriculture Practices Investment Prioritization

Investment Prioritization for Region XII: SOCCSKSARGEN on Integrated Rice-Duck Farming System (IRDFS)

Overview

North Cotabato, a prime province of Region XII (SOCCSKARGEN), has a total land area of 656,590 hectares, of which, 55.11 percent are classified as alienable and disposable while the remaining 44.89 percent are forest lands. This land area of the province is suitable for various uses.

With the vast resources found in the region as well as in the province, it has become suitable for lowland rice, corn, and sugarcane production. These are found in the municipalities of Kabacan, Matalam, Libungan, Carmen, Pikit and parts of Tulan, M'lang and Midsayap. Oil palm, rubber, coconut, and banana as well as coffee and fruit trees are also suitable in the province, thus, making the province a producer of various agricultural commodities and the leader of rice production in the region.

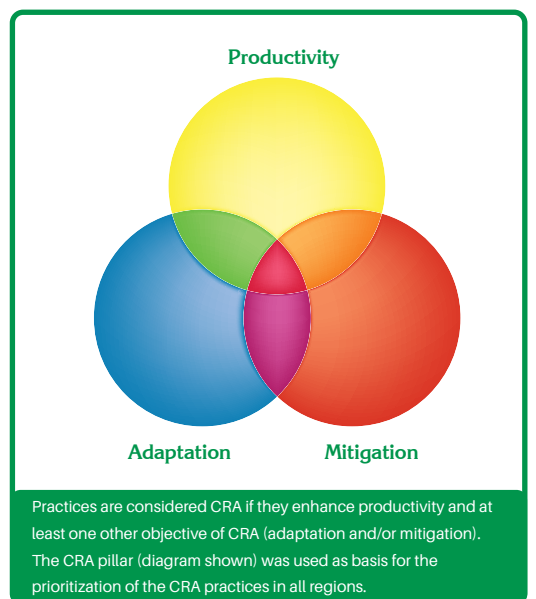
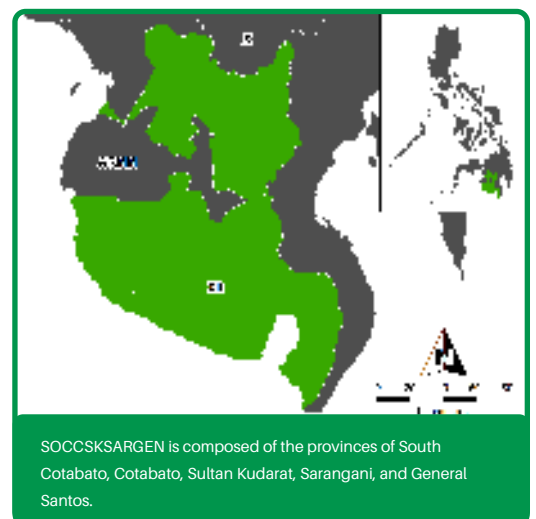
However, the province is confronted with various climate hazards making it vulnerable to climate change. This affects the agricultural production in the province especially during the dry spell experienced in 2015 where vast agricultural areas were devastated.

Prioritized Climate Resilient Agriculture (CRA) Practice

The Integrated Rice-Duck Farming System (IRDFS) appears to be the most popular farming system among smallholders with irrigated fields. This has been implemented in selected areas of Zamboanga del Sur, Bukidnon, Misamis Oriental, Misamis Occidental, North Cotabato, Agusan del Sur and Agusan del Norte.

The CRA practice is not labor intensive and does not require high investment. Farmers could have triple sources of income and food - rice, eggs, and duck meat. The integration of ducks in rice fields creates symbiosis between rice and ducks yielding mutual benefits. However, this can not be implemented by farmers without access to irrigation facilities.

Research showed that through this CRA practice, methane gas (CH₄) emission is reduced from rice fields contributing to reduced global warming. With the adoption of this CRA practice, the application of synthetic fertilizers and pesticides can be reduced thereby improving soil quality and pest control.



Data Gathering Methodology

Data on conventional rice farming were generated from the interviews with 75 conventional rice farmers. On the other hand, in terms of integrated rice-duck farming, 70 farmers were interviewed to gather the necessary information.

Secondary data were used to supplement the needed information and data for the Cost-Benefit Analysis (CBA) using the tool by the International Center for Tropical Agriculture (CIAT).

Results

The adoption of CRA practice needs private initial investment of around Php35,319.00 (USD 730.18) per hectare. There is a rice yield difference of 1,848.47 kilograms per hectare and rice-duck farming system yield higher relative to conventional farming.

Due to price premium of organic rice, the yield of conventional rice was adjusted. The projected net cash flow of the CRA result profitable from the private point of view with a potential net present value (NPV) of Php95,159.94 (USD 1,952.8) and an internal rate of return (IRR) of 93.01 percent way above from the 12 percent discount rate making the CRA practice likely to be adopted by the farmers. Since there is a price premium for organic rice, the initial investment is realized in 3 years.

On the other hand, from the point of view of the society in general and by incorporating the externality (reduction of CH4 emission), the CRA seems to be highly attractive with a potential NPV of Php1,666,456.4 (USD 34,197.75) and a quasi-social IRR of greater than 500 percent.

Recommendations

It is recommended that the Government continue to promote the adoption of the CRA practice based on the existing divergence between private and social gains reaped from the adoption although the adoption rate is low.

The low adoption rate could increase by promoting the CRA practice as it can increase productivity. Further, in order to reduce degree of uncertainty in the evaluation of the impacts of the CRA practice, the authors recommend to allocate more funds to finance researches to allow substantial generation of information on the externalities, prices and yield.

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 1,952.80*	USD 4,197.75	93.01%	592.81%	3 years	USD 730.18	WITHOUT CRA: Conventional Rice Farming	WITH CRA: Rice-Duck Farming
Aggregate analysis	Total area of rice	Current adoption rate	Adoption rate	Aggregate NPV		Period		
	315,690 ha	1%	5%	USD 125,933.28		10 years		

*USD 1 = Php48.73

References

Socio-demographic profile of North Cotabato, 2015.
 Philippine Rural Development Program. 2016. Value Chain Analysis and Competitiveness Strategy: Organic Rice in Mindanao
 Photo source: <https://practicalaction.org/integrated-rice-duck-farming>

About the authors

This investment brief was authored by the team from the University of Southern Mindanao (USM), CIAT-AMIA's partner SUC for the CRA-DS project in SOCCSKSARGEN.

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