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Agricultural Projects on the Life of Rice Farmers: A Moderator or A Mediator?

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Abstract
Malaybalay city is mainly an agricultural area with 70% of employment is in farming. The city cultivates a lot of crops but among of it, rice has the highest production volume. The local government unit through the City Agriculture Office (CAO) initiated three (3) projects for rice farmers, namely, Farmer Field School (FFS), Rice Seeds Subsidy (RSS) and Rehabilitation of Irrigation (RoI). The study revealed that the participation in all these government agricultural projects moderates in the relationship of the physical, socioeconomic and institutional factors in the rice production. These projects showed a significant relationship to the farmer's average yield, that is, it helps increase the farmer's rice production. Thus, improvement in agricultural production was observed, thereby, uplifting the economic status of the recipient farmers.

Keywords: moderator, FFS, RSS, RoI

1. Introduction
Malaybalay city which is dubbed as the "South Summer Capital of the Philippines" because of its weather relatively cooler the whole year round has a predominantly type of soil which is good for agriculture. The City is mainly an agricultural area. In the past years, corn was principal crop of the city. However, due to the emergence of poultry (chicken and hogs), sugar cane, pineapple plantations and residential areas (subdivision and villages), corn areas were replaced and rice became the dominant crop instead.
Malaybalay City produces roughly 30,000 metric tons of palay annually, from close to 10,000 hectares of rice farms. The city shares at least 10% of Bukidnon's total rice production, which comprises up to 60% of Northern Mindanao's rice output. The CPDO collected data from DTI, License Department, and City Agriculture Office to get the distribution of employment per industrial sector and the result showed that 70% of employment is in the farming/ crop production sector. Farmers and so with their families depend on their production. Thus, the government of Malaybalay particularly, the CAO has initiated several projects to help the farmers not just to increase their production but also to uplift their living.

Objective of the study
This study aims to evaluate the effect of Agricultural Projects initiated by the Local Government of Malaybalay through City of Agriculture (CAO) to the lives of rice farmers. Specifically;
- To identify if the agricultural projects mediate on the production of the rice farming.
- To identify if the agricultural projects moderate the production of the rice farming.

2. Material and methods
The survey was participated by sixteen (16) Barangays of Malaybalay City. There were 135 rice grower farmers. These farmers were recipient of the projects initiated by the Local Government Unit (LGU) through CAO.
The following are the projects they implemented;

1. Farmer Field School (FFS)
This is a research activity conducted by the Malaybalay - CAO. Within the 16-week period, farmer-participants will experience an actual or hands-on at the demo farm that include land preparation, planting of rice and soil checking to determine if the soil is suitable for rice planting and identifying the type of fertilizer to be used.

2. Rice Seeds Subsidy (RSS)
Distribution of rice seeds in farmers coming from the 28 rice growing barangays of the city. Farmers can avail a bag of rice seeds with 50% discount of the actual price. About 2,844 bags were LGU initiated which costed Php 1,706,400.00 and 352 bags were DA-NFA initiated.

3. Rehabilitation of Irrigation (RoI)
For Irrigation development Project, under the Bukidnon Sagip Patubig Program (BSPP) LGU approved & released PhP 1.219 M for the repair, rehabilitation, and restoration of seven communal Irrigation Systems in Malaybalay City. This amount is the LGU equity for the NIAs total project cost of Php 7.2819M.
This study is anchored by the data gathered from the City of Agriculture Office (CAO) in Malaybalay City, Bukidnon. The study utilized the following variables;

- Physical factors: ecosystem (irrigated or rainfed), area planted (per hectare)
- Socio-economic factors: Cost of input (Seeds, insecticide, fungicides, and labor) and ownership of agricultural assets such as tractors, etc.
- Institutional factors: agricultural monitoring by extension worker per month
- Production per hectare

2.1 Data Treatment. The evaluation of the impact of agricultural projects in Malaybalay City is analyzed using Mediation and Moderation Analyses.
Moderator or mediator is a third variable included in the model. A series of test is conducted to see its effect on the independent and the dependent variable/s, respectively. There is significant overlap between the two, though; they are quite different in their goals, their enactment, and in the resulting interpretations.

Moderation Analysis
In moderation, or interaction, it determine how the third variable (moderator) affects the relationship of the two (2) variables (X and Y) (Morgan-Lopez, et.al., 2006). According to Aiken, et.al. (1991), the general approach in moderation analysis is formulate a regression model involving the dependent variable, Y, the independent variable/s, X, the moderating variable, Z and the product of Z and X which is the ZX. It can either be a continuous or categorical variable.
Moderation answers when (under what conditions) does the effect occur? Under what conditions of is significantly associated with It can either be qualitative or quantitative variable that affects the relationship (direction and/or strength) of the independent (or predictor) and the dependent (or criterion) variable (Baron, R. M., & Kenny, D. A. (1986).)

Mediation Analysis
Mediation answers “how” (by what means) does an effect occur? What accounts for the impact of X on Y? A mediation model is a causal model, whereby it is hypothesized that X "causes" M and that M then "causes" Y.

Comparison of Mediation and Moderation Analyses
Many people interchange the terms mediator and moderator. The distinction between the two (2) analyses needs statistical analysis.

A Moderator is an independent variable that affects the relationship of another independent variable and the dependent variable but is not part of the causal sequence between X and Y. On the other hand, a **Mediator** is also an independent variable that is included in causal sequence between two variables, X and Y.

3. Results and discussion
Based on the data gathered, the following findings are thereby presented.
As seen in table 1, the z values associated with the p-values are greater than the desired level of significance, $\alpha = 0.10$. Thus, the hypothesized mediators, the Agricultural projects, do not mediate in the relationship of the independent variables and the dependent variable, the rice production.

Table 1: Variables and Z-values.

Hypothesized Mediator	Independent Variable	Z value	p-values
Rice Seed Subsidy (RSS)	Area of lot planted	0.525	0.599
	Ecosystem	-0.317	0.751
	Types of Cropping	-1.342	0.180
	Amount of Input	1.242	0.214
	Agricultural Assets	-0.346	0.729
Farmer Field School (FFS)	Area of lot planted	-0.638	0.524
	Ecosystem	0.449	0.654
	Cropping	-0.589	0.555
	Amount of Input	-0.391	0.696
	Agricultural Assets	-0.671	0.502
Rehab of Irrigation (RoI)	Area of lot planted	0.933	0.350
	Ecosystem	-0.392	0.695
	Cropping	0.703	0.482
	Amount of Input	-1.333	0.182
	Agricultural Assets	1.308	0.191

There is a significant F change in the model as can be seen in table 2. The p-values are less than 0.10, level of significance.

Table 2: variables and F change.

Presumed Moderator	Independent Variables	F Change	P-value
All three projects	Land area	4.823	0.010*
(Farmers who are	Ecosystem	3.531	0.018*
Recipient of	Cropping	3.860	0.024*
the three projects)	Amount of Input	5.707	0.005*

*significant at 0.10

The result implies that the agricultural projects initiated by CAO serve as a moderating variable in the production of the rice farmers. The relationship of the physical, socio-economic, and institutional factors to the rice production is affected by the said agricultural projects. The more the farmers involve in all the projects, the higher rice

production they achieved. Their involvement in the projects was motivated by their need in learning new techniques and technology in farming. The projects assist in the inputs. It lessens their expenses because they can avail cheap but good seeds, thus enabling them to save.

4. Conclusions

Based on the findings, it is therefore concluded, that the Agricultural projects serve as a moderator, and not a mediator. It is not the reason for the increase in rice production rather it just an aid to augment the rice production. Involvement in only one project is not enough to moderate in the increase in rice production, instead an active participation in all the three projects is necessary so that an expectation for a higher production will be achieved. With the help of agricultural projects, a good harvest and high yield were achieved, thus increases the farmer's profit, and because of this, they were able to send their children to school and pay their debts thus, gives them a better living.

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