Does an agricultural intervention impact the socio-economic development of farmers in upland barangays of Goa, Camarines Sur? Evidence from regression discontinuity design

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Abstract

The contribution of agriculture in the socio-economic development is undeniable and is truly an important part of the Philippine economy. It is also a major source of livelihood and employment of most Filipinos especially in the rural areas. The general intent of this study is to evaluate the impact of the government agricultural intervention on selected upland communities in Goa, Camarines Sur especially on the far-flung barangays of the municipality using Regression Discontinuity Design. This study focused on the local farmers that already received the agricultural interventions and the local farmers that did not receive any agricultural interventions as well and is the basis to determine the socio-economic and poverty status of the local farmers. The study showed that the distribution of seeds, fertilizers and cash assistance to the upland farmers could improve the overall outputs of the farmers and in turn, which can help alleviate the lives of the farmers. The said agricultural interventions of the governments assume that it has a great and positive impact to alleviate poverty and improve the quality of life of the local farmers. On the other hand, irrigation and farm-to-market roads are one of the things that need to be considered or prioritized by the government especially by the agriculture sector to ensure that the output or production in agriculture shall increase.

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Introduction

Considering the contribution of agriculture in the socio-economic development of the country, truly that agriculture is an important part of the Philippine economy. It is also a major source of livelihood and employment of most Filipinos especially in the rural areas. According to the Statista Research Department (2022), the Philippines is primarily an agricultural country wherein the large portion of its population that lived in the rural and far flung areas of the country worked at the agricultural sector. Additionally, this sector generated a gross value added of about 1. 76 trillion pesos in the year 2021. This growth in the agricultural sector in the Philippines may be due to the various agricultural intervention programs being implemented by the government that augment the needs on agriculture in the country. According to the Department of Agriculture (DA, 2019), their programs prioritized the Production Support Services, Market Development Services, Extension Support, Education, Training Support Services, Research and Development; Irrigation Network Services and Provision of Agricultural Equipment and Facilities for the improvement on productivity in rice, corn, high value crops, livestock, and organic agriculture. These aforementioned programs will directly contribute to Sustainable Development Goals(SDG) 2.3 which aimed to address issues on food security, poverty alleviation and sustainable growth through increased farm income and productivity.

In Goa, Camarines Sur, agriculture is one of the main source of livelihood of those who lived in the upland communities. These includes planting rice, corn, coconut, abaca, root crops and they also domesticate animals such as native chickens, pigs, carabaos, cows and a lot more. With this, the Local Government Unit of Goa Camarines together with other agencies and other private organizations implement different programs as well as agricultural interventions as a primary initiative to alleviate the lives of upland farmers on their locality.

This study presented to evaluate the impact of agricultural intervention on upland communities in Goa, Camarines Sur specially on the selected far flung barangays of the municipality as they are vulnerable and face enormous challenge in achieving the Sustainable Development Goal (SDGs) especially for food security and poverty. In line of this, there is a challenge in agriculture and to its ability to provide food and nutrition security for the people and it is still unclear whether these interventions have had a positive impact on their economic and social well-being wherein there is a need for rigorous impact evaluation

methods to assess the effectiveness of agricultural interventions in improving the lives of the selected upland communities in Goa, Camarines Sur which the Regression Discontinuity Design (RDD) offers a promising approach for evaluating the impact of the agricultural interventions.

The objectives of this study includes (1) determine the socio-economic profile of the respondents in terms of their age, gender, marital status, highest educational attainment, household size and other sources of livelihood and average monthly income, (2) identify the government interventions received by the farmers as well as the agencies where the interventions received from, (3) determine the type of irrigation and the house structure of the upland farmers , (4) evaluate the poverty status of the registered and unregistered farmers in upland barangays of Goa, Camarines Sur, (5) analyze the impact of the government agricultural interventions to the upland local farmers including the distributions of cash assistance, seeds , fertilizers, machineries , tools and equipment ,irrigation system as well as the development of farm-to-market road and (6) estimate the local average treatment effects of the government agricultural interventions to upland farmers of Goa, Camarines Sur.

Methodology

The study used both descriptive and statistical approaches in processing and analyzing the data. Quantitative data will be obtained from the questionnaires and was analyzed using statistical methods in order to give a broader and more meaningful picture of the information. The respondents of this study will be the registered farmers in the locality of Goa, Camarines Sur, Philippines, particularly from barangay Lamon, Scout Fuentebella (Laki-Laki) and Tamban (Mabini) with a total respondent of 155 that was obtained from the 199 total population through sampling method. The study used primary data from the respondents through house-to -house interview. In order to collect data, the researchers used survey questionnaires and interview guides/questions. In data analysis and interpretation, a computer software was used to get the result. Microsoft Excel and R Studio were used in the statistical analysis of the data. R Studio is very helpful especially in the regression analysis which enables to provide graphs and figures on the data. The use of Regression Discontinuity

Design (RDD) - a quasi-experimental design will provide valuable insights into the effectiveness of the interventions.

Findings

The main objectives of this study includes (1) determine the socio-economic profile of the respondents in terms of their age, gender, marital status, highest educational attainment, household size and other sources of livelihood and average monthly income, (2) identify the government interventions received by the farmers as well as the agencies where the interventions were received from, (3) determine the type of irrigation and the house structure of the upland farmers, (4) evaluate the poverty status of the registered and unregistered farmers in upland barangays of Goa, Camarines Sur, (5) analyze the impact of the government agricultural interventions to the upland local farmers including the distributions of cash assistance, seeds , fertilizers, machineries , tools and equipment ,irrigation system as well as the development of farm-to-market road and (6) estimate the local average treatment effects of the government agricultural interventions to upland farmers of Goa, Camarines Sur.

In the result of the logistic regression of the upland farmers using logit regression model, age predicts that it has a direct impact to the poverty outcome of the upland farmers which implied that the higher the age is, the more socio-economic development there will be because they used to join the work force or the higher possibility that they engage in working and participate in the economic activities. On the other hand, number of household member is a strong predictor of increasing poverty specially when the members prefer not to be joining in the working group by which it has a coefficient of -0.14731 and a p-value of 0.035. Also, a number of parcel of land being farmed predicts poverty status which implies that the more the number of parcel of land is, the more likely the reduction of poverty among the farmers will have because they have a capacity to use or cultivate the said parcels. The number of years as farmers also predict poverty status which implies that the more years in engaging in farming is, the more likely the occurrence of poverty alleviation there will be.

In the result of the logit regression, distribution of seeds was the primary predictor to increase the yield in agriculture or to increase the agricultural yields which says that seeds

had a significant effect which can result to the increase of yields. Fertilizer, machineries, tools and equipment, cash and irrigation had also influenced the increase in agricultural yields among farmers.

In the result of the Regression Discontinuity Design, at the poverty index a discontinuity can be observed from point delta to point omicron. The fit of registered group is at a higher level as compared with the fit of the unregistered group. The distance from these levels reflects the discontinuity which can be interpreted that for those who are eligible to receive the program or are part of the treatment group, the yield as well the quality of life will increase. This increase can be measured through the regression model which revealed that the overall model was significant and all p-values are also significant. The eligible had a coefficient of -0.41613, which means that for a unit increase in the eligible (or as when those farmers become eligible to the program), the yield or quality of life will have decreased by -0.41613. Since the households on the left side and right side of the cut-off line had similar attributes and characteristics, the quality of life and number of yields between farmers on the left and right sides of the cut-off line were attributed to eligibility. The left side was eligible to receive or become beneficiaries in the program while the right side was not.

Conclusion

Based on the result of the study, the distribution of seeds, fertilizers and cash assistance to the upland farmers can improve the overall outputs of the farmers helpful in alleviating the lives of the farmers. The null hypothesis of the study proved that government agricultural interventions had a positive and significant impact on the lives of the upland farmers in Goa, Camarines Sur. This in turn had a positive impact in alleviating poverty and improving the quality of life of the local farmers. Likewise, irrigation and farm-to-market road are one of the things that need to be considered or prioritized by the government especially by agriculture sector to ensure that the output or production in agriculture shall increase.

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