



RESEARCH ARTICLE

Impact assessment of the organic agriculture production training program in Northern Philippines

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Abstract

A study was conducted to assess the impacts of the Organic Agriculture Production (OAP) Training Program of Ifugao State University (IFSU) on beneficiaries. The Australian Centre for International Agricultural Research (ACIAR) framework for impact assessment was used in tracing the impact pathways of the program. It utilized quantitative methods of data collection. The data were analyzed using descriptive and inferential statistics and the Likert scale. Respondents were the beneficiaries of the training that served as the treatment and non-beneficiaries that served as the control. The majority of the treatment and control respondents are young adults and middle-aged, female, married, finished secondary and college, have less than five household members, and are employed. Most of the respondents in the study have organizational affiliations. The inputs to the program were from the Technical Education and Skills Development Authority (TESDA) and the IFSU. The use of these inputs produced technological and capacity building outputs. All the training respondents received their National Certificates, which means that they are all competent in the use of the OAP technologies and that they can produce new products that they can utilize for subsistence and livelihood. The evidently used adoption pathways were capacity building and communication. Respondents from the treatment group "agreed" that their participation in the training resulted in capacity building outcomes utilized at a personal and organizational level. The training program showed significant impacts on farm income, total annual income, employment, organizational affiliation and involvement, and adoption. Policy recommendations for the improvement of the program are discussed.

Keywords

Organic agriculture training; impact assessment; Ifugao, Northern Philippines

Introduction

Organic agriculture production (OAP) has been gaining popularity worldwide because people have become aware of its benefits, especially for health, wellness, and the environment. It has been contributing to food security (1,2,3), poverty reduction (4,5), health and well-being (6,7,8), as well as reducing environmental impacts from agriculture, especially if it is implemented in a well-designed food system (9,10). As opposed to conventional or traditional farming, it has frequently been claimed to be more sustainable (11).

Organic agriculture is "a holistic production management system that avoids the use of synthetic fertilizers, pesticides, and genetically-modified

organisms, minimizes pollution of air, soil, and water, and optimizes the health and productivity of interdependent communities of plants, animals, and people" (12). It is guided by the principles of health, ecology, fairness, and care (13,14). With all these promising possibilities, consumer demand for organic products will continue to expand and flourish (15).

According to data on global production, there are at least 3.1 million farmers overseeing 72.3 million hectares of agricultural land in 187 countries that practice organic agriculture. In 2019, global sales of organic food and drink exceeded 106 billion euros (16). Since the 1970s, expansion of organic production has begun as more people became interested in their own health and that of the environment (17) and this has been steadily increasing over the years (16).

The Philippines ranked 8th among the top 10 countries worldwide with the highest increase in organic land, 4th in Asia, and first in the Association of Southeast Asian Nations (ASEAN) with 234,642 hectares and 165,958 organic practitioners in 2015 (18). These figures increased and have been continuously increasing in the country over the years due to the emphatic support of the Philippine Government with the passage of the Organic Agriculture Act of 2010. The act involves the development and adoption of production and processing methodologies that have already been created or are currently being created, as well as the promotion and commercialization of organic farming practices, ongoing research and improvements, the development of farmers' capacities and consumer education, and the provision of support to local government units (LGUs), people's organizations (POs), nongovernmental organizations (NGOs), and other stakeholders.

In response to this act, the TESDA, with its mandate to fund programs and projects for technical education and skills development, has been offering and funding OAP training programs in partnership with public and private Technical Vocational Institutions (TVIs) all over the country. These programs catered to various clients/beneficiaries including but not limited to indigenous peoples, persons with disabilities, senior citizens, and rebel returnees (19).

In the Province of Ifugao, one of the TVIs is the Ifugao State University (IFSU). The IFSU has been accredited by the TESDA as one of its Training and Competency Assessment Centers for various qualifications. The accreditation led to the establishment of the IFSU-Training and Competency Assessment Center (IFSU-TCAC). Henceforth, IFSU through the center has been conducting training to cater to various learners who are interested in enrolling in TESDA registered courses, especially, in agriculture. These programs are geared towards the attainment of National Certificates (NCs) for the trainees. Trainees are granted scholarships.

Since 2017, the IFSU has produced a total of 280 graduates from the different municipalities of Ifugao, and almost all of them received their national certificates.

Training grants totaled Php 5,336,800. With the time and resources invested, there is a need to assess if this program has impacted the lives of the beneficiaries. This is very important because it can greatly improve the management and effectiveness of the programs, rationalize the use of public funds, and provide directions to policy makers and funding institutions. Aside from that, one common problem in Higher Education Institutions (HEIs) in the Philippines, including IFSU is the lack of studies on the impact of extension services.

An impact assessment (IA) study is a valuable tool for identifying, assessing, and quantifying the impacts of a program/project. It is evidence-based and answers the questions of what works, what does not, and why (20). It is a method for determining whether observed changes in outcomes among project target groups may be attributed to development programs (21). It was defined as the process of determining the expected or actual implications of a development intervention on social, economic, and environmental issues (22). On a spectrum, the application of impact assessment can be classified as 'proving impact' on one side and 'enhancing procedures' on the other (23). For continuous improvement, the organization must analyze and assess the project that has already begun.

This study was conducted to assess the impacts of the OAP Training Program from the perspective of its beneficiaries.

Materials and Methods

The study was guided by the ACIAR framework for assessing impacts. It used quantitative methods of investigation. Specifically, the study utilized a cross-sectional survey. This method was used because the data were collected four years after the training program's first year of implementation.

The study was conducted in the Province of Ifugao. Ifugao is a province in the Philippines that is part of Luzon's northern-central region and is located in the Cordillera Administrative Region (Figure 1). About 1,010.82 square miles or 2,618.01 square kilometers make up the province's land area. The 2020 Census found 207,498 people living there (24).

Ifugao is a group of 11 municipalities with Lagawe as its capital, including Lamut, Kiangan, Asipulo, Hingyon, Banaue, Hungduan, Aguinaldo, Mayoyao, Alfonso Lista, and Tinoc. The economy is agriculture-based (25), with rugged terrain, river valleys, and massive forests. The study sites were the municipalities of Banaue, Kiangan, Lamut, Lagawe, and Hingyon where the beneficiaries of the Organic Agriculture Production (OAP) training program are from.

There were two sets of respondents: the beneficiaries and non-beneficiaries of the OAP Training Program. For the first set, respondents were the beneficiaries of OAP trainings conducted from 2018-2020 in the different municipalities of Ifugao. Stratified random sampling was done among the 220 beneficiaries by



Figure 1. Location map of the study

location, generating a sample size of 105. For the second set, respondents were non-beneficiaries, who have similar characteristics to those of the first set of respondents. Following the same sampling procedure, the sample size is 105, totalling to 210 respondents.

Secondary data was sourced from program documents. These included the inputs, the outputs, the intended outcomes, and the adoption pathways of the OAP Training Program. For the primary data, a survey instrument was designed. The instrument was adopted from Davis, et al. (20), from the impact assessment survey of TESDA (26), and from the Feed the Future Indicator Handbook (27) and fitted for the OAP Training Program subjected to IA. The instrument included socio-demographic characteristics, organizational characteristics, capacity building outcomes, adoption of OAP technologies, and impacts. The instrument was subjected to validity and reliability testing and yielded 99% and 0.81, respectively.

There were two sets of survey questionnaires: one for control and one for treatment. The following components made up the control instrument: socio-demographic characteristics; organizational characteristics; and adoption of OAP technologies. The following components made up the treatment's instrument: socio-demographic characteristics; organizational characteristics; capacity building outcomes; adoption of OAP technologies; and impacts.

Letters to the Barangay Local Government Units were given to seek permission and assistance in the gathering of data. Survey questionnaires were used to conduct in-person interviews with the respondents.

Additional data were obtained through field visits and observations.

In terms of the inputs, outputs, and adoption pathways used, data were obtained from the IFSU-TCAC, Lamut Campus.

Descriptive statistics, particularly frequency counts and percentages, were utilized to describe the profile of respondents in terms of socio-demographic and organizational characteristics. A narrative description was done for the inputs, outputs, and adoption pathways of the program. A 4-point Likert scale was used to analyze the outcomes: strongly agree; disagree; agree; and strongly disagree. Inferential statistics specifically the F test utilizing Analysis of Variance, was used to test the difference in adoption of OAP technologies when grouped by profile variables, the difference in outcomes when grouped by profile variables, and the impacts between the treatment and control groups of respondents.

To avoid selection bias, the study involved matching beneficiaries and non-beneficiaries based on socioeconomic indicators that were as close to those of the beneficiary households as possible. Only families that were systematically similar were compared; households that were systematically dissimilar were excluded from the analysis.

In assessing the impacts of the OAP training program, the study established counterfactual measures. This was done by identifying the following: 1) treatment groups, who received the intervention; and 2) a control group, with the same characteristics as those of the treatment groups but who did not receive the intervention.

Results and Discussion

The socio-demographic profile of the respondents is presented in Table 1. Ages ranged from below 20 to 61 and above. The majority of the respondents from the treatment group were 40 and younger, while the majority of the respondents from the control group were 41 and older. Most of the treatment and control respondents are female, married, have finished secondary and college, have less than five household members, and are employed.

The organizational characteristics of respondents are presented in Table 2. Results reveal that the majority of respondents in the treatment group, in contrast to the control group, have more organizational affiliations. This could be attributed to their participation in the training program. "Working in a Team Environment" was one of the program's modules that taught participants how to define team roles and responsibilities, as well as how to describe work as a team member. Involvement, however, is not maximized.

The OAP Training Program is a resource sharing program between the TESDA and Ifugao State University (IFSU). For the inputs, the TESDA provided two scholarship grants. The IFSU on the other hand, was the training

Table 1. Socio-demographic characteristics of respondents

Socio- demographic characteristics	Treatment		Control	
	Frequency	%	Frequency	%
Age				
≤20	1	1	2	2
21-30	27	26	17	16
31-40	28	27	28	27
41-50	19	18	31	30
51-60	19	18	12	11
≥61	11	10	15	14
Total	105	100	105	100
Sex				
Male	17	16	32	30
Female	88	84	73	70
Total	105	100	105	100
Civil Status				
Single	20	19	21	20
Married	73	70	75	71
Widow/Widower	11	11	7	7
Others	1	1	2	2
Total	105	100	105	100
Highest Educational Attainment				
Primary	7	7	19	18
Secondary	34	32	38	36
Technical/ Vocational	2	2	4	4
College	61	58	44	42
Post Graduate	1	1		
Total	105	100	105	100
Household Size				
≤5	71	68	84	80
6-10	33	31	20	19
>10	1	1	1	1
Total	105	100	105	100
Employment				
Yes	89	85	79	75
No	16	15	26	25
Total	105	100	105	100

Table 2. Organizational characteristics of respondents

Characteristics	Treatment				Control			
	Yes		No		Yes		No	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Organizational Affiliation	59	56	46	44	39	37	66	63
Involvement in the Organization	32	31	73	69	10	9	95	91

provider. Counterpart funds/resources from the university include faculty and personnel time, facilities and utilities. The use of these inputs produced outputs classified into two categories: technology and capacity built. Under technology, it involved OAP technologies that included sixteen (16) processes and five (5) products derived therefrom. Whereas, the capacity building output was the capacity building skills of beneficiaries in the use of OAP technologies. All the OAP training respondents received their National Certificates II, which means that they are all competent on the use of the OAP technologies and that they can produce new products such as organic chicken, organic vegetables, organic fertilizers, organic concoctions and extracts, and organic hogs, which they can utilize for subsistence or as a livelihood/additional source of income for the family. The evidently used adoption pathways were capacity building and communication, since the nature of the intervention is a capacity building program utilizing

different communication strategies. Commercialization and regulatory pathways, however, were not evident.

Respondents from the treatment group “Agreed” that their participation in the training resulted in capacity building outcomes utilized at a personal and organizational level, as shown in Table 3. At a personal level, they agreed to have gained, used, and shared knowledge and skills in OAP production; produced better outputs; performed better at work; received promotion and pursued work opportunities; as well as gained greater satisfaction at work. At an organizational level, respondents “Strongly Agreed” that the program has increased efficiency in undertaking OAP; the program added to the quality of OA products; the program has promoted a more innovative culture in the organization to which they belong; and the program improved the capacity of the organization which has allowed it to attract more funding.

Table 3. Capacity built outcomes of respondents

Outcomes	Mean	Description
I was able to apply the knowledge/skills gained to my work	3.01	Agree
I continue to use the knowledge/skills gained	2.98	Agree
I increased my professional collaboration with organizations	3.44	Agree
I have trained others in the skills I learned	2.75	Agree
I was able to secure additional resources to expand or enhance my work	2.80	Agree
The networks made during the program have enabled me to produce better outputs	2.95	Agree
The technologies/ knowledge/ skills gained from the program enabled me to perform better at work	2.94	Agree
I was offered a promotion as a result of my training	4.13	Strongly Agree
I have pursued work opportunities in the field	2.99	Agree
As a result of what I learned and have applied, I gained greater satisfaction from my work	3.10	Agree
The organization has increased its efficiency in undertaking OAP	3.77	Strongly Agree
The program added to the quality of OA products	3.76	Strongly Agree
The program has promoted a more innovative culture in the organization	3.80	Strongly Agree
The improved capacity of the organization has allowed it to attract more funding	3.76	Strongly Agree
Over-all	3.30	Agree

The identified economic impacts of the OAP Training Program were in terms of food consumption patterns, household assets, income, and employment. There is a significant difference in the food consumption patterns of respondents from the treatment and control groups in the last seven days and during the past twelve months, which implies that whether or not respondents attended the OAP training, they have similar food consumption patterns. This result could be attributed to the values of the Ifugaos of hard work and giving food premium priority, as evidenced by the carving of the majestic rice terraces in the mountains. In fact, in 2016, the Province of Ifugao was headlined (28) as a consistent champion in nutrition implementation when it bagged the highest award in the nutrition landscape in the country, the Nutrition Honor Award. In terms of household assets, there is no significant difference in the household assets of respondents from the treatment and control groups, which implies that whether or not respondents attended the OAP training, they have similarities in terms of household assets. In terms of income, there is a significant difference between farm annual income and total annual income, as shown in Table 4. This means that respondents who attended the OAP training program have significantly higher incomes compared to the respondents in the control group.

In terms of employment, a few years after the training program, it is very interesting to note that most of them (89) or 85% claimed to have employment (Table 5). This means that 8 out of every 10 are employed. This result is higher compared to the employment rate of Technical Vocational Education and Training (TVET) graduates in 2020 (29) which was 78.57 percent, or approximately 7 out

of every 10 were employed. This implies that the training program has a remarkable impact on the employment of beneficiaries. The result corroborates the funding agency's main goal of providing quality technical education and training programs to Filipino citizens so they can be employed in various industries.

The identified social impacts were organizational affiliation and involvement. There is a significant difference in organizational affiliation (Table 6) and involvement (Table 7). There were more respondents from the treatment group who joined organizations and were actively involved either as officers/members compared to respondents in the control group. Salazar (30) emphasized the significance of institutional, organizational, and social variables in the development of organic agriculture. The development of organic farming has been accompanied by various social arrangements and a supportive environment, such as training opportunities, resource access, and organizational assistance.

In terms of adoption and patronage of OAP technologies, there is a significant difference in the adoption of OAP technologies, specifically in raising organic chicken, producing organic vegetables, producing organic fertilizers, and producing organic concoctions and extracts (COC 1 to COC 4). The treatment group generated higher means for COC 1 to COC 4 than the control group (Table 8). Respondents who participated in the training program showed a higher level of adoption than those who did not join the program. In terms of patronage, there is no significant difference in the patronage of OAP products. This implies that whether or not respondents attended the OAP training program, they are the same in terms of patronage of OAP products.

Table 4. Difference in terms of income between treatment and control respondents

Area of Implementation	Group of Respondents	Mean	SD	t-value	p-value	Remarks
Farm Annual Income	Treatment	48330.1238	56118.01348	4.051	0.000	Significant
	Control	21994.5673	35458.44295			
Non-Farm annual Income	Treatment	38232.9524	64524.59046	-0.325	0.746	Not Significant
	Control	41421.1154	76999.26143			
Total Annual Income	Treatment	86563.0762	80600.98346	2.118	0.000	Significant
	Control	62811.7238	81921.49480			

Table 5. Employment status of respondents

Employment	Treatment		Control	
	Frequency	Percentage	Frequency	Percentage
Yes	89	85	79	75
No	16	15	26	25
Total	105	100	105	100

Table 6. Difference in terms of organizational affiliation between treatment and control respondents

Organizational Affiliation	Group		Total
	Treatment	Control	
Yes	67	46	113
No	38	59	97
	105	105	210

Chi-Square: 8.449 p value: 0.004 Significant

Table 7. Difference in terms of organizational involvement between treatment and control respondents

Organizational Involvement	Group		Total
	Treatment	Control	
Yes	93	66	159
No	12	39	51
	105	105	210

Chi-square: 18.879

P-value:0.000 Significant

Table 8. Difference in terms of adoption of OAP technology between treatment and control respondents

Adoption of OAP Technology	Group	Mean	t-value	p-value	Remarks
COC 1: Adoption of raising organic chicken	control	0.223	-4.811	.000	Significant
	treatment	0.648	-4.811	.000	Significant
COC 2: Adoption of producing organic vegetables	control	0.4171	-7.874	.000	Significant
	treatment	1.2024	-7.874	.000	Significant
COC 3: Adoption of producing organic fertilizers	control	0.158730	-5.388	.000	Significant
	treatment	0.644444	-5.388	.000	Significant
COC 4: Adoption of producing various concoctions and	control	0.100000	-4.834	.000	Significant
	treatment	0.467460	-4.834	.000	Significant
COC 5: Adoption of raising organic hogs	control	0.1119	-1.140	.256	Not Significant
	treatment	0.1810	-1.140	.256	Not Significant

Conclusion

The findings show that Ifugao State University's Organic Agriculture Production (OAP) Training Program has a substantial impact on farm income, total annual income, organizational membership, organizational involvement, and the adoption of OAP technology.

To further enhance the program, the following should be considered:

Additional inputs to the program on the part of the funding agency are start-up toolkits. It is recommended to include these in all scholarship programs, and have these kits distributed right after the training. On the part of the university, a policy to incentivize personnel working on the program should be put in place.

The adoption pathways communication and capacity building should be enhanced in consideration of the following: a) development of information, education, and communication (IEC) materials in the local language and availability of the same on or before the training; b) evaluation of IEC materials and modules; c) development of an online OAP training program; d) regular field monitoring or home visits to beneficiaries even after the training; and e) development of a policy to incentivize adopters of technologies.

Commercialization and regulatory adoption pathways should also be explored and maximized in consideration of the following: a) engagement with agribusiness; engagement with the private sector; b) engagement with the local government units (LGUs) for strong policy support; c) establishment of an outlet for OAP products; d) promotional activities for OAP products to consumers; and e) assistance with organic certification.

There should be sustained support and follow up with the beneficiaries to ensure the sustainability of capacity-built outcomes.

Organize the OAP Training Program graduates into an alumni network and assist them towards enterprise build up.

Develop an extension program for the OAP graduates towards enterprise build up.

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