



The Journal of Public Affairs and Development

Volume 2 Number 1 2015 | ISSN 2244-3983

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in Southern Leyte, Philippines**

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The Journal of Public Affairs and Development

The Journal of Public Affairs and Development is a double-blind peer-reviewed journal of the College of Public Affairs and Development, University of the Philippines Los Baños.

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ISSN 2244-3983

Printed in the Republic of the Philippines

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The Journal of Public Affairs and Development
Volume 2 Number 1 2015

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Preface

The Journal of Public Affairs and Development (JPAD), a refereed journal, publishes original articles on public affairs and development issues. These include rural and agricultural policy analysis, institutional innovations and development, local governance, community development and community education, and agrarian reform, among others. Papers that advance the understanding on how transdisciplinary social science research can support agriculture and community development or provide analysis on the relationship between various development policy and governance issues are especially welcome.

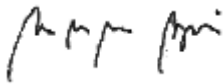
Preferred are papers from research and model applications at the community and organizational levels that bridge and integrate social and technical knowledge, particularly those that underpin agriculture and community development. Because of its emphasis on transdisciplinary approach to development studies, the Journal caters to readers from a wide range of disciplines, including scientists, practitioners, administrators, policymakers, and students in social sciences, natural sciences, and related fields.

The first three articles in this issue focus on the participation of different stakeholders in development programs. The fourth article is on agrarian reform, while the last one is on the performance of agriculture graduates in a state university.

Using binary logit regression, the paper of CASTILLO and ARMENIA found that REDD+ project site, membership in an organization, experience in environmental risks, access to natural resources, household size, and the total on-farm income of households were positively associated with tree planting. MYO AUNG, DIZON, QUIMBO, and BUSTOS examined the motivating factors that increased grassroots participation. The beneficiaries' contributions in terms of their resources like food, labor, shelter, knowledge, and time were indicators of their commitment to the project. The article of GASMEN and BACONGUIS investigated the patterns of interaction as evidenced by established networks and collaborative arrangements among organic agriculture practitioners – as individuals and organized groups – as well as interaction among agencies and institutions – public and private – that provide support services. Pressing needs for inputs, technical support, and market drew organic practitioners together to interact.

Meanwhile, GONDONCILLO revealed that the likelihood of being classified as non-poor was higher for agrarian reform beneficiaries (ARBs) compared to non-ARBs. Further, the likelihood of being classified as non-poor in 2000 was higher than in 1990 and the likelihood was higher in 2006 than in 2000. The study implied that the observed difference in the likelihood of being classified as non-poor in either intervention or time trend effect cannot be attributed to the Comprehensive Agrarian Reform Program (CARP).

Lastly, DIMAYUGA's paper found that passers of the Licensure Examination for Agriculturists (LEA) were those who performed well academically during high school and college and enrolled in a formal LEA review class backed up by self-review.

A handwritten signature in black ink, appearing to read 'Merlyne M. Paunlagui'.

Merlyne M. Paunlagui, PhD

Editor-in-Chief

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Determinants of Households' Participation in Tree Planting Activities at the REDD+ Project Sites in Southern Leyte, Philippines

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PEDRO T. ARMENIA, PhD²

Abstract. This paper aims to identify the determinants of households' participation in tree planting activities using available survey data, which included 797 randomly selected smallholder households from five REDD+ pilot project sites in Southern Leyte, Philippines. Binary logit regression model was employed to identify the factors that affected household-respondents' decisions to participate in tree planting or tree farming activities. The model was also employed to predict the probability of participation for given socio-economic and other characteristics of smallholder households. Results of the analysis show that REDD+ project site, membership in an organization, experience in environmental risks, access to natural resources, household size, and the total on-farm income of households were positively associated with tree planting. On the other hand, non-farm income, age of spouse, and decisions on production and livelihood activities that were made solely by household heads were negatively associated with participation. These determinant factors, in conjunction with their associative influence on participation, may be used as inputs

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for instituting or redesigning a roadmap aimed at enhancing smallholders' participation in tree planting activities and ventures.

Keywords: *REDD+, environmental practices, tree planting, participation, binary logit regression*

INTRODUCTION

Deforestation and forest degradation, through destructive logging, agricultural expansion, conversion of pasture land, infrastructure development, among other factors, account for about 12 percent of greenhouse gas emissions in the tropics (Van der Werf et al., 2009; Huettner, 2012). Reducing Emissions from Deforestation and Forest Degradation most popularly known as REDD is a mechanism designed to use market/financial incentives to reduce the emissions of greenhouse gases from deforestation and forest degradation. Moreover, REDD+ includes climate mitigation activities by forest occupant-households and communities for the sustainable management of forests and for the enhancement of forests' carbon stocks. Hence, Lasco, Pulhin, Bugayong, and Mendoza (2011) state that "many sectors in the Philippines are looking into the potentials of REDD+ to help finance forest protection and rehabilitation in the country." As a policy strategy, the country seeks to maximize the co-benefits from REDD+ involvement and participation as shown in its 2010 Philippine National REDD-plus Strategy which gave rise to the piloting of REDD+ project sites (FMB, 2004; FMB, 2011; The Philippines REDD-plus Strategy Team and DENR, 2010).

The Province of Southern Leyte experienced a loss of forest cover from 17.8 M ha in 1934 to only 7.17 M ha in 2003 or a loss of almost 60 percent for the period. It was identified as a REDD+ pilot site on Forest Policy and Piloting of REDD measures

through the Department of Environment and Natural Resources (DENR) and with support from BMU/GIZ (The Philippines REDD-plus Strategy Team and DENR, 2010; Carandang et al., 2013). The pilot project site is one of the remaining forests. It has active peoples' organizations involved in agro-forestry and forest protection activities. It is also one of the areas where the community-based forest management (CBFM) reforestation program of the government is implemented (Armenia et al., 2013). However, because of the very limited opportunities of upland farm-households, the project site also demonstrates the unsustainable upland farming practices of households who have access to natural forest resources, forest products, and by-products. The dependence of households on upland farms to support family needs and their continuous encroachment and dependence on forest resources and products contribute more to forest degradation and destruction, thus, making it an appropriate site for the REDD+ program.

The success of environmental conservation practices, especially on forest resources, depends largely on the participation of the forest-occupant households. Paul (1989 as cited by Datta & Sarkar, 2010) views participation as an active process by which beneficiary/client groups influence the direction and execution of a development activity in order to enhance their well-being in terms of income, personal growth, self-reliance, or other values they cherish. Their beneficiaries' participation in environmental activities such as tree planting helps preserve biodiversity and other natural resources. Households or individuals with diverse profiles participate in different environment-related activities. However, not all individuals are involved in these environmental activities. Different factors contribute to their decision to participate or not. These include awareness and understanding of environmental risks, attitudes, and knowledge of forestry programs (Bell, Roberts, English, & Park, 1994); household size and farm area (Salam, Noguchi, & Koike, 2000); level of resources controlled by the household in terms of land area managed; their tenurial security; and their cash income (Emtage & Suh, 2004).

But some other socio-cultural factors might be operative to prevent the potential of participation from being fully realized (Datta & Sarkar, 2010). Hence, this paper presents an analysis of one of the major activities of the households in the study sites. More specifically, it analyzed the factors affecting the households' decision to participate in tree planting activities and practices among smallholder household residents in the REDD+ sites in Southern Leyte, Philippines.

METHODOLOGY

The Project Site

The REDD+ pilot project sites are composed of 5 out of 19 Local Government Units (LGUs) in Southern Leyte (Figure 1). The five sites are generally characterized by relatively narrow strips of flat lands along coastal areas but rugged and mountainous towards the interior part. Of the five pilot sites, Bontoc has a total land area of 102.1 km², which covers 5.9 percent of the total land area of the province. Maasin City has a land area of 197.8 km², which comprises 11.4 percent of Southern Leyte. Silago has a total land area of 195.8 km², which occupies 11.3 percent of Southern Leyte. Sogod covers a total area of 192.7 km², which is equivalent to 11.1 percent of Southern Leyte's total land area. Finally, Tomas Oppus has the smallest land area of 85 km² among the five geographical units.

Sources of Data

Data for this paper were obtained from the research project entitled "Socio-economic Baseline for the REDD+ Project Sites in Southern Leyte, Philippines." The project, which was conducted to establish socio-economic baseline data and information for future assessment of project impact, covered a sample of 71 REDD+ barangays and 20 non-REDD+ barangays. These barangays are located in five LGUs in Southern Leyte, namely: Bontoc, Sogod,

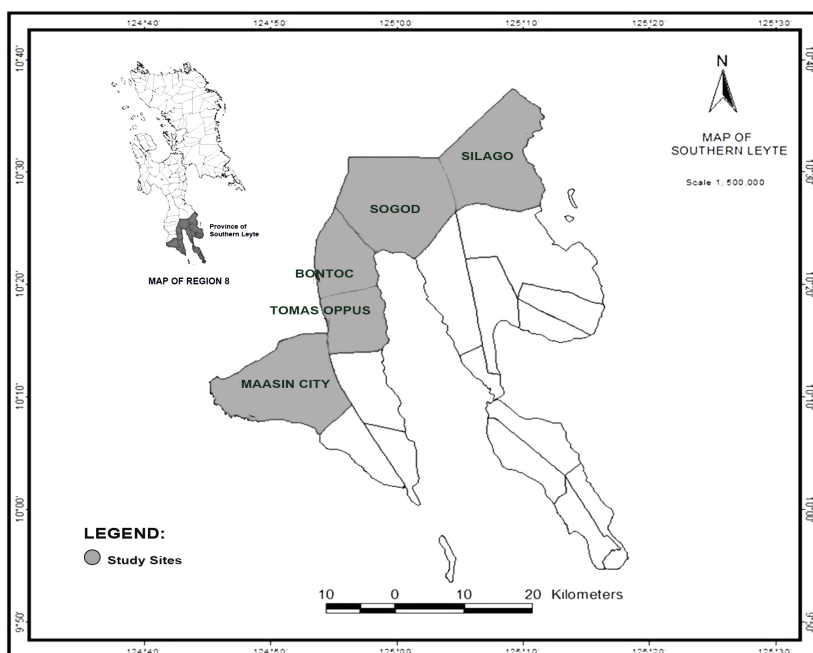


Figure 1. Map of Southern Leyte showing the five study sites
(adapted from Armenia et al., 2012)

Tomas Oppus, Silago, and Maasin City. Data and information came from 797 upland households that were selected randomly. Based on the total number of households per barangay, a total of 597 sample households from the REDD+ sites were randomly selected using proportional allocation technique. Similar procedure was also employed to choose the 200 sample households from 20 barangays in non-REDD+ project sites (Armenia, Bulayog, Patindol, Glova, & Serioño, 2012).

Location and Classification of Households

From the socio-economic baseline project data, the REDD+ sites were selected for the REDD+ project intervention activities, while non-REDD+ sites were identified as control. Households in REDD+ sites were located in relatively interior areas and comparatively farther from available transport facilities, closer to

the forest resources, and where farm holdings are more favorable for crops and tree farming. For purposes of this paper, however, farm-households both from REDD+ and non-REDD+ sites are classified as a) participants or b) non-participants in tree planting or tree farming activities.

Focus Group Discussions

Two focus group discussions (FGDs) were conducted at the project sites to validate, verify, and/or highlight important findings from the analysis. FGDs were also done to counter check whether the results of the analysis were reflective of the actual field conditions of households in the project sites. This approach had been used in previous studies to capture divergent viewpoints about the determinants of participation decisions (Hopkins, 2007 as cited in Kwayu, Sallu, & Paavola, 2013).

Members and non-members from people's organizations, namely: the Young Innovators for Social and Environmental Association (YISEDA) located in Barangay Lunas, Maasin City and the Anahao Movement for Productive Community Organization (AMPCO) in Barangay Anahao, Bontoc were visited. Representative groups were requested to participate in the two FGDs conducted in the two project sites. The FGD participants were asked questions based on the results of the data analysis. The results of the FGDs and field observations were used to substantiate and supplement the report for this study.

Logistic Regression Model

A binary logit regression model was employed to identify the factors that affected the households' decision to participate in tree planting or tree farming activities. The model is one of the most common approaches used to study the decision between two alternatives. The model may also be employed to predict the probability that an individual with certain socio-economic characteristics and other determinants can choose one of the

two alternatives (Long & Freese, 2001; Gujarati, 2004). This model has also been employed to identify the determinant factors toward participation to forest stewardship or woodland programs in advanced countries since the 1990s (e.g., Bell et al., 1994; Nagubadi, McNamara, Hoover, & Mills, 1996; Crabtree, Chalmers, & Barron, 1998). Logit regression modeling was likewise adopted in the Philippines to assess, among others, the decision to participate in the Sloping Agricultural Land Technology (SALT), smallholder agroforestry systems, and tree growing among upland farm-households (Armenia, Sandoval, & Abit, 1990; Sureshwaran, Londhe, & Frazier, 1996; Emtage & Suh, 2004; Schuren & Snelder, 2008).

Adopting from Gujarati (2004), a binary choice logit regression may be illustrated in equation (1):

$$Ln\left(\frac{P_i}{1-P_i}\right) = \beta_o + \sum_{j=1}^k \beta_j X_{ij} \quad (1)$$

Where: P_i =probability of the event occurring, β_o = constant term, β_j = coefficients, and X_{ij} = independent variables. Based on the general empirical model presented in equation (1), the effect of explanatory variables on farmer's decision to participate in tree planting activity could be expressed through the following linear relationship with their corresponding model specification shown in equation (2):

$$Y_1 = \begin{matrix} \vdots \\ \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \\ \beta_9 D_1 + \beta_{10} D_2 + \beta_{11} D_3 + \beta_{12} D_4 + \beta_{13} D_5 + \beta_{14} D_6 + \beta_{15} D_7 + u_1 \dots \\ \vdots \end{matrix} \quad (2)$$

Where: Y_1 = participation on tree planting activity, 1 if participant and 0 otherwise; X_1 = age of the household head in years; X_2 = age of spouse in years; X_3 = educational attainment of household head in years of formal schooling; X_4 = educational attainment of spouse in years of formal schooling; X_5 = number of household

members; X6 = annual on-farm income of household in pesos; X7 = annual non-farm income of household in pesos; X8 = farm area cultivated in hectares; D1 = project site, 1 if REDD+ site, 0 if otherwise; D2 = active membership in farmers' organization, 1 if member, 0 if otherwise; D3 = experienced environmental risks and degradation, 1 if yes, 0 if otherwise; D4 = access to support and extension services, 1 if yes, 0 if otherwise; D5 = access to natural resources, 1 if yes, 0 if otherwise; D6 = head of household make sole decision on farm inputs and farm activities, 1 if yes, 0 if otherwise; and D7 = household head make decision on production and livelihood activities, 1 if yes, 0 if otherwise; u_i is the residual term.

The model in equation (2) was estimated using the STATA statistical package. To ensure the validity of the results, the estimated model was subjected to the standard post-estimation diagnostic procedures such as model specification errors, goodness-of-fit, and multicollinearity tests (Long & Freese, 2001; Samprit & Hadi, 2006).

RESULTS AND DISCUSSION

The Determinant Factors

Table 1 presents the summary characteristics of sample smallholder households by participation to tree planting or tree farming. Location wise, although majority of participating households were identified from the REDD+ sites (81%), a small proportion (19%) of participants also came from the Non-REDD+ sites. With regard to membership in organizations, majority of the participants (64%) were active members and only 36 percent were non-members. The greater majority of participating households (86%) experienced environmental risks and degradation than those who did not (14%). Likewise, more or less 40 percent of participating households had access to natural resources. However, majority of sample households (59%) with no access to natural resources still participated in tree planting activities.

Table 1. Distribution of household respondents by selected determinants of participation

ITEMS	PARTICIPATION IN TREE PLANTING				TOTAL	
	Non-Participant		Participant		Count	Col %
	Count	Col%	Count	Col%		
<i>Project site/Location</i>						
Non-REDD	182	25.9	18	18.9	200	25.1
REDD	520	74.1	77	81.1	597	74.9
Total	702	100.0	95	100.0	797	100.0
<i>Membership in farmers' organization</i>						
Non-member	354	50.4	34	35.8	388	48.7
Member	348	49.6	61	64.2	409	51.3
Total	702	100.0	95	100.0	797	100.0
<i>Experienced environmental risks</i>						
Did not experience	222	31.6	13	13.7	235	29.5
Experienced	480	68.4	82	86.3	562	70.5
Total	702	100.0	95	100.0	797	100.0
<i>Access to support and extension services</i>						
With access	148	21.1	19	20.0	167	21.0
Without access	554	78.9	76	80.0	630	79.0
Total	702	100.0	95	100.0	797	100.0
<i>Access to natural resources</i>						
With Access	385	54.8	39	41.1	424	53.2
Without Access	317	45.2	56	58.9	373	46.8
Total	702	100.0	95	100.0	797	100.0

Table 1. Distribution of household respondents... (continued)

ITEMS	PARTICIPATION IN TREE PLANTING				TOTAL	
	Non-Participant		Participant		Count	Col %
	Count	Col%	Count	Col%		
<i>Decision making on farm inputs activities</i>						
Other household members	441	62.8	59	62.1	500	62.7
Household head	261	37.2	36	37.9	297	37.3
Total	702	100.0	95	100.0	797	100.0
<i>Decision making on production and livelihood activities</i>						
Other household members	586	83.5	81	85.3	667	83.7
Household head	116	16.5	14	14.7	130	16.3
Total	702	100.0	95	100.0	797	100.0

For both participants and non-participants of tree planting activities, the average age of household heads was 53 years and about 47 years for their wives. About 8 years of formal schooling was also observed for both household heads and their spouses. For annual on-farm income, participants in tree planting activities had higher average annual on-farm income (Php 75,870.55) than non-participants (Php 70,471.17). However, non-participants of tree planting activities had higher non-farm income (Php 46,092.16) than participant households (Php 39,006.23). Moreover, participant households cultivated a higher average area of 5 hectares, while non-participants had about 4 hectares (Table 2).

Table 2. Household characteristics included in the logit model by participation to tree planting activities

ITEMS	PARTICIPATION IN TREE PLANTING	
	Non-Participant	Participant
	Mean	Mean
Age (Household head)	53.50	53.23
Age (Spouse)	47.72	46.62
Educational attainment (Household head)	7.27	8.02
Educational attainment (Spouse)	8.35	8.95
Household size	4.72	5.08
Annual on-farm income (Pesos)	70,471.17	75,870.55
Annual non-farm income (Pesos)	46,092.16	39,006.23
Farm area (hectares)	3.93	4.77

Results of the Logit Model

The binary logit regression model was employed to identify the factors that affect household-respondents' decisions to participate or not participate in tree planting or tree growing activities. Given certain characteristics of households, the model was likewise used to predict the probability of participation or non-participation to tree-planting activities among households in the project site. Although the coefficients of the logit model are not directly interpretable unlike the standard regression, the signs of the coefficients may be used to identify association between participation and the statistically significant variables included in the model. As applied in this study, variables with positive and significant coefficients may be associated with participation in tree planting or tree farming activities. On the other hand, factors with negative and significant coefficients may also be used to

describe the characteristics of the most likely non-participants to tree planting in the project. Contrary to expectations, the other variables such as awareness of environmental risk and degradation, access to support and extension services, and educational attainment of head of households, did not have positive and significant impact on participation to tree planting or tree farming activities. Hence, their associative influence in the model can just be attributed to chance probability.

As gleaned from Table 3, results of the logit regression on factors affecting participation to tree planting activities show that REDD+ project site (D1), active membership in organization (D2), experienced environmental risks (D3), access to natural resources (D6), household size (X5), farm area in hectares (X8), and annual on-farm income (X6) have positive and statistically significant coefficients. These factors are indicative of the characteristics of farm households who would more likely participate in tree planting or tree farming activity in the project site. On the other hand, age of housewife (X2), annual non-farm income (X7), and the household heads who make sole decision on production and livelihood activities (D7) have negative and statistically significant coefficient implying that households whose heads are the sole decision makers on production and livelihood activities, those with older housewives, and those with higher income from non-farm sources are the ones who would most likely not engage in tree planting or tree farming.

The positive and statistically significant coefficients of the REDD+ and access to natural resources dummy variables capture the inherent and favorable geographical locations of the project site where upland smallholders would most likely participate in tree planting activities in the project area. The positive association between access to natural resources and participation to tree planting activities could perhaps be attributed to the proximity of participating households to where these natural resources can be found. As delineated by project REDD+ project proponents, the sample REDD+ barangays are located relatively closer to forest

Table 3. Logit model estimates on the factors affecting tree planting activities

Variables	Coefficient	Std. Error	P>[Z]
<i>Dummy Variables</i>			
REDD+ project site	1.261***	0.416	0.002
Membership in an organization	1.008***	0.314	0.001
Experienced environmental risks	2.770***	0.741	0.000
Access to support and extension services	-0.466	0.340	0.171
Access to natural resources	0.655**	0.299	0.028
Farm inputs/farm activities	0.487	0.321	0.130
Production and livelihood activities	-0.796*	0.464	0.087
<i>Continuous Variables</i>			
Age (Household head)	0.007	0.015	0.645
Age (Spouse)	-0.022*	0.012	0.079
Educational attainment (Head)	0.037	0.022	0.107
Educational attainment (Spouse)	-0.003	0.019	0.874
Household size	0.238***	0.065	0.000
On-farm income	2.830**	1.270	0.026
Non-farm income	-6.380**	2.820	0.024
Total farm area in hectares	0.039*	0.024	0.097
Likelihood Ratio ($\chi^2 = 93.29$, $df = 14$, $Sig = 0.000$)			
Hosmer-Lemeshow test of Goodness-of-fit (Prob>chi2 = 0.6680),			
Goodness-of-fit: Percent Correct Classification = 91.18%			

***Significant at 1%, **significant at 5%, and *significant at 10%

resources. Further, both have biological and physical environment comparatively favorable to tree planting or tree farming activities vis-à-vis the non-REDD+ sites.

The positive association between participation and experiences of environmental risks such as increase in temperature, drought, flooding due to typhoons, and soil erosion may be attributed to upland dwellers' perception or understanding on the positive effects of tree planting on the environment. Exposure and understanding of environmental risks, which could be due to training on environmental aspects of forestry programs, may have contributed to decisions on participation to tree planting activities (Bell et al., 1994).

The association between active membership in farmers' organization and participation on upland farming or smallholders' tree farming systems is already well documented. For instance, participation in SALT, reforestation programs, agroforestry practices, and smallholders' tree planting and management decisions were found closely influenced by or associated with active membership in relevant community/farmer organizations (Armenia et al., 1990; Nagubadi et al., 1996; Emtage & Suh, 2004; Nkamleu & Manyong, 2005). In this study, the positive association between membership or active involvement in organizations and participation in tree planting or tree farming may have been attributed to the fact that tree planting activities in the study sites are usually associated with active involvement as well as participation in community-related activities as well as previous exposure and experiences in community forestry programs. In the project sites, the existence of CBFM sites in some areas where upland dwellers are already exposed to and knowledgeable on forestry programs may have positive contribution on their decisions to participate in tree planting activities. This is in consonance to what Bell et al. (1994) found that attitudes and knowledge on forestry programs may influence a landowner's decision to participate.

Economic incentives are usually considered the major drivers to participation in any economic activity. In this study, household size, farm area, and the amount of on-farm income had the expected positive relationships with participation to tree planting activities. On the other hand, non-farm income, age of spouse, and decisions made solely by heads of households on production and livelihood activities had negative coefficients and therefore negatively associated with participation. Since upland household dwellers in the project sites are generally resource poor, the more number of household members and relatively larger farm holdings would imply higher availability of labor and land resources at the disposal of households and therefore the higher the likelihood of participation.

The result is in consonance with the findings of Salam et al. (2000) on the positive influence of household size and farm area on tree planting decisions in homestead agroforestry in Bangladesh, but contrary to the finding of Alassaf, Majdalwai, and Nawash (2011) in marginal upland farming areas in Jordan. In the case of on-farm income, its positive association with participation can be attributed to the fact that participation may be enhanced by the availability of income to support the immediate and basic needs of households during the initial establishment of the tree farms. Likewise, participation can also increase the future expected income opportunities of participating households. This is in consonance to what was claimed by Datta and Sarkar (2010) that active participation in forest conservation activities presupposes a sense of commitment, attachment, and economic motivation of forest dwellers.

Moreover, the economic success conditions of participation identified by Pasicolan, Udo De Haes, and Sajise (1997) on small tree farm holdings in the Philippines without government support showed that: 1) farmers' direct need for tree products and other uses, 2) wood products market prospects, 3) farmers' economic situation, and 4) farmers' enterprising attitude, among other

things, are the important drivers of participation and success in smallholder tree farming. Further, the findings of Emtage and Suh (2004) on the social and economic factors affecting small-scale forestry development in Leyte, Philippines showed that level of resources controlled by the households in terms of land area managed, their tenurial security, and their cash income are correlated with higher levels of participation in forestry activities, and greater intentions to plant more trees in the future.

The negative association between non-farm income and participation can be explained by the nature of income opportunities faced by upland dwellers in the project sites. While all of the upland dwellers face somewhat similar income opportunities to engage in upland and tree farming systems, some households are more inclined towards non-farm entrepreneurial ventures in view of their inherent management capabilities and their strategic locations in the villages. Hence, as their income from non-farm sources increases, the likelihood of their participation to tree farming goes down. These findings and observations were noted in the baseline study of Armenia et al. (2012) but contrary to what Salam et al. (2000) found for homestead agroforestry in Bangladesh wherein farmers, whose main source of income is non-agricultural, are more likely to decide to plant trees.

It is commonly observed that both the household heads as well as their spouses are active partners in most crops and livestock farming systems most especially in upland agriculture. However, the physical capability of the spouses as partners may decline with age. As in the case of aging spouses, the negative association between participation and age of spouse is expected. Likewise, the negative relationship between participation and decisions made solely by heads of households on production and livelihood activities is indicative that the likelihood of participation to tree planting may not be forthcoming when only the head of households make decisions on matters related to production and livelihood activities.

Predicted Probability of Participation

The result of the logit regression model indicating positive and significant relationships between tree planting and selected predictor variables may be used to predict the average probability of participation given certain characteristics of farm households. For instance, given the following characteristics of households: 1) farm areas are within the REDD+ project sites, 2) they are active members in farmers' organizations, 3) they experienced environmental risks, and 4) they have access to natural resources. The blue line in Figure 2 shows an increasing probability of participation with increasing levels of on-farm income.

On the contrary, the red line shows the very low probability of participation with increasing level of on-farm income if the farm-household comes from the non-REDD+ site; it is not a member of an organization; it did not experience environmental risks; and it had no access to natural resources. This result has important implications on the characterization of project beneficiaries to ensure higher participation in implementing the

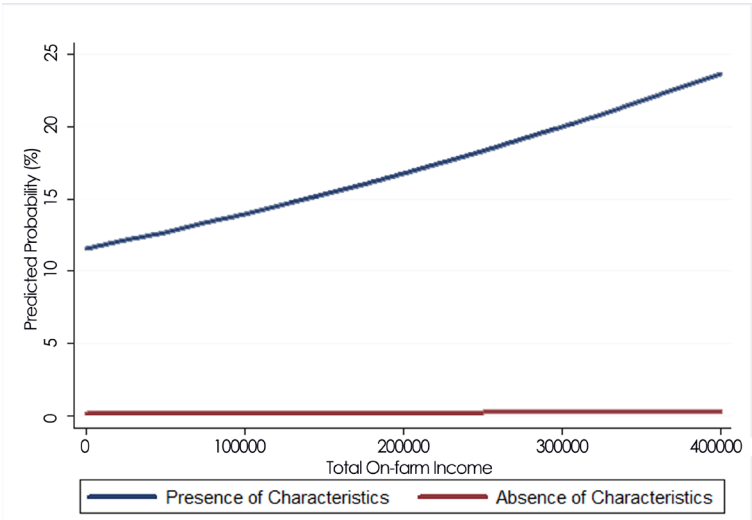


Figure 2. Predicted probability of participation to tree planting with given levels of on-farm income

REDD+ project. Moreover, the expected increase in probability of participation with increasing annual on-farm income indicates that participation of smallholder households, with low on-farm income but with the other desired characteristics of would-be participants, may be expected to participate; that is, if counterpart projects that enhance on-farm income can be instituted as stop-gap support to a tree planting or tree farming program.

CONCLUSIONS AND RECOMMENDATIONS

The smallholder upland households make appropriate choices and decisions to commit their limited human and non-human resources to activities they think will provide the most benefits. In making such choices, such as their participation in tree planting or tree farming, their decisions are usually influenced or associated with the interplay of physical, institutional, and socio-economic factors. The factors that were positively associated with participation were: location of farms within the REDD+ project sites; the household's active participation in farmers' organizations; their relative access to natural resources, which implied that participation was enhanced if farm areas were relatively closer to forest resources and available land was relatively suitable for tree farming; they were cultivating relatively larger farm holdings, which indicated the relative availability of land to be allocated for tree planting; and they were earning modest to higher annual on-farm income.

The positive association between participation and on-farm income implied that households would most likely participate if their family earned at least a modest on-farm income to support their immediate family needs, while they allocated labor and financial resources to establish and manage their tree farms with anticipated income. On the other hand, the negative association between non-participation and non-farm income implied that non-participation might be the more rational decision for households

earning more non-farm income sources than the expected income from tree farming activities.

The following policy recommendations can be drawn:

1. To enhance participation among upland households, some factors that were found positively associated with participation should be considered in targeting, characterizing, and prioritizing project beneficiaries. These include location of farms within the REDD+ project sites, the household's active participation in farmers' organizations, their relative access to natural resources, larger farm holdings, and higher annual on-farm income.
2. Participating households or potential smallholder households with appropriate characteristics but with very limited on-farm income must be provided with immediate alternative income sources. Such initiative needs to be designed and implemented in conjunction with tree planting or tree farming programs. For instance, there is a need to continue and sustain the "cash for work scheme" where households are paid for labor provided during the initial establishment and management of tree farms implemented by the REDD+ project. However, this scheme should be exclusive to the smallholder and marginal upland households.
3. Alternative livelihood support schemes such as trees and crop intercropping, and small-scale cottage industries may be implemented to provide other income opportunities to participating households while there is still no income from tree farming.

ACKNOWLEDGMENT

The authors thank the following persons and institutions whose support and contributions made possible the completion of this study: The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) for the financial support, Ms. Nelfa M. Glova for improving this article, Dr. Teofanes A. Patindol for assisting the major author in conducting the fieldwork and FGDs in Southern Leyte, LEYECO IV Electric Cooperative, and most especially Dr. Jose M. Alkuino, Jr. for helping the major author obtain a scholarship grant and thesis support.

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Participation of Beneficiaries in Community Health Care Program: The Case of Tangpre Parish, Kachin State, Myanmar

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Abstract: This study determined the perception on the participation level of village people as beneficiaries of a community health care project, which served as a development strategy in four villages of Tangpre Parish in Kachin State, Myanmar. A total of 62 beneficiaries including one project staff served as respondents of the study. Data were collected through a combination of individual survey and key informant interviews. Results of the survey were analyzed using descriptive statistics.

Results showed that the perceived level of participation was moderate in all phases. Project activities such as health prevention trainings; support for basic needs; and provision of medicines, supplementation and treatment; and referral services were the motivating factors that increased the participation of the grassroots. The beneficiaries' contributions in terms of their resources like food, labor, shelter, knowledge, and time were

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indicators of their commitment to the project. Highly favorable attitude, improved skills, and knowledge of the community health care workers, health and development committees, and project staff were important factors that encouraged the beneficiaries to achieve the project's objectives.

Political conflicts and lack of transportation were found to be the major barriers to program implementation. Hence, there is a need to address the conflicts and improve the peace and order situation in the villages. There should also be a close collaboration of the Community Health Care and Development Program with the national government and the Kachin Independence Association to address a wide range of issues in attaining basic needs and in improving all aspects of the people's lives.

Keywords: *participation, program management, program effectiveness*

INTRODUCTION

Myanmar (formerly Burma) is one of the countries in Southeast Asia with an estimated population of about 58 million (World Food Programme, 2012). Myanmar is among the region's most ethnically diverse countries comprising 135 officially recognized ethnic races, two-thirds of which live in the rural areas. These include the largely Buddhist, Burmese-speaking Burman majority. Non-Burman ethnic groups live predominantly in highland areas and are culturally and linguistically distinct from each other and from ethnic Burmans, who traditionally reside in lowland, central Burma. These non-Burman ethnic groups include Kachin, Kayah, Kayin, Chin, Mon, Bamar, Rahkine, and Shan (Human Rights Watch, 2012).

Among the states and divisions, Kachin State is the northernmost state in Myanmar, bordered by China and India. The state is populated mostly by the Kachin people, a predominately Christian group with a Tibeto-Burman language and a culture and identity distinct from Burma's Buddhist majority and ethnic Burman population (Physicians for Human Rights, 2011). Of the 46,660 estimated population of Kachin State (Lin, 2014), majority of the people dwell in vast hilly regions mainly engaged in the cultivation of a large amount of arable land for their staple food and social welfare. Despite the country's significant human potential and natural resources, Myanmar is still categorized as one of the world's least-developed countries. It ranked 149th out of 187 countries and territories assessed in the 2011 United Nations Development Program (UNDP) Human Development Report.

The World Health Organization (2008) stated that about 70 percent of the population in 284 out of 325 townships of Myanmar live in malaria-endemic areas. Infant deaths were caused by acute respiratory infections, diarrhea, brain infections, low birth weight, premature births, and malaria.

In Kachin State, most mothers have between five and eight children. Half of their children die before they reach the age of five because of diseases that can be easily prevented or cured, such as malaria, diarrhea, or pneumonia. Electric power, clean drinking water, and health services are luxury resources in the villages. Nine out of 10 people go hungry for four months every year (Health Poverty Action, 2013).

There are international and local NGOs whose programs are aimed at addressing these problems. However, with government's stringent rules, organizations have limited opportunities to provide interventions. One of these organizations is the Community Health Care and Development Program (CHC&DP), which was founded by Sr. Susanna of the Columban Order of the Roman Catholic Church.

CHC&DP worked with the communities in five target parishes, consisting of 24 target villages and six non-target villages in Tangphre Parish in the Myitkina District of the Kachin State. The Program, which ran from 2009 to 2011, considered all community members (men, women, children, and adults) as participants.

Under the Program, common diseases and other health-related issues were identified and activities for a three-year project were set up in the target areas. Community mobilization strategies conducted were capacity building, organizing the village volunteers, and mobilizing the village development committees. These strategies were aimed at helping the local people identify their basic needs and lead their communities in addressing these needs.

Mosquito nets, blankets, rice, and cash were identified as basic needs. These were provided to them with the assistance of the community health care worker according to the Program criteria. The village volunteers were also provided with health and development trainings and given medicines and equipment to treat common diseases. Nutrition supplementation activities for backyard gardening and seeds were provided as an important component of the Program.

Consequently, the Program had a lot of positive outcomes, namely: improved handwashing practices, correct usage of mosquito nets, improved personal hygiene, and observing balanced diet. Furthermore, the rural people were able to build fly-safe latrine and undertake backyard gardening with local resources.

However, while there were many positive health outcomes from the Program, people's participation in some Program areas was rather low.

Objectives of the Study

The general objective of the study was to determine the beneficiaries' perception on their participation in the CHC&DP as a community development strategy in Myitkyina, Kachin State, Myanmar.

The specific objectives were to: 1) describe the level of participation of the target beneficiaries in Program management; 2) determine the level of effectiveness of the CHC&DP vis-à-vis its immediate objectives; and 3) analyze the facilitating and constraining factors of Program effectiveness.

METHODOLOGY

The study was conducted in Tanghphe Parish, Kachin State in 2012 upon completion of the Program which was implemented from 2009 to 2011. The study sites were four villages, namely: Tang Bau Yang, Bum Nyen Yang, Pung Tswi Yang, and Ngreng Kawng.

The study used a survey research design with interviews among the participants. The respondents were selected from the household beneficiaries: 21 in Tang Bau Yang, 31 in Bum Nyen Yang, 62 in Pung Tswi Yang, and 46 in Ngreng Kawng. The sample size of 62 was computed using Slovin's formula and selected through draw lot method. The samples were drawn as follows: 8 from Tang Bau Yang Village, 16 from Bum Nyen Yang, 28 from Pung Tswi Yang, and 10 from Ngreng Kawng using proportional allocation. Secondary data such as Program documents were reviewed.

Quantitative and qualitative data such as the respondents' socio-demographic characteristics, participation in the program management phases, program effectiveness, and facilitating and

constraining factors were collected through face-to-face interview using a structured questionnaire. Close and open-ended questions were used in the questionnaire to elicit the required information from the household respondents. To ensure reliability of the instrument, it was pre-tested on two persons who came from nearby target villages. The data were collected by the principal researcher with the assistance of four enumerators.

A set of guide questions was prepared for the staff-respondent to gather additional information and to provide context for the information from the survey. Qualitative analysis was used in this study. Descriptive statistics such as frequency counts, percentages, mean, weighted mean, over all weighted score (average of the mean score of each statement), and adjectival rating scale were used to analyze the findings.

The perceived level of participation was measured using a rating scale of 1-5, where 5 = very high, 4 = high, 3 = moderate, 2 = low, and 1 = very low. The mean scores were interpreted as high (3.68-5.00), moderate (2.34-3.67), and low (1.00-2.33).

RESULTS AND DISCUSSION

Socio-demographic Characteristics of the Respondents

Most of the respondents were male and with ages ranging from 24 to 74 years old, married, and head of families. Majority (93%) had very low level of education, most reaching only primary grade level. Out of the 62 beneficiaries, 21 percent had not gone to school at all. Only 55 percent had gone to primary school (Grades 1 to 4); 18 percent to secondary school (Grades 5 to 8); 5 percent to high school (Grades 9 to 10); and only one to college. The average of schooling is three years (Table 1).

Table 1. Socio-demographic characteristics of the beneficiaries

PARAMETER	TOTAL (n=62)	
	Frequency	Percentage
Age (years)		
24 - 33	17	27
34 - 43	20	32
44 - 53	16	26
54 - 63	6	10
64 - 73	2	3
>74	1	2
Mean = 42.77		
Sex		
Male	34	55
Female	28	45
Educational attainment		
Have not gone to school	13	21
Primary (Grades1-4)	34	55
Elementary (Grades 5-8)	11	18
High school (Grades 9-10)	3	5
College	1	2
Mean = 3 years		
Range = 0-13 years		
Occupation		
Farmer	60	96
Teacher	1	2
Catechist	1	2

Majority of the respondents (96%) were farmers. Only two did not engage in farming - a school teacher and a catechist (Table 1). Studies have shown that age is related to participation (Liu, 2003), and education is a key component to improving income, economic competitiveness, and health (De Stefano & Moore, 2010). Greater participation by women also leads to improvements in health, nutrition, and poverty for the women, men, and families (Bill and Melinda Gates Foundation, 2008).

Beneficiaries' Attitude Towards the Project's Health-Related Trainings and Support

Of the 62 beneficiaries, 28 (40%) agreed and 14 (27%) strongly agreed that "the trainings given were clear, relevant, and included health prevention education and other related trainings" (WM=3.8). They believed that the trainings were important. One target area was given at least two trainings of four to five days in a year. The trainings employed several methods such as role playing, storytelling, singing, group work, presentation, practical, and lectures based on the beneficiaries' existing knowledge (Table 2).

For the statement "the volunteers and committees were well trained and their skills improved during the implementation," 18 percent strongly agreed and 48 percent agreed (WM=3.8). After attending the basic community health care workers trainings, the community health workers (CHWs) could give health education, administer treatment, and organize the beneficiaries to participate in the project implementation. In addition, the target villages were provided with books, pamphlets, and VCDs as learning materials, which they brought back in their villages.

Some 28 beneficiaries (45%) strongly agreed that the "basic support provided by the Program such as money, food, and medicines were effective" (WM=4.2). The 24 beneficiaries (39%) who agreed with the statement mentioned that the villages were often intensely affected by rice shortage, floods, and diseases.

Table 2. Beneficiaries' attitude towards the projects' health-related trainings and support

No.	STATEMENTS	RESPONSE (n=62)												Weighted Mean	Adjectival Rating
		SA		A		N		DA		SDA		Range			
		F	%	F	%	F	%	F	%	F	%				
1	The trainings given were clear, relevant, and included health prevention education and other related trainings.	14	27	28	40	19	31			1	2	1-5	3.8	Highly favorable	
2	The volunteers and committees were well trained, and their skills improved during the implementation.	11	18	29	48	22	35					3-5	3.8	Highly favorable	
3	I find the program's basic need support to be effective.	28	45	24	39	8	13	1	2	1	2	1-5	4.2	Highly favorable	
4	The medicines and facilities provided by the program are relevant and affordable for us.	20	32	32	52	10	16					3-5	4.2	Highly favorable	
5	Because of the project, illness as well as death rate decreased.	21	34	24	39	12	19	3	5	2	3	1-5	3.9	Highly favorable	
Overall Weighted Score													4.0	Highly favorable	

Legend: Categories: SA = Strongly Agree, A = Agree, N = Neutral, DA = Disagree, SDA = Strongly Disagree
Rating Scale: Highly Favorable = 3.68-5.00, Favorable = 2.34-3.67, Slightly favorable = 1.00-2.33

However, there was no organization that supported such basic needs. Eight beneficiaries (13%) were neutral, one beneficiary (2%) disagreed, and one (2%) strongly disagreed with the statement.

Further, 20 (32%) strongly agreed and 32 (52%) agreed that “the medicines and facilities provided by the Program were relevant and affordable for us” (WM=4.2). The beneficiaries shared that there had many serious illnesses and high death rates in their community in the past. At present, however, people are healthy because of the medicines and facilities provided in the communities. The medicines are of good quality and the prices are more affordable compared to those bought from shops or other people.

Lastly, 21 beneficiaries (34%) strongly agreed and 24 (39%) agreed that “illness as well as death rate decreased compared to the past because of the Program” (WM=3.9). They explained that the villages then were not conducive places to stay as it boded possible sickness. At present, the beneficiaries feel secure. However, 12 beneficiaries (19%) were neutral, while three beneficiaries (5%) disagreed, and two (3%) strongly disagreed with the statement.

The study showed that majority of the beneficiaries agreed with the statements. They became more aware of the value of good health, especially the women who used to be malnourished and suffered insomnia due to loss of appetite. They felt proud because they were able to avail of safe and reliable treatments and medicines. In the past, they did not know much about sickness prevention and had no access to medicines.

Participation of Beneficiaries in the Project

Mac Ginty and Williams (2009) stated that public or local participation through the years have become prominent theme in

relation to development and peace building. The high success of programs and projects depended on the high level of participation from the beneficiaries. Participation means full involvement of the local leaders and the household members or villagers from pre-planning up to the monitoring and evaluation phases. Thus, the target beneficiaries' perception on their level of involvement in the project was assessed to see whether this was a critical success factor of the project. Appendix Table 1 provides information on the beneficiaries' participation in the different phases of the project.

Pre-planning phase. Of the 62 beneficiaries, 19 beneficiaries (31%) had moderate level of participation in "initial discussions with local authority and the community." As regards to Statement 2, a total of 24 beneficiaries (37%) had very low and four (6%) had low levels of participation in identifying, analyzing issues, and presenting the conditions of the village. For Statement 3, a total of 21 beneficiaries (34%) had very low, while seven (11%) had low levels of participation in the formation of village health and development committees and in the selection of volunteers. Based on the overall results, the beneficiaries had moderate level of participation in the pre-planning phase (OWS=2.7).

In the pre-planning phase, the priest and the catechists initiated the discussion about the current situation and issues in the target areas. After the discussion, the program leaders made the decision of entering the target areas or not. Their decision was communicated to the priest and catechists only and not to the national government authorities and the Kachin Independence Association (KIA).

Results revealed various reasons for non-participation among the beneficiaries in the pre-planning phase. Some were engaged in farm work; some had many children to take care of; some often travelled out of the village for jobs like hunting, gold mining, and farming; and there were no educated persons in the house.

The staff-respondent also gave answers that were consistent with the beneficiaries' answers regarding the pre-planning phase. She was involved in the preparation stage as facilitator; she led the planning activities; and she prepared the agenda for the entry of the Program in the target areas. However, she mentioned that the priest, catechists, and villagers were not included in this phase and that only a few beneficiaries were engaged in planning. The staff mentioned that they conducted home visits to find out the real condition in the villages. They conducted awareness campaigns, identification, and discussion of issues specifically on the health improvement strategy against malaria, diarrhea, and the need for modern fly-safe latrine and safe and clean water.

Overall, there was moderate participation in the specific activities, except in Statement 1, "deficiency in advocacy," which can be considered as the weakness of the Program management. The staff were not able to communicate first with some leaders.

Planning phase. As for Statement 1, a total of 21 beneficiaries (34%) had very low and five (8%) had low level of participation in organizing people to attend the workshop. For Statement 2, some 20 beneficiaries (32%) had very low and eight (13%) had low participation in attending the workshop in setting activities and in sharing of responsibility. As for Statement 3, 18 beneficiaries (29%) had high and eight (13 %) had very high participation in contributing materials and resources and in sharing of food and accommodation.

Overall, the beneficiaries had a moderate level of participation in the planning phase (OWS=2.7). This appeared to be a consequence of the lack of participation in the pre-planning phase. Some leaders and beneficiaries were not familiar with the Program because of their inability to participate in the pre-planning phase. Hence, they hesitated to participate in the planning phase.

During the survey, 41 beneficiaries (66%) said that they participated in the planning. Those who did not participate reasoned out that they were constrained by household, school, and farm works; they had frequent travels; and there was no educated person in the house.

The staff-respondent mentioned that she led the planning activities as facilitator, coordinator, communicator, and reporter of all the issues identified. She asserted that these had been put in the plan. Further, she participated whenever there was a preparation for the activities in the villages and had to follow up these things.

Based on the results, majority of the beneficiaries participated in the planning phase in many forms, but they moderately participated in specific activities. According to Swanepoel and De Beer (2006), planning is one important aspect to take into account to be successful in community development. Planning must involve everyone and should not just be the prerogative of few members.

Implementation phase. Some 24 beneficiaries (39%) had moderate level of participation in organizing communities for different activities. Further, 21 beneficiaries (34%) had a moderate level of participation in trainings and meetings. Lastly, 22 beneficiaries (35%) had moderate participation in contributing resources and suggestions for the activities. Likewise, 21 beneficiaries (34%) had moderate level of participation in formulating income-generating activities.

Overall, the beneficiaries had moderate level of participation in the implementation phase (OWS=2.9). However, participation level increased slightly compared to the previous phases since the Program changed its communication and organizing strategies. This time, the Program communicated with the religious leaders to organize or rally the people to participate. Later, they also involved the village development committees that were elected by the beneficiaries. The members of the committees

organized the beneficiaries to participate in the implementation of the Program. Hence, the participation of the beneficiaries reached a moderate level at the implementation stage.

In terms of the beneficiaries' participation in the implementation stage, 37 beneficiaries (60%) said that they participated, while 25 beneficiaries (40%) said they did not.

The staff-respondent explained that the project staff and the beneficiaries had different roles in the implementation phase. The roles of the staff include providing health education, contributing to meeting basic needs, and sharing responsibilities with the committees and the CHWs in monitoring and evaluation. For the community members, it was important to attend the health trainings. The community's participation level was found to be very low during the trainings. It was mostly the women and children who participated.

The staff-respondent also asserted that there were beneficiaries who did not participate in the meetings because they did not understand well the project and its activities. She observed that some communities did not have much interest in the Program.

Overall, majority of the beneficiaries had moderate participation in the implementation phase. Those who participated benefited more than the others in terms of health education and other development-related trainings. The basic needs and referral services were delivered to the most difficult households according to the criteria. Further, medical attention such as treatment, home visits, and other technical assistance were offered to the people in the villages. As Swanepoel and De Beer (2006) pointed out, implementation is not for the project management team alone but also for the affected people.

Monitoring and evaluation phase. In this phase, 24 beneficiaries (39%) had very low and six (10%) had low level of

participation in regular monitoring and discussions. On the other hand, 22 beneficiaries (35%) had very low and four (6%) had low level of participation in analyzing the condition of the people and in collecting data. Meanwhile, 25 beneficiaries (40%) had moderate participation in contributing resources and materials for the workshops. Some 21 beneficiaries (34%) had very low and 9 (15%) had low level of participation in the data collection and evaluation stage. Another 21 beneficiaries (34%) had very low and four (6%) had low level of participation in presenting the conditions of the target villages and in writing the report.

Overall, the beneficiaries had moderate level of participation in the monitoring and evaluation stage (OWS=2.6). Monitoring was mostly done on committees and CHWs' performance. Their skills were in giving treatment and health education, record keeping, and communicating problems to the beneficiaries. However, evaluation was conducted only once at the end of the first year of project implementation in three villages except in Pung Tswi Yang village.

Summary of beneficiaries' participation in the project.

The beneficiaries had moderate level of participation in all the phases. However, pre-planning activities (Statements 2 and 3) were done without much participation of the local people and leaders. This resulted to a moderate participation of the beneficiaries in the planning phase. Realizing the condition, the project staff together with the committees and CHWs exerted much effort in organizing the beneficiaries to participate in the implementation activities. These included trainings, workshops, and income-generating activities.

As regards to monitoring and evaluation, there was moderate participation by the beneficiaries. Evaluation was conducted only once during the first year of project implementation in the three villages, namely: Tang Bau Yang, Bum Nyen Yang, and Ngrengr Kawng. According to the project staff, implementers, and beneficiaries, results of the evaluation helped them to identify mistakes and learn from them.

The staff-respondent mentioned that a formative evaluation was done during the first year of implementation with only the beneficiaries and herself as participants. However, they were not able to conduct a summative evaluation at the end of the Program.

Measuring Program Effectiveness

Participation is one of the key factors for program effectiveness (Reid, 2000). In this study, program effectiveness was measured by asking the beneficiaries their perception on whether the program objectives had been achieved through the following statements: 1) having been provided with health and capability trainings, the volunteers and development committees in the target areas will support the communities in implementing the project; 2) having attained knowledge about the prevention of common diseases, the communities in the target areas will be able to prevent the common diseases affecting them; 3) the communities in the target areas will be provided medical attention and the poor people will be supported on their basic needs; 4) having learned the basic techniques of backyard gardening and locally available aids, the communities in the target areas will implement backyard gardening for adequate nutrition; 5) the poor people, having been provided with educational aids and techniques for income generation, will implement income-generating activities for the school children; and 6) being provided with capability trainings, the facilitating skills of the CHC&DP staff will be improved, and would enable them to provide the best services to the community.

Appendix Table 2 shows the statements and the indicators for each objective as well as the corresponding weighted means and adjectival ratings. The respondents used a scale of 1-5 to reflect their opinions on the achievement of the six objectives. The weighted mean is qualitatively described as low (1.00-2.33), moderate (2.34-3.67), and high (3.68-5.00).

The Program was rated high (OWS=3.9) for the achievement of Objective 1 indicating that the beneficiaries' needs have been met. Majority of the beneficiaries received community health and development-related trainings and support from the Program. The staff-respondent affirmed that the Program had given health and other related trainings through participatory method, which included actual practices. The Program conducted trainings with external resource persons, but only for the community health care workers and not for the villages. She attested that the volunteers and the committees were able to support the communities in implementing the project after the trainings.

The Program was rated high (OWS=4.2) for the achievement of Objective 2 because the respondents were able to gain prevention and development-related knowledge. Further, they were able to apply the health practices they learned and prevent diseases, hence improving their health conditions. The project staff affirmed that the project provided health education on the prevention and treatment of common diseases. The attendees, she said, were able to prevent and manage well diseases such as malaria, diarrhea, and pneumonia.

Achievement for Objective 3 was also rated high (OWS=4.0). The beneficiaries improved their health conditions and met their basic needs. Majority of the beneficiaries received different forms of medical attention that improved their health. The staff confirmed that the Program provided the basic needs of the most needy beneficiaries as well as care and treatment for all and the seriously ill patients were referred to clinics when needed.

Objective 4 had low achievement rating (OWS=2.2). Although they received seeds, majority of the beneficiaries were not able to implement the backyard gardening project very well. While they mentioned having received less training, the staff said that they did provide training on basic agriculture and backyard gardening methods to the beneficiaries. They also gave seeds such as those of beans, ladyfingers, water crest, roselle, and soap acacia

leaves to those interested. The seeds were not locally available but could be planted in the villages. The communities were able to do backyard gardening, but as explained by the staff, this may have been perceived as ineffective because there was not much improvement on the nutrition of the communities.

The effectiveness of the CHC&DP Objective 5 was rated low (OWS= 2.1) because the beneficiaries claimed that they did not receive educational aid. Neither did they receive information on income-generating activities. The staff believed that her role was supposed to be facilitative; the beneficiaries were expected to be participative in generating ideas and in discussing about the potential opportunities and options.

Lastly, the Program was rated as high in the achievement of Objective 6 (OWS=4.0). The beneficiaries observed that the project staff were well trained and have improved their facilitation skills during project implementation. The project staff affirmed that she was able to improve her skills because she received trainings on basic community health care, facilitating and communication skills, leadership, and proposal writing as well as a medical short course. Further, as health facilitator, she was able to echo all of these to the villages and to other organization staff members.

Facilitating and Constraining Factors to Program Success

Facilitating factors. Out of the 62 respondents, 58 (94%) observed some contributory factors to project success (Appendix Table 3). Many of the beneficiaries (17) cited unity of spirit and participation, followed by provision of funds (6), and medical treatment (5). These include financial and material support such as medicines, food supplementation (like milk powder), and seeds.

The staff-respondent mentioned similar contributory factors to success such as recommending good health practices

(e.g. use of mosquito nets) and conducting home visits. As results of these interventions by the project staff, tuberculosis patients recovered from serious conditions and the incidence of malaria decreased. Overall, the health of the local people improved.

Constraining factors. Only 21 out of 62 beneficiaries (34%) mentioned having observed constraining factors (Appendix Table 4). Some of these were personal reasons such as political conflicts (6), transportation difficulties (3), and lack of interest (2).

Some were attributable to how the project was implemented (e.g., people did not implement it well, there was not much discussions and meetings). Others had difficulty working together. They were not able to understand because of low education, family, and work concerns. One mentioned that many leaders were forced to enter into the Kachin Independence Army, hence the lack of leaders to lead the project.

Factors Towards Achieving Program Outcomes

The following factors were drawn as factors toward achieving project objectives:

1. The participation of women was an effective strategy in delivering information to family members in the household because they were the ones who mostly took care of the children. Greater enfranchisement and participation by women lead to improvement in health, nutrition, and poverty of people in the community (Bill and Melinda Gates Foundation, 2008).
2. The basic trainings of community health workers and the development-related trainings of beneficiaries provided essential health education and skills for implementing the project activities. Further, the beneficiaries were able to prevent and treat common diseases.

3. Supply of basic needs, supplementation support, medical attention, and referral services brought positive changes. Many malnourished beneficiaries and under-breastfed children were treated with supplement food-like milk powder and multivitamins. Further, the poorest households were provided with their basic needs. Those who were sick with common diseases were diagnosed and treated by the community health workers. The seriously ill, on the other hand, were referred to the hospital and clinics in Myitkyina.
4. The beneficiaries' moderate level of participation contributed towards achieving the Program objectives. Participating in meetings, workshops, trainings, and discussions enhanced their knowledge and skills. Hence, they were able to contribute cash, labor, food, and other necessary resources to make the project effective and efficient. As Reid (2000) emphasized, participation is one of the key factors for program effectiveness.
5. Highly favorable attitude and adequate knowledge and skills of the Program staff and community health workers enhanced their efficiency and effectiveness. The community workers overcame challenges such as cultural barriers, shyness, fear, and political conflicts. Their different forms of sharing knowledge such as brainstorming, group discussions, storytelling, singing, role playing, and demonstrations in the fields were observed to be effective since the adults and children were able to absorb and apply these lessons.

CONCLUSIONS

Based on the results of the study, the following conclusions were drawn:

1. The project has adequately assisted the community health workers and the village health and development committees in managing health care projects under the CHC&DP. The objectives of CHC&DP were based on the needs of the communities.

In general, the Program has successfully achieved four of its six objectives as reflected by the high ratings of the beneficiaries.

2. Health prevention education and development-related trainings were necessary to enhance essential knowledge to prevent diseases and improve lives.
3. The favorable attitude and adequate knowledge and skills of the project staff and their well-defined roles and responsibilities toward the program helped the beneficiaries increase their capacities, develop mutual respect, and sustain participation, which enhanced program effectiveness.
4. Basic needs and medical supplies, referral services, and food supplementation were important support factors that addressed the beneficiaries' basic concerns.
5. The beneficiaries' participation in program management contributed significantly to program effectiveness.
6. The demographic characteristics of the participants were contributory to the successful implementation of the health projects.

7. The weaknesses of the project were identified to be limited trainings on backyard gardening, political conflicts, transportation, and the lack of basic infrastructure.

RECOMMENDATIONS

The strong collaboration and commitment of both national government and Kachin Independence Association will strengthen project effectiveness.

To effectively prevent hunger, poverty, and diseases in the villages, the national government should be responsible for providing education, health services, proper communication and transportation facilities, and agricultural subsidies. On the other hand, KIA should provide the basic needs, protection, and security to the local communities. Further, KIA should be responsible for the education, health services, and infrastructure of their controlled areas. Since agriculture is the major livelihood of the communities, the KIA government should likewise enhance the agriculture sector.

NGOs and faith-based organizations including the CHC&DP must be allowed to supplement the peoples' needs by providing them technical assistance and educational trainings. They should be empowered to emerge as community-based organizations.

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Appendix Table 1. Beneficiaries' perception on their level of participation in the project

No.	PHASES/ACTIVITIES	RESPONSE (n=62)												Weighted Mean	Adjectival Rating
		VL		L		M		H		VH					
		F	%	F	%	F	%	F	%	F	%				
Pre-planning Phase															
1	Participate in initial discussions with local authority and the community	15	24	6	10	19	31	17	27	5	8	5-3	2.8	Moderate	
2	Participate in identifying, analyzing issues, and presenting the conditions of the village	24	37	4	6	21	34	5	8	9	15	2-1	2.5	Moderate	
3	Participate in the formation of village health and development committee and the selection of volunteers	21	34	7	11	8	13	19	31	7	11	2-1	2.7	Moderate	
Overall Weighted Score													2.7	Moderate	
Planning Phase															
1	Participate in organizing people to attend the workshop	21	34	5	8	15	24	15	24	6	10	2-1	2.7	Moderate	
2	Attend the workshop in setting the activities and sharing of responsibility	20	32	8	13	14	23	17	27	3	5	5-1	2.6	Moderate	

Appendix Table 1. Beneficiaries' perception... (Continued)

No.	PHASES/ACTIVITIES	RESPONSE (n=62)										Weighted Mean	Adjectival Rating	
		VL		L		M		H		VH				
		F	%	F	%	F	%	F	%	F	%			
Monitoring and Evaluation Phase														
1	Participate in regular monitoring and discussions	24	39	6	10	18	29	9	14	5	8	5-1	2.4	Moderate
2	Participate in analyzing the condition of the people	22	35	4	6	17	27	14	23	5	8	2-1	2.6	Moderate
3	Contribute resources and materials for workshops	14	23	2	3	25	40	13	21	8	13	2-3	3.0	Moderate
4	Participate in data collection and evaluation of 1 or 3-year project term	21	34	9	15	17	27	12	19	3	5	5-1	2.5	Moderate
5	Participate in presenting the condition of the people and in writing the report	21	34	4	6	19	31	10	16	8	13	2-1	2.7	Moderate
Overall Weighted Score													2.6	Moderate
Legend: VH = Very High, H = High, M = Moderate, L = Low, VL = Very Low Categories and Rating Scale: H = High (3.68 - 5.00), M = Moderate (2.34 - 3.67), L = Low (1.00 - 2.33)														

Appendix Table 2. Indicators used in measuring beneficiaries' perception on the attainment of program objectives

No.	OBJECTIVES/INDICATOR STATEMENT	RESPONSE (n=62)		
		Range	Weighted Mean	Adjectival Rating
Objective 1				
1	The volunteers and development committees in the village have been provided with health trainings.	1-33	4.0	High
2	The volunteers and development committees in the village have been provided with capability trainings on development-related knowledge and skills.	3-33	3.9	High
3	The volunteers and development committees in the village support the people in implementing the project.	1-30	3.7	High
Overall weighted score			3.9	High
Objective 2				
1	The community members have gained knowledge about the prevention of common diseases.	2-33	4.0	High
2	The community members in the village are able to prevent the common diseases affecting them.	1-30	3.8	High
3	They think that their health conditions are better now than before the implementation of CHC&DP.	5-36	4.8	High
Overall weighted Score			4.2	High

Appendix Table 2. Indicators used...(Continued)

No.	OBJECTIVES/INDICATOR STATEMENT	RESPONSE (n=62)		
		Range	Weighted Mean	Adjectival Rating
Objective 3				
1	Under the CHC&DP, we are provided with medical attention.	1-33	4.2	High
2	The people in the village are supported with their basic needs such as food, clothing, and shelter.	5-21	3.4	High
3	I am satisfied with the medical attention and the basic services provided to us.	2-34	4.2	High
Overall weighted score			4.0	High
Objective 4				
1	We are provided the techniques of backyard gardening and locally available aids.	3-32	1.8	Low
2	As a result of the techniques taught to us, we are able to implement backyard gardening.	2-34	1.9	Low
3	Our nutrition has improved since we are able to harvest food products from our backyard garden.	6-19	2.8	Moderate
Overall weighted Score			2.2	Low

Appendix Table 2. Indicators used...(Continued)

No.	OBJECTIVES/INDICATOR STATEMENT	RESPONSE (n=62)		
		Range	Weighted Mean	Adjectival Rating
Objective 5				
1	Under the CHC&DP, we are provided with educational aids and techniques on income generation.	3-42	1.7	Low
2	As a result of the educational aids and techniques provided to us, we are able to implement income-generating activities to support our children’s education.	3-31	2.0	Low
3	Our income- generating activities are still ongoing and we are able to generate income from them.	5-19	2.7	Moderate
Overall weighted score				
			2.1	Low
Objective 6				
1	The CHC&DP staff were provided with capability training.	1-28	3.9	High
2	As a result of the capability training, the facilitation skills of the CHC&DP staff were improved.	12-29	3.9	High
3	I am satisfied with the performance of the CHC&DP staff assigned in our village.	1-36	4.1	High
Overall weighted Score				
			4.0	High

Categories:
H = High : 3.68-5.00
M = Moderate : 2.34-3.67
L = Low : 1.00-2.33

Appendix Table 3. Perceived facilitating factors to project success

SUCCESS FACTORS	RESPONSE	
	F	%
Financial support		
Money	6	
Money and participation	2	
Money and supplementation	2	
Money and medicines	1	
Subtotal	11	19
Institutional support		
Medical treatment	5	
Good support of community health workers	3	
Staff facilitation	2	
Giving health education	2	
Educational processes	2	
Meetings and discussions	1	
Actual implementation according to the plan	1	
Participation and words of encouragement	1	
Coordination of community health workers, committees, and staff	1	
Education and seeds	1	
Health education and treatment	1	
Education, treatment, backyard gardening tasks	1	
Good committee support	1	
Subtotal	22	38

Appendix Table 3. Perceived facilitating...(Continued)

SUCCESS FACTORS	RESPONSE	
	F	%
Material support		
Medicines, supplementation, and cash	2	
Availability of medicines	2	
Medicines and supplementation supply	1	
Support to attainment of good health	1	
Subtotal	6	10
Inspirational support		
Spirit of unity and participation	17	
Good health and spirit of unity	1	
Unity of people and good committee leadership	1	
Subtotal	19	32
Total	58	100

Appendix Table 4. Perceived constraining factors to project success

SUCCESS FACTORS	RESPONSE (n=62)	
	F	%
Observed constraining factors		
Yes	21	34
No	41	66
Total	62	100
Constraining factors		
Political conflicts	6	28
Difficult transportation system	3	14
Work and family difficulties that disabled them from attending health trainings and engaging in activities	2	9
Some disinterested people	2	9
Medicine shortages	1	5
Lack of leaders to lead the project (some have to undergo armed force groups)	1	5
Some people taking medicines who do not pay on time	1	5
Lack of education that leads to difficulty in learning	1	5
People not implementing the project well	1	5
Lack of understanding and one CHW leaving the project	1	5
Difficulty of people working together	1	5
Not much discussions and meetings	1	5
Total	21	100

Collaboration Among Stakeholders: Key to the Organic Agriculture Movement in Negros Occidental

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Abstract: The organic agriculture movement in Negros Occidental can be traced back in the 1970s through the advocacy of the civil society. The movement received significant push when the local government issued policies and formulated programs that supported organic agriculture, and further, when the private sector supported the marketing of the produce. This paper explores collaboration among organic practitioners, government agencies, and the private sector as well as their interactions that significantly advanced organic agriculture. The research is an intrinsic case study as it investigates organic agriculture through in-depth data collection involving multiple sources of information. Results show patterns of interaction as evidenced by established networks and collaborative arrangements among organic practitioners – as individuals and organized groups – as well as interaction among agencies and institutions – public and private – that provide support services. Pressing needs for inputs, technical support, and market drew organic practitioners together to interact. Organic policies and programs, organic certification and market

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support, among others, were integral in bringing together support agencies and other stakeholders, which created opportunities for collaboration. Despite active collaboration, full development of the organic sector remains elusive. A model is proposed to maximize local market potentials through partnership between big and small farmers.

Keywords: *linkages, partnerships, interactions, collaboration, organic agriculture, innovation system, organic practitioners*

INTRODUCTION

Concerns about the degrading condition of the environment brought about by excessive use of synthetic chemicals coupled with the rising demand of organic products as well as increasing health consciousness constitute some of the factors that paved the way for the present shift of agriculture development paradigm from conventional to organic agriculture (OA). However, as in any development pursuit, concerted effort is necessary to attain success. To ensure efficiency of investment, development of the organic movement has to be inclusive, shared, and holistic – a thrust foremost in the innovation system in agriculture.

The World Bank (2006) defines innovation system as a network of organizations, enterprises, and individuals focused on bringing new products, processes, policies, and forms of organizations or institutions into economic use that are designed to affect behavior and performance. This concept, however, remains widely unexplored in the agriculture sector with its many domains under a globalized setup (Chavez & Federizzi, 2010). Hence, there is a need to produce a diversity of studies to explore this phenomenon in order to map out a variety of designs available for the enrichment of the innovation systems paradigm (Hall, Mytelka, & Oyeyinka, 2004).

In response to this knowledge gap, this study was conducted to investigate collaborative set-ups in the innovation system in the context of a rice-based organic agriculture in one of the Philippines' leading provinces in the advancement of the organic agriculture movement – Negros Occidental. One aspect specifically explored in this study is the presence of collaboration among different stakeholders. Collaboration is generally understood as working together willingly with individuals or groups in order to achieve a goal (Merriam-Webster Dictionary n.d.). To understand the collaboration, this research sought to investigate the linkages and interactions among major actors of farmers/producers/processors and their organizations; and linkages and interactions among support agencies and institutions in the promotion of organic agriculture.

Discussions highlight the reasons for the linkages and interactions, which would explain the collaboration among stakeholders. A model is thereafter proposed highlighting the collaboration between institutions and big and small farmers engaged in an organic business.

Objectives of the Study

The study sought to understand how collaboration among various stakeholders contributed to the advancement of organic agriculture in Negros Occidental. In the context of organic rice-based farming system, this study aimed to:

1. describe the context of organic agriculture movement in Negros Occidental;
2. analyze the linkages and areas of collaboration and interactions among organic practitioners and support agencies and institutions in the institutionalization of organic agriculture;
3. analyze the strength and weaknesses of the above collaboration; and
4. propose a collaborative model that may enhance the organic agriculture movement.

METHODOLOGY

The research employed a qualitative approach in the form of an intrinsic case study as it explored a unique case - organic agriculture movement (Creswell, 2007). It used in-depth data collection method involving multiple sources of information and various techniques such as interview of key informants using a checklist of semi-structured questionnaire, direct and personal observations, focus group discussions, participatory rural appraisal, and review of secondary data (e.g., records, reports, studies, audiovisual materials, and published articles provided by the respondents). Useful tools in the analysis of linkages included typology of relationships, pattern of interaction analysis, and network analysis.

RESULTS AND DISCUSSION

The Organic Agriculture Movement in Negros Occidental

Negros Occidental is a province of over 2.9 million people with 19 municipalities, 13 cities, and 662 barangays. It has a land area of 792,607 hectares, of which 51 percent (406,623 hectares) is agricultural. It is part of the only island that issued an ordinance against genetically modified organisms (GMOs) in order to promote organic agriculture. Moreover, it is the only province that houses one of the only two domestic organic agriculture certifying bodies in the country. Negros Occidental aims to convert at least 10 percent of all its agricultural lands into organic agriculture. To date, there are 584 hectares of certified farms for 11 organic agriculture producers (only one for rice) and more than 4,000 hectares under conversion to organic agriculture.

Negros Occidental is thus known to be one of the leading provinces in the advancement of organic agriculture in the

Philippines. The development of organic agriculture movement in the province is a result of a conglomeration of civil society organizations (CSOs), local government units (LGUs), and the national government. The emergence of this conglomerate can be summarized into four historic waves under Figure 1 (Gasmen, Bacongus, & Medina, 2013).

Linkages and Interactions Among Major Actors of Organic Practitioners

The organic movement in Negros Occidental can be said to be a consequence of active interaction among stakeholders - primarily the major actors of farmers, producers, and processors and their organizations. Partnerships show patterns of interaction that begin within the very basic unit in the movement: individual organic practitioners of farmers, producers, and processors; followed by their organizations. Another type of interaction that appeared to be very successful is one within the family. Lastly, there are patterns of multiple interactions among organic practitioners as individuals and groups.

Individual Practitioners' Interactions

Individual practitioners of farmers, producers, and processors have varied reasons for joining the organic movement. These include economic, philosophical, and health reasons. In a personal level, those with the same reasons have the propensity to interact among themselves and form bonds as they share common interests in organic agriculture.

Specific areas of interaction:

Inputs. Seeds, fertilizers, pesticides, and other inputs are crucial in organic production. Some fellow farmers or producers have either one or two or all of these inputs. Thus, interaction occurs as individuals advertise or reach out to others who can supply what they currently do not have.

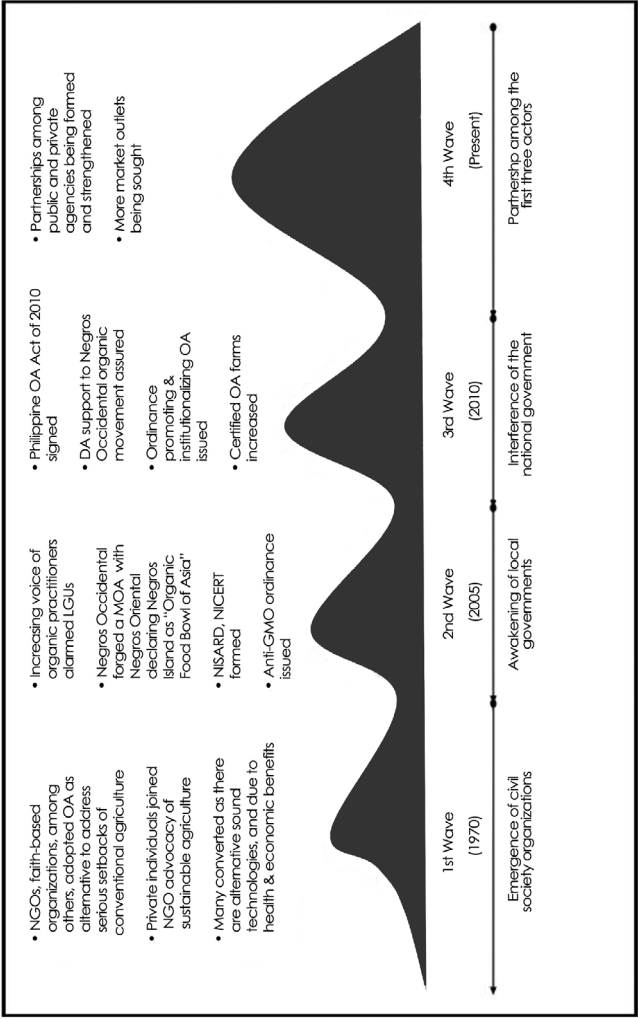


Figure 1. Historic waves of emergence of the organic agriculture movement in Negros Occidental

Technical Knowledge. Beginners usually seek technical guidance from individual farmers who are experienced, have advanced knowledge about organic practice, and have linkage to support systems (e.g., credit, advisory services, and political support, among others). Some philanthropic individuals reach out to assist fellow farmers to guide them. This attitude was demonstrated by farmer-scientists known locally as Magsasaka Siyentista (MS). They are trained and appointed by the Science and Technology (ST) agency through the consortium of ST agencies in the region.

Market. Individual farmers' interactions are also triggered by the fact that fellow organic practitioners serve as outlets of their organic products. In Negros Occidental, two scenarios are distinct: 1) small farmers need consistent market of agricultural products; and 2) farmer-entrepreneurs (such as Magsasaka Siyentista) also need other producers especially when their own produce is not enough to supply the intended market. Figure 2 shows a pattern of interaction among individual practitioners, where (A) is a farmer and supplier of vermicast and organic compost; (B) is a farmer and supplier of foliar fertilizer and other concoctions; (G) is a Magsasaka Siyentista and buyer of organic produce; (D) is a farmer and source of organic seeds; and (C), (E), (F), and (H) are small farmers.

Interactions among Farmers' Organizations

Sharing of common interest in organic agriculture is often more effective when organic practitioners are organized. As in the individual level, organized groups link with each other through a wider array of concerns and more complex interactions. In the case of Negros Occidental, some farmers first organized themselves into people's organizations (POs) or farmers' associations of organic producers. Eventually organic POs federate into organic villages to gain greater voice and access to government support. Figure 3 shows the federation of organic farmers in the Municipality of Magallion that is composed of seven POs – the largest group in

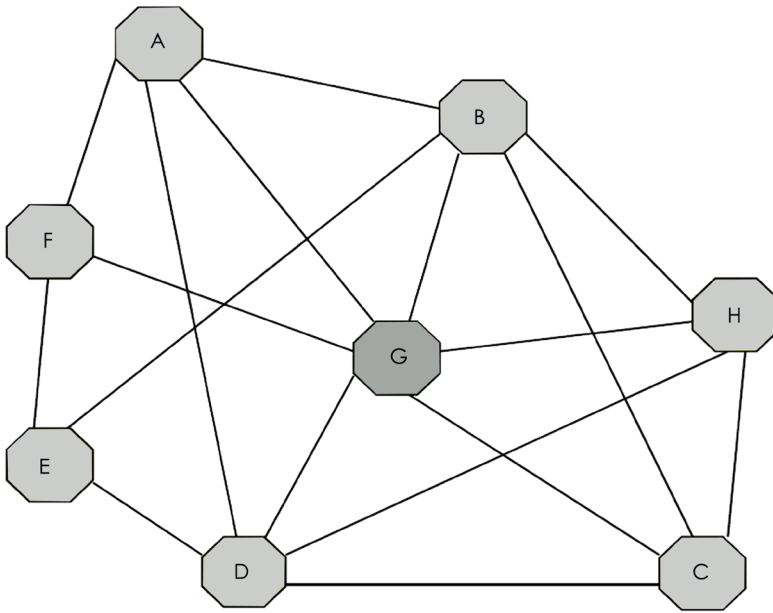


Figure 2. A typical model of interactions among individual stakeholders in the organic movement

Where:

- A - farmer and supplier of vermicast and organic compost
- B - farmer and supplier of foliar fertilizer and other concoctions
- G - Magsasaka Siyentista and buyer of organic produce
- D - farmer and source of organic seeds
- C, E, F, and H - small farmers

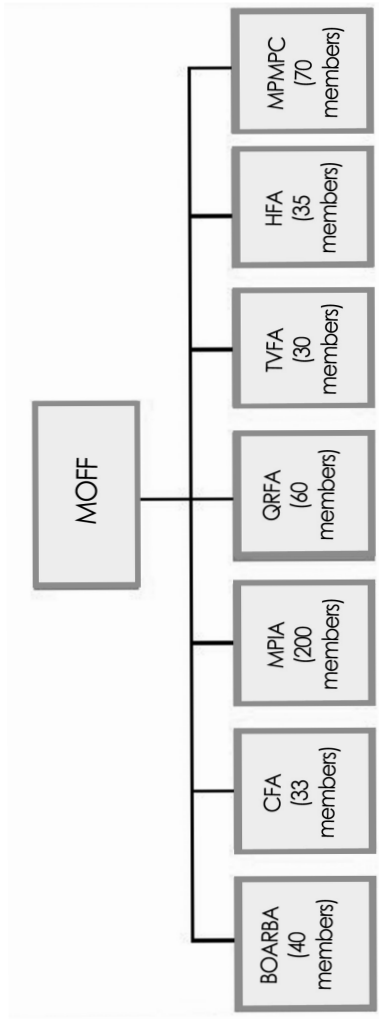


Figure 3. Composition of organic farmers’ association in the Municipality of Moises Padilla

- Where:
- MOFF - Magallion Organic Farmers’ Federation
 - BOARBA - Brgy. Odyong Agrarian Reform Beneficiaries’ Association
 - CFA - Canaan Farmers’ Association
 - MPIA - Moises Padilla Irrigators’ Association
 - QRFA - Quintin Remo Farmers’ Association
 - TVFA - Tubod Vermiculture Farmers’ Association
 - HFA - Hinulingan Farmers’ Association
 - MPMPC - Moises Padilla Multi-Purpose Cooperative

terms of membership in the entire province. It is well-supported by the municipal government making it a model among organic villages in the province.

Specific areas of interaction:

Interactions at the organizational level are broader in scope – covering the value chain and cross-cutting issues – and these are more formal than in individual level of interaction.

Concerns along the segments of the supply chain:

Pre-production. As in individual farmers' interaction, POs are concerned about inputs. They need information about seeds (e.g., type, variety, source, price, selection/production technology), fertilizers, and pesticides.

Production. POs are also concerned about technology and knowledge on cultural management practices relative to planting/transplanting, nutrient management, pest and disease control, irrigation, weeds control, harvesting, and postharvest.

Processing. In processing, POs talk about value adding and processing techniques, facilities needed, and cost to be incurred in putting up these facilities.

Marketing. Practitioners share their knowledge about market outlet, the type of market, volume of products to be transported, and the price that can be gained. Other concerns include product packaging and handling, transportation, and advertising.

Consumption. Farmers are interested in the type of consumers, consumer preferences, and the quality of product that commands the highest price.

Cross-cutting concerns:

Organizational. Organized groups of farmers, producers, and processors interact on issues that require inter-organizational attention, such as: how to obtain organic certification and comply with other organic standards, organizational strengthening, meetings and conventions, business concerns, building partnerships, and having a greater voice and political representation, among others.

Financial. These include credit support and other financial resources that POs may share among themselves, or collectively avail of from financial institutions.

Research and extension. POs care about new and up-to-date knowledge and technology on organic agriculture and how these can reach farmers to be used effectively.

Opportunities to Interact

POs interact on the above concerns during meetings, seminars, and similar activities. These activities are venues for them to get acquainted with each other and an opportunity to link each others' interest. The role of extension agencies, public and private, is crucial as they organize events that enable groups to interact. Such events include the following:

- Establishment of organic villages - The organic villages proved to be a venue for groups of organic practitioners to interact as they learn from each other in a participatory approach. They also get guidance from experts and support agencies. Some organic villages are organized to compose different farmers' associations to facilitate more interactions.
- Organic festivals - These festivals provide opportunities for organic practitioners to jointly promote organic agriculture. These have become annual activities since

2006. They feature exhibits of local organic products and technologies, cooking demonstrations by famous Negrense chefs, fora, and sharing of experiences and new technologies regarding organic production, processing, and marketing. Another milestone that they achieved in promoting organic agriculture was to make it a major part and highlight of the province's mother festival called the Panaad.

- Trainings, field days, and seminars - Sharing of experiences is normally part of these learning events.
- Weekend markets - These markets are usually organized by private individuals and groups of organic practitioners as places to sell their products. Some can afford markets that are exclusively organic, while others share a space in a big market.
- Tour packages to agro-ecotourism sites - These tour packages provide opportunities to learn and interact with one another as well as with foundations or POs that often manage the sites.

These interactions are concrete opportunities for collaboration as groups plan and act together to pursue a common goal.

Family Business Interactions

This portion illustrates patterns of interactions within family circles as they engage in businesses that help promote organic agriculture in Negros Occidental. Following is a case of a family whose contribution to the organic movement is influential not only in the province but also in the organic community nationwide.

The Case of the Uy family

Mr. Ramon Uy, Sr., known locally as RU, is an agricultural entrepreneur in Sitio Aning, Barangay Pahanocoy, Bacolod City. The Uy Family owns five businesses that concentrate on organic farming, namely: RU Foundry and Machine Shop Corporation, Ecological and Agricultural Development Foundation, Inc. (EcoAgri), Fresh Start Organics, and PURO Organic Company. The newest addition is the Ecological Organic Park and Restaurant, which intends to provide a venue for families and other business organizations to relax and enjoy an organic farm and eat organic produce.

Production of machines through RU Foundry and Machine Shop Corporation

RU Foundry is a producer of high-performance shredders of different sizes and capacities to support production of organic fertilizer. It also fabricates other equipment and machinery that respond to the needs of the organic community, such as rice thresher with a capacity of 40 to 45 cavans per hour, rice mill and dryer, essential oil distiller, and a biogas system based on orders of various organizations.

Organic production, processing, and trade of Fresh Start Organics, Inc.

The Uy family established Fresh Start Organics in 2005 to produce as well as to procure organic fertilizers, fresh organic produce, organic rice, organic coffee, and organic free range chickens from certified organizations. Other Fresh Start product lines are healthy pantries and natural personal care products from other organic companies. There are 10 market outlets of Fresh Start mostly in supermarkets, malls, hotels, and organic markets.

Expanding organic business with PURO Organics, Inc.

PURO Organics complements the packaging and processing needs of organic products that it produces and buys from other certified producers. This ensures that processed products meet the safety and regulatory requirements for commercial purposes (Figure 4).

EcoAgri Development Foundation, Inc. extending to organic farming communities

EcoAgri Foundation is an NGO formed in 2008 to handle all activities related to sustainable farming initiatives. EcoAgri services include research and development, manufacturing, and installation of technologies to support organic farming activities of partners and beneficiaries; promotion and marketing of farmers' organic products under fair trade conditions; establishment of community-based organic fertilizer production and seed banking, collection, and propagation of indigenous varieties of rice, vegetables, and other crops. EcoAgri also manages an ecotourism park with interactive showcase/demonstration of technologies to support organic farming activities as well as May's Organic Restaurant within the park. The interaction of the family businesses with that of other stakeholders is outlined in Figure 4.

Multiple Interactions Among Organic Practitioners

The study found a pattern of multiple interactions among individual and group organic practitioners due to various concerns and as evidenced by their multiple affiliations with established farmers' associations and other organizations (i.e., NGO, PO, business organizations, etc.). In a rice-based farming system, a farmer who is a member of a PO for rice, is also affiliated to one, two, or all of the following: irrigators' association, vegetable farmers' association, hog raisers' association, and multi-purpose cooperative.

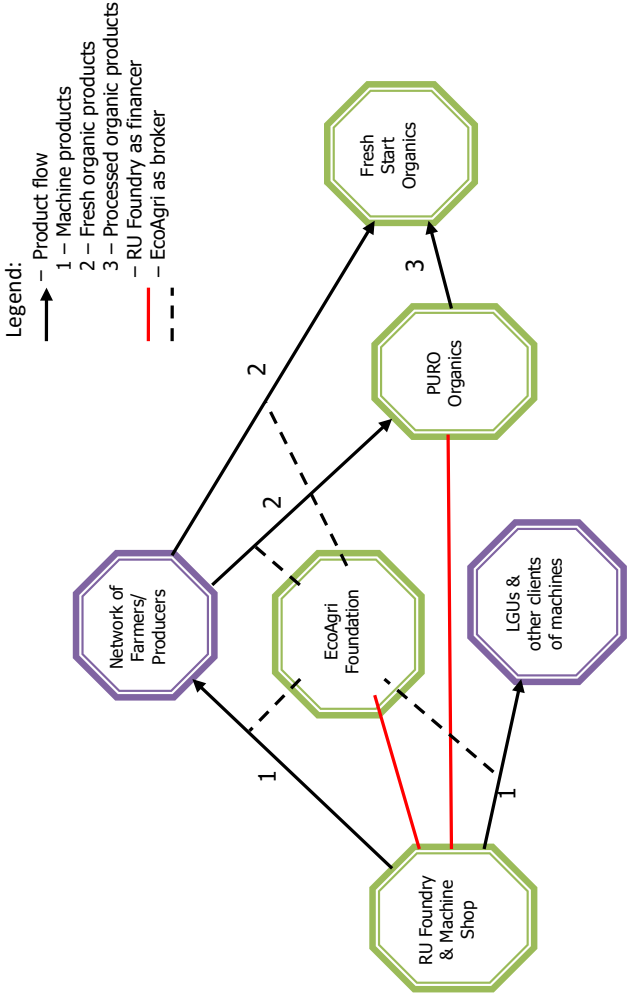


Figure 4. Interrelationship of Family Uy's organic business with other stakeholders

Collaboration Among Support Agencies and Institutions

Four types of linkages/partnerships exist in Negros Occidental, namely: collaboration among public agencies, among private institutions, among public and private institutions, and among extension providers.

Collaboration Among Public Agencies

Public agencies involve three levels of government – national government agencies (NGAs) and provincial and city/municipal governments (local government units) – that are working hand in hand in the promotion and institutionalization of OA in Negros Occidental.

Areas of collaboration:

A. Adoption of national organic policies and formulation and advocacy of local counterpart policies

The three levels of government that collaborated in putting in place supporting policies to the organic movement are as follows:

- National government policy - Republic Act 10068 (Organic Agriculture Act of 2010): calls for the national adoption of organic agriculture with provisions of fund support for stakeholders who choose to adopt the new agriculture development paradigm;
- Provincial government policies - Provincial Ordinance No. 007, series of 2007: bans the entry, importation, introduction, planting, growing, selling, and trading of genetically modified organism (GMO) plants and animals within the territory of Negros Occidental; and Provincial Ordinance No. 007, series of 2011: institutionalizes promotes, and develops organic agriculture in the province; and

- City/Municipal government policies: Organic resolutions and local versions of the above ordinances/law (e.g., City Ordinance No. 485, series of 2009, known as Bacolod City anti-GMO ordinance).

B. Development and implementation of organic programs

The Office of the Provincial Agriculturist (OPA) spearheaded the crafting of the Provincial Organic Agriculture Program. One of its seven component projects is the establishment of 10 organic villages in 10 host cities/municipalities. These villages serve as convergence areas for government agencies to collaborate in terms of expertise (Figure 5), and the role of the OPA in the partnership is largely coordinative.

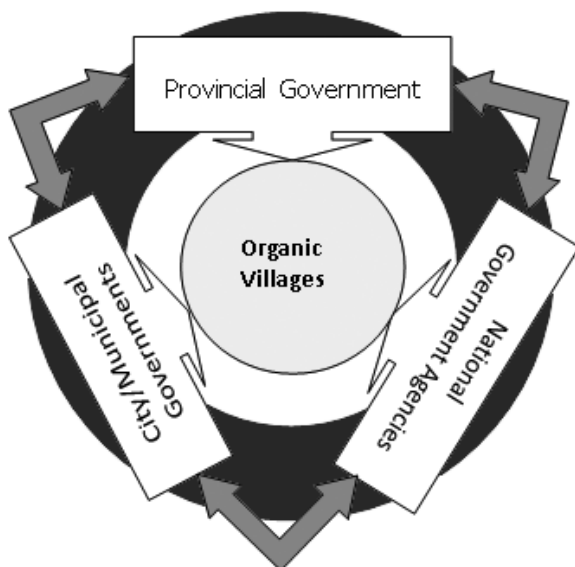


Figure 5. Collaboration of the provincial government, city/municipal governments, and national government agencies in the organic villages

Other agencies respond to technical and resource needs, as with the following collaborations:

- Collaboration with NGAs – Among the agencies that OPA collaborated with were the Department of Agriculture (DA), the Department of Agrarian Reform (DAR), and the Department of Trade and Industry (DTI). Their roles:

DA: provision of organic seeds; technical assistance through capacity building of OPA and city/municipal agriculture offices (CMAO) personnel; and financial assistance in the form of subsidy for initial organic certification;

DAR: provision of both technical and financial assistance to cooperatives of agrarian reform beneficiaries organizations (ARBOs) under its jurisdiction; and

DTI: provision of assistance to organic producers/processors to link with market outlets and to comply with requirements of both local and international markets.

- Collaboration with City/Municipal Governments – Host cities/municipalities of organic villages collaborate by identifying communities or POs that can promote OA. They share their facilities in the conduct of trainings and demonstration of technologies. City/Municipal technicians collaborate and cost-share with OPA and NGAs in organizing and conducting local events.

Collaboration Among Private Institutions

Historically, the organic movement of Negros Occidental was spearheaded by civil society organizations. Some NGOs have assumed leadership in building partnerships by consolidating private organizations as affiliates and partners.

Areas of collaboration:

A. Organizing and strengthening communities of organic practitioners

Individual NGOs and networks of NGOs and other private organizations collaborate in reaching a greater number of communities of organic practitioners.

- Multi-Sectoral Alliance for Development - Negros (MUAD-Negros) – This NGO is an alliance of 22 NGOs, POs, church-based organizations, and multi-sectoral special bodies organized to promote sustainable agriculture, OA, environment, and education mostly of the sugarcane and rice sector.
- Networks of NGOs – These are usually vertical networks created in the implementation of rural-based programs and/or projects.

MUAD-Negros - Partnership for Development Assistance in the Philippines Inc. (PDAP) promotes and develops rural enterprises for poverty reduction and promotion of peace in conflict-affected areas.

MASIPAG (Magsasaka at Siyentipiko para sa Ikauunlad ng Agham Pang-Agrikultura) network is a farmer-led network of POs, NGOs, and scientists who are working towards the sustainable use and promotion of biodiversity. They develop rice varieties or select organic seed materials that are appropriate for specific areas.

B. Development of the organic sector

Support agencies of the private sector comprising voluntary organizations such as NGOs and business organizations, and POs have tried to provide support services to organic practitioners for the total development of the organic sector.

-
- Business organization - NGO/PO collaboration – NGOs collaborate with business entities/organizations and POs, just like the Uy family's organic business.
 - Coordinating role of NISARD (Negros Island Sustainable Agriculture and Rural Development) – This was created as a result of collaboration between the two provincial governments of Negros Occidental and Negros Oriental, in which NISARD is the major agency in the private sector. It plays the most significant role in networking by forging partnership with almost all private organizations and individuals involved in organic agriculture so as to advance the field.

C. Marketing assistance to organic practitioners

To assure consumers that products are organic in the truest sense, the private sector embarked on three strategies to support the organic movement, namely: 1) certification of organic farms and producers; 2) consolidation of organic practitioners into clusters; and 3) linking of organic producers to markets. To operationalize these strategies, the sector created the following mechanisms to address market issues confronting the movement:

- NICERT (Negros Island Certification Service) – a third-party certifying body for organic agriculture that provides inspection and certification services to would-be organic producers, traders, processors, handlers, and retailers.
- ONOPRA (Organik na Negros! Organic Producers and Retailers Association) – acts as consolidator of organic producers, retailers, and all stakeholders who seek to ensure effective and efficient organic agriculture market development, promotions, and networking resulting to better access to environment-friendly and healthy products and services in Negros Island.

- NORIA (Negros Organic Rice Industry Association) – originally a member of ONOPRA, it became an independent commodity cluster for rice. During the study, NORIA has about 300 official individual members.
- Other cluster groups – Like NORIA, farmers or groups of farmers, producers, and advocates of different organic products are clustered into industry groups or associations basically to provide marketing assistance (Table 1). The concept of clustering, however, is more than attending to market needs. Cluster groups cater to all the needs of organic producers and traders as independent organic industries.

Table 1. Other cluster groups of organic commodities in Negros Occidental

NAME OF CLUSTER GROUP	COMMODITY
Negros Island Organic Fertilizer Producers' Association (NIOFPA)	Organic fertilizers
Vermicast Producers' Association in Negros (VPAN)	Vermi worms for vermi-composting
Organic Coffee Producers' Association (OCPA)	Organic coffee
Negros Organic Muscovado Industry Association (NOMIA)	Organic sugarcane and muscovado
Negros Organic Vegetables Industry Association (NOVIA)	Vegetables
Others being formed: • clusters on organic corn and other cereals, fruits, livestock, fisheries, and poultry	Organic corn and other cereals, fruits, livestock, fisheries, and poultry

Tracing the interrelationship of the above actors, Figure 6 shows their interactions resulting from their multiple affiliations in the above clusters (Gasmen et al., 2013).

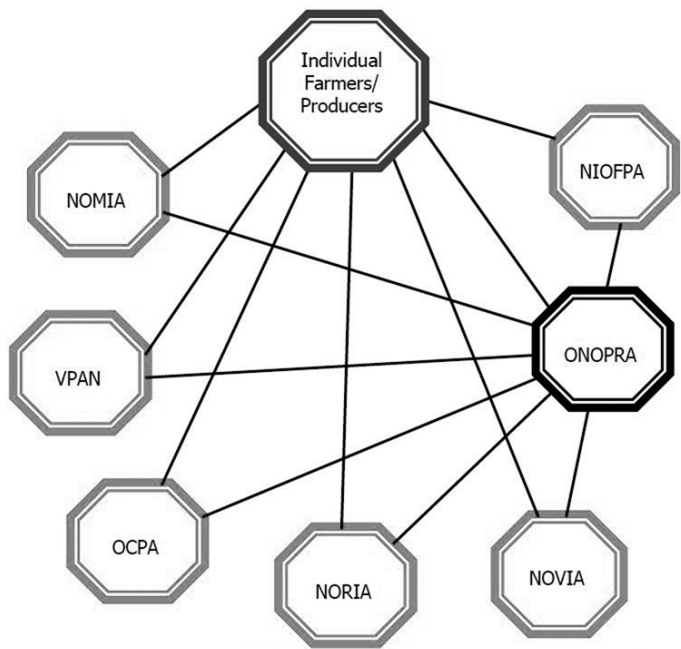


Figure 6. Interaction among individual organic producers, cluster groups, and ONOPRA

Public-private Collaboration

Areas of collaboration:

A. Crafting and implementation of ordinances in support to organic agriculture

NISARD provided the expertise and coordination within the private sector for the crafting of this ordinance, while the OPA marshaled support within the public sector. OPA facilitated the

consolidation of all inputs of content. They worked together in packaging the documents and defended the ordinance before the Sangguniang Panlalawigan.

- Sangguniang Panlalawigan – Collaboration of both sectors is also seen in the implementation of such policies. For instance, the Provincial Organic Agriculture Ordinance provided for an institutional mechanism for its effective implementation called the Negros Occidental Provincial Technical Committee on Organic Agriculture (PTCOA). The PTCOA has multi-sectoral composition largely of government agencies (LGUs and NGAs) and private sectors (NISARD, NICERT, NGOs, agribusiness organizations, consumers' associations, and their networks and alliances). This institutional mechanism led to the development of a provincial organic agriculture plan. PTCOA also monitors the implementation of the organic agriculture plan and recommends actions for improvement.
- Certification of organic producers – While NICERT provides certification services for smallholder producers, the process requires participation of other agencies providing assistance. First, they need to be organized to achieve economies of scale. Extension agencies then assist in setting up internal quality control systems as prerequisite to certification. During the certification of the first batch of certified organic producers, the Provincial Government subsidized the small farmers. Recently, the national government through the DA promised to extend the same assistance to smallholder farmers/producers.
- Establishment of organic market and restaurant – The organic market or “bagsakan” was established in 2007 and the organic restaurant in 2010, both at the back of the Provincial Capitol in Bacolod City. These two establishments are significant physical evidences of public-private partnership that respond to the call of

the consumers to make readily available to them organic products and food. ONOPRA runs the business with technical, policy, and management advice from NISARD and OPA, while OPA provides the space for free.

- Implementation of organic festivals – The implementation of the yearly Organic Festival is a joint responsibility of NISARD, the provincial government through the OPA, and ONOPRA. This partnership involves sharing of expertise and resources in coming up with a program that is unique for each year's celebration. They also share in the responsibility of overseeing the whole event and addressing issues that may arise in program implementation.

Collaboration Among Extension Providers

A more specific form of collaboration exists among the providers of extension services. This study traced the presence of at least four collaborative arrangements or networks in the provision of extension agencies to organic practitioners in Negros Occidental.

A. OPA and City/Municipal Agriculture Offices (CMAOs) collaboration

C/MAOs are often involved because they are directly responsible for empowering the farmers and their communities. Under the principle of territorial responsibility, nearly all OPA extension projects need to collaborate with C/MAOs for effective implementation in the farming communities. As mentioned earlier, a key to success in the development of organic villages – although generally initiated by OPA – is the collaborative effort of the two local government agencies.

B. National extension agency and NISARD collaboration

NISARD has been accredited as an extension service provider (ESP) by the Agricultural Training Institute (ATI), the lead extension arm of DA because of its track record as the prime mover of the province's organic agriculture plus its linkage with experts/trainers and top model organic practitioners. As an accredited ESP, NISARD can deliver publicly-funded extension and advisory services. In 2011, it conducted three batches of trainings for organic practitioners.

C. Research consortium and national extension agency interaction

This interaction relates to the operation of 10 Farmers' Information and Technology Service (FITS) Centers and farmer-scientists locally known as Magsasaka Siyentista in serving the organic movement in the province. FITS Centers are learning hubs for farmers situated at selected state universities and colleges (SUCs) and LGUs. The Philippines' Techno-Gabay (Technology Guide) Program, a consortium of research institutions in the region called Western Visayas Agriculture and Resources Research and Development Consortium (WESVARRDEC) – with seven member agencies in Negros Occidental – developed the FITS Centers and Magsasaka Siyentista to complement the Centers.

The Magsasaka Siyentista serves as resource person during technology trainings, seminars, and educational tours; promotes science and technology-based farms as demonstration sites; and gives farmer-to-farmer advisory services. Recently, the Techno Gabay Program was transferred to ATI including the oversight of FITS Centers and the Magsasaka Siyentista. Figure 7 illustrates their interaction with emphasis on the flow of research-generated knowledge to organic practitioners.

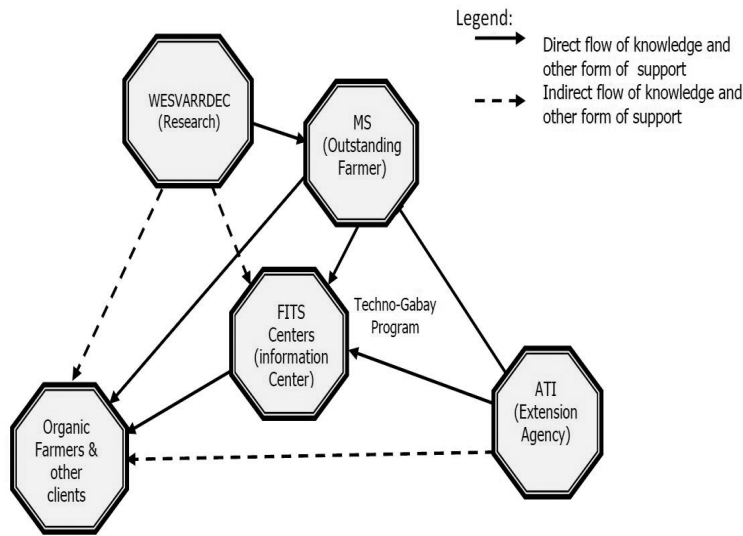


Figure 7. Model of interaction of WESVARRDEC, ATI, FITS Centers, and Magsasaka Siyentista (MS) and fellow farmer

D. Farms-Schools Network

The Farms-Schools Network is a nationwide network of farms set up by the ATI and the Foundation for People Development that serves as on-the-job training venues for the farmers, students, and would-be farmers. The network serves as a model for good agricultural practices, such as organic agriculture and the so-called “agricultural tourism.” From the list of 24 initial members, five farms are located in Negros Occidental. The presence of this network indicates the potentials of added support to the organic movement in the province.

Analysis on the Strengths and Weaknesses of Existing Collaborations

Strengths

Overall, existing collaborations of stakeholders comprising the organic practitioners as individuals and organized groups as well as public and private support institutions are indicative of success of the organic agriculture movement. It should be noted, however, that there are other factors contributing to the overall success of the movement. Qualitatively, the following are the perceived strengths of existing collaborations based on Table 2 that analyzed the different types of collaboration based on commitment, openness to share, and sustainability of collaboration:

- A considerable number of influential individuals willingly share their knowledge and expertise to fellow and interested organic practitioners;
- The proliferation of organized groups interacting to advance OA is a result of an over-30-year old endeavor indicating sustainability of the movement;
- Family ties show sincerity, growth of agri-tourism, and indicate profitability of the organic business;
- Government agencies exhibit commitment to support the organic movement; and
- The private sector is determined to advance the cause of the organic movement.

Weaknesses

The following are the perceived weaknesses of the existing collaborations that can be worked out to improve the organic agriculture movement:

- A large portion of the population as individuals are not yet organic converts. Many refuse to join the organic movement due to wait-and-see attitude.

Table 2. Indicative strength of existing collaborations to advance organic agriculture

TYPOLOGY OF COLLABORATION/ INTERACTION	NATURE OF INTERACTION	AREAS OF COLLABORATION	INDICATIVE STRENGTH OF COLLABORATION
Organic practitioners' collaboration			
• Individual	Person-to-person	Inputs, technical knowledge, marketing	3
• Organizational	Organization-to-organization	Value chain concerns, organizational, financial, and research and extension	3
• Familial	Family members	Family business concerns	4
• Multiple	Complex interactions of the above	Varied	3
Collaboration among support agencies and institutions			
• Government agencies	Public to public	Policies and programs that provide holistic support	3
• Private organizations	Private to private	Community organizing, marketing, etc.	4
• Government-private	Public to private	Varied (organic ordinance, OA certification, etc.)	3
• Extension providers	ESP to ESP	Extension concerns	4

Note: 5 = Very strong; 4 = Strong; 3 = Fair; 2 = Weak; 1 = Very weak

- Organized organic practitioners tend to depend highly on government subsidy to finance collaborative partnerships.
- The failure of the government to provide subsidy for organic certification of smallholders' farms is weakening the farmer's trust on the government's commitment to organic agriculture.

The Provincial LGU initially provided the subsidy for the first batch of smallholder organic producers. But this proved financially burdensome with more applications. Hence, farmers are now hoping for help from the national government.

SUMMARY AND CONCLUSIONS

This study explored collaboration among stakeholders in organic agriculture, specifically in a rice-based farming system in Negros Occidental. Results showed patterns of interactions and collaborations among organic practitioners within individuals and their organizations. While individuals varied in their reasons for joining the movement, they commonly interacted with each other because of their need for inputs, guidance, and marketing support. Interaction in the organizational level was wider in scope and covered a wider array of concerns along each segment of the supply chain. Patterns of interaction also appeared within the family of organic practitioners and enthusiasts whose main concern was business. Lastly, there were multiple interactions among organic practitioners as individuals and groups with various affiliations in the movement.

Four types of collaboration among providers of support services were observed, namely: among public agencies; among private institutions; between public agencies and private institutions; and among extension providers. Public agencies generally collaborated in the development and implementation of organic policies and programs converging in the organic villages. Private institutions, on the other hand, concentrated on organizing

and strengthening communities of organic practitioners and helping them gain access to support services such as marketing assistance. Collaboration among public and private institutions was seen in the crafting and implementation of organic ordinances, organic certification, establishment and operation of organic market and restaurant, and implementation of special events such as organic festivals. Lastly, collaboration among extension service providers from both public and private institutions involved the provision of extension services. Significant of these interactions is the model of a consortium of research institutions, an extension agency, knowledge hub, and farmer-scientist collaborating in the countryside.

These multiple collaborative arrangements among individuals and institutions made possible the advancement of Negros Occidental as the primary province in Philippines for organic agriculture. Other provinces and agriculture systems can draw lessons from the province in promoting and institutionalizing organic agriculture. With the interaction and collaboration of individuals, organized groups, families, and support services of the government and the private sector along diverse concerns but with the same cause, the organic agriculture movement can flourish.

RECOMMENDATIONS

To improve the organic agriculture movement based on the lessons learned from this research, the following are recommended:

1. A collaborative extension model that builds upon two concepts evident in this study is proposed – collaboration and growth of organic agri-tourism, also known as “farm tourism.” The organic movement in Negros has advanced to an entrepreneurial model that rests on the principles of organic agriculture. Negros now is home to farm tourism

sites. However, the current models of farm tourism operate independent of each other and run as a business by entrepreneurial farmers. This collaborative model (Figure 8) puts organic farms as centers of learning and collaboration, not only as sites of relaxation by consumers. Hence, accreditation of farm tourism sites that will act as “big brothers” will have to be devised by government agencies.

As tourist destinations, organic farm tourism sites increase the popularization of the culture and the promotion of national identity. The model is patterned after a partnership between a “big brother” and a “small brother” evident in the organic agriculture collaboration study, particularly with the Uy Family business. This model builds on the knowledge that there are certain individuals in the agriculture sector who have accumulated knowledge, skills, experiences, and wealth and are willing to help inexperienced farmers. This model, however, departs from the entrepreneurial collaborative model of the Uy Family business as it proposes that farm tourism sites serve as centers of collaboration. Putting farm tourism sites as centers of learning and collaboration supports both the technical and marketing needs of small farmers and promotes the organic movement to a wider range of customers.

This collaborative extension model promotes learning between and among various key stakeholders and increases participation of small holders. Given that it is operated by the private sector, the responsibility of maintaining the facilities and ensuring services that are based on quality specified by the government rests on the owner of these farm tourism sites. This arrangement frees the government of tasks related to infrastructure improvement and operations management – including organic certification of small farmers – and can therefore concentrate more on policies that will improve the system.

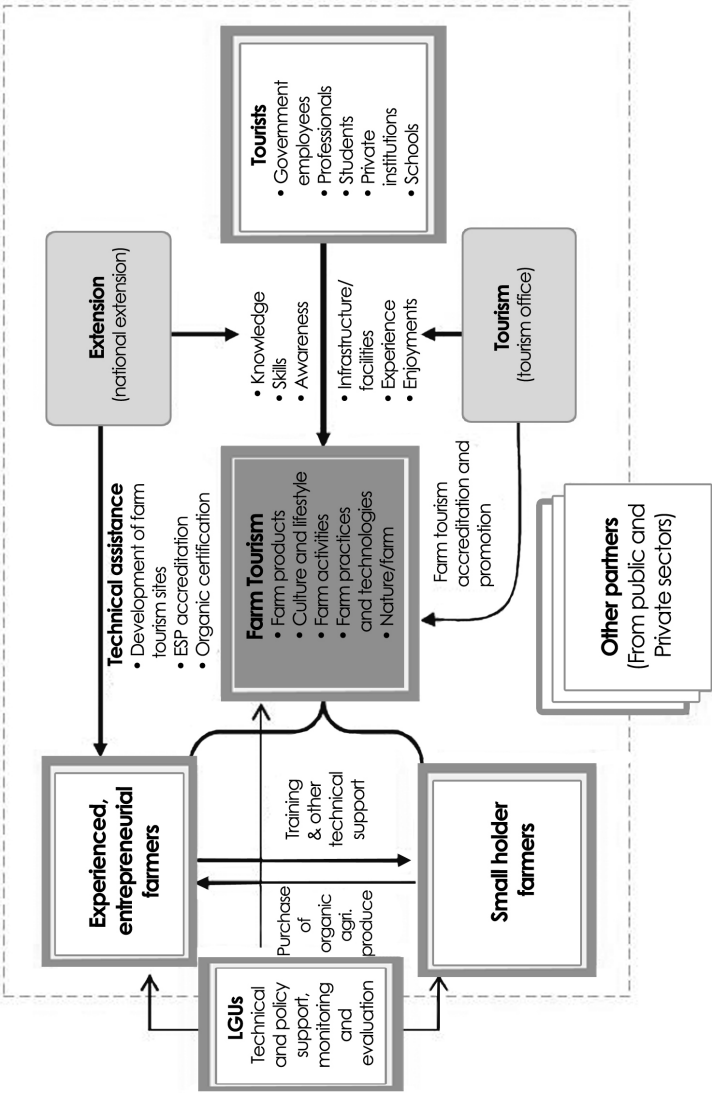


Figure 8. Collaborative extension farm tourism model

The sustainability of this model from the standpoint of farm owners heavily lies on their business interest. The farm owners can collect a reasonable amount of fees, such as but not limited to, entrance fee and disturbance fee (as some call it for maintenance due to possible damages in the farm caused by tourists), and the selling of organic food and other organic products. Farm tourism sites can be a good venue for informal learning and non-formal learning once accredited by the national extension agency represented by the Agricultural Training Institute. If accredited also by the Technical Education and Skills Development Authority, the sites can likewise provide learning opportunities where certification of training is recognized abroad. As this happens, these farm tourism sites can engage in partnership with local universities offering ladderized agricultural programs.

The participation of more small farmers will not only contribute to inclusive growth as they engage in livelihood that results in increased income but also ensure the availability of organic food. Farmers often take advantage of the market leverage of organic food and other organic products, although these also have to be affordable even to poor consumers. This model is anchored on the belief that joining producers and marketers in farm tourism maximizes the strengths of the more advanced farmers. It also promotes the role of the private sector in providing direct services to more small farmers as government agencies now focus on steering the movement.

Lastly, this model presents a simpler way by which to promote collaboration as it centers on a specific agricultural business model – farm tourism. The experience of Negros Occidental may be difficult to duplicate as it is a result of more than three decades of lobbying, networking, partnership building, and finally collaborating through various modes and activities. The proposed model centers on a specific agricultural business model that could propel collaborative

activity, and therefore, may be more practical to institute. The proposed collaborative extension model shows the interactions of actors providing support services.

Adoption of this model is very timely since the Philippine Congress is presently proposing a Farm Tourism Bill. The bill can be piloted in strategically located sites. The farm tourism site of social entrepreneurs like the Uy Family, who had been working closely with farmers through its various businesses, can be piloted as one of the ESPs in the province. Depending on the viability of each circumstance, there should be on-farm tourism accredited as a learning site per province.

Accreditation by ATI gives the farm tourism learning sites an advantage as accreditation provides legitimacy and support to an agricultural business model that is just starting in the country. This model also brings in a key national government agency, the Department of Tourism, to provide support in terms of accrediting farms as farm tourism sites and in attracting local and international tourists. The role of local government units in monitoring and evaluating the activities of the farmers and the accredited farm tourism sites is equally important. Based on the success and lessons learned from the pilot accredited farm tourism sites, the model can be replicated nationwide for institutionalization.

2. To further enrich this purely qualitative study, a more in-depth investigation may be conducted to quantify more thoroughly initial results particularly in the analysis of strength and weaknesses of existing collaborative arrangements.

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Double Difference Approach to Impact Evaluation: Case of the Effects of the Comprehensive Agrarian Reform Program (CARP) on Poverty

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Abstract: The Comprehensive Agrarian Reform Program of the Philippines has been one of the major programs of the government since its implementation in 1988. Over the years, a considerable amount of financial resources has been spent for the program that an impact evaluation is merited. Studies have established the impact of the program on some outcome variables like income and poverty. However, the studies done were limited to either a temporal comparison between the period before and after the program or a comparison between the beneficiaries and non-beneficiaries of the program. This study explored the double difference approach to verify the findings of the previous studies. The paper showed that the findings based on either the before-after or with-without comparison were not validated with the double difference approach. The paper recommends that further research be done with a more rigorous design to ensure validity of the estimation of the impacts of the program

Keywords: *agrarian reform, rural development, impact evaluation, double difference, logit regressions*

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INTRODUCTION

Agrarian reform programs in the country have been initiated to mitigate peasant unrests associated with poverty and inequality. The conceptual basis for these interventions is anchored on the argument that in an agrarian community, economic surplus is generated from the exploitation of land as the primary productive resource (Putzel, 1992). The economic surplus is a consequence of the nature of access, use, and sharing of benefits from the exploitation of land. Hence, agrarian reform programs, while primarily designed to restructure the agrarian system, are also aimed at mitigating poverty and income inequality.

The most recent attempt of the Philippine government to restructure the agrarian system is embodied in Republic Act 6657 (as amended), which provides the framework for the implementation of the Comprehensive Agrarian Reform Program (CARP). This recent attempt has been the most comprehensive of all agrarian reform interventions designed so far because its scope cover all agricultural lands irrespective of the crops planted and the tenurial arrangements (Department of Agrarian Reform, 2009). It is in the context of the goals of the program that the impacts particularly on poverty must be assessed to determine the economic merits of the continued implementation of the program.

Attempts were made to measure the economic impact of CARP to the beneficiaries of the program (Reyes, 2006 and Gordoncillo, Peñalba, & Escueta, 2003). However, these attempts were limited to measuring the difference over time or between treatment and control group. The goal of this paper is not only to test the impact of CARP on poverty but also to test if the results established in the previous studies will still be consistent with a double difference approach.

CARP Scope and Components

The estimated scope of CARP was about 8 million hectares (Garilao, 1997). However, this paper focused only on the areas covered by the implementation of CARP under the Department of Agrarian Reform (DAR), which was about 4.2 million hectares.

Program planners operationalized the intent of CARP through three components: land tenure improvement, support services and program beneficiaries' development, and agrarian justice. Land tenure improvements are implemented in several modes: such as institution of leasehold, leasehold rent reduction, and land redistribution. Support services come in the form of productivity enhancing support services such as farm to market roads (Arlanza, 2006).

Land tenure improvement includes both land transfer and non-land transfer schemes. Under the land transfer scheme is land acquisition and distribution, which involves the major processes of land survey; identification of qualified agrarian reform beneficiaries (ARBs); processing of claim folders for landowners' compensation; land valuation and compensation; registration of the awarded lands with the Land Registration Authority; and issuance of certificate of land ownership awards (CLOAs) to ARBs. Under the non-land transfer scheme are leasehold operation, stock distribution option, and production and profit sharing.

Program beneficiaries development involves a wide range of necessary support services that would make their lands more productive including the following: 1) irrigation facilities; 2) infrastructure development and public works projects in agrarian reform areas and settlements; 3) credit support; 4) promotion, development, and provision of financial assistance to small and medium scale industries in agrarian areas; 5) research, development, and information dissemination on ecologically sound farm inputs and technologies; 6) development of cooperative management skills through intensive training;

assistance in the identification of ready markets for agricultural produce and training in marketing; and 7) administration, operation, management, and funding of support services programs and projects.

As a consequence of the redistributive principle underlying the implementation of CARP, it is expected that conflicts among the various stakeholders would arise, particularly between the landowner and the tenants. Ostensibly, legal disputes arise. It is one of the fundamental mandates of DAR to provide legal assistance to farmers in resolving legal issues associated with the implementation of CARP.

CARP Assessments

Since the promulgation of the legal framework for CARP, about 4.1 million hectares have been distributed under the program through the administration of DAR (Gordoncillo and Quicoy, 2013). These lands were distributed to about 3.6 million ARBs. The total cost spent so far since its implementation was estimated at roughly Php 145 billion (Gordoncillo et al., 2003). Considering the amount spent for the program, it is only proper to examine the effects of the program particularly in one of its goals, which was to alleviate rural poverty.

Data and Sources

In 1990, during the initial stage of CARP implementation, the then Institute of Agrarian Studies (IAST) at the University of the Philippines Los Baños was able to solicit a grant from DAR to conduct a baseline study that would establish a benchmark for CARP. The sampling design projected a sample of about 10,000 respondents spread across 43 provinces in the country. These provinces were identified as the strategic operating provinces (SOPs) because said provinces accounted for the bulk of the coverage under CARP. Due to some constraints, only about 9,780 were surveyed for the benchmark study.

In 2000, the Food and Agriculture Organization (FAO) of the United Nations and Asian Development Bank (ADB) with the recommendation of DAR, again commissioned the IAST to resurvey the original 9,780 respondents of the 1990 benchmark survey. In the second survey, the list of program beneficiaries from DAR was matched with the original respondents of the 1990 benchmark survey. The intersection between the two sets was only 927 farmers. Hence, a total of 1,854 respondents were resurveyed from the original sample spread between those who eventually became ARBs of CARP and those who were not qualified for the program. The total number of respondents in the original survey who eventually became beneficiaries were matched with non-beneficiaries. In 2006, DAR again tapped the Institute to do the third survey of the original respondents to track the changes in the attributes of the ARB-respondents vis-a-vis the non-ARBs using the 2000 survey sample.

METHODOLOGY

Studies on the economic effects of rural development interventions such as CARP have been done in the past. Reyes (2006), using a logit model, established that CARP had a significant effect on the livelihood of the ARBs being classified as non-poor. Gordoncillo et al. (2003), using the Ordinary Least Squares (OLS) technique, established that the economic attributes of the ARBs were significantly higher than that of the non-ARBs. To estimate the economic effects of CARP, there is the need to know what would have been the effect without the program.

In the context of the poverty effect, this paper explores two levels of analysis. The first level is a descriptive analysis of the income structure as well as the extent of poverty. The second level is an inferential analysis of the impact of CARP on poverty using the logit procedure of a double difference model.

The arguments outlined by Pindyck and Rubinfeld (1981) and Baker (2000) on qualitative response models are used as the basis for the analysis of the likelihood of being classified as non-poor. Formally, the model is expressed as:

$$\ln \left(\frac{P_i}{1-P_i} \right) = \alpha + \beta_i X_i + \varepsilon_i$$

If P_i is the probability of being non-poor then $(1-P_i)$ is the probability of being poor. Therefore, the left hand side of the equation is simply the ratio of the odds of being non-poor to the odds of being poor. The logarithm of the ratio of these odds is linear in both the parameters and the explanatory variables (X_i).

This specification can readily accommodate additional covariates that would allow for the determination of the effects of development interventions like CARP to the likelihood of being non-poor. Recent studies (Reyes, 2002) used this specification to determine the effect of CARP on poverty. The model in this study used a binary explanatory variable with a value of 1 if the respondent is an ARB, and 0, otherwise. Such a model, however, has some limitations particularly in terms of accounting for the unobservable effects (Baker, 2000).

To address the issues of eliminating the bias due to unobservable effects, it is necessary to do a counterfactual analysis. The logit model can be expanded to allow for the estimation of the differential effects associated with CARP or the treatment effect, the time trend effect, and the double difference. Formally, the model is expressed as:

$$\ln \left(\frac{P_i}{1-P_i} \right) = \alpha_0 + \alpha_1 C_i + \alpha_2 T_i + \alpha_3 C_i T_i + \sum_i^n \beta_i X_i + \varepsilon_i$$

Where:

C_i = a binary variable with a value of 1 if ARB
and 0, otherwise

T_i = the time trend variable with a value of 1 if endline
and 0, if baseline

C_iT_i = an interaction variable capturing the double
difference

To verify if the parameters in the logistic regression function are the double difference estimators, one can take the expected value of the parameters (for this purpose, the other covariates are ignored):

$$E\left(\ln \frac{P_i}{1 - P_i}\right) | C_i = 0, T_i = 0 = \alpha_0$$

$$E\left(\ln \frac{P_i}{1 - P_i}\right) | C_i = 1, T_i = 0 = \alpha_0 + \alpha_1$$

$$E\left(\ln \frac{P_i}{1 - P_i}\right) | C_i = 0, T_i = 1 = \alpha_0 + \alpha_2$$

$$E\left(\ln \frac{P_i}{1 - P_i}\right) | C_i = 1, T_i = 1 = \alpha_0 + \alpha_1 + \alpha_2 + \alpha_3$$

Therefore, it can be verified that the first difference takes out the treatment effect α_1 , and the second difference takes out the time effect α_2 , leaving the double difference effect as α_3 or simply, the parameter estimate of the interaction variable C_iT_i .

RESULTS AND DISCUSSION

Nominal Income

To put the effects of CARP on the economic status of the farmers and farm workers in proper perspective, there is a need to establish the income profile of the respondents. Table 1 outlines the nominal income pattern by source for the three survey periods.

Table 1. Nominal income (mean) of the respondents in three survey periods by source

YEAR	TYPE OF RESPONDENT	FARM INCOME	OFF-FARM INCOME	NON-FARM INCOME	TOTAL INCOME
1990	ARB	25,619	7,566	29,133	38,464
	Non-ARB	19,546	6,485	20,624	29,061
	Total	22,528	6,930	24,380	33,507
2000	ARB	69,721	6,964	49,613	95,985
	Non-ARB	47,121	6,344	51,002	73,681
	Total	58,918	6,618	50,370	84,194
2006	ARB	69,165	11,453	47,523	101,573
	Non-ARB	52,754	10,312	54,259	80,472
	Total	61,814	10,795	51,340	90,497
Total	ARB	52,870	8,279	43,612	77,877
	Non-ARB	36,933	7,383	43,641	60,355
	Total	45,186	7,765	43,628	68,643

In nominal terms, income increased across the three survey periods. From about Php 33,000 in 1990, income increased to Php 84,000 in 2000, and in 2006, income further increased to roughly Php 90,000. In terms of the total income, the income level of the ARBs had been consistently higher compared to that of non-ARBs for all survey periods. The other notable attribute of the income structure is that non-farm income accounted for roughly 45 percent of the total income, which would have significant implications to planning interventions on poverty alleviation. Further, for both farm and off-farm incomes, the ARBs exhibited higher estimates compared to non-ARBs for all survey periods. However, for non-farm income, the subsequent surveys in 2000 and 2006 showed that the non-farm income of the ARBs had been lower compared to that of the non-ARBs.

Real Income

The level of income in real terms (2000 prices) depicted a very different pattern. While total income increased in real terms between 1990 and 2000, the 2006 estimates showed that real income actually declined to almost the same level as in 1990, which is about 15 years earlier (Table 2). This implies that for the last 15 years, there has not been an improvement in the level of income among the farmers.

This pattern is notable because in nominal terms, the level of income in 2006 was about three times than that of the 1990 levels. Again, this has significant implications to both planning and monitoring poverty alleviation interventions. In terms of monitoring, the data revealed how sensitive income is to the changes in the price levels. Any gain from poverty alleviation efforts can easily be negated by corresponding increases in price levels.

**Table 2. Real income (mean) of the respondents
in three survey periods by source**

YEAR	TYPE OF RESPONDENT	FARM INCOME	OFF-FARM INCOME	NON-FARM INCOME	TOTAL INCOME
1990	ARB	53,798	20,162	61,643	56,104
	Non-ARB	38,841	17,380	43,429	46,311
	Total	46,450	18,536	51,684	50,828
2000	ARB	69,721	6,964	49,613	95,985
	Non-ARB	47,121	6,344	51,002	73,681
	Total	58,918	6,618	50,370	84,194
2006	ARB	50,537	11,870	35,361	57,119
	Non-ARB	39,594	10,279	40,533	47,935
	Total	45,713	10,943	38,286	52,274
Total	ARB	57,917	16,307	51,007	61,062
	Non-ARB	42,798	14,489	47,069	50,475
	Total	50,799	15,266	48,838	55,413

Poverty Incidence

Using the poverty thresholds respective to the three survey periods, Table 3 outlines the incidence of poverty among the respondents. Apparently, the incidence of poverty among the ARBs was consistently lower than that of the non-ARBs across the three survey periods. Among the ARBs, the poverty incidence in 1990 was estimated at 63.5 percent. The incidence was down to 46.3 percent in 2000 and in 2006, the estimated incidence was almost the same at 45.9 percent. This is worth noting because the reduction in poverty incidence between 1990 and 2000 was considerable at about 17 percentage points. However, for the six-year period from 2000 to 2006, the incidence of poverty practically did not change.

The pattern was the same for the non-ARBs. In 1990, the poverty incidence was estimated at 72.7 percent. The estimate was down to about 56 percent in 2000, but it only slightly declined to about 54 percent in 2006. This pattern is also reflective of the trend shown with the real income across the three survey periods.

The Logit Procedure

In the earlier section in the methodology, it was argued that the effects of CARP on poverty are commonly explored using the cumulative logistic probability function.

In the logit procedure, the estimated function was specified as:

$$\ln \left(\frac{P_i}{1-P_i} \right) = \alpha_0 + \alpha_1 C_i + \alpha_2 T_{li} + \alpha_3 T_{2i} + \alpha_4 C_i T_{li} + \alpha_5 C_i T_{2i} + \alpha_6 A + \alpha_7 HZ + \varepsilon_i$$

**Table 3. Poverty incidence among sample respondents
across three survey periods**

TYPE OF RESPONDENT			YEAR			
			1990	2000	2006	Total
ARB	Poor	Count	554	404	354	1,312
		% within year	63.5%	46.3%	45.9%	52.1%
	Not-Poor	Count	319	469	417	1,205
		% within year	36.5%	53.7%	54.1%	47.9%
	Total	Count	873	873	771	2,517
		% within year	100.0%	100.0%	100.0%	100.0%
Non-ARB	Poor	Count	713	549	465	1,727
		% within year	72.7%	56.0%	54.6%	61.4%
	Not-Poor	Count	268	432	387	1,087
		% within year	27.3%	44.0%	45.4%	38.6%
	Total	Count	981	981	852	2,814
		% within year	100.0%	100.0%	100.0%	100.0%

Where

C_i = CARP treatment effect: 1 if ARB; 0 if otherwise

T_{1i} = time trend effect: 1 if 2000; 0 if otherwise

T_{2i} = time trend effect: 1 if 2006; 0 if otherwise

A = age

HZ = household size

The logit estimates were consistent with the findings of the previous studies (Table 4). The coefficients (B) of the treatment effect and time effect were significant. However, since the ratio of the odds ($P/(1-P)$) as the dependent variable was expressed in its

Table 4. Parameter estimates of the double-difference logit function

	B	Sig.	Exp(B)
CARP (C)	.481	.000	1.618
Time1 (2000)	.539	.000	1.714
Time2 (2006)	.463	.000	1.589
C*Time1	-.063	.660	.939
C*Time2	-.135	.355	.874
Age	.011	.000	1.011
Household Size	-.184	.000	.832
Constant	-.454	.005	.635

natural logarithmic form, the coefficients had to be converted into its exponential form (Exp(B)). For instance, the Exp(B) value for C (treatment effect) of 1.618 means that the intercept of the odd ratio for the beneficiaries is about 1.618 higher than the intercept of the non-beneficiaries. Similarly, the intercept of the odd ratio line for the respondents in the 2000 survey was about 1.7 higher than the original 1990 respondents.

However, the coefficients of the interaction variable between the treatment effect and the time trend effect or the double difference were not significant. This was true for the double difference parameters between treatments and the 1990-2000 periods and also true for the double difference between treatments and the 2000-2006 periods. This implies that there was no difference in the odds ratio between being classified as non-poor and being classified as poor between treatments and control groups as well as between survey periods.

CONCLUSIONS AND RECOMMENDATIONS

The panel data revealed that while nominal income considerably increased, real income (in practical terms) did not

change between 1990 and 2006. In the descriptive analysis, the data revealed that there was an apparent difference in the extent of poverty between the ARBs and non-ARBs: there are more poor non-ARBs compared to ARBs. The difference in the poverty incidence over time was also notable. Poverty incidence was high for both groups in the 1990 survey but declined in the 2000 survey. It was noted that the difference between the 2000 and the 2006 surveys was not as pronounced as the difference between the 1990 and 2000 comparison.

The inferential logit model, which employed the double difference approach, revealed that the likelihood of being classified as non-poor was higher for ARBs as compared with non-ARBs. Further, the likelihood of being classified as non-poor in 2000 was higher than in 1990, and the likelihood was higher in 2006 than in 2000. However, the parameter estimates of the double difference between the treatment-time effect for the 1990-2000 and for the 2000-2006 periods were not significant. This implies that the observed difference in the likelihood of being classified as non-poor in either intervention or time trend effect cannot be attributed to CARP.

The double difference approach could have reduced both the observable and non-observable biases because the data came from a longitudinal study for the same respondents. However, the double difference model did not support the argument that CARP had an impact in reducing poverty.

It is argued that the main reason for this is partly attributable to the design of the study. The 1990 survey was for all farmers across 43 provinces. The 2000 survey, because of the time and resource constraints, simply overlaid the original sample of the 1990 survey to the list of ARBs available at DAR. From the original sample, only about 927 respondents actually became ARBs of CARP. This intersection in the two data sets became the ARBs sampled for the 2000 survey. The members of the control group were simply chosen from the original 1990 list who did not

become ARBs but who were residing within the same community where the ARB respondents were located.

The implication is that monitoring and evaluation should form an integral part of the program implementation. In the case of CARP, the baseline was done before the list of ARBs were available. What could have been done was to select from the list of ARBs at the beginning of CARP and also systematically select a control group. This is crucial because a lot of big rural development interventions are being implemented. While there are apparent efforts to incorporate baseline surveys in the implementation, the designs are not systematic enough to allow for more robust counterfactual analyses.

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Performance of Graduates in Licensure Examination for Agriculturists in Bicol Region, Philippines

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Abstract: The study assessed the performance of graduates in Licensure Examination for Agriculturists (LEA) in the different state universities and colleges in Bicol Region, Philippines in 2008 and 2009. Central Bicol State University of Agriculture ranked 1st, Camarines Norte State College ranked 2nd, Catanduanes State College ranked 3rd, Bicol University College of Agriculture and Forestry ranked 4th, Dr. Emilio B. Espinosa, Sr. Memorial State College of Agriculture and Technology ranked 5th, and Sorsogon State College ranked 6th.

Academic variables such as fourth year high school average grade (FYHSG), college general weighted average (CGWA), and the type of preparation tool were found to have significant relationships with the LEA rating. The socio-demographic variables identified (age, gender, type of high school attended, location of high school attended, course and major field, level of accreditation of agriculture programs) had no significant relationship with the LEA rating.

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First time LEA test takers with FYHSG of 86 and above, CGWA of 1.97 and above, and good preparation such as enrolment in a formal LEA review class backed up with self-review, tended to pass the LEA.

An agriculture graduate should have a good academic performance during his/her high school and college education and must have good preparation tools to successfully hurdle the LEA.

Keywords: *licensure examination, fourth year high school grade, college general weighted average, LEA rating*

INTRODUCTION

In this age of globalization, graduates of colleges and universities must possess academic competence and professional qualities needed in the workplace. These essential attributes will give them a competitive edge over other graduates.

In the Philippines, most of the higher education institutions (HEIs) offer agriculture programs because the country's economy is primarily agriculture-based. The HEIs are trying to develop agriculturists with technical expertise and teaching skills who can empower the farming and fishing communities with new skills and technologies that would address the problems of food security, poverty, unemployment, and globalization.

In order to upgrade the agriculture and fisheries profession, Republic Act 8435 known as the Agriculture and Fisheries Modernization Act (AFMA) of 1997 was established. This mandate paved the way for the professionalization of graduates of the Bachelor of Science in Agriculture curriculum and other agriculture-related programs whose graduates must pass the Licensure Examination for Agriculturists (LEA).

Compared to other state universities and colleges (SUCs), the performance of agriculture graduates in the SUCs in Bicol during the past years had been poor based on the results of the LEA. In the 2008 LEA, an average of only seven percent of the graduates who took the examination for the first time passed the LEA. In 2009, the percentage of passers increased to 17 percent, but this figure was still way below the national passing rate. These results may be attributed to the poor preparation of agriculture graduates in the LEA. It is in this context that this study determined the factors that may have contributed to the success and failure of agriculture graduates during the licensure examination.

Specifically, the study aimed to:

1. describe the socio-demographic, academic, and experiential characteristics of graduates who took the LEA in 2008 and 2009;
2. compare the LEA scores of graduates per subject area of the six SUCs offering BS Agriculture and other agriculture-related programs;
3. determine significant differences in the LEA scores of graduates across the six subject areas in selected SUCs; and
4. analyze the factors that influenced the performance of graduates of BS Agriculture and other agriculture-related programs in the 2008 and 2009 LEA.

METHODOLOGY

The study used a combination of descriptive and ex post facto research designs. It used secondary data such as demographic, academic, and experiential characteristics of graduates of the BSA curriculum and of agriculture-related fields. These were obtained from the registrar's office, accreditation office, and guidance and testing office of selected SUCs. The LEA ratings were requested from the Professional Regulation Commission (PRC) with the consent of the dean and/or president of the different SUCs.

The respondents of the study were selected from 2008 and 2009 LEA examinees using purposive and convenient sampling. Only the first time examinees who took the 2008 and 2009 LEA and whose academic records were complete were considered.

The respondents were purposively selected from the six SUCs in the Bicol Region, namely: SUC1 - Central Bicol State University of Agriculture (CBSUA), SUC2 - Bicol University College of Agriculture and Forestry (BUCAF), SUC3 - Camarines Norte State College (CNSC), SUC4 - Catanduanes State College (CSC), SUC5 - Dr. Emilio B. Espinosa, Sr. Memorial State College of Agriculture and Technology (DEBESMSCAT), and SUC6 - Sorsogon State College (SSC). Out of the 246 first time examinees, only 152 had complete data and thus, were selected as respondents of the study. Out of the 152 examinees, 44 test takers passed the LEA.

The research instrument used was the Individual Collection Sheet based from the Data Collection Sheet used by Hereford (2005). Slight modifications were made to suit the objectives of the study. Codes were used for easy computer processing of data.

The independent variables of the study were demographic, academic, and experiential characteristics. Demographic characteristics include 1) sex, 2) age at program admission, 3) type of high school graduated from, and 4) location of high school attended. Academic characteristics include 1) course and major field of specialization, 2) fourth year high school general average grade (FYHSG), and 3) college general weighted average (CGWA). The experiential characteristics include the preparation tool categorized into: 1) enrolment in a review class plus self-review, and 2) self-review only.

The single dependent variable was the LEA rating obtained by the agriculture graduates during their first attempt.

The Statistical Package for the Social Sciences (SPSS) version 16.0 was used in the processing and analysis of data. To describe relevant characteristics of the study, descriptive statistics using frequency counts, cross tabulations, and numerical measures were used. Point-Biserial Correlation was used to determine the relationship between gender and the LEA rating; type of high school attended and the LEA rating; location of high school and the LEA rating; SUCs' level of accreditation and the LEA rating; and the preparation tool and the LEA rating. ANOVA was used to compare the significant differences among the means of LEA ratings per SUC.

Multiple linear regression analysis was used to determine the contribution of the different demographic, academic, and experiential characteristics on LEA performance. Multiple regression focused on the correlations between the dependent and independent variables. Correlation analysis and other tests were done before regression analysis.

In examining the BSA curriculum and other agriculture-related courses, the findings of the members of the AACCUP team when they visited the different Bicol SUCs were used. AACCUP stands for Accrediting Agency of Chartered Colleges and Universities in the Philippines.

The team members used the AACCUP Master Survey Instrument under Area III: Curriculum and Instruction. Out of the ten areas in assessing academic programs, only Area III was considered because performances in academic and licensure examinations are included in the assessment of the curriculum. Other instruments used to examine the BSA curriculum and other agriculture-related courses were the CHED Memorandum Order (CMO) No. 14, Series of 2008 (Policies and Standards for Bachelor of Science in Agriculture Program) and the Minimum Requirements for Bachelor in Agricultural Technology (BAT DECS Order No. 121, Series of 1991). The contents of these issuances were compared

to the existing curriculum of the SUCs, particularly the six subject-areas covered by LEA with the corresponding course descriptions.

RESULTS AND DISCUSSION

Respondents' Socio-demographic, Academic, and Experiential Characteristics

As shown in Table 1, majority of the respondents were female (56%), 17 years old when they enrolled in an agriculture program (45%), and came from a public rural high school (72%). Most of them also reported to have attended high school located in a rural area (81%).

More than half of the respondents (62%) finished their agriculture course in a Level 2 accredited agriculture program. Only few respondents (7%) graduated from a program with candidate status (Table 1). The Level 2 accreditation was granted by CHED to programs that have been re-accredited, effective for a period of three years. On the other hand, candidate status is given to programs that have undergone preliminary survey visit and are certified as being capable of acquiring accredited status within two years.

Table 2 shows that majority of the respondents finished BS Agriculture (BSA) major in Animal Science (49%). Very few respondents graduated with BSA major in Agricultural Education (1%) and BSA major in agro-forestry and crop protection (1%).

The means of the respondents' FYHSG and CGWA were categorized into "passers" and "non-passers". Out of the 44 LEA passers, FYHSG mean was 86.45 while 82.22 for the LEA non-passers (Table 3). Based on these results, an agriculture graduate who had a higher grade (86 and above) in fourth year high school tended to pass the LEA compared to those who graduated with an average grade of 82 and below.

Table 1. Respondents' socio-demographic characteristics

CHARACTERISTICS	FREQUENCY (n=152)	PERCENT
Sex		
Male	67	44.08
Female	85	55.92
Age at program admission (years)		
15	2	1.32
16	21	13.82
17	69	45.39
18	29	19.07
19	19	12.50
20	5	3.29
21	4	2.63
22	2	1.32
23	1	0.66
Type of high school attended		
Public	109	71.71
Private	43	28.29
Location of high school attended		
Urban	29	19.08
Rural	123	80.92
Level of accreditation of the BSA and agriculture-related program		
1. Level 2 accredited	95	62.50
2. Level 1 accredited	46	30.20
3. Candidate status	11	7.20

As to CGWA, the mean grade for the LEA passers was 1.97 while 2.33 for the non-passers (Table 3). Based on these figures, an agriculture graduate with a CGWA of 2.0 or better tended to pass the LEA as compared to those with GWA of 2.33 and below.

Out of the 152 examinees, 97 (64%) who enrolled in a review class apart from taking a self-review, obtained a mean of 68.34 in the LEA. On the other hand, 55 examinees (36%) who undertook only a self- review, had a mean of 63.03 (Table 4).

Table 2. Respondents' academic characteristics according to course and major field of specialization

COURSE/MAJOR FIELD	FREQUENCY (n=152)	PERCENT
BSA Animal Science	74	48.70
BSA Crop Science	15	9.90
BS Agricultural Economics	12	7.90
Bachelor in Agricultural Technology	10	6.60
BSA Agronomy	9	5.90
BSA Horticulture	8	5.30
BSA Agricultural Extension	6	3.90
BSA Plant Pathology	5	3.30
BSA Soil Science	5	3.30
BSA Agricultural Education	4	2.60
BSA Agro-Forestry	2	1.30
BSA Crop Protection	2	1.30

Table 3. Respondents' academic characteristics based on the means of FYHSG and CGWA of LEA passers and non-passers

CHARACTERISTICS	LEA PASSERS (n=44) Mean	LEA NON-PASSERS (n=108) Mean
Fourth year high school grade (FYHSG)	86.45	82.22
College general weighted average grade (CGWA)	1.97	2.33

Table 4. Respondents' experiential characteristics

TYPE OF PREPARATION TOOL	n	LEA RATING PERCENT	MEAN
Enrolment in a review class plus self-review	97	63.81	68.34
Self-review only	55	36.18	63.03
Total	152	100	

The results show that LEA examinees with FYHSG between 82 to 86 and those with CGWA between 1.97 to 2.33 should enroll in a formal review class and conduct self-review to pass the LEA.

LEA Scores per Subject Area

The study also compared the mean scores of LEA examinees per subject area and SUC. In crop science, SUC1 got the highest mean (65.07), while SUC5 got the lowest (57.63). This implies that SUC5 should focus on improving its performance in crop science.

In soil science, SUC1 got the highest mean (65.96), while SUC2 got the lowest (59.91). This may be because Soil Science 2 is not being offered in the BS Agriculture program of SUC2 when the study was conducted.

In animal science, SUC1 got the highest mean (67.86), while SUC3 (59.48) got the lowest mean even if the subject carries the same course description with the CMO 14 Series of 2008. Perhaps this was because of other factors, such as “no formal LEA Review Class within the SUC” prior to the 2008 and 2009 examination period.

In crop protection, SUC2 got the lowest mean (60.09). This may be explained by the different course descriptions and content that SUC2 was implementing compared to the CMO 14 Series of 2008 requirement. On the other hand, SUC1 had the highest mean (68.83).

Along the area of agricultural economics and marketing, SUC4 got the lowest mean (61.14) even if it had the same course description with the CMO 14 Series of 2008. This may be attributed to the lack of review center inside the campus. Meanwhile, SUC1 had the highest mean (66.12).

Lastly, in agricultural extension and communication, SUC1 got the highest mean (69.59) and SUC6 got the lowest (59.00). Obviously, SUC6 is offering a Bachelor in Agricultural Technology course and agricultural extension and communication is not included in the curriculum.

Overall, SUC1 got the highest mean scores in all the subject areas (Table 5).

Table 5. Mean score of LEA examinees per subject area and SUC

SUBJECT	SUC1	SUC2	SUC3	SUC4	SUC5	SUC6
Crop Science	65.07	58.59	65.04	59.82	57.63	64.00
Soil Science	65.96	59.91	61.79	61.47	63.71	64.00
Animal Science	67.86	59.63	59.48	61.82	60.5	63.50
Crop Protection	68.83	60.09	64.64	66.18	63.42	63.25
Agricultural Economics and Marketing	66.12	62.25	62.25	61.14	63.63	61.75
Agricultural Extension and Communication	69.59	66.63	65.89	64.83	65.17	59.00

Significant Difference in the LEA Scores

To determine the significant difference in the LEA scores of the sample population, the analysis of variance (ANOVA) was used. Results showed that the ratings of first time examinees from the different SUCs in Bicol Region has no relationship with the type of SUC, with the location of the school, and with the type of curriculum each SUC was adopting.

According to the rule (Topper, 1998), if the computed p-value is greater than $\alpha=0.05$, the null hypothesis is accepted. This means that there is no significant difference among the means of the 2008-2009 LEA ratings among the students of six SUCs in Bicol. This implies that majority of the factors that influenced the performance of first time examinees in the LEA came from the individual based from the Human Capital Theory (Schultz, 1971; Sakamota & Powers, 1995; and Psacharopoulos & Woodhall, 1997 as cited by Olaniyan & Okemakinde, 2008). Engaging in formal education increased stock knowledge and developed varied skills in students, which was measured by their performance during high school and college years. Higher grade implied an increased self-efficacy levels (Bandura, 1977) of the agriculture graduate, which led to the passing of LEA.

Factors that Influenced the Performance of LEA Examinees

To determine the strength of relationship between FYHSG and LEA rating and CGWA and LEA rating, the Pearson Product Moment Correlation was used.

Table 6 shows that the correlation coefficient between FYHSG and LEA rating was 0.481 and the computed p-value was 0.000 (less than the $\alpha=0.05$), which imply a significant positive and moderate relationship. This means that an examinee with a higher FYHSG tended to obtain a higher LEA rating.

The results further imply that a good high school preparation of a first time examinee is an important factor in passing the LEA. In the same manner, having a good grade during high school tends to increase the examinees' self-efficacy levels and will lead to their increased level of performance in future examinations such as LEA. Hence, SUC administrators are encouraged to screen applicants to the agriculture program properly. Based on interviews with the deans of agriculture of the

different SUCs, a student should have a grade of at least 80 in his/her fourth year high school card before s/he can be admitted to the agriculture program.

Table 6. Correlation coefficient between FYHSG and CGWA, and LEA Scores

PARAMETER	CORRELATION COEFFICIENT	COMPUTED p-value	STRENGTH OF RELATIONSHIP TO LEA SCORES
Fourth year high school grade (FYHSG)	0.481	0.000	Significant positive moderate relationship
College general weighted average grade (CGWA)	-0.554	0.000	Significant negative substantial relationship

Meanwhile, the correlation coefficient between CGWA and LEA rating was -0.554 and the computed p-value was 0.000 (which is less than $\alpha=0.05$). This means that there was a negative and significant relationship between these two variables. The negative correlation coefficient is explained by the SUCs’ grading system, which is 1.0 as the highest and 5.0 as the lowest grade in college. The higher the general weighted average grade of a first time examinee in college, the more likely s/he would get a high score in LEA.

The study also computed the mean and standard deviation of LEA ratings based on the accreditation level of the agriculture programs the respondents belonged to. Examinees who graduated from Level 2 accredited programs had the highest mean, followed by examinees from SUCs with a candidate status

program. Examinees from Level 1 accredited programs, however, had the lowest mean. The lowest standard deviation (8.47) was found in SUC with a Level 2 accredited program. This means that the spread of data from the mean was closer compared to the SUC with a candidate status level, which had the highest standard deviation (11.89) (Table 7).

Table 7. Level of accredited agriculture programs, mean of LEA scores, and standard deviation

LEVEL OF ACCREDITED AGRICULTURE PROGRAMS	MEAN OF LEA SCORES	STANDARD DEVIATION
Level 2 accredited	67.26	8.47
Level 1 accredited	64.65	9.42
Candidate status	66.53	11.89

Furthermore, Table 8 shows the influence of level of accreditation on LEA passing rate. SUC1 had the highest LEA passing rate with a Level 2 accredited agriculture program. On the other hand, SUC4, which had a candidate status, surpassed SUC2 and SUC5, which were accredited under Level 1. During the 2008 and 2009 LEA results, the level of accreditation had no bearing with the LEA rating.

To determine the significant predictors in the performance of the first time examinees to LEA, only the independent variables with significant relationship were considered. These variables were the FYHSG, CGWA, and preparation tool. The preparation tool refers to the enrolment to a formal review class plus self-review before taking the LEA (Table 9).

Results showed that FYHSG, CGWA, and preparation tool were significant predictors in licensure examination for agriculturists.

Table 8. Influence of level of accreditation on LEA passing rate

LEVEL OF ACCREDITED AGRICULTURE PROGRAMS	LEA PASSING RATE (DURING 2008 AND 2009)
Level 2 accredited	
SUC1	30.61%
Level 1 accredited	
SUC2	12.5%
SUC3	21.4%
SUC5	8.33%
Candidate status	
SUC4	14.28%
SUC6	0%

Table 9. Correlation coefficients of independent variables and LEA performance

VARIABLES	CORRELATION COEFFICIENTS	LEVEL OF SIGNIFICANCE
Age	0.090	Not significant
Sex	0.09	Not significant
Type of high school	0.15	Not significant
Location of high school	0.093	Not significant
Fourth year high school average grade (FYHSG)	0.481	Significant
College general weighted average grade (CGWA)	-0.554	Significant
Preparation tool	0.28	Significant

Using the regression analysis, the beta coefficient values reveal that CGWA was the strongest predictor (with 0.430), followed by FYHSG (0.203), and preparation tool (0.178) in getting a passing score in LEA (Table 10). The adjusted R square was 0.358, which means that 36 percent of the variations in LEA scores could be explained by the above three variables. The 64 percent of the variations may be caused by other factors.

Table 10. Beta coefficient between Fourth Year High School Grade (FYHSG), College General Weighted Average Grade CGWA), and Preparation Tool (PT)

PARAMETER	BETA COEFFICIENT	
FYHSG	0.203	
CGWA	-0.430	Strongest predictor
PT	0.178	

The multiple regression analysis resulted to the following regression equation:

$$\text{LEA Performance} = 55.612 + 0.435 \text{ FYHSG} - 12.371 \text{ CGWA} + 3.340 \text{ Preparation Tool}$$

The regression equation means that for every one unit increase in the fourth year high school average grade of an agriculture graduate, there is an expected increase of 0.435 in the LEA rating of the first time examinee. In addition, for every one unit increase in the college general weighted average grade of an agriculture graduate, there is an expected increase of 12.371 in the LEA rating. Lastly, for every one unit increase in the preparation tool, there is an expected increase of 3.340 of the LEA rating. The beta coefficient values also reveal that CGWA was the strongest predictor (with 0.430), followed by FYHSG (0.203), and preparation tool (0.178) in getting a passing score in LEA.

CONCLUSIONS

LEA passers were those who performed well during their fourth year high school with at least an average grade of 86 and above; a college general weighted average grade of 1.97; and enrolled in a formal LEA review class backed up by self-review. In contrast, those who failed obtained a fourth year high school average grade of 82.22 and below, with a college general weighted average grade of 2.33 and below, and had self-review only. This implies that an agriculture graduate who wishes to pass the LEA should perform well academically during high school and college and should enroll in a formal LEA review class backed up by self-review.

As for performance in the LEA, the best performing SUC during the 2008 and 2009 examination periods was CBSUA. Different SUCs offering agriculture programs should keep on improving their graduates' LEA performance. According to CHED, if the SUCs LEA passing rate is consistently 3 percent and below, the CHED may recommend closure of the agriculture program.

RECOMMENDATIONS

Each SUC must intensify its review center and invite more qualified and successful resource persons so that graduates will be motivated to review intensively.

A motivation fund (cash reward) may be considered for the passers who belong to the Top Ten at the national and regional levels. This will motivate graduates to really strive hard to be one of the topnotchers. Students who wish to pass the LEA should perform well both in high school and college; they should also read books, magazines, and journals relevant to agriculture, as well as increase their stock of knowledge. Good study habits must be maintained during high school and college days. Examinees

should enroll in a review class, aside from their self-review, if they wish to be successful in hurdling the LEA.

Graduates who finished agriculture courses under the old curriculum must enroll first in the refresher course so that they will have a good grasp of the latest trend in agriculture skills. Faculty handling agriculture subjects should also attend capability trainings in teaching agriculture subjects, specially those covered by LEA.

The data indicate that majority of the SUCs had low passing rate in LEA. Part of this may be due to the admission policies of the SUCs in terms of low cut-off fourth year high school grade. Another factor was the discrepancy between the CHED requirements and the existing SUCs' course offerings. CHED must strictly monitor the implementation of CMO 14 Series of 2008. A matrix of compliance can be issued to all SUCs to monitor whether the competencies required by CHED were being met.

Further research should be conducted similar to this study covering a wider scope (2003-2011) and perhaps the 10 areas of the AACCUP instrument to arrive at a more conclusive result.

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