

## MODELING FARMERS' INVOLVEMENT IN THE PARTICIPATORY COCONUT PLANTING PROJECT OF THE PHILIPPINE COCONUT AUTHORITY

Virgelio C. DARGANTES JR. \*, Milagros C. BALES\*, Leomarich F. CASINILLO\*\*

Visayas State University, \*Department of Agricultural Education and Extension, \*\*Department of Mathematics, Visca, Baybay City, Leyte, Philippines; E-mail:virgelio.dargantes@vsu.edu.ph, milagros.bales@vsu.edu.ph, leomarichcasinillo02011990@gmail.com

**Corresponding author:** leomarichcasinillo02011990@gmail.com

### Abstract

*Participatory Coconut Planting Project (PCPP) is one of the programs implemented by the Philippine Coconut Authority (PCA) that aims to achieve the increasing productivity and income of coconut farmers. The study was conducted to find out the level of involvement of 145 coconut farmers, from the three selected municipalities of Northwestern Leyte, in the PCPP and determine the factors that influenced their participation. Descriptive statistics like percentages, frequency counts, means, and ranges were employed. Moreover, regression analysis was used to determine the relationship between the socio-demographic/economic characteristics and other factors that influenced farmers' involvement in PCPP. Findings revealed that most of the respondents were middle-aged, males, and married. They had low educational levels and annual income and the majority of them did not attend pieces of training. They were land owners cultivating an average area of 1.5 hectares. Moreover, the majority of the respondents had fully taken part in the overall activities of PCPP which indicates genuine participation. Factors that have a high level of significance to the level of involvement were the following: educational attainment, number of training attended, benefit satisfaction, and perceived satisfaction towards the project. Other significantly related factors were sex, age, benefits awareness, and effectiveness of the Coconut Development Officer (CDO) in the delivery of services. Apparently, the most common problem encountered by the farmers was coconut pest infestation. Hence, regular monitoring from the CDO staff and provision by PCA of sufficient pesticides to control infestations are hoped to prove the productivity of coconut farms.*

**Key words:** Coconut farmers' participation, extension services, perceived satisfaction, benefits

### INTRODUCTION

The coconut industry in the country Philippines plays a vital role in national economic development [18]. In fact, this industry is one of the top ten exports as exhibited by the good export performance of both traditional and non-traditional coconut products in the country. The Philippines is the second-largest producer of coconuts globally, ranking directly behind Indonesia [6]. Coconut provides a sustainable income source for many Filipinos by giving service through its many programs [21].

Coconut (*Cocos Nucifera L.*) is considered the lifeblood of Philippine agriculture because of the assortment of products and by-products made from the coconut tree utilized for food and in industry. Coconut is one of the country's most important crops that has played a relevant role in global

competitiveness and the country's primary agricultural export. Indeed, the Philippines remain the uppermost producer and exporter of coconut throughout the world [17],[21]. Although there are numerous coconut plantations in the Philippines, still the productivity levels remain relatively low [4]. The low productivity of the coconut plantations can be attributed to the lack of information on appropriate technologies for coconut farming; fruit-bearing trees are senile and need replanting [6]. Seemingly, there is low participation of farmers in the decision-making process, especially in marketing which they do not have much control over. This results in a major problem in the export of coconut commodities due to a declining quantity of production [18]. Moreover, when Typhoon Haiyan (topically known as Yolanda) affected the Philippines on November 8, 2013, an estimated 33 million

coconut trees were battered or damaged, negatively impacting around 1 million coconut farmers [6], [25].

The devastation brought by the calamity was deeply felt by the workers in the agricultural sector, especially the coconut farmers in Eastern Visayas who were badly hit. The region experienced a significant decline in coconut production, which gravely affected demand at local and national levels. Some provinces like Leyte and Samar have suffered setbacks due to massive infestation [25]. More significantly, despite the adverse impact on the industry's contribution to the economy and its vast economic potential, coconut farmers are considered poor in the country. Their poverty can only be explained by the inability of producers to reinvigorate the production [22].

The Philippine Coconut Authority (PCA), an attached agency under the Department of Agriculture (DA), is mandated to revitalize the coconut industry by increasing coconut production and farm productivity to ensure economic stability among the coconut farmers [22]. PCA leads the farmers to help them be adequately trained, motivated, and challenged to transform coconut farms into entrepreneurial entities. PCA enhances the farmers' capability to identify demand-driven crops that should be planted in greater volume to generate more income. Moreover, farmers are also taught about marketing to be able to sell their crops at a competitive price [13], [22].

To achieve the increasing productivity and income of coconut farmers, one of the programs implemented by PCA is the Participatory Coconut Planting Project (PCPP). PCPP aimed to uplift the living standard of coconut farmers and the coconut industry. Participation implies a widening redistribution of opportunities among the people to involve them in all the phases of development activities, especially in the coconut replanting and plantation rehabilitation program. It asserts one's right to establish through their involvement in the development processes since it also affects them and ultimately the community. Furthermore, it emphasized that the user's

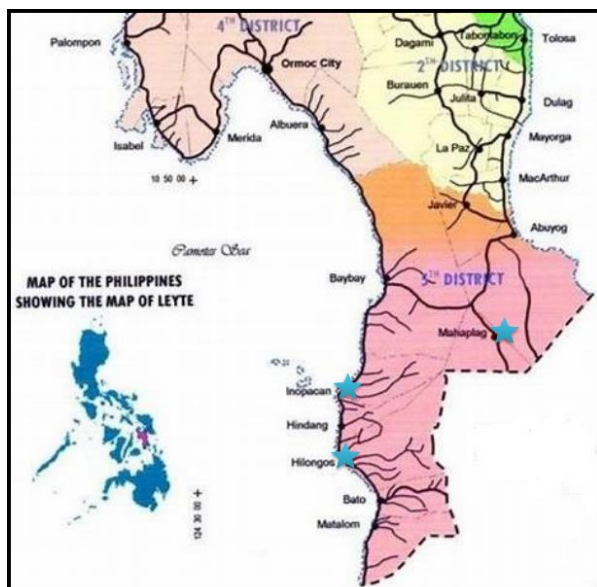
perspective is vital in sustainable development programs. Although the PCA personnel has done their best for the coconut farmers to get involved in the PCPP, the extent of their participation in this program is not yet well studied. The farmers' involvement in rehabilitating and improving productivity could be influenced by various factors which can affect their full participation. This study was anchored on the Ladder of Citizen Participation Theory [3] adapted and developed by Farshid Aref [2]. Citizen participation is a kind of procedure that provides reclusive individuals a chance to impact the public decision-making process. Thus, it was hypothesized that the participation of farmer-beneficiaries in the PCPP was influenced by four major variables: 1) socio-demographic and economic characteristics of the farmer respondents, 2) other selected factors that are associated with farmers' involvement in the project, 3) the perceived satisfaction of farmers towards PCPP and 4) the effectiveness of CDOs in delivery of extension services. The results of this study could provide valuable insights to rural development planners and policymakers in planning and implementing policies and strategies that would improve the mobilization of farmers in any development project. The information would be useful for guiding the future policies that shall form the guidelines to improve the present programs. It can also be useful to program implementers and frontline extension agents to analyze and improve extension strategies and methodologies, find solutions to whatever problems they will encounter in implementing the project, and determine the course of action to make farmers more actively involved in the project for their development and benefits.

## **MATERIALS AND METHODS**

### **Study site and respondents**

The study covered three municipalities of Northwestern Leyte under the Participatory Coconut Planting Project, namely: Mahaplag, Inopacan, and Hilongos, Leyte (Map 1). These municipalities are also the coconut top growers in Northwestern Leyte and have the

most significant number of farmers involved in PCPP.



Map 1. The location where the survey was conducted.  
 Source: [8].

The following barangays in these municipalities were selected using purposive sampling: Brgy. Sta. Cruz and San Isidro in Hilongos, Brgy. Caminto and Hinabay in Inopacan, and Brgy. Mabuhay and Palanogan in Mahaplag, Leyte. The respondents of the study were the coconut farmers involved in the PCPP from the year 2015 to 2017. A total enumeration of respondents from the selected barangays in three municipalities was used to elicit a response. The distribution of the respondents by municipalities is shown in Table 1.

Table 1. Distribution of farmers by municipality

Municipality	Barangay	Farmers
Mahaplag	Mabuhay	16
	Palanogan	14
Hilongos	Sta. Cruz	20
	San Isidro	19
Inopacan	Caminto	40
	Hinabay	36
<b>Total</b>		<b>145</b>

Source: Source: Authors' own tally (2022).

### Data Gathering and Research Instrument

A list of coconut farmers involved in the PCPP was obtained from the Provincial Office of the Philippine Coconut Authority-Northwestern Leyte. Personal interviews were

conducted by the researcher in the respondents' respective residences and were kept confidential to protect their privacy. During the interviews, the interview schedule was translated into the Cebuano dialect to make the conversations more understandable. To substantiate the data gathered, three Focus Group Discussions (FGDs), one for each municipality, were also conducted.

A research's developed structured questionnaire adapted from the study by Aref [2] and Arnstein [3] was employed for the scheduled interview. The interview schedule was pretested among selected coconut farmers who were not included in the research coverage. A five-part interview schedule was used in data gathering.

Part I dealt with the socio-demographic and economic characteristics of farmer respondents.

Part II included other selected factors that could affect their participation and involvement in the project.

Part III focused on the perceived satisfaction towards the PCPP (7 areas) and the effectiveness of CDO staff in the delivery of extension services (5 areas). This part is considered a 5-point rating scale.

Table 2 shows the range of scores in perceived satisfaction and effectiveness of CDO staff.

Table 2. Scoring guidelines for Part III

Perception scores	Adjectival rating	
	Satisfaction	Effectiveness
1.00 – 1.80	Very unsatisfied	Highly ineffective
1.81 – 2.60	unsatisfied	Ineffective
2.61 – 3.40	Undecided	Uncertain
3.41 – 4.20	Satisfied	Effective
4.21 – 5.00	Very Satisfied	Highly effective

Source: Authors' own guidelines (2022).

Part IV was on the level of farmers' involvement in the different activities (7 activities involved, two phases) of PCPP. In each activity, each farmer has to choose the following options: 1-Not at all, 2-Partially taken part, 3-Fully taken part.

Table 3 presents the scoring guidelines for farmers' involvement.

Table 3. Scoring guidelines for Part IV

Perception scores	Level of involvement
1.00 – 1.80	Not at all
1.81 – 2.60	Partially taken part
2.61 – 3.40	Fully taken part

Source: Authors' own guidelines (2022).

Lastly, Part V dealt with the problems encountered in relation to the project and suggested solutions and recommendations to solve these problems.

### Data Analysis

Descriptive statistics such as percentages, frequency counts, means, and ranges were used to describe farmer respondents' socio-demographic characteristics, including their perceived satisfaction and participation in the program. The data gathered through selected farmer interviews were presented in descriptive form and tables. Linear regression analysis was employed using a specified model (ordinary least square (OLS)) to elucidate the influencing determinants (socio-demographic, economic characteristics, and other personal factors of farmer-respondents) of farmers' involvement in PCPP. For the dependent variable, the total farmers' perception scores (summed up) in involvement in the different activities were computed. Data were coded and analyzed using the STATA version 14.0 and employed some diagnostic test that is subjected to a 5% level of significance.

## RESULTS AND DISCUSSIONS

### Profile of the PCPP Respondents

Almost half of the farmers (45%) were middle-aged, where the average age is 55. These findings indicate that age does not limit individuals in doing farm activities. The majority of the respondents were males (66%). This result confirmed Nnadi and Akwiwu's [19] study that males are usually the decision-makers and, therefore, are well placed to involve in agricultural projects. A majority (79%) of the farmers were also married: Most respondents had low education, with one to four household members.

Most of the farmers (53%) were members of one or more organizations in their respective barangays. A majority (70%) of them have not

attended training for the following reasons: they were either not informed or aware of the training, busy on their farm/work, or had no training conducted for them. However, some had attended one or more coconut-related training such as on PCA-PCPP Program (21%), PCA- Planting/replanting and Integrated Pest Management (8%), and other related training.

The majority of the respondents (74%) were landowners/heirs who were more involved in PCPP. According to Philippine Statistics Authority [21], Eastern Visayas currently pegs the poverty threshold at Php9,063.75 a month for a family of five or Php108,765.00 income in a year. This reveals that the coconut farmers in the study sites were below the poverty line, further indicating that their income cannot provide all the basic needs for their families. Although all of the respondents (100%) were mainly dependent on farming, some of them had other sources of income coming from small-scale businesses (17%), as a driver (5%), government/private employment (13%), relied on the remittance from their family/relatives (5%), and other sources.

On average, the respondents cultivated 1.5 hectares which ranged from 0.25 to 6.0 hectares which shows that the majority of the farmers qualified on the requirements of PCPP to cultivate an area of 0.5-5.0 hectares. However, there were farmers (60) who did not qualify based on this requirement but were allowed to participate in the program. On the other hand, the same percentage of respondents (23%) have a long farming experience, between 13- 23 years and 24- 34 years. Generally, the respondents had an average farming experience of 28 years.

### Factors Influencing Participation

Most of the respondents (77%) got information about the PCPP from personal sources. The study revealed that they got more reliable information from the CDO staff. This shows that the CDOs assigned in the respective areas effectively disseminated reliable information about the project.

Although the PCPP did not use radio, television, and printed materials, a few respondents (9%) availed the mass media

where they considered the radio as an effective source of information over television (4%) and printed materials (0.7%).

One of the influencing factors why people participate in government/private activities is the benefit they receive from their involvement [24], [27]. Almost all (95%) of the respondents were aware of the benefits gained from joining the project. Seventy percent (70%) indicated satisfaction since they perceived that the program helped them financially.

### Perceived satisfaction toward PCPP Project

The FGD results affirmed that the project positively affected farmers' lives because these were very useful in their livelihood. Generally, the respondents rated the project satisfactorily, as indicated in the grand mean score of 4.12. Among the favored areas listed, the project's effect and usefulness in their livelihood had the highest mean scores (4.28), indicating farmers' high satisfaction with these aspects (Table 4).

Table 4. Perceived satisfaction of the farmers

Areas	M	SD	Adjectival rating <sup>a</sup>
General assessment of the project	4.20	0.760	Satisfied
Sourcing own seed nuts	4.25	0.769	Satisfied
Usefulness in their livelihood	4.28	0.768	Satisfied
Dissemination of the concept of the program	3.97	0.931	Satisfied
Relevance to their needs	4.21	0.754	Satisfied
Process of application in the access to the project	3.63	1.296	Satisfied
Effect of the project on their lives	4.28	0.750	Satisfied
Grand Mean and Std dev(M±SD)	4.12 ± 0.86		Satisfied

Note: a-See Table 2 for details.

Source: Authors' own analysis based on data gathered (2022).

The process of application for the access to the project and dissemination of the concept of the program was still satisfactory, although with low mean scores of 3.63 and 3.97, respectively. The respondents favored other

areas such as sourcing their seed nuts, relevance to their needs, and general assessment of the project.

### Effectiveness of CDO staff

The CDOs' performance in the delivery of extension services in specific project areas was effective, with an overall grand mean of 3.98 as preferred by the respondents (Table 5).

This implies their trust in the CDO staff for the reliability of the information they received from a sense of responsibility, seriousness, and dedication to services has been rated highest (4.20).

Although the implementation of a monitoring system (3.68) was low, it was understandable because of the wide coverage of responsibility and lack of CDO staff responsible for the regular monitoring of the project.

This result is consistent with the study of Aguda et al. [1] that the agricultural project's staff in Baybay City, Leyte, Philippines has room for improvement to satisfy the participation of farmers.

Table 5. Effectiveness of the CDO staff

Areas	M	SD	Adjectival rating <sup>a</sup>
Technical capability of CDO staff	4.11	0.746	Effective
Sense of responsibility, seriousness, and dedication to services	4.20	0.742	Effective
Giving clear instructions to participants	4.14	0.782	Effective
Implementation of a monitoring system	3.68	1.033	Effective
Settling/handling problems effectively	3.79	0.980	Effective
Grand Mean and Std dev(M±SD)	3.98 ± 0.85		Effective

Note: a-See Table 2 for details.

Source: Authors' own analysis based on data gathered (2022).

### Level of involvement of Farmers

PCPP had seven activity areas which were divided into two phases (Table 6).

Farmers' level of participation was measured using a 3- point attitudinal scale with 3- fully taken part, 2-partially taken part, and 1-not at all. This 3 -point attitudinal scale was derived from Arnstein's [3] ladder of citizen participation theory, adapted and developed by Farshid Aref [2], which categorized participation into three levels only. In the Phase 1 activities, half of the respondents (50%) did not attend the awareness seminar and partially took part based on the overall level of involvement (1.82). Findings revealed that some of the respondents were not aware/informed of the PCPP seminar because no formal pieces of training/seminars were conducted in their respective areas. However, the rest of Phase 1 activities were fully taken part by the majority of the respondents. This reveals that the participants had made conscious decisions to participate in these activities and were not influenced by others.

Table 6. Respondents' rating on their level of participation in various PCPP activities

ACTIVITIES	MEAN (±SD)	Over-all response <sup>a</sup>
<b>Phase I Activities</b>		
a.Awareness seminar	1.82 (±0.23)	Partially taken part
b.Seed nuts selection	2.35 (±0.43)	Fully taken part
c.Nursery preparation and establishment	2.37 (±0.37)	Fully taken part
d.Seedbed preparation	2.39 (±0.24)	Fully taken part
e.Sowing and propagation of seed nuts	2.38 (±0.43)	Fully taken part
<b>Phase II Activities</b>		
a.Production of good quality seedlings	2.38 (±0.29)	Fully taken part
b. Field planting of coconut seedlings	2.39 (±0.35)	Fully taken part

Note: a - See Table 3 for details.

Source: Authors' own analysis based on data gathered (2022).

The same results were also revealed in Phase 2 activities, wherein most respondents at varying levels of participants took part in the

production of good quality seedlings (61%) and field planting (62%). This was also stressed in the findings of Aguda et al. [1] and Red et al. [24] that farmer-beneficiaries have varying levels of participation at the different stages of the project.

The results of Phase 1 and 2 were affirmed by the respondents during the conducted FGD as they expressed satisfaction with the different activities of PCPP because they have received monetary benefits from participating in the project. For every seedling they have planted, they received Php40.00. Their participation was largely influenced by the monetary incentives they received. Although their participation appeared to be a token passion because it was extrinsically motivated, they claimed that their involvement in the project would benefit them [20], [14], [26].

#### **Factors that Influenced the Level of Involvement of Farmers in PCPP**

Table 7 depicted that the regression model ( $F_c=3.77$ ,  $p\text{-value}<0.001$ ) is significant at a 1% level of significance. Additionally, the R-squared (goodness-of-fit) shows that ( $R^2=0.16$ ) there are significant predictors that influence the farmers' level of involvement in the project. The diagnostic test for the model suggests that the model does not suffer from heteroskedasticity, multicollinearity problems, and non-normality of residuals. The model showed that only age ( $p\text{-value}=0.077$ ), sex ( $p\text{-value}=0.018$ ), and education ( $p\text{-value}=0.007$ ) significantly influenced the respondent's level of involvement in the PCPP. Other factors showed no significant relationships (Table 5). Among the three factors mentioned above, the respondent's education showed high significance at a 1% level, indicating that the more educated the farmer, the more likely they will participate in agricultural development projects. This result conforms with Nnadi and Akwiwu's [19] notion that farmers participate in order to apply the knowledge they learn. If the farmer is more knowledgeable, then farmers possess a good attitude in practicing innovative production technologies in agriculture [24]. Moreover, based on the number of beneficiaries participating in PCPP activities, males were predominant, which revealed high

significance at a 5% level. This result is parallel to the findings of Rahman et al. [23], that farming is a masculine work and dominated by male workers. On the other hand, age was negatively correlated with the level of involvement at a 10% level which means that the older the farmer, the lesser they will participate in these kinds of activities. It is worth noting that farming is exhausting work, hence most of the farmers are young and motivated [10].

Table 7. Regression analysis (Model 1) for farmers' level of involvement in PCPP

Determinants	Coefficient	Std Error	p-value
Age	-0.067*	0.038	0.077
Sex	2.221**	0.926	0.018
Civil Status	0.429 <sup>ns</sup>	1.022	0.675
Tenurial status	0.372 <sup>ns</sup>	1.067	0.728
Education (in years)	0.856***	0.313	0.007
Household size	0.156 <sup>ns</sup>	0.206	0.449
Farm size	0.298 <sup>ns</sup>	0.317	0.348
No. of years in farming	0.040 <sup>ns</sup>	0.038	0.290
<b>Constant</b>	16.427***	3.282	<0.001
<b>N</b>	145		
<b>F-computed</b>	3.77		
<b>P-value</b>	<0.001		
<b>R-squared</b>	0.160		

Note: ns- not significant; \* - significant at 10%;  
 \*\* - significant at 5%  
 \*\*\* - highly significant at 1%.

Source: Authors' own analysis based on data gathered (2022).

Table 8 reveals that the second constructed model ( $F_c=3.77$ ,  $p\text{-value}<0.001$ ) is highly significant. It can be shown also in the R-squared of the model ( $R^2=0.617$ ) that there are several strong predictors that influenced the farmers' involvement in coconut farming. Plus, the diagnostic test declares that the model is not heteroskedasticity, no multicollinearity problem among predictors, and the residuals are closed to normality. Interestingly, among the eight (8) other selected factors subjected to regression analysis on their influence on the level of involvement of PCPP beneficiaries, five (5) showed significant relationships with training attended, benefit satisfaction, and perceived

satisfaction towards the project indicating high significance at 1% level (Table 8).

Table 8. Regression analysis (Model 2) for farmers' level of involvement in PCPP

Determinants	Coefficient	Std Error	p-value
Annual income	-1.74e-06 <sup>ns</sup>	2.65e-06	0.513
Training attended	2.959***	0.647	<0.001
Members in Organization	-0.689 <sup>ns</sup>	0.590	0.245
Information sources	0.058 <sup>ns</sup>	0.102	0.572
Benefits awareness	2.318*	1.367	0.092
Benefits Satisfaction	2.504***	0.468	<0.001
Perceive satisfaction	0.237***	0.081	0.004
Effectiveness of CDOs	0.161*	0.095	0.094
<b>Constant</b>	-2.629 <sup>ns</sup>	2.816	0.352
<b>N</b>	145		
<b>F-computed</b>	26.01		
<b>P-value</b>	<0.001		
<b>R-squared</b>	0.617		

Note: ns- not significant; \* - significant at 10%;  
 \*\* - significant at 5%  
 \*\*\* - highly significant at 1%.

Source: Authors' own analysis based on data gathered (2022).

In fact, training is vital in knowledge acquisition and stimulating farmers' involvement in the agricultural project [24], [27]. Moreover, benefits awareness and effectiveness of CDO's performance were found significant at 10%. These results explained that the more they were exposed to training, the more satisfied they were with participating in the project because they were more aware of the benefits derived from it [27]. In the study of Aguda et al. [1], farmers must be provided appropriate information and the right training to fully comprehend the benefits they can get. And this motivates the farmer's eagerness to participate the government projects. Furthermore, respondents' perceived satisfaction with the project can be attributed to the effectiveness of CDOs in the delivery of extension services. These results were also expressed during the FGDs conducted among selected groups of PCPP participants stating that the CDOs'

responsibility and dedication to the delivery of extension services contributed to their satisfaction with the project. It is worthy to note that farmers' satisfaction is associated with some indicators that include availability, relevance, accessibility, and even effectiveness [11], [15], [16]. However, the other factors such as annual income, membership in organizations, and information sources did not influence the respondents' level of involvement in PCPP significantly ( $p$ -value $>0.10$ ).

### **Problems Encountered by the Farmers and Suggested Solutions**

The most common problem encountered by the respondents who participated in PCPP was pest infestation (58%) in their coconut plantations. One of the reasons they experienced this kind of problem was the lack of knowledge on preventing pests/diseases such as *the Brontispa longissima Gestro*, also known as the coconut leaf beetle and rhinoceros beetle. In addition, they could not afford to buy pesticides for their farm. The result is parallel to the studies in the literature that one of the problems in coconut farming is pests [5], [7], [9], [12]. This problem also emerged during the FGD, stating that they did not do something about it because they could not afford to buy pesticides because of the very low price of copra. The respondents identified two distinct problems concerning the implementation of PCPP. One was on the application of the requirements of PCPP (27%) due to the unavailability of proof of land ownership where owners did not authorize tenants to participate in the PCPP. This happened because requirements in the access of the project changed from time to time. Although there were those (23%) who never encountered problems in the PCPP implementation, others (5%) claimed of having encountered these problems: delay in giving of cash incentives (5%) which caused some frustrations on the part of the beneficiaries, and the low market price of copra (4%). To address the problems identified by the respondents, they (74%) recommended the following solutions: there should be regular monitoring of their farms by the CDOs to assist farmers in solving the pest

infestations, and the PCA should provide enough pesticides so that they can have better harvest and increase in their income. To remedy problems of PCPP application requirements, their suggested solutions were to have easy access in getting requirement forms and proper dissemination of information on how to access the needed requirements (36%). Other respondents recommended that there should be a quick and easy way of giving cash incentives so that they will be encouraged to participate and be motivated to join the project (6%).

On the other hand, only a few (5%) of the respondents felt the need that the government should take action on the low market price of copra because this was one of their barriers to participating in the coconut planting project. As expressed by the respondents during the FGD, regular monitoring of their farms by the CDO and providing enough pesticides were a big help to prevent or control pest infestation, which was one of the major problems besetting the coco-farms.

### **CONCLUSIONS**

Based on the data results presented, most of the respondents in the selected municipalities of Mahaplag, Hilongos, and Inopacan belonged to the middle-age category, the majority of which were males and married. They have low educational levels, an average of four household members, and low annual income, and are below the poverty line. More than half of them were members of one or more organizations in their respective barangays, and a majority of them have not attended the training. Most of the respondents were owners/heirs, cultivated an average area of 1.5, and had an average farming experience of 28 years. It was also revealed that coconut farming was their primary source of income. Using the Ladder of Citizen Participation, it was found that the majority of the respondents had fully taken part in the overall activities of PCPP, which indicated genuine participation. Highly significant factors influencing the level of respondents' project involvement were educational attainment, the number of training attended, benefit satisfaction, and



perceived satisfaction towards the project. Other significantly related factors were sex, age, benefits awareness, and effectiveness of the CDO in the delivery of services. It was found that the following variables have no significant relationship to the level of involvement in the project: civil status, tenurial status, household size, farm size, experience in farming, annual income, membership in the organization, and information sources. Coconut pest infestation was the most common problem on the farm, which requires regular monitoring of CDO staff with the provision of enough pesticides to address for farmers to better harvest and increase their income. Hence, the government should formulate policies to address the volatile price of copra. Farmers should also be encouraged to find alternative means like engaging in crop diversification, processing products and by-products of coconut, and many others to increase their income and not just depend on copra. A similarly comprehensive study with more variables covering broader scope in other parts of the region in the Philippines may be conducted to have more reliable results.

## REFERENCES

- [1]Aguda, M.I.D., Amestoso, N.T., & Casinillo, L., 2022, Service Quality and Farmer-Beneficiaries' Satisfaction on the Plant-Now-Pay-Later Program of Baybay City Agriculture Office. Review of Socio-Economic Research and Development Studies, 6(1): 1-18. <https://doi.org/10.5281/zenodo.6542683>, Accessed on June 2, 2022.
- [2]Aref, F., 2011, Barriers to community capacity building for tourism development in communities in Shiraz, Iran. Journal of Sustainable Tourism, 19(3): 347-359. <https://doi.org/10.1080/09669582.2010.517314>, Accessed on June 1, 2022.
- [3]Arnstein, S.R., 1969, A ladder of citizen participation. Journal of the American Institute of planners, 35(4): 216-224. <https://doi.org/10.1080/01944366908977225>, Accessed on January 10, 2021.
- [4]Caladcad, J.A., Cabahug, S., Catamco, M.R., Villaceran, P.E., Cosgafa, L., Cabizares, K.N., & Hermosilla, M., 2020, Determining Philippine coconut maturity level using machine learning algorithms based on acoustic signal. Computers and Electronics in Agriculture, 172: 105327. <https://doi.org/10.1016/j.compag.2020.105327>, Accessed on June 9, 2022.
- [5]Echoh, D.U., Nor, N.M., Gapor, S.A., & Masron, T., 2017, Issues and problems faced by rural farmers in paddy cultivation: A case study of the Iban paddy cultivation in Kuala Tatau, Sarawak. Journal of Regional and Rural Development Planning (Jurnal Perencanaan Pembangunan Wilayah Dan Perdesaan), 1(2): 174-182. <https://doi.org/10.29244/jp2wd.2017.1.2.174-182>, Accessed on June 13, 2022.
- [6]Food and Agriculture Organization (FAO) of the United Nations, 2016, Restoring coconut farmers' livelihoods in the Philippines. <https://www.fao.org/in-action/restoring-coconut-farmers-livelihoods-in-the-philippines/en>, Accessed on March 13, 2020.
- [7]Fujisaka, S., 1994, Learning from six reasons why farmers do not adopt innovations intended to improve sustainability of upland agriculture. Agricultural systems, 46(4): 409-425. [https://doi.org/10.1016/0308-521X\(94\)90104-N](https://doi.org/10.1016/0308-521X(94)90104-N), Accessed on May 3, 2022.
- [8]Google Map, 2022, Map of the Philippines showing the map of Leyte. <https://www.google.com/maps/@10.7375736,124.7863885,15z>, Accessed on April 2, 2022.
- [9]Gurbuz, I.B., Manaros, M., 2019, Impact of Coconut Production on the Environment and the Problems faced by Coconut Producers in Lanao del Norte Province, Philippines. Scientific Paper Series Management, Economic Engineering in Agriculture and Rural Development, 19(3): 247-258. [http://managementjournal.usamv.ro/pdf/vol.19\\_3/Art32.pdf](http://managementjournal.usamv.ro/pdf/vol.19_3/Art32.pdf), Accessed on July 20, 2021.
- [10]Hariadi, S.S., Widhiningsih, D.F., 2020, Young farmers' motivation and participation in horticultural organic farming in Yogyakarta, Indonesia. International Journal of Social Ecology and Sustainable Development (IJSESD), 11(1): 45-58. <https://doi.org/10.4018/IJSESD.2020010104>, Accessed on June 1, 2022.
- [11]Hoang, H.G., 2018, Effectiveness of Extension Program Delivery Methods as Perceived by the Central Vietnamese Extension Workers. American Journal of Rural Development, 6(2): 45-48. <https://doi.org/10.12691/ajrd-6-2-3>, Accessed on April 2, 2022.
- [12]Ishii-Eiteman, M.J., Ardhianie, N., 2002, Community monitoring of integrated pest management versus conventional pesticide use in a world bank project in Indonesia. International journal of occupational and environmental health, 8(3): 220-231. <https://www.tandfonline.com/doi/abs/10.1179/107735202800338768>, Accessed on May 25, 2022.
- [13]Jamnadass, R.H., Dawson, I.K., Franzel, S., Leakey, R.R.B., Mithöfer, D., Akinnifesi, F. K., Tchoundjeu, Z., 2011, Improving livelihoods and nutrition in sub-Saharan Africa through the promotion of indigenous and exotic fruit production in smallholders' agroforestry systems: a review. International Forestry Review, 13(3): 338-

354.<https://doi.org/10.1505/146554811798293836>,  
Accessed on May 3, 2022.

[14]Johnson, N.L., Lilja, N., Ashby, J.A., 2003, Measuring the impact of user participation in agricultural and natural resource management research. *Agricultural systems*, 78(2): 287-306.[https://doi.org/10.1016/S0308-521X\(03\)00130-6](https://doi.org/10.1016/S0308-521X(03)00130-6),  
Accessed on June 10, 2022.

[15]Kassem, H.S., Alotaibi, B.A., Muddassir, M., Herab, A., 2021, Factors influencing farmers' satisfaction with the quality of agricultural extension services. *Evaluation and Program Planning*, 85: 101912.<https://doi.org/10.1016/j.evalprogplan.2021.101912>,  
Accessed on June 13, 2022.

[16]Kyveryga, P.M., 2019, On-farm research: experimental approaches, analytical frameworks, case studies, and impact. *Agronomy Journal*, 111(6): 2633-2635.<https://doi.org/10.2134/agronj2019.11.0001>,  
Accessed on June 7, 2022.

[17]Lapiña, G. F., Manalo, N. A. Q., Dorado, R. A., Andal, E. G. T., Valientes, R. D. M., Cruz, M. B., 2020, To Compete or Not? Revisiting the Competitiveness of Banana, Mango, and Pineapple in the Context of the ASEAN Economic Community. *Journal of Economics, Management & Agricultural Development*, 6(2390-2021-961), 35-52.  
<https://ageconsearch.umn.edu/record/310893/>,  
Accessed on May 2, 2021.

[18]Moreno, M.L., Kuwornu, J. K., Szabo, S., 2020, Overview and constraints of the coconut supply chain in the Philippines. *International Journal of Fruit Science*, 20(sup2), S524-S541.<https://doi.org/10.1080/15538362.2020.1746727>,  
Accessed on June 7, 2022.

[19]Nnadi, F.N., Akwiwu, C.D., 2008, Determinants of youth participation in rural agriculture in Imo State, Nigeria. *Journal of Applied Sciences*, 8(2): 328-333.  
<https://doi.org/10.3923/jas.2008.328.333>,  
Accessed on June 13, 2022.

[20]Neef, A., Neubert, D., 2011, Stakeholder participation in agricultural research projects: a conceptual framework for reflection and decision-making. *Agriculture and Human Values*, 28(2): 179-194.<https://link.springer.com/article/10.1007/s10460-010-9272-z>,  
Accessed on March 1, 2022.

[21]Philippine Statistics Authority (PSA), 2019, Data on Coconut Production, Yield, and Area Planted. Available at: <http://countrystat.psa.gov.ph>,  
Accessed on April 30, 2020.

[22]Philippine Coconut Authority (PCA), 2018, History of Coconut Industry in the Philippines. Available at: <http://www.pca.da.gov.ph/index.php/2015-10-23-06-25-48/programs>,  
Accessed on December 3, 2021.

[23]Rahman, M., Palash, M., Jahan, H., Jalilov, S. M., & Mainuddin, M., 2020, An empirical investigation of men's views of women's contribution to farming in Northwest Bangladesh. *Sustainability*, 12(9): 3521.<https://doi.org/10.3390/su12093521>,  
Accessed on June 13, 2022.

[24]Red, F.S., Amestoso, N.T., Casinillo, L.F., 2021, Effect of Farmer Field School (FFS) on the Knowledge, Attitude, Practices and Profitability of Rice Farmers. *Philippine Social Science Journal*, 4(4): 145-154. <https://doi.org/10.52006/main.v4i4.420>,  
Accessed on April 3, 2022

[25]Seriño, M.N.V., Cavero, J.A., Cuizon, J., Ratilla, T.C., Ramoneda, B.M., Bellezas, M.H.I., Ceniza, M.J.C., 2021, Impact of the 2013 super typhoon haiyan on the livelihood of small-scale coconut farmers in Leyte island, Philippines. *International Journal of Disaster Risk Reduction*, 52: 101939.<https://doi.org/10.1016/j.ijdr.2020.101939>,  
Accessed on June 5, 2022.

[26]Thompson, L.J., Glewen, K. L., Elmore, R.W., Rees, J., Pokal, S., Hitt, B.D., 2019, Farmers as researchers: in-depth interviews to discern participant motivation and impact. *Agronomy Journal*, 111(6): 2670-2680.<https://doi.org/10.2134/agronj2018.09.0626>,  
Accessed on January 2, 2022.

[27]Valenzona, R.M.P., Amestoso, N.T., & Casinillo, L.F., 2020, Assessing the success of farmers' associations: The case of Baybay City, Leyte, Philippines. *Journal of Agriculture and Technology Management (JATM)*, 23(1): 14-25.  
<http://jatm.ctu.edu.ph/index.php/jatm/article/view/338>,  
Accessed on June 11, 2021.