

Original Research Article

Effectiveness of Community-Based Forest Management Program as a Strategy on Forest Restoration Using Rainforestation Approach in Cienda and San-Vicente, Baybay City, Leyte

ABSTRACT

This study was conducted in Sitios Cienda, Gabas and San Vicente, Kilim, Baybay City, Leyte. This study draws on the effectiveness of the CBFM program on the aforementioned communities through Cienda-San Vicente Farmers Association (CSVFA) as the CBFM holder. The assessment was based on the CBFM program's main principle, "people first and sustainable forestry will follow". Moreover, an interview schedule was used in collecting primary data. During the survey, there were 41 respondents from the CSVFA members and 50 respondents from the non-members. Moreover, the use of Finite Population Correction (FPC) was the statistical tool applied in the study.

It was found that the active involvement of CSVFA members could be affected by the level of their awareness and understanding on problems related to biodiversity conservation. In the advent of the increasing forest destruction in the area, rainforestation approach has been an alternative way for them to protect and conserve their forests. This paper also focuses on the sense of ownership of the program based on the empowerment shown by the CSVFA members as evidenced by their ability to handle the CBFM activities.

Generally, it was noted that the effectiveness of the CBFM in the two communities was affected by various pillars which include the a) CSVFA and its b) tenorial instrument which is the CBFM agreement as the foundation of the program; c) innovation of natural resources and income-generating activities which serves as its wealth; and lastly, the d) governance which is responsible for the distribution of responsibilities and decision-making process.

Keywords: CBFM, CSVFA, sustainable forestry, rainforestation, empowerment

1 INTRODUCTION

The Community-Based Forest Management (CBFM) emerged as a search for alternative approach to forest management in parallel with a growing international interest in participatory development and linkages between land rights movements and environmental movements (Menzies, 2004). In 1991, the Philippine government through the Department of Environment and Natural Resources (DENR) implemented CBFM as a national strategy on forest restoration and biodiversity conservation. This strategy was based on the premise of, "People first and sustainable forestry will follow" (FMB-DENR, 2011). The Philippine government believes that by addressing the needs of local communities, they themselves will join hands to protect and manage the very source of their livelihood. In this strategy, the management, protection, and utilization of natural resources are transferred to the community through the issuance of a Community-Based Forest Management Agreement (CBFMA) which entitles forest communities to use and develop their forestland and resources for duration of 25 years and renewable for another 25 years.

The application on the CBFM program within the communities of Cienda and San Vicente was made possible through the formalization of their **PO** named as Cienda-San Vicente Farmers Association (CSVFA). One of their leading activities which highlight their CBFM site was the adoption of Rainforestation Farming even before CBFM was implemented in the area. This is a method which is used to sustain human food production while simultaneously preserving the biodiversity of terrestrial ecosystem and their vital functions to humankind (Milan and Ceniza, 2009). The adoption of rainforestation in the area leads to the key interest of various environmental advocates in the country and even in abroad. Moreover, CSVFA already have the mindset of reforestation in their community because of the various trainings they have attended in terms of Rainforestation Farming in the mid-90s.

Nevertheless, there are still several questions raised on the degree and measurement of success on community-based forest restoration strategy. Perhaps this is the reason why there are several differences in the outcome of the program. As Groetschel et al. (2001) propounded, it is a question of finding out what can be changed or improved in order to reach sustainable development for natural resources and to enhance the economic situation of the people.

The main objectives of the study were: 1) To describe the socio-demographic characteristics of the Cienda-San Vicente Farmers Association (CSVFA) members and non-members; 2) To identify indicators that are critical to community preparedness and participation in forest restoration and protection initiative; 3) To assess the sense of ownership and the benefits derived by the people's organization in sustaining and managing their CBFM area; and 4) To examine the effectiveness of Community-Based Forest Management Program as a strategy on forest restoration in the communities of Sitios Cienda and San Vicente.

2 METHODOLOGY

2.1 Site Selection

The study was conducted in Sitio Cienda, Barangay Gabas and Sitio San Vicente, Barangay Kilim, Baybay City, Leyte. Cienda and San Vicente communities are villages located on the western side of the Central Highlands of Leyte wherein their forest was designated by the DENR as a Community-Based Forest Management (CBFM) area which covers 2,236 has of land. This is divided into a 1,230 ha protected area, a 559 ha buffer zone and a 447 ha multiple use area.

2.2 Formulation and Pre-testing of Survey Instrument

The survey questionnaires used for the CSVFA members and non-members were based on the **following**: a) demographic data; b) socio-economic data; c) biophysical data of their natural resources; d) initiatives related to CBFM based on the approved Community Resource Management Framework (CRMF); and f) lessons learned in the implementation of the CBFM. Furthermore, to ensure validity and reliability as well as clarity and appropriateness in gathering the data, pretesting of the instruments was done in Sitio Batuan, Brgy. Linao, Inopacan, Leyte on April, 2013. The survey questionnaires were further improved and standardized based on the results of the pre-test conducted.

2.3 Calculation of Sample Size

Calculation of the number of respondents that were included in the survey was determined by adopting statistical method used by Israel (1992) which includes the Slovin's Formula (Equation 1). Moreover, Finite Population Correction (FPC) presented in Equation 2 was used in order to come up with a lesser number of respondents to be interviewed due to the consideration of time element in the study:

$$n = \frac{N}{1 + NE^2}$$

Equation 1

$$n = \frac{n_0}{1 + \frac{n_0}{N}} \quad \text{Equation 2}$$

Where: n = sample size
N = population size
E = margin of error*desired
 n_0 = sample size from Slovin's Formula

2.4 Data Collection and Encoding

The data collection was primarily done from August, 2013 to January, 2014. The approved survey questionnaires and interview schedules were used in gathering the primary data. In terms of the secondary data, the information was obtained from various literature and official documents from CSVFA, Community Environment and Natural Resources Office (CENRO)-Baybay, and municipal and barangay offices. The data were collated and encoded using Microsoft Excel. This was done to summarize the results gathered during the survey. Prior to statistical analysis, a numerical code was provided for each variable of the encoded data.

2.5 Focus Group Discussion

All the data gathered during the interview was validated through a Focus Group Discussion (FGD). The FGD was done by selecting sectoral representatives from CSVFA members (CBFM holder), non-members, Barangay Local Government Unit (BLGU) and City Local Government Unit (CLGU), and CENRO. All information that was documented during the FGD was used to revalidate the primary and secondary data obtained during the survey and from the available documents, respectively.

2.6 Statistical Analysis

All the data were encoded and results were analyzed using the Statistical Packages for Social Studies (SPSS). On the comparison between the socio-demographic profile of the members and non-members, independent samples t-test was used to compare the means of the two variables. However, other results of the data were simplified in a descriptive statistical analysis such as those data with no significant relationship between the two variables.

3 RESULTS AND DISCUSSION

3.1 Socio-Demographic Profile between CSVFA Members and Non-members

Using t-test for equality of means, comparison between the two groups was presented and analyzed in order to understand the respondents' perception towards the program based on their socio-demographic characteristics. Statistical analysis results revealed that four socio-demographic variables showed significant ($P \leq 0.05$) difference between CBFM members and non-members. These included the age, type of household, membership in some organizations and annual income (Table 1).

Table 1 Socio-demographic profile between CSVFA members and non-members

Variables	Members (n=41)	Non-members (n=50)	P-value
1. Age	42.20 ± 2.73	47.10 ± 2.08	0.040
2. Type of Household	1.61 ± 0.08	1.74 ± 0.06	0.015
3. Organizations Membership	1.83 ± 0.06	1.74 ± 0.06	0.039
4. Annual Income	44,182.93 ± 4,995.05	29,720.20 ± 3,317.74	0.007

The age between the two groups significantly ($P=0.04$) differed due to the reason that CBFM members included the youth as legitimate member (who had a minimum age of 15 years old) while non-members

who were interviewed were mostly the head of the family. It was learned that the youth joined the group because they were encouraged by their parents for the following reasons: a) to develop their leadership and interpersonal skills; b) to transfer their local knowledge in order to ensure that these will remain for the future generations; and c) to be a part of the social sustainability of the association and the program which is in line with the main goal of the CBFM program. On the other hand, most of the respondents (both members and non-members) had a nuclear type of household. But, for the non-members, there was a considerable difference ($P=0.015$) between extended and nuclear families.

Meanwhile, the significant ($P=0.039$) difference on membership in some organization between members and non-members was due to the differences on their time availability which were correlated on their working hours. According to non-members, the time they would devote in participating in any community-based organization would greatly affect their livelihood activities and would considerably reduce their income. Finally, the significant ($P=0.007$) difference on the income between members and non-members was mainly on their tangible and stable sources of income. It was found out that members had an annual average income of Php 44,182.93 while non-members had Php 29,720.20. This was because they greatly differed on their sources of income. This can be explained in two reasons: a) major sources of income by non-members were seasonal (i.e., hired labor) while CSVFA members relied mostly on farming which is a better and more stable source of income, and b) the security of tenure over the land wherein non-members were mostly tenants while members are landowners. This is also perhaps the reason why most of the non-members did not join any organization because of its relation to their sources of income.

3.2 Indicators in Community Preparedness and Participation in Forest Restoration and Protection Initiative

3.2.1 Environmental Education

Trainings may help the community on the environmental advocacy in sustaining and managing their natural resources specifically forest resources. Meanwhile, results showed that some of the non-members were able to attend trainings on aspects of forest restoration and protection but they attended lesser trainings compared to the members (Table 2). This could probably be the main reason for the difference between their levels of environmental awareness. Likewise, results revealed that the more they became aware on their environmental problem, the more they will keep on participating on forest restoration activities.

Table 2 Trainings attended by CSVFA members and non-members

Activity	Members	Non-members
Biodiversity conservation	- Biodiversity and wildlife conservation	- mining activities and its threats
Livelihood	- Tilapia production	- Agricultural production
	- Abaca production	
	- Asexual propagation of seedlings	
	- Ecotourism	
	- Rootcrop production	
Forest Restoration and Protection	- Tree planting	- Tree planting
	- Reforestation technology	- Environmental protection
	- Deputation of farmers	- Community based forest management
	- Water supply within the watershed	
	- Dendrology	
	- Community based forest management protection	
Climate Change	- Disaster risk reduction management	

3.2.2 Level of Environmental Awareness

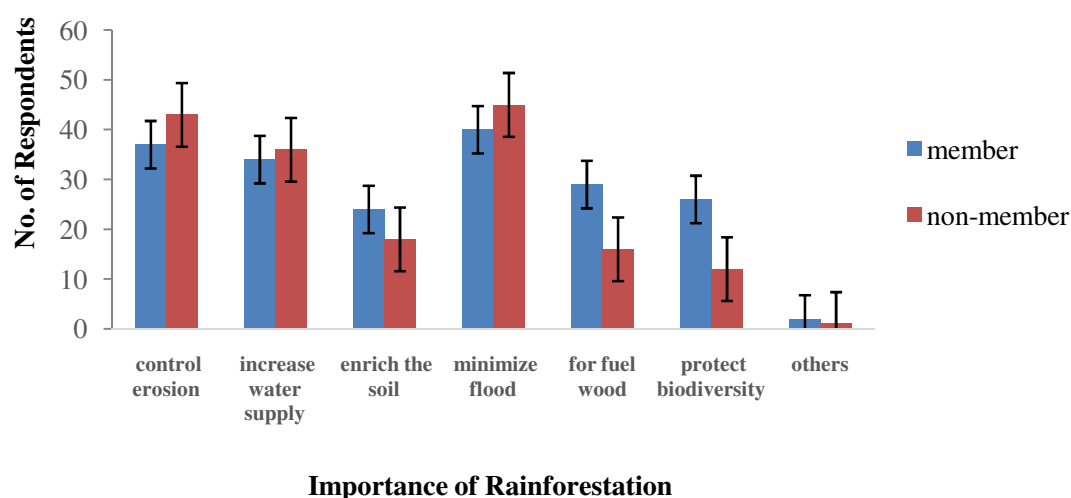
Based on the survey criteria, a respondent was considered fully aware if he/she could explain the interdependency of a certain environmental problem to another (Table 3). Meanwhile, a respondent was partially aware when he/she could identify an environmental problem but failed to explain it explicitly. Finally, a respondent who was not aware at all were those respondents that could not identify and understand any problems related to the environment. Results showed that most of the members were fully aware (70.7%) while the non-members were partially aware (60 %) on environmental issues. This could somehow be a proof of the direct relationship between the trainings and seminars attended by the respondents on their level of environmental awareness.

Table 3 The level of environmental awareness as perceived by the respondents

Variables	Members		Non-members	
	Frequency	Percentage	Frequency	Percentage
Fully Aware	29	70.7	19	38.0
Partially Aware	9	22.0	30	60.0
Not Aware at all	3	7.3	1	2.0
TOTAL	41	100.0	50	100.0

3.2.3 Recognition on the Importance of Rainforestation Farming

Impact and status of reforestation in the community was assessed in order to determine the improvement of the community's environmental condition. Results showed that both members and non-members recognized that problems related to water was the major factor that encouraged them to restore and protect their forest through the application of Rainforestation (RF) technology (Figure 1). This type of approach was introduced to the community in December 1995 through training on Rainforestation Farming which was conducted with the financial assistance from the ViSCA-gtz Applied Tropical Ecology Program. Prior to the development of RF farm, a memorandum of agreement (MOA) was signed between the landowner, CSVFA (represented by the President) and ViSCA-gtz (represented by the Program Director) for a period of 50 years. In response, the CSVFA members started developing the RF farm in March 1996.



Source: Compendio, 2014

Figure 1 Importance of rainforestation as perceived by CSVFA members and non-members

The effect of forest restoration was confirmed during the FGD where participants acknowledged that CSVFA was organized to prevent deforestation (i.e. *kaingin* and illegal timber poaching) which significantly affected their water supply (i.e. irrigation). This was due to the fact that farming, the primary source of income in the two communities was affected either in terms of flooding and drought during wet and dry season, respectively.

One of the responses of the CSVFA members with regards to the importance of rainforestation was on its effect on the conservation and preservation of biodiversity. This recognition may due to the intensive number of trainings and seminars attended by the members that enhanced their awareness on the conservation of biodiversity in the CBFM area. It was also found out during the survey that some of the non-members could not fully understand and explain what biodiversity **is**. Forest restoration was implemented by the association in order to attain its goals on sustainable forestry, thereby, creating livelihood opportunity to upland dwellers specifically its members.

Additionally, as mentioned earlier, CSVFA deals with the adoption of Rainforestation Farming within their CBFM site which covers a total land area of 0.9707 ha. This farm contains a number of 3,434 native trees with 55 different species including fruit trees planted in the site. Furthermore, CSVFA members were able to replicate the concept of rainforestation within their own private plots. This is because they already seen the positive effects of this technique based on their experiences as a CSVFA member.

3.2.4 Creation of *Bantay Gubat* or Forest Warden

Based on the survey, forest protection involved several teams of forest wardens (locally known as *Bantay-gubat*) who patrolled within their forest giving special attention to areas that, based on their local knowledge, were ideal for timber harvesting. Moreover, this strategy has proven very effective, as evidenced by the apprehension of 14 illegal timber and wildlife poachers and documentation of the 125 *kaingineros* within the buffer zone of the CBFM area (average landholding of 3 ha). Likewise, the prosecution and conviction of two illegal timber poachers was achieved by the organization in 2002 which recorded the CSVFA as the only people's organization in Leyte that had won a case on illegal logging.

3.3 Ownership and Benefits in Sustaining and Managing the CBFM Area

3.3.1 Sense of Ownership

Due to the increasing environmental awareness of the people in the community especially the CSVFA members, several forest destructions (i.e., illegal timber poaching, slash-and-burn-cultivation) and some other water-related problems (i.e., river poisoning, sand and gravel quarrying) were prohibited in the area. To assess the CSVFA members in handling such program, their willingness and belongingness were determined. Willingness, as the term used in this study was the sense of ownership of the CBFM holder to continuously manage their site without getting monetary incentives. It was their sense of responsibility that mattered wherein they were willing to sacrifice their time, effort and financial resources in protecting their environment. As reflected in Table 4, majority (90.2 %) of the CSVFA members were willing to be involved in the program making them feel that they want sustain it through their effort in forest restoration. According to them, they had started forest protection and biodiversity conservation activities a long time ago even without getting any incentives. Based on Asio and Bande's (2005) study, the active participation of an individual through volunteerism and commitment without expecting for incentives is a symbol of empowerment which is a major element on sense of ownership.

Table 4 Willingness and belongingness in participating on the CBFM program

Variable	Frequency			Percentage		
	Yes	No	Total	Yes	No	Total

Willingness	37	4	41	90.2	9.8	100
Belongingness	37	4	41	90.2	9.8	100

Another major reason which was validated during the FGD was the intensive environmental education which made them aware that their environment would be critical if they would continue the usual practices (i.e., slash-and-burn cultivation, river poisoning, wildlife poaching) in the forest. CSVFA members also revealed that the technical advice of the Visayas State College of Agriculture (now VSU) was an eye-opener for them to realize the importance of preserving and restoring their forest resources. Figure 2 shows that members were willing to participate in forest resource management due to various reasons.

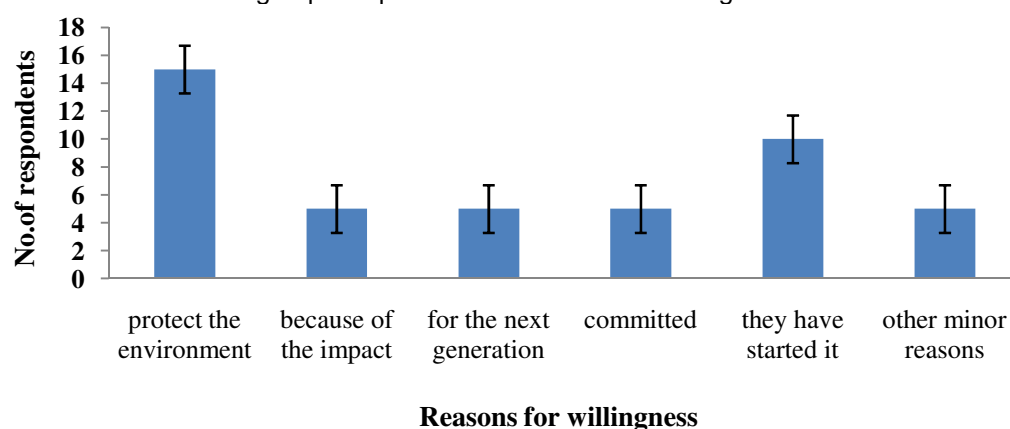


Figure 2 Reasons on the willingness of the members in participating in the program

On the other hand, belongingness was determined by asking the CSVFA members if they recognized that their individual participation was a vital factor for the success of the program. This was the stage where members considered themselves as an important element in attaining the goals of the program. As presented in Table 4, most of the respondents (90.2%) considered themselves as part of the group. This means that members already internalized their responsibility and understood clearly the importance of their participation in all activities initiated by the program. Moreover, the awarding of the tenurial instrument in the area through the CBFM program gave them greater responsibility and legal security to manage their natural resources as their own.

3.3.2 Benefits of CSVFA Members and Non-members from the CBFM Program

According to the CSVFA members, benefits from the CBFM program were divided into three categories, namely: economical, social, and environmental (Table 5). Moreover, Guiang and Harker (n.d.) explain that “people first and sustainable forestry will follow” expresses the commitment of the community towards forest protection and biodiversity conservation.

Table 5 Benefits of the CBFM Program as perceived by the CSVFA members

Benefits	Frequency	Percentage
A. Economical		
• Supports gadgets and other equipment within the group	25	61.0
• Provides livelihood	28	68.3
• Additional income	20	48.8
B. Social		
• Increases the interests of the members to actively join	30	73.2
• Communication and cooperation	30	73.2
• More responsible	26	63.4
• Others		
✓ Closeness	4	9.8

✓ Organized	6	7.3
C. Environmental		
• Minimal soil erosion	30	73.2
• For the next generation	38	92.7
• Enhances biodiversity	35	85.4

No. of respondents= 41

Furthermore, non-members also noted various advantages of the CBFM program in the community and this involved good environmental condition, limited calamities in the area, increased social relationship and additional income. This shows that the impact of the CBFM did not only limit on the members but also on the entire community with regards to the environmental conditions and ecosystems services. However, issues and problems were also noted during the study but only 18% of the respondents identified problems and most of these respondents were not actually related on the program.

3.4 Effectiveness of the CBFM Program as a Strategy on Forest Restoration in Sitios Cienda, Gabas and San Vicente, Kilim, Baybay City, Leyte

3.4.1 Effectiveness of the CBFM Program Based on the Non-members

Table 6 presents the perception of non-members. Results showed that most of the non-members were impressed with the CBFM program's activities and its impact on their community. This also proves that even those who were not part of the program were still affected by its positive impacts especially on its environmental effects.

Table 6 Comments of the non-members regarding the effectiveness of the CBFM program

Effective	Frequency	Percentage
Yes	38	76.0
No	8	16.0
Abstain	4	8.0
TOTAL	50	100.0

3.4.2 CSVFA's Framework towards Effective CBFM Program

Based on the results gathered, Figure 3 presents the different pillars which had led to the effectiveness of CBFM program in Sitios Cienda and San Vicente to become successful. These pillars were proven effective as evidenced by the various achievements made by the group in terms of environmental protection, restoration and conservation. These achievements were also attained through the awarding of a CBFM agreement in the two communities.

With regards to the people's organization, it was considered that CSVFA was an important pillar in the framework of a responsive CBFM program. This pillar involves creating several awareness activities. In addition, the integration of the youth in every activity ensures social sustainability of the program. This pillar involves the leadership skills within each farmers as well as their ability to manage the program effectively.

Furthermore, people's organization (CSVFA) together with the tenurial instrument (CBFMA) was found to be the basic fundamental pillar in the framework pertaining to the effectiveness of the CBFM program. Environmental education and communication convey information to people that may influence attitudes and behaviors regarding natural resources practices. Additionally, in the course of reforestation farming applied in the area for forest restoration, rapid biophysical assessment in the two communities was done. The most abundant species of trees recorded in the area were: Dipterocarps, *Calophyllum blancoi*, and *Rademachera pinnata* (Pogosa & Almeroda, 2012). Langenberger (1998) also reported that at least 160

different species with up to 100 dominant trees per hectare were found on the two communities' forested areas.

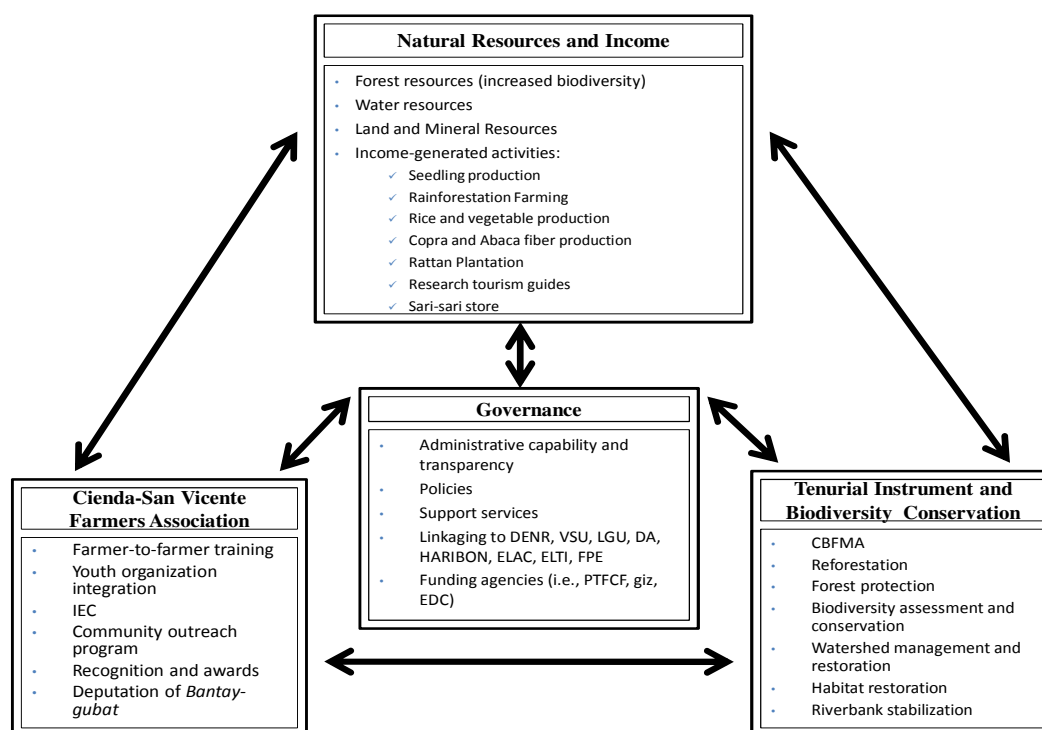


Figure 3 CSVFA's framework towards responsive Community-Based Forest Management efforts to local needs

However, in order to attain the CBFM program's interest which states that "people first and sustainable forestry will follow", this program should be supported by economically viable income generating projects from their effort in sustaining their natural resources. At the time of this study, income generating activities of the association includes: production of indigenous forest tree seedlings, sari-sari store and research tourism guides. As stipulated in their Constitution and By-Laws, 15 % of the cumulative gross income would be allocated to finance restoration, agro-forestry enhancement and trainings and seminars of the members.

Finally, governance was identified as another pillar. Governance assists communities in their efforts to network with external actors and to locate and obtain external assistance such as funding and expertise (research and academic institutions). However, there was only limited involvement of the LGUs (both BLGU and CLGU) and DENR. According to the CBFM members, the main source of their technical assistance came from their active and long-term collaborative relationship with the Institute of Tropical Ecology and Environmental Management (ITEEM) of the Visayas State University that started in December, 1995. At the same time that this study was conducted, that collaboration still continued. Meanwhile, as of the study period, based on the CSVFA-PTFCF (2011), ONE the major funding agency that supported the CSVFA was the Philippine Tropical Forest Conservation Foundation (PTFCF).

3.4.3 Achievements and Recognitions of the CSVFA

Another strong indication for the effectiveness of the CBFM program in the communities of Cienda and San Vicente were the different achievements attained by the CSVFA as a CBFM

holder (Table 7). This only proves that they were competitive enough in handling the CBFM program.

Table 7 Achievements and recognitions of the Cienda-San Vicente Farmers Association

Categories	Achievement
Community Level	Deputized Forest Warden
Municipal Level	Replication of CSVFA's experiences to 6 communities in Baybay City
Regional Level	Best CBFM holder (2005 and 2010)
National Level	a) National Rainforestation Trainer (DENR MC 2004-2006) b) National Rainforestation Trainer accredited by Environmental Leadership Training Initiative, Yale University
International Level	a) United Nations Innovative Communities (2005) b) FAO Search of Excellence (2003) c) Paradise Regained (BBC Documentary, 2002) d) Equator Initiative Finalist (2002)

Source: CSVFA reports

4 CONCLUSIONS

The massive and intensive environmental education by making the people aware enough of their environmental issues serves to be the basis for the community's preparedness and participation. This was attained through continuous conducting of trainings, seminars and IEC (farmer-to-farmer trainings, youth organization, and community outreach program). It was also indicated in the results that the ability of the CSVFA members to handle the program was an indicator of empowerment which is a vital element on their sense of ownership. This was further enhanced by the issuance of the CBFM agreement on their community forest resources which gives them legal security and great responsibility over the area.

Finally, the effectiveness of the CBFM program within Sitios Cienda and San Vicente was mainly because of the strong foundation between the people's organization (CSVFA) and their ability to manage their environment through the issuance of tenurial instrument (CBFMA). However, these should be supported by economically viable income generating projects from their effort in sustaining their natural resources. Lastly, governance plays an important role in achieving a more responsive and effective CBFM.

REFERENCES

Asio, V.B. and Bande, M.J.M. 2005. Innovative Community-led Sustainable Forest Resource Conservation and Management in Baybay, Leyte, the Philippines. In: *Innovative Communities People-centered Approaches to Environmental Management in the Asia-Pacific Region* (J. Velasquez, M. Yashiro, S. Yoshimura and I.Ono, eds). United Nations University Printing Press, New York, USA.

Cienda-San Vicente Farmers Association. 2011. Philippine Tropical Forest Conservation Foundation Project Proposal.

Cienda-San Vicente Farmers Association. 2008. Livelihood and Forest Enhancement-Department of Environment and Natural Resources. Project Proposal. Cienda-San Vicente Farmers Association-Community Resource Management Framework (CRMF), 2001 (unpublished).

Department of Environment and Natural Resources (DENR)- Forest Management Bureau (FMB). *Community-Based Forest Management (CBFM) Program Primers*. <http://forestry.denr.gov.ph/primer.htm#cbfm> (Updated: June 7, 2001; Cited: April 23, 2013).

Groetschel, A., R. Aquino, I. Bucholz, T. Mazo, A. Ibikendanz, N. Sales, J. Seven and K. Vicentuan. 2001. *Natural Resource Management Strategies on Leyte Island, Philippines*. Baybay/Berlin.

Guiang, E. and Harker, B. n.d. *Participatory Planning and Management in Philippines Community-Based Forestry*. Natural Resources Management Program Department of Environment and Natural Resources, Quezon City, Philippines.

Israel, G.D. 1992. *Determining Sample Size*-PEOD 6. U.S. Department of Agriculture, Cooperative Extension Service, University of Florida, IFAS, Florida A&M University Cooperative Extension Program, and Boards of County Commissioners Cooperating.

Langenberger, G. 2003. Diversität, Struktur und Reliefabhängigkeit der Vegetation in einem Tieflandregenwald der Insel Leyte, Philippinen. APIA-Verlag.

Lanly, J. 1982. *Tropical Forest Resources*. Food and Agriculture Organization. Forestry Paper 30. FAO, Rome.

Menzies, N. 2004. *Communities and Their Partners: Governance and Community-Based Forest Management*. Conservation and Society, SAGE Publications New Delhi/Thousand Oak/London.

Milan, P. and Ceniza, M.J. (Eds) 2009. Rainforestation Trainer's Manual, Institute of Tropical Ecology, Visca, Baybay City, Leyte, Phil.

Pogosa J. and Almeroda F. 2012. Rapid Vegetation Assessment in Sitios Cienda and San Vicente, Barangays Gabas and Kilim, Baybay, City, Leyte.