

Effectiveness of Community-based Forest Management Program as a Strategy on Forest Restoration in Cienda and San-Vicente, Baybay City, Leyte, Philippines

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Authors' contributions

This work was carried out in collaboration between both authors. Author SJMC designed the study, whereas author MMB supervised the work. Both authors managed the analyses of the study. Author SJMC managed the literature searches and wrote the manuscript. Author MMB did the editing of the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

This research was conducted in Cienda, Gabas and San Vicente, Kilim, Baybay City, Leyte. This study draws on the effectiveness of the Community-Based Forest Management (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, the sampling method used was the combination of Slovin's formula and Finite Population Correction (FPC), wherein 41 respondents were interviewed from the CSVFA members and 50 respondents from the non-members.

All the data were encoded and results were analyzed using the Statistical Packages for Social Studies (SPSS). Moreover, independent samples t-test was used to compare the means of the two

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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. 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) tenurial 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; natural resources; tenurial instrument.

1. INTRODUCTION

The continuing loss of forest cover together with widespread protest against the policing actions of government agencies as well as environmental and social impacts of large-scale commercial logging has led to an impasse in implementing forest management, a paralysis in the whole forest policy making and planning [1]. Accordingly, large scale logging operation and the extensive conversion of forest land into agricultural area, especially into coconut and abaca plantations are considered the main cause of forest degradation in Leyte Island [2].

To restore the original forest vegetation cover in the Philippines, government agencies and non-government organizations (NGOs) conduct reforestation programs in order to avoid habitat and biodiversity loss in the country. However, ways must be found to ensure that these programs can improve the benefits to those who are affected by the project and that the choice of a restoration methodology is appropriate for each site [3]. Additionally, careful planning must be done especially that the capacity of government agencies and private organizations to protect and manage natural resources is limited, especially in remote areas [4].

In response, 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 [1]. 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" [5]. 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 the duration of 25 years and renewable for another 25 years.

Consequently, 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 [2]. Moreover, with the current practices and project implementation, problems persisting on the concept of CBFM are certainly not reaching much of its objectives and doubts must be raised whether it is worth pursuing. As stated also by one author:

"The success of CBFM efforts is hinged on how well communities have exercised their right not only to participate in forest governance but also to employ their internal cultural resources—such as indigenous knowledge systems and social organizations—toward attaining resource sustainability, as well as on how much space they are given for exercising this right. How the government's CBFM program and the indigenous forest community management systems interact and influence each other is a question that should, therefore, interest government and non-government promoters of CBFM. This is tied to the CBFM funders' keen interest in whether or not the current CBFM strategy and related programs are indeed (1) embarking on and investing in sustainable forest and forestland management, and (2) translating into reality the benefits promised to the communities. [6]"

Finally, there are still several questions raised on the degree and measurement of success on community-based forestry restoration strategy. Perhaps this is the reason why there are several

differences in the outcome of the program. Thus, in response with the said queries, the main objectives of the study were: 1) To evaluate indicators which are critical to community preparedness and participation in forest restoration and protection initiative; 2) To determine the sense of ownership and the benefits derived by the people's organization in sustaining and managing their CBFM area; and 3) 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

A community with a CBFM agreement was the major criteria in choosing the study site. The study was conducted in Sitio Cienda, Barangay Gabas and Sitio San Vicente, Barangay Kilim, Baybay City, Leyte. This was designed to assess CBFM as an effective strategy in managing the community's forest resources through a people's organization named Cienda-San Vicente Farmers Association (CSVFA). 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 (Appendix 1). 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

After the selection of the study sites, the survey was done and semi-structured interviews were conducted for the CSVFA members and non-members were based on the following parameters [7,8]: 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 wherein 12 respondents were interviewed. The survey questionnaires were further improved and standardized based on the results of the pre-test conducted.

2.3 Calculation of Sample Size

The calculation of the number of respondents from members that were included in the survey was determined by adopting statistical method which includes the Slovin's Formula [9] (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:

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

$$n = \frac{n_0}{1 + \frac{n_0}{N}} \quad (2)$$

Where:

n = sample size

N= population size

E = margin of error*desired

n_0 = sample size from Slovin's Formula

During the survey, total number of CSVFA members subjected in calculating the sample size was 92. By using the Slovin's formula, 75 persons were included on the sample however, due to the time constraints of the study, the use of FPC was used to have a lesser number of respondents. Thus, a total of 41 respondents from CSVFA members were surveyed on the study. In terms of the non-members, 25 persons in each village (Cienda and San Vicente) were interviewed in order to come up with some opinions from people who were not included on the association to avoid bias of data coming from the members.

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. Potential respondents were selected from the following sectoral organizations (Table 1).

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. Ocular inspection around the site was also conducted to verify the results of the interview. Likewise, conducting bio-physical assessment in the area was initiated to support

and confirm the initiatives implemented by the CBFM holder in relation to their approved Community Resource Management Framework (CRMF). Lastly, 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.

Table 1. Number of respondents interviewed in relation to their sectoral affiliation

Respondents	Number of respondents
1. CSVFA (CBFM holder) members	41
2. CSVFA non-members	50
3. Barangay Local Government Unit (BLGU)	1
4. City Local Government Unit (CLGU)	1
5. Community Environment and Natural Resources Office (CENRO)	1
Total	94

2.5 Focus Group Discussion

All the data gathered during the interview was validated through a Focus Group Discussion (FGD). FGD was done by selecting sectoral representatives from CSVFA members (CBFM holder) which involves all the Board of Director officials; randomly selected non-members, representative from environmental sector of Barangay Local Government Unit (BLGU) and City Local Government Unit (CLGU), and CENRO. A total of 20 participants were invited. 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.

Moreover, questions used during the FGD were divided into several parts which started from the importance of forests as the foundation of the PO. It also involves environmental problems before CBFM implementation and how CBFM does addressed the said problems and issues. Meanwhile, problems and challenges encountered by the PO during the management of their environmental resources within the CBFM area where also assessed from the different stakeholders involved together with the

benefits and the experiences met that made a positive result on its CBFM program.

2.6 Statistical Analysis

All the data were encoded and results were analyzed using the Statistical Packages for Social Studies (SPSS). Independent samples t-test was used to compare the means of the variables (members and non-members) in the study. Using t-test for equality of means, comparison between the two groups (members and non-members) was presented and analyzed accordingly in order to identify their differences in terms of their characters and traits in forest restoration in relation to their socio-demographic profile.

Meanwhile, 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 Indicators of Community Preparedness and Participation in Forest Restoration and Protection Initiative

In the study, the structure of the interview conducted points the effect of the following which indicates the community's preparedness and participation in forest restoration: Socio-demographic profile; environmental education; level of awareness; and the recognition on the importance of forest restoration. These indicators were hypothesized to have a significant value on the capacity of the people to be involved in forest restoration. Likewise, people living near forests are the first to be affected by deforestation [10]. They also added that millions of forest-dwelling people depends on forest products for subsistence this is why they need to be involved in the restoration activity.

3.1.1 Socio-demographic profile between CSVFA members and non-members

Meanwhile, statistical analysis revealed that there were significant ($P \leq 0.05$) differences between CSVFA members and non-members in terms of their profile (Table 2). This can be explained that some of their socio-demographic characteristics can affect each other's way of thinking on forest resources and conservation [11].

The age between the two groups significantly ($P=0.04$) differed due to the reason that CSVFA 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 which is in line with the main goal of the CBFM program. However, 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 the two 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.

3.1.2 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 3). 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. Additionally, it was pointed that trainings and demonstrations are the best way to aware the farmers and non-farmers to adopt the technology education which results the management of biodiversity in a sustainable manner [7,12]. It was noted that one of the indicators of success for community-based programs is the community's cultural knowledge and assets while encouraging them into an intergenerational transfer through education [13]. As what was observed during the survey, one of the strategies developed by the community was the utilization of multimedia approaches. These include radio plays, songs and posters to raise people's awareness about the negative environmental effect of deforestation, mining and destructive freshwater activities.

3.1.3 Level of environmental awareness

The level of innovation on forest conservation approach within the community was enhanced by the high level of member's awareness of the danger of unabated forest destruction. One of the factors that raised their awareness in rehabilitating and protecting their forest resources was the water scarcity they faced in the mid-1980s [14]. Based on the survey criteria, a respondent was considered fully aware if he/she could explain the interdependency of a certain environmental problem or issues to another (Table 4). 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. According to the survey, 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 2. 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. Organizational Membership	1.83 ± 0.06	1.74 ± 0.06	0.039
3. Annual Income	44,182.93 ± 4,995.05	29,720.20 ± 3,317.74	0.007

Table 3. 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 - Abaca production - Asexual propagation of seedlings - Ecotourism - Rootcrop production	- Agricultural production
Forest Restoration and Protection	- Tree planting - Reforestation technology - Deputation of farmers - Water supply within the watershed - Dendrology - Community based forest management protection	- Tree planting - Environmental protection - Community based forest management
Climate Change	- Disaster risk reduction management	

Table 4. 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

Based on the discussions during the FGD, another evidence that the CSVFA members attained a high level of awareness on environmental issues was the implementation of the outreach program to six barangays (i.e., Barangays Sabang, Maypatag, San Juan, Palhi, Kabalasan and Banahaw) within the City of Baybay. The project was funded and supported by LGU-Baybay from January, 2000 until December 2003. The main consideration by the funding agency was the achievements of the association making them capable to share their experiences and learnings on forest protection and biodiversity conservation to other communities.

3.1.4 Recognition on the importance of forest restoration through reforestation

In a social forestry program, local people have their right to be involved in forest management activities because it is an important role in determining the success of a sustainable forest management [15]. Hence, impact and status of forest restoration in the community was assessed in order to determine the improvement of the community's environmental condition through reforestation. One of their leading activities which highlight their CBFM site was the

adoption of reforestation 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 [16]. The adoption of reforestation in the area leads to the key interest of various environmental advocators in the country and even in abroad. Moreover, CSVFA already have the mindset of forest restoration in their community because of the various trainings they have attended in terms of Reforestation Farming in the mid-90s.

Results showed that both members (n=41) and non-members (n=50) recognized that problems related to water was the major factor that encouraged them to restore and protect their forest through the application of Reforestation (RF) Technology (Fig. 1). This type of approach was introduced to the community in December 1995 through training on Reforestation 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.

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 which make a difference between CSVFA members and non-members was the impact of rainforestation on the conservation and preservation of biodiversity. This recognition may be 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? Moreover, it was also explained during the FGD that forest restoration using Rainforestation technology 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. According to its latest monitoring conducted after super typhoon Yolanda, this farm contains a number of 3,434 native trees with 55 different species including fruit trees planted in the site (Appendix 2). As of the moment, 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.

3.1.5 Concept of *Bantay gubat* or forest warden

Due to the intensive environmental awareness and education of the CSVFA members, one of the leading activities which was made known to the two villages for forest management was the concept of *Bantay-gubat*. The commitment of CSVFA members on 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. 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.

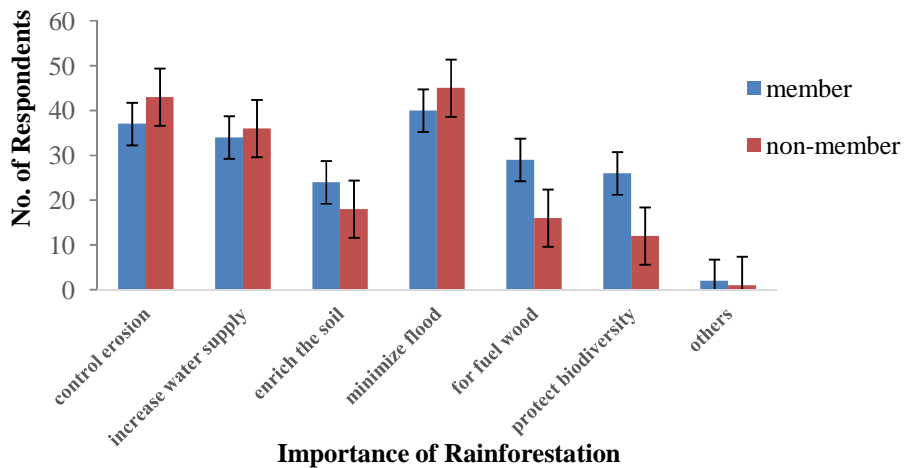


Fig. 1. Importance of rainforestation as perceived by CSVFA members and non-members

3.2 Ownership and Benefits in Sustaining and Managing the CBFM Area

3.2.1 Sense of ownership

In line with 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. This also proves that the greatest strength of the CBFM program was the issuance of security of tenure over resources and empowerment given to rural communities to protect and manage the resources on publicly controlled lands [17].

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 incentives. It was their responsibility that mattered wherein they were willing to sacrifice their time, effort and other resources in protecting their environment. 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.

Meanwhile, as reflected in Table 5, majority (90.2%) of the CSVFA members were willing to get involved in the program making them feel

that they want to sustain it through their efforts in forest restoration. According to them, they had started forest protection and biodiversity conservation activities a long time ago even without getting any incentives. The active participation of an individual through volunteerism and commitment without expecting for incentives is a sign of empowerment which is a major element of the sense of ownership [14]. Moreover, in relation to their willingness to join, they also felt that they were a vital factor on the CBFM program within their community because they considered themselves part of the group (Sense of belongingness) as also shown in Table 5. 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.

Another major reason during the assessment on the sense of ownership 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. Fig. 2 shows that members were willing to participate in forest resource management due to various reasons.

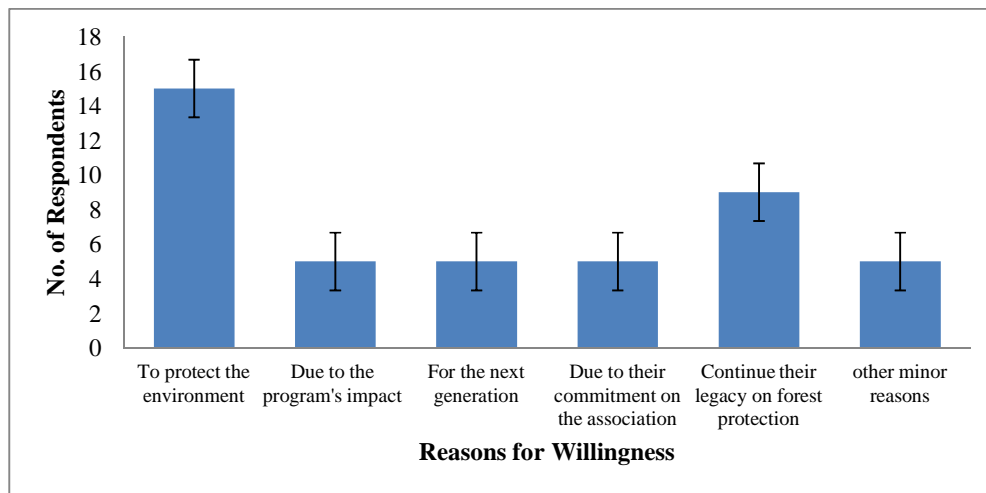


Fig. 2. Reasons on the willingness of the members in participating in the program

Table 5. 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

Table 6. 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

Note: Multiple responses were allowed during the survey

3.2.2 Benefits perceived by 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 6). Moreover, “people first and sustainable forestry will follow” expresses the commitment of the community towards forest protection and biodiversity conservation [18].

One way to encourage community innovation is to ensure a fair balance at the community level between economic well-being and environmental protection [13]. This also pointed the link between income and welfare benefits and sustainable local support for a community to become successful [14]. It was also stipulated on the reports of the CSVFA that the provisions of alternative livelihood through production of indigenous forest tree seedlings offered additional cash incentives in protecting the mother trees within the CBFM area.

The production of indigenous seedlings as income generating project of the association provided local revenues (Appendix 3). Again, this would sustain restoration and protection

initiatives of the association. Thus, income would be used to sustain future restoration and agroforestry enhancement activities within the CBFM area. Through the help of the different funding agencies, the group has invested on various infrastructures (i.e., office, nursery sheds and sari-sari store), equipment (radio for communication), and purchase of land (Alienable and Disposable area within the community). For the social benefits within the community, 73.2% of the CSVFA members interviewed said that the CBFM program increased the interest of the members to participate in all association-related activities. It also enhanced communication and cooperation between members. This became a great impact for the non-members because according to some of them, during the interview, one of the positive effects that they liked about the group was their sense of closeness with each other. They also added that, “it is nice seeing them protecting the environment while building a strong bond of relationship with each other and making themselves more responsible enough to think of the next generation’s condition.”

Another major improvement that happened during the past 14 years since the implementation of the CBFM program was the prevention of forest destruction caused by illegal-

logging, mining application and slash-and-burn practices [19]. These benefits were also true with the diversified flora and fauna within the CBFM area which was one of the various activities spearheaded by the association.

Furthermore, to evaluate the impact of CBFM program for the non-members, various advantages of the CBFM program in the community was also noted during the study and this involved good environmental condition, limited calamities in the area, increased social relationship and additional income (Table 7). 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.

On the contrary, during the conduct of the study, while benefits were noted, some misinterpreted problems were also clarified during the conduct of the FGD. It was highlighted that lack of funds was the major reason why some members could not participate or became inactive in group activities. This was due to the reason that when financial problems were encountered by a particular member, it motivated him/her to seek for an alternative income generating activity, thus making him/her inactive on group-related activities. However, this problem is common in organization practicing volunteerism. To minimize this problem, the organization reflected a certain provision on their constitution and by-laws (CBL) pertaining to income sharing. The provision stipulated that every time a member rendered voluntary work in a particular group activity, it would be considered and recorded as his/her contribution to the association's Capital Build-up (CBU). The CBU was calculated by the number of hours (Php 12.50/hour) rendered by a particular member in a specific group activity. As soon as the income of that activity would be distributed among the members; then each member would receive the corresponding amount of CBU (per share). Therefore, inactive members or a member who could not participate during voluntary work meant he/she did not contribute any amount to the association's CBU. This meant that he/she would not receive any share during the time when the organization would distribute income accumulated/derived from such activity. Moreover, for those group activities with corresponding funding, the members were paid based on the agreed salary reflected in the budget. Nevertheless, conflict arose when inactive members started to

complain that he/she was not included in the payroll.

Table 7. Benefits of the implementation of CBFM according to the non-members

Benefits	Frequency	Percentage
1. Limited calamities in the area	18	36
2. Better environmental condition	26	52
3. Income	5	10
4. Social aspects	8	16

No. of respondents=50

Note: Multiple responses were allowed during the survey

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

Sustainable forest management is the process of managing forests to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of desired forest products and services, without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment [20]. However, in the case of the report of CBFM, it was stipulated that it has three main goals which include: 1) sustainable management of forest resources; 2) social justice and improved well being of local communities; and 3) strong partnership among local communities and the DENR [11]. Without a commitment on the part of the national government to secure the legal status on the community level, CBFM institutions will remain vulnerable and unable to play their full part in more effective forest management governance [1].

3.3.1 Effectiveness of the CBFM program based on the non-members

Table 8 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 8. 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

3.3.2 CSVFA’s framework towards effective CBFM program

Based on the results gathered, Fig. 3 presents the different pillars which had led to the effectiveness of CBFM program in Sitios Cienda and San Vicente to become successful. Modified by previous study [21] in social and environmental sustainability a framework of the CSVFA was done in order to distinguish the contributing factors on the program’s effectiveness (Appendix 4). As seen on the results, each pillar was identified due to its contribution for the over-all success of the program. Each of them serves as a single element in order for the program to attain its goals. 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 rainforestation 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* [22]. Another report states that at least 160 different species with up to 100 dominant trees per hectare were found on the two communities’ forested areas [23]. Moreover, Appendix 5 shows the inventories of the different fauna found within the CBFM area.

However, in order to attain the CBFM program’s interest which states that “people first and sustainable forestry will follow”, this should be supported by first 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). This can be evidenced in Fig. 4 which shows the evaluation on the assistance of the different agencies involved on the program which was assessed by the CSVFA members. However, results revealed that 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, one the major funding agency that supported the CSVFA was the Philippine Tropical Forest Conservation Foundation (PTFCF).

During the survey, the respondents were asked to rate the staff from 1-5 where 5 meant very good, 4 was good, 3 was fair, while 2 was poor, and 1 was very poor. The survey questionnaires only included three institutions, namely: CENRO, CLGU, BLGU. However, on the interview, it was observed that the respondents did not limit their answers to the three institutions pre-identified on the questionnaire. It was note that majority of the

respondents recognized the support provided by the Philippine Tropical Forest Conservation Foundation (PTFCF) and Visayas State University (VSU). Character being assessed by the respondents was the responsibility of each institutions which was defined as the ability of the institution's staff to manage the said program

effectively and efficiently based on its goals and objectives. Based on the results, the sense of responsibility was clear to the two agencies (i.e., PTFCF and VSU). But, the CSVFA members were not satisfied of the LGU's responsibility (both Barangay and the City) with respect to the implementation of the program.

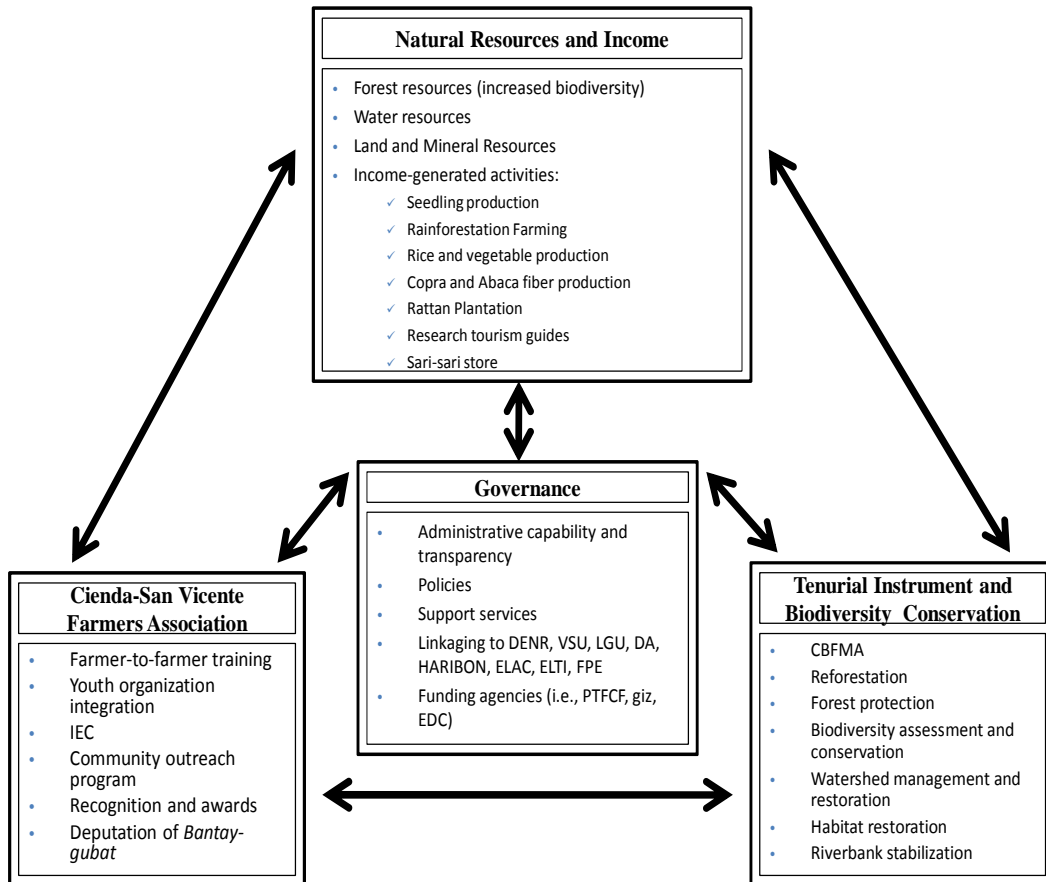


Fig. 3. CSVFA's framework towards responsive community-based forest management efforts to local needs

Table 9. 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 Reforestation Trainer (DENR MC 2004-2006) b) National Reforestation 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 (2008)

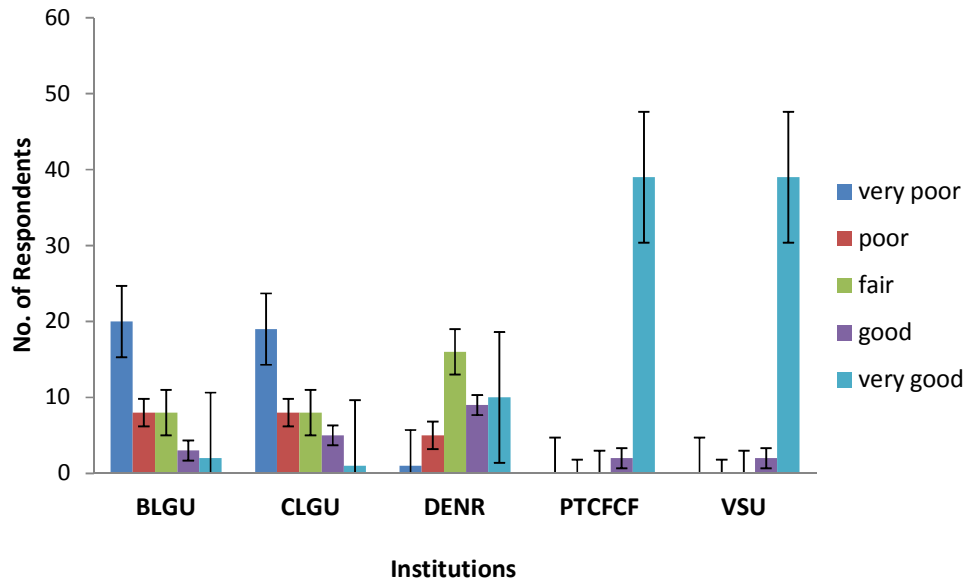


Fig. 4. Responsibility of the different institutions as perceived by the CSVFA members

3.3.3 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 9). This only proves that they were competitive enough in handling the CBFM program.

4. CONCLUSIONS

Socio-demographic profile of the respondents was found to be the basis for their involvement on the CBFM program. Likewise, it was noted also that differences on their profile was due to their daily livelihood basis that affects them to join the program or not. 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. 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. Additionally, 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).

COMPETING INTERESTS

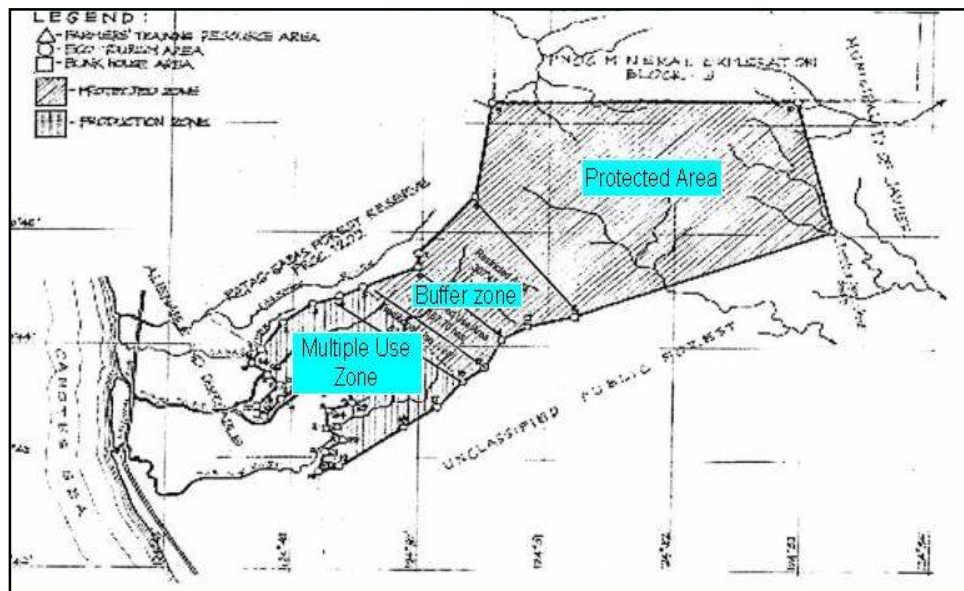
Authors have declared that no competing interests exist.

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APPENDICES



Appendix 1. Map of the community based forest management area of the Cienda-San Vicente farmers association (Note: The two communities are situated outside the CBFM area)

Appendix 2. List of tree and perennial plant species tagged at CSVFA's Rainforestation farm

Scientific name	Common name	Successional guild classification	Total number of individuals	Remarks
Dipterocarps				
1. <i>Dipterocarpus grandiflorus</i>	Apitong	Long-lived late successional species	43	Planted
2. <i>Parashorea malaanonan</i>	Bagtikan	Long-lived late successional species	631	Planted
3. <i>Dipterocarpus warburgii</i>	Hagakhak	Long-lived late successional species	8	Planted
4. <i>Shorea contorta</i>	White lauan	Long-lived late successional species	422	Planted
5. <i>Hopea malibato</i>	Yakal kaliot	Long-lived late successional species	213	Planted
6. <i>Hopea plagata</i>	Yakal saplungan	Long-lived late successional species	364	Planted
	Sub-total		1681	
Nurse trees				
1. <i>Casuarina nodiflora</i>	Mt. Agoho	Long-lived early successional species	22	Planted
2. <i>Agathis philippinensis</i>	Almaciga	Long-lived late	7	Planted

Scientific name	Common name	Successional guild classification	Total number of individuals	Remarks
3. <i>Artocarpus blancoi</i>	Antipolo	successional species Short-lived late successional species	8	Existing
4. <i>Ormosia calavensis</i>	Bahai	Long-lived early successional species	11	Planted
5. <i>Radermachera pinnata</i>	Manaibanai	Short-lived early successional species	5	Planted
6. <i>Vitex parviflora</i>	Molave	Long-lived early successional species	111	Existing
7. <i>Pterocarpus indicus</i>	Narra	Long-lived early successional species	44	Existing
8. <i>Strombosia philippinensis</i>	Tamayo-an	Short-lived early successional species	148	Planted
9. <i>Tectona grandis</i>	Teak	Introduced species	14	Planted
10. <i>Premna odorata</i>	Alagao	Long-lived early successional species	3	Existing
11. <i>Artocarpus ovate</i>	Anubing	Long-lived early successional species	2	Existing
12. <i>Calophyllum blancoi</i>	Bitanghol	Short-lived late successional species	308	Planted
13. <i>Dracontomelon dao</i>	Dao	Long-lived early successional species	56	Planted
14. <i>Alstonia scholaris</i>	Dita	Long-lived early successional species	1	Existing
15. <i>Terminalia microcarpa</i>	Kalumpit	Long-lived early successional species	187	Planted
16. <i>Albizia lebbekoides</i>	Kariskis	Short-lived early successional species	2	Existing
17. <i>Podocarpus philippinensis</i>	Malakawayan	Mid successional species	257	Planted
18. <i>Dracontomelon edule</i>	Lamio	Long-lived early successional species	1	Planted
19. <i>Albizia lebbek</i>	Langil	Short-lived early successional species	3	Existing
20.	Unidentified 1		11	Existing
21.	Unidentified 2		3	Existing

Scientific name	Common name	Successional guild classification	Total number of individuals	Remarks
22.	Unidentified 3		1	Existing
23.	Unidentified 4		1	Existing
24.	Unidentified 5		7	Existing
25. <i>Cassia javanica</i>	Antsoan dilaw	Introduced	58	Planted
26. <i>Melia dubia</i>	Bagalunga	Short-lived early successional species	4	Planted
27. <i>Garcinia binucao</i>	Batuan	Short-lived early successional species	2	Existing
28. <i>Knema mindanensis</i>	Bunod	Mid successional species	1	Planted
29. <i>Artocarpus nitidus</i>	Kubi	Long-lived early successional species	5	Existing
30. <i>Toona philippinensis</i>	Lanipga	Long-lived early successional species	5	Planted
31.	Malacogon	Short-lived early successional species	7	Existing
32. <i>Polyalthia oblongifolia</i>	Lapnisan	Short-lived early successional species	4	Existing
33. <i>Spondias pinnata</i>	Libas	Short-lived early successional species	1	Existing
34.	Nipot-Nipot	Short-lived early successional species	2	Existing
35. <i>Cratoxylum celebicum</i>	Pag-uringon	Short-lived early successional species	1	Existing
36. <i>Peterianthus quadrialatus</i>	Toog	Long-lived early successional species	2	Existing
37. <i>Cassia siamea</i>	Thailand shower	Introduced	1	Planted
38. <i>Azalia rhomboidea</i>	Tindalo	Long-lived late successional species	2	Planted
39.	Hambabalud	Short-lived early successional species	1	Existing
40. <i>Instia bijuga</i>	Ipil	Long-lived late successional species	50	Planted
	Sub-total		1359	
Fruit Trees				
1. <i>Durio zibethinus</i>	Durian	Introduced (improved variety)	7	Planted
2. <i>Lansium domesticum</i>	Lansones	Introduced (improved)	30	Planted

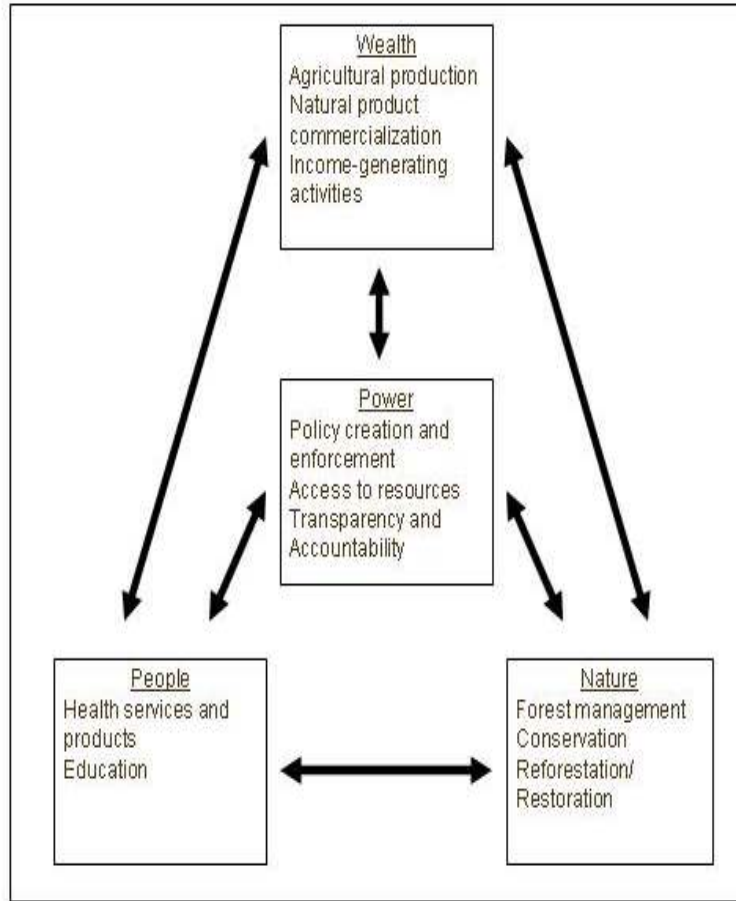
Scientific name	Common name	Successional guild classification	Total number of individuals	Remarks
3. <i>Garcinia mangostana</i>	Mangosteen	variety) Introduced	27	Planted
4. <i>Nephelium lappaceum</i>	Rambutan	Introduced	33	Planted
5. <i>Sandoricum koetjape</i>	Santol	(improved variety) Introduced	2	Planted
6. <i>Artocarpus odoratissimus</i>	Marang	(Bankok variety) Introduced	65	Planted
7. <i>Artocarpus heterophyllus</i>	Nangka	Introduced	6	Planted
	Sub-total		170	
Palms and Rattan				
1. <i>Cocos nucifera</i>	Coconut	Introduced	100	Existing
2. <i>Calamus merrillii</i>	Palasan	Mid successional species	124	Planted
	Sub-total		224	
Total			3434	

Source: ITEEM Files, 2014

Appendix 3. Cumulative annual seedlings sales of Cienda-San Vicente farmers association (November, 1997-December, 2012)

Year	Consumers	Sales from the seedlings (Pesos)
1997	Initial purchase of ViSCA Tropical Ecology Program	231,281.25
1998	Jesus Doyon	197,142.00
1999	Del Monte, Philippines, DENR, NORMISIST	117,276.00
2000	Del Monte, Philippines, LGU, Tribal Filipino Program	75,325.00
2001	Del Monte, Philippines, NERALDECO, LGU	100,488.00
2002	Del Monte, Philippines, ELAC, ICRAF, DAR, RAFI	45,640.00
2003	Del Monte, Philippines, RAFI, Private individuals	56,310.00
2004	PNOC, Private individuals	46,500.00
2005	HARIBON, LGU, Pivate individuals	12,320.00
2006	Diocese of Maasin, DA, Private individuals	28,230.00
2007	Diocese of Maasin, DENR, Private Individuals	96,500.00
2008-2009	LiFE Project	150,000.00
2010	Energy Development Corporation (EDC)	60,000.00
2011	National Greening Program	305,000
2012	National Greening Program	610,000
Grand Total		2,134,014.25

Source: CSVFA documents, 2008



Appendix 4. People, nature, wealth, and power which provides a conceptual framework to guide the assessment of the responsiveness of community-based forest management efforts to local needs (Raik and Decker, 2007)

Appendix 5. Inventory of endemic bird and mammal species of conservation concerns recorded in 1996-2005 within the CBFM area of the Cienda and San Vicente communities in Baybay City, Leyte

Common name	Scientific name	IUCN/CITES status
Rufous hornbill	<i>Buceros hydrocorax</i>	Endangered (IUCN)
Philippine eagle owl	<i>Bubo philippensis</i>	Endangered (IUCN) Trade strictly prohibited (CITES)
Philippine falconet	<i>Microhierax erythrogyns</i>	Endangered (IUCN) Trade strictly prohibited (CITES)
Green-headed racket-tailed parrot	<i>Priniturus luconensis</i>	Insufficiently known (IUCN) Trade strictly prohibited (CITES)
Phillippine hawk eagle	<i>Spizeatus philippensis</i>	Vulnerable (IUCN) Trade strictly prohibited (CITES)
Taritic hornbill	<i>Penelopides Panini</i>	Vulnerable (IUCN) Trade strictly prohibited

Scops owl	<i>Otus scops</i>	(CITES) Trade strictly prohibited (CITES)
Serpent eagle	<i>Spilornis holospilus</i>	Trade strictly prohibited (CITES)
Philippine hanging parakeet	<i>Loriculus philippensis</i>	Trade strictly prohibited (CITES)
Philippine grass owl	<i>Tyto capensis amauronata</i>	Trade strictly prohibited (CITES)
Philippine tarsier	<i>Tarsius syrichta</i>	Endangered (IUCN)
Philippine flying lemur	<i>Cynocephalus volans</i>	Vulnerable (IUCN)
Philippine deer	<i>Cervus mariannus</i>	Trade strictly prohibited (CITES)
Squirrel	<i>Sundascirus samarensis</i>	Endangered (IUCN)
Philippine monkey	<i>Macaca fascicularis</i>	Vulnerable (IUCN)
Philippine warty pig	<i>Sus philippensis</i>	Vulnerable (IUCN)

Sources: Field observation and monitoring of CBFM area conducted by the members of the CSVFA (CSVFA, 2000); Asio and Bande (2005)

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