Abstract—This study assessed the impact of the CBFM program on livelihood and income, forest condition and forest equity (LIFE). The study was conducted in four barangays issued with different land tenure instrument issued under the CBFM program. Data were gathered through review of secondary data, household survey, key informants interview, focused group discussions, map overlay and direct field observation. Analysis revealed that the number of livelihoods as well as income of the respondents increased after tenure issuance. However, at least 40% of the respondents whose income increase perceives the issuance of land tenure instrument had nothing to do with the income change while the remaining 60% strongly believed that the issuance of land tenure instrument directly affected the increase of their income because of improved farming system or because of the livelihood projects introduced in their area. Despite increase in income, majority of the respondents are still below the poverty threshold. The notable impact of CBFM implementation is control of timber poaching and slash-and-burn cultivation. Forest condition generally improved as evidenced in the increased area of natural forests and conversion of grasslands to tree plantations and agricultural production areas. Substantial natural regeneration were observed in tree plantation areas and open spaces. However, water quality and quantity as well as fauna resources is deteriorating. Forest equity has improved as manifested in increased participation in PO activities but leadership roles and distribution of benefits needs improvement. In general, the DENR benefitted in the implementation of the CBFM program because of the improved forest condition. The mobilization of local communities as ‘partners’ in forest development activities is an effective strategy. In contrast, the objective of improving the livelihood and income of participating communities in the CBFM program remains vague because the DENR still need to come up with a clear and workable plan on how to make this objective happen.

Keywords—Community-Based Forest Management, impact assessment, LIFE indicator, tenure instrument.

I. INTRODUCTION

The Philippines is one of the many Asian countries that considered lands classified as “public domain” or “forest lands” to be owned by the government [1]. This arrangement is traced back with the “Regalian doctrine” established by the Spanish government which affirmed ‘state ownership’ for all lands of the public domain [2], [3]. However, history showed that under state management, forest and forest lands resources were not properly managed as evidenced in the rapid loss of the country’s forest cover after the government has awarded large areas to logging companies. While the government benefitted from the use of natural resources, forest cover was significantly reduced to only about 34% or 10.2 million hectares by end of the 1970s [4] to only about 5 million hectares of residual and old-growth natural forests, in 1999 [5]. Logging also paved way for the entry of local communities in the uplands [6]. By early 2000, population in the upland has reached 24 million individuals [5], [7]. Majority of the upland communities were considered as “poorest of the poor” [5] and most of them are involved in slash and burn cultivation/farming for their survival. The continuous influx of migrant communities has further aggravated the diminishing forest resources. Because of the open access nature of many forest lands, it was difficult for the government to determine who should be held accountable for such action.

This condition prompted the government to craft new laws and policies to improve forest management and respond to the needs of local/upland communities. From highly centralized form of management [2] with punitive environmental laws, forest management evolved into more people responsive and participatory [4] in nature. The government realized the importance of recognizing the claims of local communities to ensure accountability in the sustainable development and management of forest and forestland areas [8]. The government expected that with the improvement in socio-economic condition of local communities, management of natural resources will also improve.

In 1995, the Department of Environment and Natural Resources (DENR) formally launched the Community Based Forest Management (CBFM) Program, as the overall strategy of the government towards the management and protection of forest and forestlands. Land tenure instruments are given to organized upland communities/people’s organization (PO) [9], [10] or individual households/families. Among the tenure instruments issued include Certificate of Stewardship Contract (CSC), Community-Based Forest Management Agreement (CBFMA) and Certificate of Ancestral Domain/Land Claims - Community-Based Forest Management Agreement (CAD/LC-CBFMA) [8]. The CBFMA “legitimates the migrant communities” rights with respect to forestlands upon which their livelihood depends while the CADC recognizes the ancestral claims of indigenous peoples to public forest and forestlands and other natural resources assets therein” [5].

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Except for the CADC, the agreements mentioned earlier have 25 years duration and can be renewed for another 25 years subject to the result of evaluation and recommendation of DENR. The agreements also stipulate the roles and responsibilities expected from the tenure holder as well as DENR.

Since its launching in 1995, about 5.97 million hectares of forest and forestlands areas have been awarded to organize upland communities comprising about 690,691 households [1]. This figure represents 66.3% of the 9 million hectares target of the DENR to be devolved to different stakeholders for management and protection [10], [11].

The conceptual framework of this study was based on the international research study titled “Improving Equity and Livelihoods in Community Forestry”, a joint initiative of the Center for International Forestry Research and Rights and Resources Initiatives (CIFOR-RRI) implemented in selected countries in Asia, Africa and Latin America. Various features of land tenure regimes, regulation, market and institutions and their outcome to the livelihoods and income, forest condition, and equity (LIFE) were assessed [4]. This study, however, was only focused on the assessment of CBFM program impacts to LIFE. The parameters used in the assessment include: before and after condition of livelihood and income, six (6) factors for forest condition and three (3) for equity. Forest condition factors are forest area, agroforestry area, forest land uses, water quality, landslides and soil erosion, water quality, fire occurrence and biodiversity. Equity factors include participation/involvement in PO activities, access to livelihood opportunities, and access to PO leadership.

II. MATERIALS AND METHODS

This case study was conducted in barangays¹ of Maddiangat and Baresbes in the municipality of Quezon representing CSC and villages of Bansing and Buenavista in the municipality of Bayombong for the CBFMA. For convenience and to eliminate confusion, each of the four barangays was given codes based on the tenure instrument issued to them: Baresbes CSC, Maddiangat CSC, Bansing CBFMA and Buenavista CBFMA.

The method employed in this study is exploratory social research using questionnaire survey. A total of 101 respondents (individuals) were interviewed from the four sites. Other necessary information was gathered through focused group discussion, key informants interview, direct field observation and map overlays.

III. RESULTS AND DISCUSSION

A. Impacts on Livelihood

In this study, livelihood refers to all the sources of income of the respondents, either from the use of land (agricultural farming) or from the use of trees and other non-timber forest-products harvested in the tenured area. It may also include income derived from the development and management of forest and forest land areas (e.g. seedling production and maintenance, plantation establishment and maintenance and forest protection among others) [4]. It also includes other sources of income not directly related to the use of forests and other resources, e.g employment.

Respondents have various sources of income prior to the issuance of land tenure instrument. Among their livelihood activities include vegetable gardening (35.64%) rice farming (26.73%) timber poaching (6.93%), employment in the government and non-government sector (3.96%), driving (1.98%), mining (0.99%) and overseas work (0.99%). More than 61% of the total respondents have 1-4 livelihood activities in a year. From the four case study sites, only the community members of Bansing CBFMA have access to forest resources through timber poaching. This activity was carried out by community residents at night time when the DENR staffs returned to their home stations. The respondents admitted that this livelihood brought them large amount of money which could not be acquired in a short period of time. Because of the viability of the activity to bring bigger income, almost all members of the community were into timber poaching. The reforestation projects introduced in the area by the DENR was not as appealing as timber poaching.

The issuance of tenure instruments changed the access and management of forest resources by the local communities. Management and protection of natural forest and development of individual land claims became their major responsibility which is embodied in the land tenure agreement. Illegal activities such as timber poaching, wildlife hunting, harvesting of non-timber forest products, mining and other extractive activities was prohibited. Because of the prohibition of harvesting, more than 81% of the total respondents went back to rice farming or vegetable gardening as their major livelihood.

Although access to forest resources was regulated, the issuance of land tenure instrument resulted to the introduction of additional livelihoods and an increased in the respondents’ number of livelihoods. Forest-based projects such as reforestation and agroforestry projects were introduced to tenure holders where they provided labor. Non-forest-based livelihoods such as livestock dispersal, trading and fossilized flower production were developed to augment their income. High-value fruit-bearing seedlings, rattan seedlings and coco seed nuts were given to PO members as incentives for working in watershed rehabilitation projects.

Overall, the CBFM program contributed to “more environment-conscious livelihood strategies” [1] because of the introduction of various forests and non-forest-based livelihoods by the DENR and other participating organizations. This finding support the findings of Pulhin, Dizon, Cruz, Gevana, and Dahal [4] conducted in four different CBFM sites in the Philippines where they found out that the issuance of tenure instrument brought several livelihood opportunities like livestock dispersal, trading as well as the different reforestation and agroforestry projects. This finding also coincide with the observations of Fernando and Nanca [12] where they observed that livelihood projects such as agroforestry and livestock husbandry were made available to the PO members after the issuance of tenure instrument.

¹ Smallest unit of government
Despite the restriction in the use of forest resources, resilience of local communities was developed. Their ingenuity to cope with change was observed through the improvement of their farming system. They explored the planting of mixed crops like fruit-bearing trees (coconut, avocado, mango, oranges, etc.) and other high value crops such as pineapple, bitter gourd, sweet peas, ginger and red bell peppers and not just rely on the usual sweet potato, tomato and taro grown in upland areas. Livestock raising also became an important component of their farming systems. The respondents realized that diversifying livelihoods can be considered an effective method of adjusting to difficulties and opportunities because of the creation of various activities and resources [13].

B. Impacts on Income

Income in this study refers to the amount of money derived from the use of land awarded under the CBFM program. Annual income of respondents before and after tenure issuance differed significantly. Prior to tenure issuance, 42 of the total respondents have annual income ranging from PhP30,000-40,000.00, 32 are within the PhP10,000-30,000 range, 7 within the PhP70,000-140,000, 1 respondent have less than PhP10,000.00 and 19 do not have income. It was found out that local community members from Bansing CBFMA have higher income compared to the rest of the respondents from the three study sites. Almost 20% of the respondents from Bansing CBFMA are within the annual income range of >PhP70,000-140,000.00. Respondents admitted that their income from timber poaching contributed to the increased income. Accordingly, a resident can earn as much as PhP8,000-12,000.00/week which can still increase depending on the frequency and volume of timber harvested while reforestation projects would pay them a meager amount on a daily basis. Chainsaw operators as well as financiers (some of whom are also community members while others came from adjacent lowland barangays) also acquired revenue which is much higher than what a normal timber poacher would earned. This finding coincide with the findings of Kamanga, Vedeld, & Sjaastad, [13] in their study conducted at Chiradzulu District in Malawi where they found out that households with access to mountain reserves have higher income than those households without access to the mountain reserves.

The income of respondents improved with the issuance of tenure instrument. The number of respondents without income as well as those who have below PhP10,000.00 income declined to zero. On the other hand, respondents with income ranging from >PhP30,000.00-70,000.00 rose to 60 compared to 42 before tenure was issued while respondents with >PhP70,000.00-140,000.00 income range also increased to 21 from 7 before tenure issuance. Eight (8) respondents reported they have >PhP140,000.00 annual income. Respondents admitted that improving farming system and not just relying on a single crop could increase income.

Although there was an increase in income, the average annual income of respondents for the year 2009 was only PhP64,443.28 which is way below the PhP67,364.00 annual income needed to support a 4-member family or PhP84,205.00 for a 5-member family in the year 2007. Only respondents from Maddiangat CSC have average monthly income (PhP7,654.60) surpassing the required monthly per capita income (PhP7,107.00) for a 5-member family. Buenavista CBFMA posted the lowest mean annual income of PhP55,486.97 and average monthly income of PhP4,623.90. This is quite surprising considering the fact that Buenavista CBFMA is a recipient of two multi-million special projects from the International Tropical Timber Organization (ITTO). An analysis of the current situation in Buenavista CBFMA showed that majority of the PO members were not able to use their farmlots for agricultural crops cultivation because these were utilized as experimental plots during the two ITTO projects implemented in the area. At present, the established tree plantations already have closed canopy which made it unsuitable for vegetable production.

The respondents’ perception regarding income change was also determined. Sixty-eight (68) respondents believed that their income has increased (either slightly or significantly) while the remaining 33 admitted their income has not changed at all. It was surprising to learn that 27 out of the 68 respondents whose income increase did not believe that CBFMP has something to do with the increase in income. On the other hand, the remaining 41 respondents (60.29%) strongly believed that the issuance of land tenure instrument affirmed their ownership to the land. They also invested money and effort to optimize the use of land.

While livelihood projects and farm inputs were distributed to PO members, many of the respondents claimed that these livelihoods have not improved their income. The employment brought by reforestation and agroforestry projects were mostly short-term and farm inputs provided are long-gestationing which require long periods before benefits could be obtained. Fruit-bearing seedlings were encouraged to be planted in individual land holdings with the main purpose of adding to forest cover while provision of additional income once it bears fruit was only secondary. This result verified previous finding [4] which mentioned that livelihood support to tenure holders are “biased towards primarily improving forest cover” and not intended to help tenure holders improved their economic condition. Tenure holders said that alternative livelihood projects should be identified and developed for them, specifically those that can provide for immediate income to address their daily needs.

C. Impact on Forest Condition

The most notable impact of CBFM program implementation was the improvement in forest condition. Result of map overlay analysis and direct field observation showed that forest area has increased. The increase was attributed by the respondents to the reforestation program of the DENR and initiatives of the tenure holders to develop their own land holdings. The conduct of individual lot survey and mapping as well as issuance of individual property rights agreement within CBFM areas motivated them to develop their own farmlots because their occupation has become secured. The respondents acknowledged that the implementation of the CBFM program drove them to develop and improve their land use practices for their own benefit. This outcome confirmed
the findings of Balooni, Pulhin and Inoue [14] that the issuance of land tenure instrument is the driving factor that encourages local people to replace their destructive swidden farming practices to agroforestry as a result of information, education and communication (IEC) campaigns. Although there are no immediate benefits from planting fruit trees, farmers shifted their farming practices into more environment-friendly technologies by integrating agriculture crops, forest trees and livestock. Varied methods of forest development could be observed in individual farms including boundary planting, tree plantation, multi-storey and contour planting. The stricter enforcement of forestry laws and organization and mobilization of forest protection teams was also seen by the respondents to have contributed to the increased in forest area.

The overall land use has improved with the increase in forest cover. Large pasture areas were converted into various productive uses. The non-renewal of Pasture Lease Agreements (PLAs), control of timber poaching and shifting cultivation contributed to the improved land use. Despite the absence of funding for forest protection activities, PO members continuously protect natural forest from fire, timber poaching and other illegal activities.

Water quantity particularly potable water continues to dwindle despite the increase of forest cover. Water insufficiency is obvious during the summer season when farmers not only need water for drinking but also for watering vegetables. This condition has also created misunderstanding between farmers who competed in using the scarce water. Volume of rainfall during the rainy seasons has also increased causing landslides and soil erosion in steep areas. Soil erosion and landslides however have not so far brought any major negative impact to the people, their livelihoods and properties.

Water quality has deteriorated over the years as a result of the establishment of road networks and swidden farms. After heavy rains, water running from rivers and creeks becomes muddy and cloudy which is not suitable for domestic use. Downstream communities testified that water drawn from higher elevation areas during rainy season became murky indicating heavy sediment loads.

Fire or burning was a common activity prior to tenure issuance. This was undertaken for various reasons: to provide for new grazing forage, to open up patches of land for shifting cultivation or clearing of existing farm lands. This destructive method of land preparation resulted in many wild forest fires and caused damage to vegetation within and adjacent areas. With the issuance of tenure instrument, this method was gradually controlled. Forest protection teams in each barangay were formed and were seen as an effective strategy for controlling forest fire. It also paved way for natural regeneration not only in the tree plantations but also in open spaces near fragmented forests.

Flora resources have improved after tenure issuance. Large areas previously used for grazing were converted to agricultural production areas or tree plantations. Vegetation in individual land holdings likewise improved. Mixed species of forest trees and fruit-bearing trees and some species of rattan are maintained by the tenure holders. However, the presence of fauna resources, particularly bird species have deteriorated in lower elevation areas. According to the respondents, many of the bird species preferred to stay in the upper elevation where natural forests still abound. This observation is in consonance with the findings of Cannel [15] where they observed that some bird species cannot live on a particular tree species but on “particular forest structures and ranges of food sources”.

D. Impact on Forest Equity

Equity was assessed in terms of participation in different PO activities, livelihood distribution and access to leadership. Participation in different PO activities prior to tenure issuance was rarely observed. Local communities did not have any participation in the management and development of forestland areas which were covered with PLAs. Decision-making regarding the use and management of natural resources were held by the PLA holders. Local communities have organization but remained loose because they were not officially registered. They also do not have the legal personality to transact for funding assistance to support their projects. Leadership was held by the Barangay Council and any decision pertaining to any development effort within the barangay was cours ed through the Barangay Council.

The issuance of tenure instrument improved forest equity. The tenure instrument affirmed the local communities’ claims over the public domain. And unlike in the previous years, the tenure holders were more secured to invest in the development of their land holdings after the area was issued to them. They were able to exclude others from entering and gathering resources in their individual land claims. The tenure holders also organized themselves into people’s organization, crafted laws and policies that govern the operation of their respective organization. As a result, participation in community meetings has increased. Participation of male and female in meetings both increased although the percentage of female attending meetings was higher than the male. Participation in forest development activities (seedling production, foot patrolling, land preparation activities, etc.) varied per study site. Majority of the respondents from Baresbes and Maddiangat CSC have not participated in any forest development activities which were funded by DENR. This is in contrast with Bansing and Buenavista CBFMAs where participation has increased. Participation in decision making and conflict resolution is also higher in the two barangays issued with CBFMA than in the two CSC areas.

Perception of respondents regarding livelihood sharing prior to tenure issuance generally favored the rich and those who have power while local communities seldom benefitted. Employment in reforestation projects also favored men. Some of the respondents also revealed that elite capture still exists up to the present where some officers get more benefit and livelihood projects than other members of their association.

The issuance of tenure instrument has improved access of local community to leadership. The associations formed by the tenure holders became the major actors in forests and forestlands management. The tenure holders’ decisions are now taken into account by the Barangay Council as well as the DENR in any activity relating to forest management. The DENR directly coordinates with the associations for whatever matter concerning forest and forestland management.
IV. ISSUES AND PROBLEMS

While the study was focused on the assessment of impacts to LIFE indicators, issues and problems were also recorded. Many of these problems relate to policy, operational procedures and socio-economic development. Among the issues and problems noted includes the vending or “selling” of rights with the two barangays issued with CSC; Monitoring & Evaluation (M&E) Team has not been organized and M&E Tool has not been established; Limited involvement of Municipal local government units and other agencies in the implementation of the CBFM program; Absence of management and development plans for individual farmlots within CSCs; Long and complicated procedure for Resource Use Plan approval; Poor financial management by the People’s Organization; Absence of alternative livelihood that could provide for short-term benefits and farm-to-market roads remained undeveloped.

V. CONCLUSION

In general, the CBFM program has provided local communities better option than the previous forest management strategies implemented in the past by the DENR. The result of the study showed that the CBFM program has the potential to provide positive impact on LIFE because it allows local communities to occupy, utilize and control forests resources [4]. Its impact is clearly seen on the ground with the improved forests condition and also equity. But then, to sustain the initial gains of the program, various interventions have to be done to ensure that objectives are met especially on improving the socio-economic condition of tenure holders. The DENR should closely collaborate with the local government units for the identification and development of livelihood projects that could provide for immediate benefits.

To enhance the impacts of CBFM program, the following recommendations are forwarded:

- Improvement of operational procedures which include the institutionalization of collaborative partnership between the DENR, local government units, people’s organization and other agencies and institutions that could help in improving delivery of social, economic and environmental services.
- The DENR should create a policy environment that would allow tenure holders to harvest planted trees in individual farmlots or communal areas. This is a way of encouraging local people to plant more trees because they know that they will benefit from it in the future.
- Development of viable community-based livelihoods. The CBFM program should not only focus on reforestation and agroforestry projects but also on the identification and development of sustainable alternative livelihoods that can provide for immediate benefits. It is important that daily needs of local communities are addressed to ensure that they will have income while waiting for long-gestation forestry crops.
- The DENR should strengthen the devolution of functions to local government units. Capacity-building trainings and orientation about the CBFM program as well as other forestry and environmental laws should be given to local government staff to ensure that will be able to carry-out their job efficiently and effectively.

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