

Community Participatory Action Research Approach as an Effective Tool Towards Adoption of Corn-Based Farming System Technologies by Libona, Bukidnon Farmers

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Abstract

Community Participatory Action Research (CPAR) approach was utilized as a tool to diffuse the developed Corn-Based Farming Systems (CBFS). Limitations commonly encountered by farmers thru Participatory Rural Appraisal are low farm productivity, profitability and non-application of appropriate farm technologies identified. Consultation and planning, strategies were developed for effective integration and intervention to solve identified problems by farmers. From monocropping farming, farmers learned to shift to diversified farming like crop relay and rotation, livestock integration, Integrated Nutrient Management (INM), a high yielding variety of seeds and Integrated Pest Management (IPM). Through the application of these technology, farmers produced 40% increase on yield and 111% increase on the income of . Further, through crop relay, corn-cassava increased 245% ROI, and corn-peanut crop rotation increased 195% ROI. Since 100% farmer members and 85% non-members adopted CBFS, CPAR approach proved to be effective. The 100% repayment was an achievement, and the success was a product of strong support through input and technical assistance from DA and its collaborators. Thus, CPAR concepts demonstrated a significant impact on the social, economic, technological and environmental aspects of farming communities.

Keywords

participatory, community, technologies, adoption, sustainability

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INTRODUCTION

In the province of Bukidnon, corn is the primary commodity followed by rice and sugarcane. Still, the yields of corn, both yellow and white, were still below the expected magnitude that could cater its domestic demand. This was because corn farmers face challenges such as lack of capital and lack or no application of appropriate technologies that eventually results to low yield and reduced farmers' income which caused them to till their farms for other purposes.

For decades, agricultural technologies were developed by research to improve farmers farming systems and the focus was to obtain low-cost farming and high yield. Despite research efforts to develop technology, it was observed that most farmers were still tied with using inorganic pesticides, inappropriate application of fertilizer and mono-cropping system that produce low yield and low income. Traditional farmers' practice of monoculture system was appealing to them because of its simplicity. Moreover, this was because it was easier to practice, for it focused on one crop. But mono-cropping depletes soil nutrients and this results to the application of more fertilizers and pesticides. Aside from the alarming harmful effects of fertilizers and pesticides, the additional investments of farmers drain them due to high expenditures. These expenses bring about farmers income into a difficult state where poverty is the aftermath. Even with the researchers' efforts to mainstream these technology developments to farmers, awareness was not able to drag framers on performing agricultural technology developments on their farms.

Most probably, the previous diffusion for adoption attempts was ineffective since innovations were brought to farmers in a top-down model and the strategy used was not an effective tool to influence adoption. Moreover, the yield and income advantage of crop diversification such as crop rotation and the importance of shifting to high yield varieties technology need to be diffused to farmers. Although, farming activities depend on the specific manner that the farmers choose to pursue.

Community Participatory Action Research (CPAR) is an active engine that drives farmer to imitate the remodeled farming systems. Farmers' exposures to different trainings build character and provide skills that make them more productive. The principles of CPAR encourage farmers to experience individualized learning thru active participation and observation. Technical and farm inputs support from DA and other agencies were provided. Participation of Farmers brought them to an actual situation wherein they personally observe actual outcomes of the introduced technologies that eventually influence their decision towards the possibility of adopting the developed technology. The thoughtful policy responses encourage development and diffusion of appropriate agricultural technologies is crucial in enabling an effective technological response (Lybbert and Summer, 2010). CPAR is molded by organizing corn farmers in selected sites and brought partnerships by establishing a cooperative.

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The cooperative members will function in a participatory manner and motivate self with the sense of ownership. Thus, members act in accordance to commitment and effort towards project sustainability wherein the members themselves find ways on how they can contribute to the project's success as a result of personal involvement.

The Bureau of Agricultural Research (BAR) has funded and supported CPAR on Corn-based farming System in Libona, Bukidnon. It is a collaborative research project with the Department of Agriculture Northern Mindanao Agricultural Crop and Livestock Research Complex (NMACLRC) formerly known as NOMIARC as the implementer.

This project aimed to increase corn yield and income utilizing the introduced Corn Based Farming Systems (CBFS) technologies. It also endeavored to achieve farmers' adoption towards a sustainable agricultural production guided by the principles and influence of CPAR approach. It empowered and enhanced the capabilities of the community for agricultural production, and it established strategies that helped ensure project sustainability.

METHODOLOGY

Site and Farmer Cooperators (FC) Selection

The study was implemented in 2009 and ended five years after. However, farmers who planted corn in May of 2014 using crop diversification technology combined with all other technologies introduced reaped their harvest in March of 2015. In 2008, preliminary discussions on the project's rationale and objectives were done before its official implementation. Northern Mindanao Agricultural Crops and Livestock Complex (NMACLRC) researchers had project briefing, consultations, and coordination with the Local Chief Executives (LCE), Agricultural Extension Worker (AEW), Municipal Agriculturist Officer (MAO) and farmer leaders of Libona. The meeting agenda was regarding the selection process of the Municipality of Libona barangay sites. Another important concern discussed during the meeting was the setting of criteria on the process of site and farmer selection.

NMACLRC researchers with the help of LGU of Bukidnon agreed that Libona, Bukidnon was the best choice from among the corn-growing municipalities of Bukidnon province. It was required that the target site had at least two adjacent and homogenous barangays, had supportive LGU for financial and technical support, had existing active associations of farmers or cooperatives, must be accessible to ordinary modes of transportation, had electricity and access to mobile phone communication and a good peace and order situation. As for selecting the qualified farmer, the community members identified the qualified candidate Farmer Co-operators, and this was validated by MAO and AEWs guided by the criteria agreed. To qualify, candidate FC must be willing to cooperate in the process of project implementation, and this includes the willingness to pay the cost of inputs after harvest. They must also be willing to give a counterpart for the project of their land area and labor. Aside from that, they were expected to be willing to

share their learning and share new knowledge with other farmer partners, and their area must be accessible to allow frequent visits during monitoring.

The LGU, MAO, and AEW of Libona took the lead in selecting the two barangay sites out of the fourteen barangays of Libona municipality and were in charge of selecting five qualified farmers per site. This provided a total of 10 CPAR members as FC. The active involvement and commitment of the project participants were emphasized for the project implementation to be successful. The sense of project responsibility and ownership was encouraged from each of the project participants.

Conduct of Participatory Rural Appraisal

To identify limiting factors that affect poverty and low income the corn farmers are facing on selected sites, Participatory Rural Appraisal (PRA) was conducted in 2008 before the official implementation of the project. This activity was vital to determine the landscape of selected areas, identify appropriate technology options, socio-economic status, socio-cultural aspects, and resources utilization to design a validated Barangay Development Plan (BDP). The two BDP formulated from each barangay were submitted to the Barangay Development Council (BDC) and farmer leaders for validation. Once validated, the BDP formulated was then consolidated to formulate a Community Development Plan (CDP). The CDP was again validated before the LGU executives on March 11-14, 2008. A vital development plan functions as a guide to the implementers and its collaborators as to how the project be conducted and what needs to be done to achieve a successful implementation.

Corn-Based Farming Systems (CBFS) Technologies Introduced to Farmers

The project team used training and seminar as a way to introduce CBFS technologies to farmers. From 2009 until 2014, a series of Training and seminars were gradually conducted prioritizing the most important topics. Learning the accurate knowledge about organic fertilization was one of those topics that were given priority. Hands-on training on bio-organic fertilizer and vermiculture making were also one of the first training conducted, in order to equip farmers with skills in organic fertilizer making. The farmers were trained in Integrated Nutrient Management (INM) a method wherein organic + inorganic + Bio N are combined. In relation to this, the team conducted soil analysis in April of 2009 as part of the land preparation and to identify site soil nutrient needs. Integrated Pest Management (IPM) such as the use of *Trichogramma evanescens* a form of parasitic wasps of Lepidoptera eggs, was also taught to farmer cooperators. Another significant technology introduced was the use of appropriate and improved high yield hybrid variety of seeds. Moreover, crop diversification system was also introduced through training. Farming systems that involve cassava relay planting were explained such as corn-cassava and corn-peanut cropping as technologies that were discovered as essential contributors to high yield.

Other activities that were included during the implementation were simple financial preparation,

bookkeeping, and farm recording. How to process value-added products like soybeans production, processing, and utilization, as well as corn wine making were included. Within the inclusive dates of implementation, NMACLRRC as research implementer was always open to inviting Libona farmer cooperators to visit and observe on station during Farmers Field Days (FFD) to observe techno demonstrations.

Farmer Cooperator (FC) Field Establishment of Corn Production using CBFS Technology

To make the best of those CBFS technologies, ten farmer co-operators (five from Kinawe and five from Gango) were picked to establish corn production and apply the technological intervention in their one-hectare land. With the help of MAO and their AEWs, CBFS technologies that were introduced to Libona farmers through training and seminars were required to be followed with full assistance from NMACLRRC, LGU-Libona, and other collaborators. FCs first applied corn mono-cropping with the use of high yield variety of seeds, INM and IPM technologies on their farms. The yield and income of corn were gathered and recorded by farmers themselves every harvest. The last technologies applied were the methods of crop diversification which were crop relay and crop rotation. Most farmers did the corn-cassava (crop relay) while some preferred the corn-peanut (Crop rotation). Either of the two was recommended, but most farmers' preferred the corn-cassava due to the availability of local market/processors of cassava in the area.

The significant support coming from LGU Libona, as well as farmers' compliance of requirements and assistance from NMACLRRC and its collaborators, were ensured through the memorandum of agreement (MOA). The MOA stated the duties and responsibilities of all the parties concerned and ensured the smooth flow of implementation. Farmers were also required to practice farm management, farm accounting by keeping records and do simple bookkeeping for them to keep track of farm cost, yield, and income. The farmers were expected to gather their own farm data and report their updates during meetings done by AEWs from LGU weekly and Research Assistants from NMACLRRC monthly.

Technical and Farm Input Assistance

To address the need of farming capital, NMACLRRC distributed farm inputs such as seeds, fertilizers and corn inoculants as a form of assistance to each FC with a maximum of one-hectare allowable area to cultivate each farmer. Specifically, each farmer received 18 kilos of high yield variety corn seeds. Inorganic and organic Fertilizers, Bio-N, lime, and recommended pesticide were distributed based on the soil analysis recommendation. The input assistance was not given for free to the FCs. Instead, it was considered as a borrowed capital for upon harvest they need to pay the amount of that farm input received to the association (later became cooperative) and the committee appointed will release the collected repayments to members who were next priority members. The domino effect process will pass on and continue from one member to another.

Technical assistance was also provided to monitor and guide farmers. FCs will be visited from time to time for farmers to receive constant reminder and instructions from experts regarding the proper procedure of technology implementation. Research Assistant (RA) from NMACLRRC does the site visit to gather data, bring updates and information, listen to farmers' feedbacks, and perform documentation tasks.

Integration of Livestock Production

In 2013, three years after CPAR was implemented, swine production was integrated into the system to maximize land utilization and income as well as ensure the supply of affordable meat to the family and community. NMACLRRC as research implementers distributed five heads of ready to breed gilt and one boar that were improved breeds to first six farmers as their initial source for additional livestock production. The Farmers who received were required to give back two piglets to be dispersed to other members, and the procedure will continue in a rollover method. To keep farmers from spending for feeds, NMACLRRC provided Madre de Agua and Rensonii for farmers and planted these for nutritive feeding.

Organization of a Cooperative

Farmer co-operators first organized themselves into a small association still guided by the Department of Agriculture (DA) and LGU Libona. The farmers appointed officers and committee to set policies and criteria in selecting priority farmers who will receive assistance. The loan committee and treasurer were assigned to facilitate the collection of loans. However, to have assistance that can access from both government and non-government aid/grants programs, either through monetary or in-kind support, the group decided to raise the organization to a higher level. Hence, a cooperative was organized. Two years after CPAR was implemented, the Gango-Kinawe (GK) CPAR Producer Cooperative was created under the Cooperative Development Authority (CDA) dated April 14, 2011.

Repayment in the form of rollover scheme was implemented to ensure sustainability. All assistance received by the farmer was not given for free. They were to pay it every harvest to the cooperative with the very low-interest rate to benefit other members. In case a farmer cannot make any payments due to unavoidable reasons, the cooperative will temporarily take over the farm for one cropping season. The cooperative will till the land, and when harvest time arrives, the net income of yield will be deducted with 500 pesos as interest and the remaining amount will be divided into two. The 50% income will go to the cooperative while the remaining 50% income will go to the farmer and the land will be returned to them.

RESULTS AND DISCUSSION

The Community Participatory Action Research (CPAR) Site

Libona, Bukidnon is a first class municipality in the province with tropical rainforest climate. It is situated in the northern part and is approximately 92 kilometers from

Malaybalay, Bukidnon which is the capital city of Bukidnon Province.

Its total land area in hectares is 37,437.3175 which is the 11th largest in terms of area among the 20 municipalities and two cities of Bukidnon. The topographic characteristic of the area indicates that the municipality is potentially well suited for agriculture since 16% of the total land area is level to gently sloping that is best for intensive agricultural purposes. As for land classification, 53% of the area has been classified as alienable and disposable. Mostly, the central parts of the municipality were predominantly devoted to agricultural and commercial crops such as corn.

Barangay Gango has a total land area of 3,762 hectares and has a total population of 4,686 while Barangay Kinawe has a total of the land area of 1,983 hectares and a total population of 3,243. These two Barangays are homogenous as far as land classification and topographic characteristics are concerned, and both are major corn growing barangays of the municipality.

Participatory Rural Appraisal (PRA) Results and the Formulated Community Development Plan (CDP)

Based on the conduct of PRA, results showed problems and causes that resulted in low yield and

income. Some of these constraints were financial related issues like high price and no capital to buy farm inputs while they had no access to credit for available loans and financial assistance. It was also found out during the PRA that farmers had limited or no knowledge of new farming technologies resulting in no appropriate application of technologies in their fields. They faced the inadequate source of livelihood while farm products are bought at a very low price.

Table 1 shows that Formulated Community Development Plan (CDP) worked as a guide to the research implementers on how to run the project that will cater farmers' needs. CDP was helpful enough to help the success of the project. Planned strategies were carefully followed, and researchers were able to reach out to the responsible agencies that provided their positive response to the aid requested. The presence of CDP showed that CPAR as a bottom-up approach worked by knowing the farmers' limitations and concerns first before jumping to solutions and assistance without the effort to identify whether or not strategies and approach were developed based on farmers' needs and constraints.

Trainings and Seminars

Table 2 shows the series of trainings and seminars

Table 1

Community Development Plan of Barangay Kinawe and Gango Libona, Bukidnon

PROBLEMS	STRATEGIES	RESPONSIBLE
POVERTY		
Lack of financial capital	Request for loan assistance	DA, LGU, Community
Inadequate source of livelihood	Request for livelihood projects	DA, Community
Low wage rate	Family budgeting, Accounting skills	DA, Community
Inadequate food supply	Backyard gardening (vegetables and root crops); family budgeting	DA, Community
Absence/limited land area to cultivate	Crop Diversification and livestock integration	DA, Community
LOW FARM PRODUCTIVITY		
High cost of farm inputs	Request input assistance Request input subsidy	DA, LGU
No/lack application of appropriate farm inputs	Request for training on the utilization of existing/available resources of organic fertilizer Submit soil samples for analysis Timing of season for planting	DA, LGU, Community
Low Price of Farm Products	Price Monitoring	DA, MCO, Community
INFRASTRUCTURE		
No irrigation system	Prepare Barangay resolution address to the Municipal Mayor through the Sangguniang Barangay for allocation of funds.	Barangay council, LGU DAR-ADB-ARCP
Lack of solar dryer		
No area for the cemetery		

Note: DA Department of Agriculture

LGU Local Government Unit

DAR-ADB-ARCP Department of Agrarian Reform-Asian Development Bank-Agrarian Reform Communities Project

Table 2

Training/Seminars conducted for Community Participatory Action Research Corn-Based Project Libona, Bukidnon CY 2009- 2014

Title of Training/Seminar	No. of days	No. of Participants	Resource Person
1. Training on Corn Production & Management	1	30	CPAR Team, LGU
2. Integrated Nutrient Management on corn and other crops	1	35	CPAR Team, LGU
3. Integrated pests Management	1	35	CPAR Team, LGU
4. Corn-Cassava relay farming system Cassava Cultural Management Practices	1	35	CPAR Team, NOMIARC expert, LGU
5. Corn Wine Hands-on Training	1	25	CPAR Team, LGU & Wine Expert
6. Hands-on Training on Bio-organic Fertilizer and Vermiculture making	1	25	CPAR Team, LGU
7. Simple Financial Preparation, Bookkeeping and Farm Recording	1	25	CPAR Team, LGU
8. Training on Soybean Production, Processing & Utilization (farmers)	1	25	CPAR Team, NOMIARC expert, LGU

Note: CPAR Community Participatory Action Research
 LGU Local Government Unit
 NOMIARC Northern Mindanao Integrated Agricultural Research Center

conducted that was attended by Farmer co-operators. These training provided the FCs an accurate know how about CBFS technology methods. The purpose was not only to create technology awareness, but it give lifelong learning that equipped FCs with lifelong skills and abilities essential to farming. The bio-organic fertilizer and vermiculture making hands-on training showed relevant for FCs were able to produce their own vermicompost that was useful to FCs farm.

All trainings and seminars conducted were helpful and useful to the FCs not only within the project implementation but its relevance showed to extend as long as it is needed on the field. Livelihood training such as corn winemaking and processing of soybean products that teaches how to convert raw materials to valuable products gave way to FCs additional income.

Furthermore, the simple farm accounting skills learned was an effective way to get the active involvement of farmers to the project for they were able to feel the sense of ownership as well as cultivate the sense of project responsibility. FCs were able to record all their financial transactions personally and these financial reports were submitted to either the farmer-leaders or project officers who were tasked to present the project accomplishments with considerations of the comments and suggestions from the evaluators. Thus, the exposure of the FCs to various training and other related activities taught them speaking skills. Farming training is an important tool widely utilized by development programs in developing countries.

Study on the effects of training and facilitation of farmers on livestock development revealed that in some ways training and facilitation are of advantage to the farmers, but sometimes other factors such as the farmers'

resources are limiting to the farmers progress (Ampaire & Rothschild, 2015).

CPAR also conducted a postseason forum, congress, review and planning workshop that evaluated, reviewed and gathered feedback that aided in the plans for improvement. Either farmer leaders or project officers were tasked to present the project accomplishment with considerations of the comments and suggestions from the evaluators. Thus, it boosted their self-confidence that gave a good decision-making skills and benefited their organization to be more successful and productive.

The contribution of new technologies to economic growth can only be realized, if and when these are widely diffused and used. Diffusion itself results from a series of individual decisions. It begins with decisions which often result in a comparison of the uncertain benefits of new inventions with the uncertain cost of their adoption (Hall & Khan, 2002).

Corn-Based Farming Systems (CBFS) Technology Productivity and Profitability

Significant findings were noted by the FCs in terms of productivity and profitability. Farmers were able to observe that CBFS practice cost lower. Table 3 illustrates the soil analysis result that barangay Kinawe site contains 5.31 pH while barangay Gango has 5.16 pH. Identifying the soil nutrient needs was an effective way to avoid unnecessary fertilization which was the usual mistake done by farmers that caused overspending. Knowing what and how to apply is essential to achieve low-cost farming. Avoiding pure inorganic fertilizer prevented soil depletion and resulted to in healthier soil. The table shows INM application enhanced corn growth and gave better yield.

The IPM skill of FCs was an advantage for it gave them the ability to identify appropriate pest control and the reduced application of chemical pesticides eventually reduced pest control cost. Corn monocropping practice with CBFS technology applied such as INM, IPM, and the use of high yield varieties resulted in higher yield and better income brought by low-cost farming compared to farmers practice. Economic analysis showed that the average increase in yield for five years was 40% and income increase or its ROI was 111%.

Moreover, the application of Crop diversification together with INM, IPM and use of high yield varieties

showed yield advantage than corn monocropping. Table 5 shows that planting corn and cassava (Corn+Cassava) gained an average ROI of 245.08% while planting peanut after corn gained ROI of 195.45%. Because of this, almost all members practiced crop diversification such as planting corn+cassava and corn-peanut. The corn+cassava crop relay was the most preferred systems by FCs mainly due to the availability of local market processors of cassava in the area. Other members continuously planted peanut after corn during the dry season.

Technical and Farm Input Assistance

It showed that providing farm input assistance

Table 3

Initial Soil analysis of Community Participatory Action Research Corn-Based Project Sites

Site	Soil pH	
	Before	After
Barangay		
Kinawe	5.31	5.83
Gango	5.16	5.60

Table 4

Economic Analysis of Corn Monocropping using Integrated Pest Management , Integrated Nutrient Management , and High Yielding Variety of Corn

PARTICULARS	YEARLY CROPPING					
	2010	2011	2012	2013	2014	AVERAGE
Baseline data on yield (t/ha)	8.88	8.89	8.88	8.88	8.88	8.88
Ave grain yield (t/ha)	12.49	11.95	12.37	12.75	12.62	12.44
Cost per kg	12.05	11.72	12.08	12.1	13.71	12.33
Gross Income (PhP)	150504.50	140054.00	149428.60	154275.00	173020.20	153456.66
Cost of Production (PhP)/ha	71520	68118	73264.5	74629.23	7578.5	72663.25
Net Income (PhP)/ha	78984.5	71936	76165.1	79645.77	97235.7	8079.41
ROI (%)	110.44	105.6	103.96	106.72	128.31	111
Yield advantage over farmers' practice (%)	40.65	34.42	39.3	43.58	42.12	40

Table 5

Economic Analysis Corn Diversification Corn-Cassava and Corn-Peanut CY 2014-2015

PARTICULARS	FARMING SYSTEMS			
	Corn-Cassava (PhP/hectare)		Corn-Peanut (PhP/hectare)	
	Corn	Cassava	Corn	Peanut
Actual grain yield (kg/ha)	4,820	11,019	6,500	915
Price/Kilo (PhP)	13.8	7.6	13.8	50
Gross Income (PhP)	66,516.00	83,744.40	89,700.00	45,750.00
Production Cost (PhP)	39,886.00	16,000.00	39,886.00	12,500.00
Net Income (PhP)	26,630.00	7,744.40	49,814.00	33,250.00
ROI %	66.77	423.4	124.89	266
Average ROI %	245.08		195.45	

helped farmers overcome financial constraints. Immediate and future problems related to crop production expenses were managed. As a result, farmers were able to focus on taking care of their farms without any distraction brought by financial worries in the presence of farm problems like disease and pest infestation. The giving of farm inputs was not to tolerate some farmers' behavioral problems such as laziness but to help them develop good character. The requirement to pay assisted inputs made farmers establish a sense of responsibility. It helped them realize the value of receiving and understand the importance of payments to avail the same benefits in their times of need.

Moreover, technical assistance contributed essentially to the project's success. The technical consultation and monitoring provided updates on new technologies. Farmers trusted technicians' opinions and were all willing to listen to suggestions provided to them.

Swine Dispersal

Swine dispersed produced a total of eight piglets and were also distributed to eight members who were not yet able to benefit. This livestock integration provided farmers additional income while waiting for harvest. Furthermore, swine raising was not an additional cost for FCs since swine were only fed with formulated feeds from cassava and corn stocks from the previous harvest and gave stem and leaf cuttings of *Madre de Agua* and *Rensonii* which are both good protein supplement for ruminants.

The GK CPAR MPC

Membership increased from 10 to 35 active members. The money received from their payment was

further revolved among members with interest. One of the approved cooperative's policies was to minimize the acceptance of new members. Hence, all members were able to avail of the production loan from the project. As of December 31, 2015, the total seed money and interest income of the CPAR Coop had reached to PhP229, 990.00 from the initial seed money of PhP of 179,990 (CY 2010-2015), with an increment of 28%.

The manner of accepting new members of the GK CPAR cooperative supports the case studies of IFAD on sustainability. This project did not rush to create quick outputs but promoted engagements in a slow and patient process of group formation, as well as, to gain trust and encourage participants at the community level. Although this approach meant only minimal tangible progress during the early years, it has lead to a group of people with high potential for sustainability (Tango International, 2009).

It had an exceptional record as a cooperative. Gango-Kinawe (GK) CPAR producers cooperative was highly empowered and self-reliant that they were flooded with various support from LGUs and GAs through financial and technical assistance, farm facilities and equipment and farm inputs. The total assistance was worth 7 million pesos. All these support truly facilitated in the different farming activities that reduced yield loses during harvesting, improved the quality of harvested products and it helped enhance the financial capacity of the cooperative. Officers and members were committed and understood the concept of CPAR.

In practice, empowerment and participation are closely linked (Oakley, 2011). The UNDP Report (1995) claimed that empowerment does not only mean promoting

Table 6
Inventory of Swine Dispersal and its Offspring CY 2013-2014

RECIPIENTS	NUMBER OF SWINE DISPERSAL		
	1st Dispersal	Payment	2nd Dispersal
1	1	2	
2	1	2	
3	1*		
4	1	2	
5	1	2	
6	1**		
7			1
8			1
9			1
10			1
11			1
12			1
13			1
14			1
TOTAL	6	8	8

* Not productive

** Boar

Table 7

Farm Machinery and Equipment availed with GK CPAR Cooperative from Different Government Organization and Local Government Unit CY 2014-2016

Supporting Agency	Description	Quantity	Amount PhP	Form of
LGU-Libona	Tractor & Accessories (2015)	1 unit	2M	Paid by Cooperative (15% equity)
DA RFO-10	Tractor and Accessories (2015)	1 unit	2M	Paid by Cooperative (15% equity)
LGU-DOLE	Corn production	33 hectares	1M	Grant
LGU-Libona	Cassava Chopper	1 unit	120K	LGU-Libona
LGU-Libona DA RFO-10	Organic swine production	Gilts and Boar	30	Grant
DA RFO-10	Hammer Mill	1 unit	100K	Grant
DTI	Cassava Chopper	1 unit	45K	Grant
NFA	Tie-up with NFA			
DA RFO-10	Solar Dryer	2 units	240K	Paid by LGU (Equity)
DA RFO-10	Flatbed Dryer	2 units	1.24M	Paid by LGU (Equity)

participation and capacity building. Its most significant context is to provide access to essential economic resources and to improve people's opportunities for better income.

Repayment Success

A cooperative policy which was to take over members' farm in case of failure to make any payments resulted to a 100% repayment rate. The repayment showed that the CPAR COOP is unique and has effective strategies and policies in disbursing and collecting loan payments.

The empirical model of Paxton (1996) explained that homogenous groups with good leadership training and prior history of working groups have a higher probability of repaying loans. However, the domino effect and matching probability were significant factors that influenced loan default, creating a destabilizing effect. This empirical model suggests that modification of project designs could enhance recovery.

Technology Adoption

The GK CPAR Production Cooperative had

positively responded to the technologies introduced. The integrated nutrient management (INM), i.e. a combination of organic and inorganic fertilizers was highly appreciated by the farmers. This was based on the initial results on crop yields and the reduction in the use of inorganic fertilizers in favor of organic fertilizers.

To date, this technology had been adopted by most farmers in three communities. The increased 35 FC members at present from the initial count of 10 chose to continue their membership and adopted the CBFS technology introduced. Members' adoption of technology was monitored through the cooperative since farmers application of technology introduced was the cooperatives top membership policy. Thus, there is a 100% technology adoption on CPAR farmer co-operators.

There were 137 corn farmers from Barangay Kiliog of Libona located adjacent to Kinawe and Gango who adopted the technology practiced by Gango and Kinawe CPAR FCs. There were also 261 non CPAR members from Kinawe and 204 non CPAR members from Gango who adopted the technology introduced. Out of the 708 non CPAR members from the three barangays (Kinawe, Gango

Table 8

Total Seed Money and Repayment Rate on CPAR Corn-Based Project CY 2010-2014

Particulars	Year/Cropping Season												
	2010		2011		2012		2013		2014		January 2015	Increment	
	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Total		
No. of FPs served	10	10	10	10	10	10	10	10	10	10	10	30	
Seed Money (PhP)	179,990	184,990	189,990	194,990	199,990	204,990	209,990	214,990	219,990	224,990	224,990	224,990	25%
Repayment (PhP)	179,990	184,990	189,990	194,990	199,990	204,990	209,990	214,990	219,990	224,990	224,990	224,990	
% repayment	100	100	100	100	100	100	100	100	100	100	100	100	

and Kili-og), 602 or 80% of non CPAR members adopted the technology and eventually increased to 85% by 2015. As long as farmers continue to adopt the suggested and more appropriate technologies and apply these to their farms, the economic and environmental benefits are to be expected (Catacutan et al., 2004). The active involvement and commitment of the officers and members were significant.

CONCLUSIONS

From the previous practice, mono-cropping system, farmers learned to shift using diversified cropping systems, livestock integration, and value-adding technologies through the intervention of CPAR technologies. The adoption of integrated corn-based farming systems resulted in improved productivity (40%) and profitability (111%). The concepts of CPAR demonstrated a significant impact on the social, economic, technological and environmental aspects of farming communities. This also enhanced awareness on sustainable farming practices and climate change associated risks, provided more opportunities to sustain a productive and profitable farming enterprise. Since the project was sustained, it created a direct testimony on the feasibility of technology interventions resulting in 100% adoption among its members and 80% to 85% of adoption among the neighbouring farm areas.

The institutionalization of CPAR key elements, with the community's commitment and action, combined with innovations and suitable technologies through time served as proof of Suitable developmental interventions importance. Furthermore, farmers' involvement and participation in the CPAR project improved their income and uplifted their livelihood. Such progress turned their lives around that made them potential assets to the community.

RECOMMENDATION

This community project exhibited slow group formation but nonetheless, showed progress through time. Thus, this encouraged farmers to generate more ideas that could increase productivity and profitability. The value-adding interventions provided an opportunity to community members to be more productive. They could become entrepreneurs of their own demand-driven products of interest that could augment their family income. Poverty in the rural areas or countryside can be easily addressed and worked out if farming communities are equipped with accurate skills and dedication to achieve agricultural productivity, profitability, and sustainability.

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