

# PARTNERSHIP FOR SUSTAINABLE UPLAND DEVELOPMENT AMONG AGRARIAN REFORM BENEFICIARIES IN BUKIDNON SETTLEMENTS, SOUTHERN PHILIPPINES

<sup>1</sup>Judith D. Intong\*, <sup>2</sup>Anthony M. Penaso and <sup>1</sup>Reynaldo L. Intong

## Abstract

A development project was implemented by government agencies with people's organization in three upland settlement areas in Bukidnon Province, Southern Philippines to provide alternative source of livelihood to beneficiaries of the agrarian reform program of the government. Specifically, the project aimed to enhance farmers' knowledge and skills on small-scale dairy production and management; augment the income of the upland farmers by introducing an additional agricultural activity, and assess perceived benefits and problems encountered by the farmers in the implementation of the project. A state university, the local government units in the settlement areas and the Department of Agrarian Reform provided technical, financial and other infrastructure support to the farmers and their local organization. Interventions included provision of capability building activities which changed farmers' knowledge and skills on dairy production and management. As a result, 92 upland farmers in 14 villages produced 158 calves and realized additional income from selling dairy milk in school canteens, bus terminals and in the neighborhood from the 175 cows provided by the project. Farmers' utilized additional income to support farm and home needs as well as school needs of their children. The project generated local employment, provided available fresh milk in the neighborhood, utilized farmers' vacant time and created a cleaner environment in the villages. In general, the project provided a mechanism whereby the government and the local people could collaborate to improve the livelihood of agrarian reform beneficiaries in upland communities.

*Keywords:* upland development, agrarian reform program, development partnership, rural livelihood

\*Corresponding Author: Judith D. Intong, jdsintong@yahoo.com

## 1.0 Introduction

People are the centerpiece of any development effort. They are the key resources who will take responsibility of their personal, family and community development. About three-quarters of the poor people who subsist on less than \$1 a day are found in developing countries (Dixon, Gulliver and Gibbon, 2001). This situation calls for massive interventions to enhance human resource development through partnership. Development among the people could be effected through the delivery of extension services and vital infrastructures. Knowledge and skills gained and developed from extension activities are essential ingredients to empower an upland community.

The Philippines is generally hilly or mountainous with more than half of its national territory (59%) categorized as uplands providing home to about 20 million Filipinos (NSO, 2003). Its upland resources are challenged by two development issues: food for the increasing population and a denuding area for food production (Gascon, Gascon & Takahashi, 2006). Unlike level areas, hilly lands pose restrictions on agricultural production through soil erosion, sedimentation and floods. The growing population threatens sustainable productivity in the uplands. More importantly, the uplands offer the last refuge to the Philippine poor in times of economic and political upheaval.

Consequently, upland households experienced poverty caused by low productivity, low income, lack of employment opportunities resulting to food insecurity, malnutrition, and low level of education which threatens

peace and order in the community. It is therefore essential to provide alternative entrepreneurial ventures to improve food security and usher peace and progress in the uplands. With appropriate and adequate technical and infrastructure support, energy and potentials of the dwellers could be harnessed to sufficiently contribute to upland development.

In 1960s and 70s, Mindanao in Southern Philippines has been the melting point of the transmigration program of the government. Filipinos from thickly populated far north and the neighboring Visayas islands (central Philippines) were transmigrated to Mindanao where the Department of Agrarian Reform (DAR) prepared settlement areas for the in-migrants. Three settlement areas in the province of Bukidnon particularly in the municipalities of Maramag, Pangantucan and Kalilangan were established for the in-migrants. These settlement areas were the focused of the DAR project called Mindanao Sustainable Settlement Area Development (MINSSAD Project Document, 2004).

In Bukidnon, agriculture remains to be the major industry in the settlement areas. About 50-90% of the economic activities in these areas are purely agricultural or agri-based in nature. Similarly, more than 50% of the household incomes are derived from agriculture. Agricultural activities in the settlement areas were characterized by low productivity due to monoculture or mono cropping practices, soil depletion and lack of support services and facilities such as credit, market and rural infrastructure. Majority of the settlement areas have rolling to mountainous terrains which are largely eroded

or denuded. Some of these areas are presently devoted to or are potential areas for agro-forestry development.

The MINSSAD project envisaged to alleviate poverty and help increase income among the farmers in the settlement areas through technology transfer. Foltz (2003) offered four (4) hypotheses in explaining innovativeness of farmers towards agricultural technology. Learning-cost hypothesis suggests technologies will diffuse fastest in areas where information about the technology is most readily available. Capital scarcity proposes that new technologies will diffuse fastest among those who have best access to capital. Economic theory states that increase in the prices of natural resources should cause farmers to switch to techniques that use fewer farming resources. Resource scarcity hypothesis suggests that new technologies will diffuse at their own pace depending on relative prices of resources in the area.

The MINSSAD project considered the learning-cost and capital scarcity theories in conceptualizing the project. The interventions of the project include capability building activities, technical expertise; provision of dairy cows, milking pails and biologics as well as the establishment of a milk processing center. Figure 1 presents the conceptual model of the study showing the partnership of the different agencies in implementing the project components within the settlement areas to improve and sustain household income in the uplands.

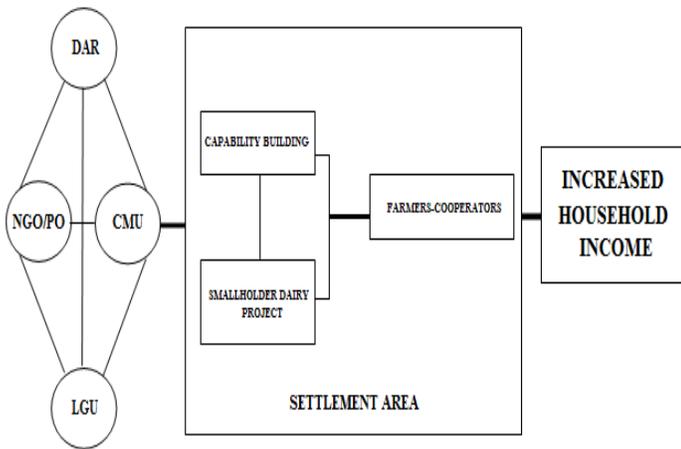


Figure 1. Conceptual paradigm of the MINSSAD project for Bukidnon settlement areas

In particular, the Central Mindanao University (CMU) at Musuan, Bukidnon, a state-owned higher education institution in Southern Philippines, was contracted by the DAR to implement the Agricultural and Environmental Development, and Institutional Development components of the MINSSAD Project for Bukidnon settlement areas (Fig. 2). The MINSSAD Project covered the three municipalities of Maramag, Pangantucan and Kalilangan with 14 barangays (villages) for duration of five years which terminated in 2010. Since then, the project has

been institutionalized at the three (3) local government units.

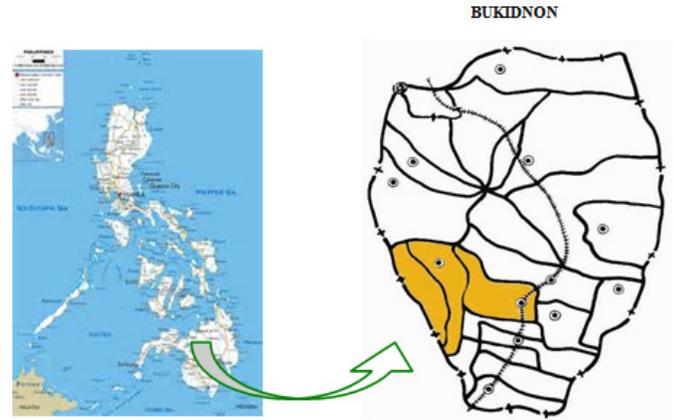


Figure 2. Map of the Philippines showing the location of the Settlement areas in Bukidnon province

More specifically, the project sought to enhance farmers’ knowledge and skills on small-scale dairy production and management; augment the income of the upland farmers by introducing an additional agricultural activity, and assess perceived benefits and problems encountered by the farmers in the implementation of the project.

## 2.0 Research Methodology

### Components of Project

The Project has two components: capability building component and smallholder dairy project component.

The Capability Building Component provided technical support for farmers by demonstrating a technology at farm level particularly on dairy production & management. This included technical training, cross visit, on-the-job training and skills enhancement trainings on dairy nutrition and health. This is aligned with the learning-cost hypothesis espoused in this project.

Consistent with the hypothesis on capital scarcity, the Smallholder Dairy Project component was responsible in procuring dairy animals for dispersal together with milking pails and biologics, determining farmer-cooperators, as well as the day-to-day management of this project component. A Dairy Processing Center was established in one of the settlement areas particularly at the municipality of Pangantucan to gather, process and market dairy products of farmer-cooperators. The Pangantucan settlement area was chosen as the site of the Processing Center because it is strategically located at the center of the three (3) settlement areas.

### Management of the Project

In general, the MINSSAD project was implemented through a partnership among the Department of Agrarian Reform (DAR) for the funding and overall supervision represented by the regional and provincial DAR offices in

Region 10 and Bukidnon; the Central Mindanao University (CMU) as technical service provider and for the day-to-day project management; the local government units (LGU) through a Settlement Management Unit (SMU), represented by the mayors and municipal agricultural officers of the three settlement areas, for the identification of cooperators and monitoring of the project; non-government organizations (NGO), represented by a private consultancy firm, for community organizing prior to animal dispersal; and the concerned people's organization (PO), the PAMAKA (Pangantucan, Maramag and Kalilangan) Cooperative, for social preparation and management of the Milk Processing Center based at Pangantucan, Bukidnon.

At CMU, the MINSSAD Project was managed through the policy committee as the policy-making body headed by the DAR MINSSAD Executive Director and co-chaired by the CMU President; the operations committee for the general operations of the two project components headed by the CMU Vice President for Research and Extension and co-chaired by the Provincial Agrarian Reform Officer of Bukidnon, and the project implementing team for the implementation of each project component headed by the CMU Director of Extension for the Capability Building component and an Animal Science Professor from the CMU Department of Animal Science for the Small-holder Dairy Project component. The two project components operated interdependently with each other. The training, cross-visit activities of the Capability Building Project component formed part of the requirements for a farmer to qualify as cooperator of the Small-holder Dairy Project.

There were policies encompassing implementation of each project component. To qualify as farmer-cooperators (FCs), CMU, DAR and LGU technical personnel assessed the location, accessibility, as well as availability of water supply of the farmers' farms. In addition, farmers were required to participate in the capability building activities including on-the-job training at the CMU Dairy Project. Similarly, each farmer was required to establish a 1,000 to 1,500 sq.m. pasture planted with recommended legumes and forage grasses as well as construct an animal shed prior to dispersal of dairy animals. In addition, farmers agreed to provide feeds, medicine and other equipment/materials as equity participation in the project. Upon satisfaction of the requirements, each farmer-cooperator was provided with at most two (2) heads of dairy cows for milk production, milking pails and biologics. The policy mandated FCs to pay back to the project one (1) dairy cow for every dairy cow received which will be rolled-over to the next batch of farmer-cooperators. Similarly, FCs are obliged to pay in-cash for negligence leading to loss or death of dispersed dairy cows.

The CMU Project Implementing Team composed of professors in animal science, veterinary medicine and agricultural extension conducted weekly monitoring and

submitted regular reports to the MINSSAD management. Aside from the visits, survey questionnaires and pre/post tests were developed and administered among the FCs to provide benchmark information as well as determine changes in knowledge and skills; income realized; benefits derived and problems encountered from the project.

### 3.0 Results and Discussion

#### *Farmer-cooperators' attributes*

The project has a total of 129 farmer-cooperators. In general, the farmer-cooperators were middle-aged (45-46 years old), about 27% of them reached or graduated college, 84% engaged primarily in farming, 87% Roman Catholics, 84% originated from the Visayas groups of islands, 60% have resided in their present villages for more than 30 years; 68% owned 1-3 hectare-farms (42%) and all were members of farmers' organizations.

#### *Enhancing farmers' knowledge and skills on dairying*

The experts on animal production and veterinary medicine from the Central Mindanao University trained the 129 farmers on dairy production and management including health management. Results of pre and post tests indicated a higher percentage change in knowledge level in the nutrition modules (6.25%) compared to the health modules (5.1%) (Fig. 3).

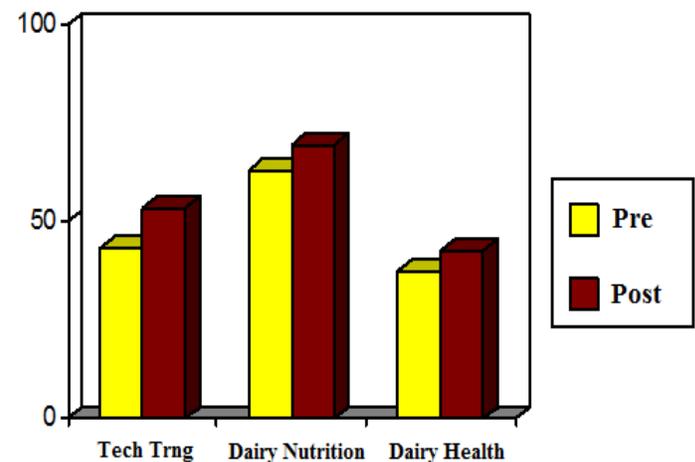


Figure 3. Change in knowledge level of farmers on dairy nutrition and health.

The results showed difficulty of farmers in diagnosing animal diseases as well as in recalling preventive and control animal health measures. This also implied that farmers could relate more easily with topics on feeds and feeding than on prevention and control of diseases in dairy animals. Consequently, two (2) skills enhancement trainings on dairy nutrition and herd health management were conducted by CMU at the settlement areas attended by 34 farmers.

Moreover, a total of 165 farmers and members of the Settlement Management Units have visited different

dairy farms in Davao City and in the provinces of Misamis Oriental and Bukidnon. During the farm visits, farmers were able to interact with experienced dairy farmers. Furthermore, 101 farmers in separate batches, spent two (2) days on-the-job training (OJT) at the CMU Dairy project where they practically took over the farm activities of the CMU Dairy project under the supervision of the project team.

From the OJT, farmers perceived that their skills in dairying have improved substantially, except in milking using machines (Table 1).

Table 1. Perceived change in skills of farmers in dairying as a result of the OJT

Learning Activities	Mean Score (N=72)	Adjectival Rating
Hand milking	3.67	Very high
Mechanized milking	2.18	Low
Feeding cows	3.98	Very high
Determining quantity of feeds for cows	3.72	Very high
Pasture establishment	3.73	Very high
Making UMMB	3.83	Very high
Silage making	3.48	High
Caring the calves	3.49	High
Castrating cattle	3.44	High
Dehorning	3.66	Very high
Ear notching	3.24	High
OVER-ALL MEAN	3.49	High

In general, the MINSSAD Small-holder Dairy Project has implemented extensive capability building activities to upland farmers to ensure successful application and to facilitate sustainability of the dairy production technology at farm level. Keil et al. (2005) emphasized that information and knowledge of a given technology is a key to adoption of agricultural practices. Farmers must have information about new technologies before they can consider adopting them (Doss 2003). Access to information as well as infrastructure support could increase innovativeness of farmers towards agricultural technology (Foltz 2003).

### *Increasing farmers' income through dairy production*

#### *A. Dairy cows dispersed*

A total of 175 dairy animals were procured locally. Majority of these animals were offspring of dairy animals imported by the National Dairy Authority from New Zealand and Australia. Majority of the dairy animals procured and dispersed to farmers were pregnant as tested by the project team. The Pangantucan settlement area received 75 cows as it has the most number of farmer-cooperators, followed by the Maramag (57) and

Kalilangan (48) settlements. Depending on the results of the farm evaluation, some farmer-cooperators received two (2) dairy cows, while others got one (1) dairy cow.

Besides, five (5) bulls were procured by the project for natural breeding as the artificial insemination (AI) component of the project had not been in place during the early part of project implementation. The five (5) bulls were distributed by farmer-cluster based on the number of cows dispersed in the area: two (2) bulls for Pangantucan farmer-cooperators, another two (2) bulls for Maramag farmers and one (1) bull for Kalilangan farmer-cooperators. Specifically, the bull was given to a farmer-cooperator whose farm is accessible to the other farmer-cooperators in the cluster. Overall, a total of 92 farmer-cooperators received 180 dairy animals from the project.

#### *b. Calves produced*

From the 175 dairy cows dispersed, a total of 158 calves were produced: 83 calves were males and 75 were females. Pangantucan produced the highest number of 57 calves, followed by 54 calves in Maramag and 47 calves in Kalilangan settlement area. The female calves are needed by the farmers for the repayment of the dispersed dairy cows. Overall, the cows showed an 80% calving performance.



Plate 1. A farmer-cooperator with her dairy cow and calf.

During the project implementation, a total of 13 dairy cows were collected as repayment from 11 farmer-cooperators. These animals were redistributed to the second batch of farmer-cooperators following similar evaluation process.

#### *c. Dairy milk produced*

About 72% of the farmer-cooperators milked their animals producing 3-6 liters of milk per day. The farmers marketed their cow's milk as fresh milk and some processed them into choco milk and ice candy. The

Cooperative kept part of the farmers' sale as additional capital build-up. Private milk processors bought the fresh milk at much higher price but on limited quantity. The PAMAKA Cooperative bought and processed the fresh milk at the Milk Processing Center. Cow's milk were sold either as fresh milk or processed into ice candy or choco milk at school canteens, Philippine Carabao Center at CMU, town market or peddled in the neighborhood. Farmers' income from fresh dairy milk ranged from Php15.00-Php40.00 per liter or an additional income of Php45.00-Php240.00 daily depending on quantity of produce.



Plate 2. Processed milk products sold in the market

#### *Benefits derived by farmer-cooperators from Dairying*

Results of the monitoring survey among farmer-cooperators show that income from dairy cows' milk was used to buy animal feeds, home needs and school needs; pay farm labor, and kept as savings. In addition, farmers have observed changes in their environment caused by dairying: there is an increasing curiosity of the people to raise dairy cow, local people are hired for milking cows and gathering forage grasses, there is availability of fresh milk in the neighborhood with children starting to drink fresh milk and other processed dairy products, farmers' slacked time is used for dairying and the environment becomes cleaner with grasses are used as forage for animals.

In general, the perceived benefits attributed to the project could indicate its potential sustainability in these upland communities. Rogers (1995) emphasized that success of development programs depends on close compatibility of the communication intervention with client's needs. The early economic gains derived from the project may help alleviate poverty in these upland communities that could support success of the agrarian reform program of the government.

#### *Problems encountered by farmer-cooperators in dairying*

The project incurred a total mortality of 67 animals with a mortality rate of 38.28% during the whole project duration or 7.65% mortality rate per year. The Pangantucan settlement registered the highest mortality of 30 animals

(44.77%), followed by Kalilangan settlement with 19 (28.35%) and the lowest is Maramag settlement with 18 animals (26.86%).

As diagnosed by the project veterinarian, causes of animal death included abortion, dystocia, encephalitic listeriosis, extreme debility, asphyxiation, snakebite, acute pneumonic pastereiosis, sub-acute to chronic pneumonia, chronic suppurative pneumonia and malnutrition.

Moreover, farmers encountered problems on susceptibility of dairy animals to diseases; animals need extra care, inaccessibility to veterinarians; less available pasture grasses particularly during dry season; burden in waking up early to milk the animals; the need to plant forage grasses; difficulty of animals to get pregnant; high animal mortality and the need for additional farm labor. It is observed that the major constraint to adoption of dairy production technology among farmer-cooperators is their inaccessibility to financial and infrastructure support like funds to buy feeds, medicine and other materials/equipment necessary for dairying. As part of the agreement, farmers should provide feeds and other materials/equipment as their equity in the project. This could help dispel the notion of 'dole-out' among government projects and enhance farmers' ownership of the project. Foltz (2003) noted that farmers who wanted to adopt a new technology must have access to capital to pay for the technology. This could be done by establishing credit facilities to increase input use of a new technology (Manganaan, 2003). Kulecho (2006) stressed however, that efficient technical and institutional support services were the critical factors influencing adoption of small-scale low-cost drip irrigation in Kenya.

## **4.0 Conclusion**

The MINSSAD Small-holder Dairy Project employed a participatory approach to upland development by providing a mechanism for partnership with government, non-government and people's organization in three (3) upland settlement areas in Bukidnon Province, Southern Philippines to support the agrarian reform program of the government. The project offered an avenue where the local people participate in community development through collective efforts. These joint efforts have harnessed the knowledge and skills of the upland farmers on dairy production and management and provided them with livelihood opportunity which augmented their farm income.

Farmers' perception of the positive results attributable to the project could facilitate integration of this new livelihood program into the upland farming system thus, contribute to alleviating poverty in the uplands. However, partner agencies should give serious considerations to the problems encountered by the farmer-cooperators in project implementation and management.

In general, the project showcases a partnership

between and among government institutions, non-government organization and people's organization which offered the essential impetus for upland development. People's organizations provided the third sector between public and private sectors where members' interests are advanced through collective action. This active involvement of the farmers and the local government units with the assistance of the DAR and CMU triggers people empowerment in these upland settlement areas in Bukidnon.

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Local Government Units: Maramag, Pangantucan & Kalilangan, Bukidnon.

Central Mindanao University, University Town, Musuan, Bukidnon.

Farmer-cooperators in the settlement areas in Maramag, Pangantucan and Kalilangan, Bukidnon.

## References

Dixon, J., Gulliver A. & Gibbon D. (eds). (2001). *Farming systems and poverty*. Food and Agriculture Organization. Rome.

Doss, C. R. (2003). *Analyzing technology adoption: challenges and limitations of microstudies*. <http://www.yale.edu/Macmillan/faculty/papers/7.pdf> [Accessed July 5, 2009].

Foltz, J.D. (2003). *The economics of water-conserving technology adoption in Tunisia: an empirical estimation of farmers technology choice*. <http://www.aae.wisc.edu/foltz/EDCC1.pdf>. [Access July 15, 2009].

Gascon, C.N., Gascon, A.F. & Takahashi, K. (eds). (2006). *Agroforestry in the Philippines: experiences and lessons learned in Mt. Banahaw, Hanunuo Mangyan and some community-based forestry projects*. Japan International Research Center for Agricultural Sciences, Southern Luzon Polytechnic College and UPLB.

Keil, A., Zeller, M. & Franzel, S. (2005). Improved fallows in smallholder maize production in Zambia: Do initial testers adopt the technology? *Agroforestry Systems*, 64 (3), 225-236.

Kulecho, I.K. & Weatherhead, E.K. (2006). Adoption and experience of low-cost drip irrigation in Kenya. *Irrigation and Drainage*, 55 (4), 435-444.

Manganaan, E.R. (2003) *Assessment of farmers' participation in some components of intervention*. Introduced by Kapwa Agroforestry Project Davao, Phils.

Mindanao Settlement Area Development Project Document. (2004). Department of Agrarian Reform, Region 11.

National Statistics Office (NSO). (2003). *Census of the Philippines 2003*. Manila, Philippines.

Rogers, E. (1995) *Diffusion of innovations*. (Fourth Edition), New York, Free Press.