The Republic of the Philippines
Office of the Presidential Adviser on the Peace Process
(OPAPP)

The Republic of the Philippines

The Project for Capacity Building for Community Development in Conflict-Affected Areas in Mindanao

FINAL REPORT

Summary

July 2016

Japan International Cooperation Agency (JICA)
IC Net Limited
Central Consultant Inc.

EI
JR
16-121

The Republic of the Philippines
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Abbreviations

ANC	African Night Crawler
ARMM	Autonomous Region in Muslim Mindanao
ARMMAARRDEC	Muslim Mindanao Agriculture & Aqua-Marine Resources Research Development & Extension Consortium
DPWH	Department of Public Works and Highways
ATI	Agricultural Training Institute
BDA	Bangsamoro Development Agency
BFAR	Bureau of Fisheries and Aquatic Resources
BFAR-MFFTC	Bureau of Fisheries and Aquatic Resources - Mindanao Freshwater Fisheries Training Center
BTC	Bangsamoro Transition Commission
CAAM	Conflict-Affected Areas in Mindanao
CAB	Comprehensive Agreement on Bangsamoro
CEPSEL	Community Empowerment Program for Sustainable Economy and Livelihood
CDA	Cooperative Development Authority
CD-CAAM	The Project for Capacity Building for Community Development in Conflict-Affected Areas in Mindanao
CDP-ELA	Comprehensive Development Plan – Executive Legislative Agenda
CenMin	Regional Management Office of Central Mindanao
CMO	Central Management Office
CO	Community Organizer
DA	Department of Agriculture
DAF-ARMM	Department of Agriculture and Fisheries in the Autonomous Region in Muslim Mindanao
DGR	Daily Growth Rate
DOLE	Department of Labor and Employment
FAB	Framework Agreement on Bangsamoro
FCR	Feed Conversion Rate
FPJ	Fermented Plant Juice
FT	Farmer Trainers
FTF	Farmer-to-Farmer extension approach
GAP	Good Agricultural Practices
GPH	Government of the Philippines
GOJ	Government of Japan
ILO	International Labor Organization
IMO	Indigenous Microbial Organism
IP	Indigenous people
IRA	Internal Revenue Allotment
JICA	Japan International Cooperation Agency
LBT	Labor-Based Technology
LGU	Local Government Unit
MAO	Municipal Agriculture Officer
MBRLC	Mindanao Baptist Rural Life Center
ME	Municipal Engineer
MILF	Moro Islamic Liberation Front
MLGU	Municipal Local Government Unit
MNLF	Moro National Liberation Front
MSU	Mindanao State University
MOA	Memorandum of Agreement
MPDC	Municipal Planning and Development Coordinator
OHN	Oriental Herbal Nutrients

OJT	On-the-Job Training
O&M	Operation and Maintenance
PAO	Provincial Agriculture Office
PCM	Project cycle management
PDCA	Plan-Do-Check-Act
PHP	Philippine Peso
PMO	Provincial Management Office
PMU	Project Management Unit
PO	People's Organization
POO	Plan of Operation
PPOO	Provincial Project Operation Officer
ROI	Return On Investment
RP	Resource Person
RPOO	Regional Project Operation Officer
RMO	Regional Management Office
RRDCC	Regional Research and Development Coordinating Council
SERD-CAAM	Socio-Economic Reconstruction and Development of Conflict-Affected Areas in Mindanao
TOT	Training of Trainers
TRAC	Tawi-Tawi Regional Agricultural College
UAS	Upi Agricultural School
USM	University of South Mindanao
VET	Value Enhancement Training
VTT	Value Transformation Training
WFP	World Food Program

1. Background and objectives of the CD-CAAM

Development in the conflict-affected areas of Mindanao (CAAM) has been stalled for the last four decades, and the prolonged conflict in these areas has further exacerbated poverty among the population. In 2001, the peace talks between the Government of the Philippines (GPH) and the Moro Islamic Liberation Front (MILF) commenced, and confidence building agreements on Security and Rehabilitation and Development were signed. These agreements provided for the cessation of hostilities between the forces of the government and the MILF, and the start of rehabilitation and development of the CAAM. Against this background, the Bangsamoro Development Agency (BDA) was created to determine and then lead and manage the relief, rehabilitation and development projects in the CAAM.

The Project for Capacity Building for Community Development in Conflict-Affected Areas in Mindanao (CD-CAAM) was launched in February 2012 to develop capacities of the BDA as well as to establish an effective community development mecanism in CAAM. The implementation of the CD-CAAM project is largely divided into two phases, namely the pilot phase (from February 2012 to April 2015) that includes the preparatory and compilation phase, and the extension phase (from May 2015 to August 2016).

During the pilot phase, three different pilot community development projects on agriculture, fisheries and road rehabilitation and maintenance have been carried out in two municipalities jointly by the BDA, the Local Government Unit (LGU) of Sultan Mastura and Matungao, and the JICA expert team. Through joint implementation of the pilot projects, the capacities of the BDA to manage more conflict-sensitive community development interventions were greatly enhanced. Moreover, the approaches, process, and methods of community development as well as specific technologies tested during the pilot project implementation were compiled in the Community Development Guidelines and basic technical manuals. In the Guidelines, the more conflict-sensitive community development approach is named the CD-CAAM model, which is underlined by the so-called Six Pillars of CD-CAAM. Built upon the results of the pilot phase, the extension phase was carried out to further strengthen the BDA's capacities to promote the CD-CAAM model to the wider population within future Bangsamoro areas. The extension phase put a particular emphasis on the BDA's capacity on the Farmer to Farmer (FTF) extension approach, internal technology transfer, identification and implementation of new community development projects, as well as financial management and procurement for community development projects.

2. Establishment and Strengthening of the CD-CAAM model

Based on the results of the pilot phase, the so-called CD-CAAM model has been formulated, which includes the processes/steps and activities listed as below;

SN	Major Process/Step	Description
1	The selection of municipalities	Following the set criteria and processes, selection of the target municipalities is carried out through short-listing practice and field validation survey.
2	Social Preparation 1	Social Preparation 1 is carried out in two tiers of mutually supplemental activities namely, community profiling and a technical survey. Community profiling aims to deepen the understanding of the target municipalities and barangays through a questionnaire survey, semi-structured interviews resource mapping. Whereas a technical survey aims to further emphasize a detailed sector study within the target municipalities, and to identify the most relevant community development projects.
3	Formulation of the Project Implementation Plan (PIP)	Based upon the results of Social Preparation 1, the detailed project plans is formulated to guide the implementation of the respective projects. During this process, project sites are also selected in line with the barangay selection criteria and processes, thereby ensuring objectivity and transparency in selecting the most appropriate project sites.
4	Social Preparation 2	Social Preparation 2 aims to prepare for the actual implementation of the community development projects, which includes selecting the direct beneficiaries of the projects and sensitizing them, the relevant community leaders and stakeholders to the contents, visions and values underlining the projects. Social preparation 2 also aims at collecting basic data about the direct beneficiaries of each project. In particular, the baseline survey collected data and information on the initial household situation of the beneficiaries of the agriculture and fisheries pilot projects, as well as data and information related to each pilot project.
5	Implementation of the pilot projects	Following the PIP, a series of training are carried out for projects mainly through workshop and on-the-job training (OJT) while regular monitoring/follow-ups are also carried out to ensure effective and sustainable capacity building at the target communities.
6	Technology transfer through the Farmer-to-Farmer (FTF) extension approach	Activities of the FTF starts with the training of trainers (TOT) wherein farmers who has already acquired relevant technologies are trained as the farmer trainers (FT), and then the FTs provide training to other farmers.

During the extension phase, the CD-CAAM model has been further established through strengthening the FTF extension approach, staring new community development projects, as well as implementing the model in a remote island province.

The CD-CAAM model is illustrated by the following six distinct characteristics, or the six pillars.

Pillar 1: Balancing “development needs” and “development potential”

The first pillar addresses both development needs and development potentials in order to ensure greater impact of community development interventions. Development needs refer to communities’ priorities, whereas development potential refers to whether interventions can have a wider economic and socio-economic impact in terms of area and population. The activities of social preparation, particularly the community profiling and technical survey are the linchpins that provide the planners with necessary

information to determine appropriate community development interventions, training contents, project sites, participants and so on while considering the balance between development needs and potential.

Pillar 2: Emphasizing a strong partnership with LGUs

The second pillar emphasizes strong partnership with the LGUs where the community development interventions are implemented. Establishing strong partnerships with LGUs was a critical task in terms of ensuring the successful implementation and sustainability of the community development projects. The local chief executive and other development officials such as the Municipal Agriculture Officer (MAO), the Agricultural/Fisheries Technician, the Municipal Planning and Development Coordinator (MPDC), as well as the Barangay LGU officials/staffers are the key partners. The CD-CAAM model also emphasizes multi-sector interventions simultaneously within target municipalities, which bolsters LGU's interest in and commitment to providing technical and financial support. Strong commitment from the LGU increases the sustainability, impact, and visibility of interventions, thereby attracting the attention of other potential development partners.

Pillar 3: Ensuring inclusiveness

The third pillar aims to ensure inclusiveness of community development. As the prolonged armed conflict often fragments the socio-cultural fabric of communities, it aims to contribute to bridge different socio-cultural and political groups in the communities. Under the CD-CAAM model, groups are formed for respective community development projects, and it advocates that groups include members with diverse backgrounds in terms of ethnicity, religion, gender, political affiliation, and so on. Women are also encouraged to play important roles in every aspects of activities and decision making.

The beneficiary groups are also encouraged to register themselves as the official entity such as a Cooperative or a People's Organization (PO), which further institutionalize their group unity, and may make the group eligible for external supports and financial credit.

Pillar 4: Promoting a comprehensive management process

The fourth pillar emphasizes the entire income generation process of livelihood projects, including planning, production, processing, marketing, distribution, sales, and internal financial management. While many community development projects in Mindanao tend to put more focus on production, the CD-CAAM model looks more carefully at marketing and selling aspects so as to ensure sustainable income generation. The farmer groups are continuously encouraged to innovate and add value to the products to better market products as well as maximize the benefit by reducing the production costs. For example, introduction of organic fertilizer greatly reduced the cost by decreasing usage of chemical fertilizer and pesticides for vegetable production. Semi-organic production in also added value to the vegetables at the markets. In fisheries projects, the processing of the tilapia into dried fish is one way of adding value. So-called match making session is another interesting initiative to link producers with the markets and buyers.

Pillar 5: Mobilizing partnerships and networks with locally available resources

The fifth pillar promotes mobilization and utilization of locally available resources—technical, material, or human. Although Mindanao has experienced prolonged conflict, there are possibly abundant valuable resources locally. However, these valuable technical resources often remain untapped in CAAM. The CD-CAAM model ensures maximum use of locally (regionally) available (technical) resources such as universities and governmental and non-governmental technical resources, which strengthens the relevance and sustainability of interventions in CAAM's specific contexts. By ensuring the relevancy of interventions to local contexts, community people could replicate relatively easily community development activities introduced through the CD-CAAM.

Pillar 6: Promoting farmer-to-farmer extension of technologies

The last pillar of the CD-CAAM model is the FTF technology extension approach. Given the current shortage of financial and technical resources, extension of certain technologies within municipalities is a serious challenge faced by LGUs. Thus, the CD-CAAM model provides the TOT, and encourage famers to disseminate their technical knowledge and skills as a FT to other farmers in and out of their community. FTF aims not only to disseminate necessary technologies on livelihood to wider population in cost-effective way, but also to contribute to social cohesion and peacebuilding through intimate instruction between farmers of different communities.

3. Results of Community Development Projects

Different community development projects were implemented in the communities listed in the table below;

Sultan Mastura, Maguindanao	**Matungao, Lanao del Norte**	**Panglima Sugala, Tawi-Tawi**
Pilot Project for Vegetable Production and Marketing		
Macabiso: 20 beneficiaries	Puntod: 20 beneficiaries	
Pilot Project for Tilapia Culture, Processing, and Marketing		
Tambu (pond): 20 beneficiaries Solon (cage)	Cadayonan (pond): 20 beneficiaries Pasayanon (cage)	
Pilot Project for Road Rehabilitation and Maintenance		
Tariken (rehabilitation) Namuken (maintenance)	Cadayonan/Bubong Radapam (rehabilitation) Bangco/Batal (maintenance)	
Promotion of Vegetable Production and Marketing through the FTF approach		
Boliok: 30 beneficiaries	Matampay: 30 beneficiaries	Kulape: 10 beneficiaries
Promotion of Tilapia Culture, Processing, and Marketing through the FTF approach		
Tapayan: 15 beneficiaries (pond) Balut: 15 beneficiaries (cage)	Purok 3, Sta. Cruz: 15 beneficiaries (pond) Koriod, Sta. Cruz: 15 beneficiaries (pond)	

Project for Seaweed Production		
		Buan: 10 beneficiaries
Project for Goat Production		
Kirkir: 20 beneficiaries	Somiorang: 20 beneficiaries	Sumangday: 10 beneficiaries

(1) Agriculture Sector

In the pilot phase, technology transfer through the pilot project for vegetable production and marketing in the two municipalities was successfully carried out, and most of the basic technologies on vegetable cultivation were effectively applied by the beneficiaries at the demonstration farm and their own farms. Their knowledge and skills on selling was also improved to some extent because of marketing approaches used in the pilot project. 11 participants out of 20 have since acquired market destinations for individual farming. In Sultan Mastura, a few buyers came to observe the demonstration farm to buy vegetable products and to find out when the products would be harvested and ready for the market. In Matungao, through the practice of selling vegetables from the demonstration farm to Gaisano Shopping Mall in Iligan City, the beneficiaries from the pilot project and two other non-members signed an agreement with the Marketing Head of Gaisano Mall to collective supply 150-250 kg of pechay to the mall every three days. In addition, retailers within the Municipality of Linamon and Barangay Buruun of Iligan City also became a market destination for certain beneficiaries.

The beneficiaries pointed out that their attitude toward farming has greatly changed thanks to the pilot project. Some of the beneficiaries mentioned that they changed their attitude not only toward farming but also changed their attitude toward life more positively. In Matungao, the beneficiaries pointed out that another impact created from the pilot project in agriculture was the establishment of good relationships between Muslims and Christians. The collective work on the demonstration farm, aimed at common objectives, production, and profit, created and fostered a family-like atmosphere among them. Eventually, positive outputs in production and profit attributed to unify the members beyond different religions. Upon completion of the pilot project, the beneficiaries group of Sultan Mastura registered itself as a legal cooperative, and the beneficiaries group of Matungao was also officially registered as a farmer's association. These two examples of legal registration as groups is a sign of beneficiary consolidation. Most importantly, the beneficiaries realized economic gain through the pilot project and do not want to lose this positive momentum.

Additionally, one of the innovative practices of the pilot project in agriculture is the extension activity that was carried out by some beneficiaries to other farmers in Sultan Mastura under the supervision of MAO. According to MAO, a lack of manpower is one of the serious challenges that the Department of Agriculture (DA) faces in terms of technology extension/dissemination. As such, MAO and BDA have mobilized the beneficiaries who were trained by the pilot project to disseminate technology as volunteer instructors.

Built on such initiatives, in the extension phase of the CD-CAAM, the technology of vegetable production and marketing was expanded to other barangays within Sultan Mastura and Matungao using the Farmer-to-Farmer extension approach (FTF). FTF aims to supplement the agricultural extension activities of the government. Prior to conducting FTF, Training of Trainers (TOT) targeting the 1st beneficiaries in the municipalities was implemented. TOT was primarily managed by BDA, particularly Regional Management Office (RMO) with technical support from resource organizations.

Farms established for the extension purpose are called "practice farms" to differentiate them from the demonstration farms that were established for learning sites for the 1st beneficiaries in the pilot phase of CD-CAAM. The 2nd beneficiaries started cultivating vegetables as part of FTF activities. Unfortunately, the production was very poor in Sultan Mastura because dry spell/draught condition affected the plants before and during the harvesting season; thus, only tomatoes produced a positive profit. However, as the effects of technology transfer became tangibly recognizable, some 2nd beneficiaries began to apply the technologies that they had learned through FTF on their own farms. The 2nd beneficiaries of Matungao also understood the importance of most technologies that were introduced during FTF, and some beneficiaries tended to apply them. The extent of application of the technologies appears to be dependent on the land tenure situation among the beneficiaries. As a new effort for marketing of the products, matchmaking activity was organized in both municipality, which provided an opportunity not only to the producers but also to the buyers to learn more about the production capacity of the producers. Through this activity, the relationship between farmers and buyers was strengthened, and the 2nd beneficiaries were able to sell their products constantly. The numbers of walk-in buyers / traders increased as well.

Results of the extension phase proved that technology transfer using FTF is more understandable and an acceptable extension method by farmers. According to the 2nd beneficiaries and Famer Trainers, major advantages of FTF are as follows;

Firstly, FTs use the same language as the beneficiaries. This ease in communication makes technology transfer more efficient and effective. Moreover, both FTs and 2nd beneficiaries are farmers, which eliminates any hesitation to interact with each other. Open communication in terms of farmer terminology can be maintained which increases comprehensibility for both sides.

Secondly, FTs teach technology by illustrating how they work practically following a theoretical explanation in the lecture. The DA's extension activity only involves talking without any practical demonstration. In addition, FTF practices a two-way learning process because FTs also learn from the good practices of the 2nd beneficiaries during vegetable cultivation by observing the practice farm.

Thirdly, FTF establishes a good network among the 2nd beneficiaries and FTs. For example, the FTs can share markets, and the 2nd beneficiaries can ask the FTs if they can sell to the FTs' buyers or vice versa.

Moreover, FTs can refer buyers to the 2nd beneficiaries when FTs do not have sufficient supply in order to maintain a stable supply of vegetable for the buyers. Additionally, uniformity and standardization of vegetable cultivation, particularly organic–conscious farming, can be practiced in Matungao so that the Municipality becomes a well-known site to produce vegetables with fewer chemicals.
While FTF was effectively implemented and both 2nd beneficiaries and FTs recognized the advantages of the approach as an agriculture extension method, FTF should be institutionalized using the budget plan of LGU to further mobilize FTs who are now present in the Municipality.

Although problems and difficulties occurred during the implementation process, BDA is experienced in taking counter-actions to mitigate various challenges during a project's implementation. In particular, the RMO staffs in charge of agriculture (Regional Project Operation Officer: RPOO) has acquired vegetable production technology at a remarkable level. For example, the BDA radio program is now aired every Monday, which is hosted by the RPOO of RMO CenMin and includes topics on vegetable production and a question-and-answer segment with SMS senders and callers. The RPOO of RMO Ranaw was also invited to provide a lecture on vegetable production technologies on a daily program of a Local ICOM Radio within the Province of Lanao del Sur.

The project for vegetable production and marketing was also implemented in the municipality of Panglima Sugala of Tawi-Tawi Province by applying the so-called internal technology transfer method. Here, the BDA, particularly RMO support activities by applying experiences and lessons learned from previous activities implemented in Sultan Mastura and Matungao. The implementation mechanism used for the beneficiaries of Panglima Sugala was essentially the same as that used in the pilot phase. However, the absence of direct intervention by Japanese experts meant that the BDA Central Management Office (CMO) and RMOs, who experienced project management at the ground level in the pilot phase, provided supportive actions to the Provincial Management Office (PMO) Tawi-Tawi throughout the planning and implementation stages.

The degree of technology transfer shows a positive result. More than 30% of the participants in the group interview had already applied 19 of the 21 technological topics in their farming. Matchmaking was also conducted, and buyers from the Batu-Batu public market in Panglima Sugala participated in the activity. Most of the vendors showed interest in the vegetables on the farm, and some discussed buying them. One of the buyers told the beneficiaries that they were happy to know about the vegetables grown in this area because of the short supply of vegetables due to hot weather, resulting in a high cost of farm products in the market.

Eventually, farmers established the Kulape Kaadilan Farmers Association by registering at the Department of Labor and Employment (DOLE), Province of Tawi-Tawi, ARMM. The long-term goal of the association is to work together to sustain organic vegetable production in the province.

(2) Fisheries Sector

The project for the fisheries sector in Sutltan Mastura and Matungao introduced two different types of fish culture: pond culture and cage culture. During the pilot phase, in both practices, the beneficiaries managed to sufficiently feed fish throughout that culture's period, and the growth trend of cultured fish at all locations smoothly increased. They sold most of harvested fish directly to local people in the municipalities at reasonable prices: P 100–120/kg. Most of the customers admitted that their tilapia had a better taste and was fresher. The results of the harvest in two municipalities suggest that the profitability of the cage culture is better than that of the pond culture.

To add to the variety of fish culture practices, the pilot project introduced red tilapia seeds into the pilot sites. Additionally, after selling almost all of their marketable fish, the beneficiary groups tried to process dried tilapia (tilanggit) with the smaller fish, which remained in the ponds. They also sold it at a local market. The result indicates that smaller fish can be sold for a better price by processing them as dried fish. Training for community-based tilapia seed production were also held in both target municipalities and the beneficiary groups successfully produced tilapia seeds at their own sites. Some of the fish seeds were nursed in hapa-nets in preparation of the next fish production cycle, while the other seeds were sold or given to other communities or farmers for their fish culture activities.

During the implementation of the pilot project, many local people in the neighboring communities visited the project sites to directly observe the fish culture activities and listen to some advice from the beneficiary groups on preparing for fish culture. A few community groups and families who were stimulated by the pilot project started fish culture activities using their own capital.

During the extension phase, while culture technologies were transferred to the new farmer groups through FTF extension approach, the fishery sector has also implemented two new technologies in tilapia farming: one is the integrated fish farming using duck and another is the mono-sex culture. The former approach aims to reduce feed cost by using natural organisms and planktons that grow in pond water through fertilization with livestock manure. Integrated farming also aims to diversify the income source, as farmers can obtain income from both fish and livestock. Mono-sex culture refers to the selection of all-male tilapia through manual sexing for the cage and pen culture system. Mono-sex culture can produce a high yield compared to a mixed-sex population. Through FTF extension, the new farmer groups successfully harvested tilapia and sold them at a reasonable price.

Generally speaking, the technical and management capacities of BDA counterparts drastically went up through a various experiences in the project implementation. During the extension phase, BDA RMO, particularly the RPOO in charge of fisheries sector was able to lead the preparation for activities in coordination with the technical partner and JICA expert team. Following guidance from JICA expert team

and resource organization, the BDA staffs facilitated the TOT, and became able to carry out the training by themselves. With regard to actual implementation of FTF extension as well as new activities such as integrated farming/mono-sex culture, it is fair to say that the BDA mostly succeeded in facilitating the planned activities in effective manner, which produced satisfactory results given the limited time allocated for the extension phase.

Additionally, it is remarkable that the BDA has initiated its own extension work to disseminate technologies of tilapia culture to the wider population. The RPOO and other staffs with the farmer trainers from Sultan Mastura provided technical trainings as well as initial fingerlings in some cases to other farmers in Sultan Mastura and other municipalities in Maguidanao. The RMO Ranaw has also initiated its extension work to other communities. For example, it conducted the on-site guidance to the farmers in Barangay Cormatan and Daramba in the municipality of Poona Piagapo in Lanao del Norte, and provided them with fingerlings bought from 1st beneficiaries. Remarkably, the RPOO was asked to be a resource person (RP) for training on basic tilapia culture of the World Food Program (WFP), for the beneficiaries in the municipality of Masio, Lanao del Sur.

The project has developed the appropriate extension model for developing community-based fish culture, especially adapted to the Bangsamoro region. Based on the experience, the extension model should be extended to other communities. However, to start the fish culture activities, a community group has to prepare the initial capital to cover the construction costs of the fish ponds or cages and the operational costs of fish culture. According to the results of first harvest trials, the necessary initial capital reached P 50,000–60,000 for the pond culture and P 20,000–40,000 for the cage culture. This varies according to the scale of fish culture and the stocking density of the cultured fish. It is not a small amount for the local people and their communities. In the case of fish culture development, the most serious issue is how they acquire the financial assistance needed for the initial capital. Therefore, we should consider not only extension programs for developing fish culture, but also programs for financial assistance for beginning fish farmers. This means that the extension program should be convened alongside a financial program, such as a subsidy, loan, or micro-credit program.

In Tawi-Tawi, in the beginning, the project was expected to disseminate technologies of tilapia culture as an income generating source in Tawi-Tawi, which can be done through the internal technology transfer within the BDA. However, based on a technical survey conducted by the BDA and the JICA expert team, it was found out that marine species, rather than freshwater species, are more suitable for aquaculture in view of development needs and potentials in the area. As such, instead of internal technology transfer within the BDA, the seaweed culture was selected as a new livelihood project for the CD-CAAM model. In Tawi-Tawi, seaweed producers often experienced the uneven quality of product that led to an unstable market price. Thus, the project aims to improve the quality of seaweed culture, post-harvest, and the marketing of the finished product. The poly-culture of sea cucumber was also tested to give farmers a

further opportunity to diversify their income source.

The project adopted two types of seaweed farming methods, namely the stake-off bottom method and the floating method. On-the-job training was effectively conducted by the JICA expert teams and MSU-Tawi-Tawi for the BDA staffs and beneficiaries in Tawi-Tawi. In particular, the staff in charge of fisheries (Provincial Project Operation Officer: PPOO) is recognized by the CMO as one of the most capacitated staffs in spite of the limited time of the project. It is remarkable that the PMO was invited to represent the BDA at the Muslim Mindanao Agriculture & Aqua-Marine Resources Research Development & Extension Consortium (ARMMAARRDEC) Regional Research and Development Coordinating Council (RRDCC) meeting at Santa Maria, Zamboanga City.

(3) Road Rehabilitation and Maintenance

The pilot project for Labor-Based-Technology (LBT) included two different types of road works: road rehabilitation and maintenance.

The pilot roads in Sultan Mastura are composed of Sitio Padian-Kinugkungan Pilot Road Rehabilitation in Barangay Tariken, with a total length of 1.50 km, and Sitio Dungguan-Mareges Pilot Road Maintenance in Barangay Namuken, with a total length of 2.14 km. A two-barrel box culvert was implemented in the rehabilitation of Tariken to accommodate the large volume of flood water flow due to the insufficient capacity of existing pipe culverts. In addition, the single line of pipe culvert in the pilot road maintenance in Namuken was replaced with two lines of pipe culverts to accommodate the large volume of water during rainy season. This will also mitigate the constant flooding in the area during this time of the year. The pilot roads in Barangays Tariken and Namuken generated employment for 186 and 116 skilled and unskilled laborers from the local community, respectively within a period of about six months. The pilot roads in Matungao are composed of Cadayonan-Bubong Radapan Pilot Road Rehabilitation in Cadayonan, with a total length of 1.12 km, and Banco-Batal Pilot Road Maintenance in Banco, with a total length of 1.52 km. To mitigate flooding on the low-lying sections of the pilot road maintenance in Barangay Banco, a two-barrel reinforced box culvert was installed to accommodate the large volume of surface run-off during heavy rains. The piloting generated employment for 81 and 102 unskilled laborers from the community for road rehabilitation and road maintenance, respectively within a period of about four months.

The pilot project established a Project Management Unit (PMU) for the infrastructure sector, comprised of individuals from BDA CMO and RMOs, and the LGUs that engaged in all of the activities under the three major stages, i.e. (1) planning, (2) procurement and (3) implementation, monitoring and supervision. The project adopted the LBT and do-nou method using the “Pakyaw” contract system. Under this, community members were grouped into work teams and assigned to finish a specific task within a fixed contract amount and specific period of time.

The overall outcome of the capacity building interventions within the infrastructure sector succeeded in addressing the limited knowledge and skills of the BDA, LGU, and communities regarding LBT and "do-nou" method. During the implementation stage, one of the impacts was a change in perception of the BDA, LGU, and community members on the effectiveness of the LBT and do-nou method in road rehabilitation and maintenance. They gradually began appreciating and accepting the concepts as an alternative means to improve and maintain the rural road networks in lieu of the commonly used equipment-based methods. Through the extensive trainings on LBT and "do-nou" method, coupled with hands-on application through the pilot project implementation, the BDA, LGUs, and communities in the target areas become well-equipped with skills and knowledge to identify rural road distresses and deficiencies, their causes, as well as appropriate solutions and work procedures to improve road infrastructure and sustain its usefulness through proper maintenance processes and procedures.

However, with the current limited resources and technical personnel available in the LGUs to monitor and evaluate their road network, the management of community-based road development as a whole is difficult for them to sustain. In addition, the LGUs' linkage with technical institutions such as Department of Public Works and Highways (DPWH) to provide technical and financial support is not yet clearly established under the Bangsamoro entity. Should the local community have its own initiatives to intermittently monitor and maintain their local roads, the guidance of the local LBT facilitators is crucial to ensure that proper work methods and specifications are observed to achieve optimal effectiveness. Thus, the lack of technically capable personnel or the unavailability of trained LBT facilitators might also hamper the sustainability of the interventions. The roles and responsibilities of the BDA, as the catalyst of the technology, are crucial to the institutional, managerial, and technical sustainability of the initiatives of community-based read development projects. The BDA is expected to continue to advocate the application and replication of the technology to wider areas in Bangsamoro.

(4) Livestock Sector

During the extension phase, the project for goat production was implemented as a new livelihood option for the CD-CAAM model. As the extension phase lasts only around 15 months, a period which is shorter than the ordinary goat production cycle, special attention was paid to the most important stage of goat production, such as fattening, breeding, kidding, and selling.

The demonstration farm was established where the beneficiaries learned the basic idea and practical and financially attainable know-how on got production system which is finely adjusted to the local socio-economic and climatic conditions. As a one-size-fits-all model is not appropriate, three types of goat house, i.e. a commercial type, a semi-commercial type and a backyard type were constructed in Sultan Mastura, whereas two types, i.e. a semi-commercial type and a backyard type were constructed in Tawi-Tawi. In real life, the most suitable goat house can be chosen by the farmers, depending on their

purpose, and/or technical and financial backgrounds. Among the three types of goat houses, there is no difference in production, reproduction, or flock health, including growth rate, fertility, mobility, and mortality. However, the commercial type of goat house attracts more attention from farmers, especially financially capable ones.

In addition, improved grass pastureland was established. In general, goats are reputed to be highly willing to eat a wide variety of plants, some of which cattle and sheep totally reject. This is one of the great advantages of the goat, because a small-holder can try many types of plants it may find in its environs such as roadside grasses, weeds, or scrubs. However, naturally grown plants are often not nutritionally sufficient to keep their goats healthy. Thus, two of the highly renowned and locally available improved grasses, namely Super Napier and Setaria grass were introduced. Vermi-compost preparation was also introduced in all three locations as part of integrated faming.

A series of training was conducted for beneficiaries, the LGU and the BDA, and goats were introduced to the demonstration farm. All these training courses had emphasized not only technical aspects, but also on business aspects of goat production. Initially, many goats suffered the stress caused by such factors as the long trip, a transfer from its original location to each demonstration farm, and adaptation to the new environments. Some of them died especially in the early stages, but the flocks regained their normal conditions. Generally goat are now in good physical conditions and the number of kids is on the increase. The goat project originally did not include FTF extension due to its limited time frame. However, having observed and visited the demonstration farm, many local farmers in Sultan Mastura and Matungao requested to the BDA for technology extension of goat-keeping. In response to this request, a TOT was conducted by the resource organization to train the 1st beneficiaries to become a FTs to further promote the technologies to other farmers.

In Sultan Mastura, considering the abundance of Napier grass and room in the goat houses of the demonstration farm, the beneficiaries decided to purchase more goats to fatten and resell on a trial basis because their own growing kid goats needed more time to be finished for meat. The beneficiaries bought 10 does, of which they resold five of them. Eventually, the beneficiary group formed a farmer cooperative authorized by the Cooperative Development Authority (CDA) of the ARMM. Apart from main products, goat farmers have other materials or by-products that are marketable. This includes goatskins and goat manure for fertilizers, including vermicompost or cuttings of some improved grasses. In Tawi-Tawi, having observed the lush Napier grass at the demonstration farm, other farmers bought some cuttings from the demonstration farm to plant as pasture for their goats' grazing. While the revenue earned from the sale of the grass cuttings was small, the fact that a product or by-product of the demonstration farm was commercially attractive to local farmers seems promising. Additionally, because the demonstration farm has perhaps the best bucks for breeding in the municipality, the beneficiaries are encouraged to charge a reasonable amount from farmers who want their does serviced as commonly practiced in the livestock

industry.

To promote goat production as a stable source for livelihood, marketing efforts should be further taken. Value adding activities such as slaughtered goat, goat dishes catering, and processed goat meat are needed. Halal goat meat is another way to add value. Goat milk should also be considered because even in Mindanao, some institutes are already exploiting goat dairy activities successfully.

4. Results of capacity building of BDA

The CD-CAAM aims at strengthening the BDA's comprehensive capacity to lead development activities within areas in Mindanao that have been affected by conflict. In particular, the primary objective of the extension phase was to strengthen the BDA's capacities to carry out and promote the CD-CAAM model's own initiatives. To assess to what degree the capacities within the BDA were developed, nine key areas of capacity to promote the CD-CAAM model were identified, namely 1) logical decision making, 2) data gathering and analysis, 3) plan formulation, 4) community mobilization, 5) technology transfer through FTF approach, 6) technology transfer for new sector, 7) internal technology transfer, 8) assessment and 9) revision and modification, while key competencies to carry out related tasks and activities were specified. Capacity development of the BDA also address financial management, procurement, and logistics arrangements.

In summary, the key capacities within the BDA CMO and two RMOs to promote the CD-CAAM model have been greatly strengthened through their engagement with the CD-CAAM project. In particular, their achievements in the remote Tawi-Tawi province during the extension phase clearly shows how much they have achieved over the past several years. While the JICA expert team often led implementation of the CD-CAAM project during the pilot phase, the BDA had to take more initiatives in Tawi-Tawi as the JICA expert team was not allowed to visit the project sites.

As the BDA newly established its provincial office in Tawi-Tawi to implement the CD-CAAM project, the BDA often faced different challenges. Although most staff in the PMO had some knowledge and experience in community development, they were not familiar with the CD-CAAM model. The staff of the CMO and the two RMOs have provided the necessary guidance and technical supports to the PMO through a series of workshop, OJT, and daily communication. It can be said that achievements of the BDA in Tawi-Tawi are remarkable given the very limited budget and time for the extension phase. In particular, although the MILF historically does not have very strong presence in Tawi-Tawi, BDA gradually but successfully established trust among the LGU and local leadership through carefully observing the six pillars of the CD-CAAM model. The BDA eventually obtained acceptance and recognition not only in Panglima Sugala but also in a whole province, which lays a good foundation for future promotion of the CD-CAAM model in the island provinces.

Their commitments to the communities were very impressive as well. The staff of the RMOs often stayed at the communities for a long time (and sometimes overnight) to build trust with the community leaders and members of the beneficiary groups, and discuss various issues. The RMO CenMin, on their own initiative, also organized a monthly study circle about the holy Qur'an to strengthen rapport with the beneficiary groups, which, they claimed, has further united and inspired the groups to commit to work together for the success of the project. They had some doubts on the FTF approach in the beginning as they thought that FTs might not be able to work for a nominal honorarium given their own difficult livelihood. In Matungao, they found that some members of the beneficiary group of the pilot phase were quite hesitant to teach the new beneficiary group, as they did not have confidence in their technical knowledge and skills. However, such continuous community mobilization, they believe, greatly contributed to motivate the trainers to teach other farmers and fellow community people.

5. Conclusion and recommendations on the CD-CAAM model

The CD-CAAM project tried to establish an approach for community development that addresses the realities in Bangsamoro more effectively. Through the pilot phase, the so-called CD-CAAM model for community development was formulated based on experiences and lessons learned from the field operations, which was further strengthened during the extension phase. As mentioned earlier, the CD-CAAM model is illustrated by the six distinct characteristics, or the six pillars. Each pillar itself is not necessarily innovative or original, but the uniqueness of the CD-CAAM model is that it combines different approaches and perspectives into something whole. Through carefully ensuring the six pillars throughout the whole process of community development interventions, the model aims to foster the resilience of the communities.

The impact of the CAAM model is not only economical but also social. An assessment of livelihood projects revealed that some of the beneficiaries experienced positive attitude changes not only toward farming itself but also toward life as a whole. For example, a male beneficiary of an agriculture project did not have a farm and was not engaged in any productive activities before participating in the CD-CAAM training. After a year of training, he started cultivating vegetables at his backyard garden, and keeps himself busy. With the additional money that he earns from his garden, his daughter can go back to school now. Similarly, the husband of a female beneficiary was a coconut climber, and he could not generate a stable income from his work. Now, the couple established a backyard garden in their home and started vegetable farming. The husband helps his wife in selling the vegetables by using his motorbike, and they have become able to earn income constantly from their garden. Meanwhile, villagers who were involved in armed struggle for a long time are engaged in livelihood activities, which would facilitate their transition to normal living. In addition, different religious groups, gender groups, and groups with different political affiliations have nurtured friendship and partnership through joint activities on the ground. Cooperation was sometimes extended outside group members to the wider population in the municipality. In sum, if it

can be replicated on a larger scale in a proper way, the CD-CAAM model of community development is likely to make a substantial contribution to peaceful and productive Bangsamoro through nurturing community resilience.

The CD-CAAM project also aimed to equip the BDA with sound skills and knowledge in implementing and promoting the CD-CAAM model. It may be safe to conclude that the BDA successfully carried out all the necessary tasks, and it also succeeded in adhering to all the six pillars of the CD-CAAM model, all of which were time-consuming and delicate tasks given the complex realities in the conflict-affected areas. During the extension phase, the BDA has also proved its flexibility and adaptability to carry out the activities and engage with the new LGU and communities even in a remote island province. The remaining challenges for the BDA are to reconcile the needs for quick and cost-effective implementation of the community development interventions while adhering to the six pillars of the CD-CAAM model, which inevitably requires time-consuming and costly engagement with communities, LGUs and other stakeholders. Additionally, while proper and efficient administrative and financial management should be the foundation of effective implementation of the CD-CAAM model, it remains to be seen whether the BDA's limited involvement in those tasks during the CD-CAAM project can equip the BDA personnel with enough skills to handle larger workload and funds when they are required to manage the CD-CAAM model on a far larger scale in the future.

Meanwhile, it is remarkable that the BDA has already replicated promotional activities of the CD-CAAM model in different locations. For example, the BDA, in cooperation with the Bureau of Fisheries and Aquatic Resources (BFAR)-ARMM, has provided tilapia fingerlings and breeders as well as technical guidance to the fisheries groups in municipalities such as Barira, Buldon and Mamasapano. The RMO CenMin has also started preparing to replicate three livelihood projects in the municipality in North Cotabato with the support from the FTs of Sultan Mastura. Known as a development catalyst, the BDA volunteers who live in the communities play a vital role in initiatives to disseminate the experiences of the CD-CAAM model in various parts of Bangsamoro. The BDA now envisions establishment of provincial FTs and provincial demonstration farms for agriculture, fisheries and livestock that facilitate promotion of the CD-CAAM model at the provincial level. Another interesting example of the BDA's initiatives is a BDA radio program on vegetable production based on the experiences of the CD-CAAM project, which provides practical information on vegetable production, and covers the Central and North Cotabato and other areas. As a de facto leading development agency within the ongoing peace process towards establishment of the new autonomous Bangsamoro government, the BDA is expected to scale up such initiatives and promote the CD-CAAM model to the wider population in the region. It may be fair to conclude that almost five years of engagement with the CD-CAAM project provides the BDA counterpart personnel with enough capacities and confidence to become the vanguard for the CD-CAAM model in Bangsamoro.

Meanwhile, the BDA may still need external support in two major areas. First, while the CD-CAAM model was suggested based on the lessons learned from the field operation of different community development projects in CAAM, the model is still in its infancy has ample room for improvement. For example, choices of community development projects must be increased to match diverse development needs and potentials in Bangsamoro; thus far the CD-CAAM model includes five different community development projects. Additionally, it is necessary to seek new measures to expedite the time-consuming process of technology transfer while maintaining the quality of the interventions. The quick service delivery of so-called peace dividends may help greatly in building a new Bangsamoro government because it increases government visibility and legitimacy among hitherto marginalized communities. To strengthen the relevance and effectiveness of the CD-CAAM model, the BDA still needs to improve its expertise on community development, to which the organizations such as JICA can continue to provide technical support.

Another serious challenge for the BDA may be its still weak financial foundation. While the CD-CAAM project developed capacities within the BDA relatively successfully, the lack of sustainable resources is still likely to be a serious obstacle to the BDA's ability to promote the CD-CAAM model. In fact, most of the BDA personnel whose capacity was improved in the CD-CAAM project may leave the organization upon the completion of the project because they are not regular BDA personnel and their entire salary are paid by the project. The newly established PMO in Tawi-Tawi may be closed soon after the end of the CD-CAAM project because it depends completely on the financial support from the project. A large pool of development catalysts is one of the valuable assets for the BDA to reach the wider population in the region. However, the BDA may not be able to fully use the asset without sound financial foundation. Continuous resource mobilization that can sustain the momentum created by the CD-CAAM project is one of the key issues. This has no immediate solution given the stalled peace process, but it may be one of the areas where development partners such as JICA may need to continue their support to help build a peaceful and productive Bangsamoro in the long run.

CHAPTER 1: INTRODUCTION

1.1. Background and objectives

Development in the conflict-affected areas of Mindanao (CAAM) has been stalled for the last four decades, and the prolonged conflict in these areas has further exacerbated poverty among the population. In 2001, the peace talks between the Government of the Philippines (GPH) and the Moro Islamic Liberation Front (MILF) commenced, and confidence building agreements on Security and Rehabilitation and Development were signed. These agreements provided for the cessation of hostilities between the forces of the government and the MILF, and the start of rehabilitation and development of the CAAM. Against this background, the Bangsamoro Development Agency (BDA) was created to determine and then lead and manage the relief, rehabilitation and development projects in the CAAM.

The Government of Japan (GOJ) has been undertaking an active role in the peace process in Mindanao. The Japan International Cooperation Agency (JICA) conducted the Study on the Socio-Economic Reconstruction and Development of Conflict-Affected Areas in Mindanao (SERD-CAAM) in 2007–2009 which aimed to formulate a socio-economic development plan in the CAAM, with the end purpose of promoting the consolidation of peace in Mindanao. Following the results of the SERD-CAAM, the GPH has requested the GOJ for community development projects as well as capacity building for the BDA. In response to the request, the Project for Capacity Building for Community Development in Conflict-Affected Areas in Mindanao (CD-CAAM) was launched in February 2012. In October 2012, the GPH and the MILF signed the Framework Agreement on Bangsamoro (FAB), and subsequently signed the Comprehensive Agreement on Bangsamoro (CAB) in March 2014. The CAB stipulates the process leading toward the establishment of the Bangsamoro Government in 2016, and the BDA is expected to coordinate the development programs with the Bangsamoro Transition Commission (BTC) to further contribute to peaceful and sustainable development in Bangsamoro.

Meanwhile, under the CD-CAAM project, three different pilot community development projects have been carried out in two municipalities jointly by the BDA, the Local Government Unit (LGU) of Sultan Mastura and Matungao, and the JICA expert team. Given the short implementation period of nearly one year and the still vulnerable security situations in CAAM, it is fair to say that each pilot project has produced a significant impact on community development with regard to not only income generation but also peacebuilding in the conflict-affected communities. Moreover, through joint implementation of the pilot projects, the capacities of the BDA to manage more conflict-sensitive community development interventions were greatly enhanced. Additionally, all the planned activities were completed by February 2015, and the approaches, process, and methods of community

development as well as specific technologies tested during the pilot project implementation were compiled in the Community Development Guidelines and basic technical manuals. In the Guidelines, the more conflict-sensitive community development approach is named the CD-CAAM model, which is underlined by the so-called Six Pillars of CD-CAAM.

Following the success of the CD-CAAM project, the CD-CAAM model is expected to become one of the initiatives that can strengthen resilience of communities, and contribute to socio-economic development and peacebuilding in Bangsamoro. To meet such expectation, the BDA must improve its capacity to lead and promote the CD-CAAM model. Against such background, the CD-CAAM project has been extended for 16 months to strengthen the BDA's institutional capacities to implement community-based livelihood projects by following the CD-CAAM model at its own initiative.

1.2. Expected outcomes

The implementation of the CD-CAAM project is largely divided into two phases, namely the pilot phase that includes the preparatory and compilation phase, and the extension phase.

During the pilot phase, one of the purposes of the CD-CAAM is to help improve the livelihoods of the people in the CAAM. As the development of primary industries, such as agriculture and fisheries which are the core means of livelihood in the CAAM, will play a key role in improving livelihoods, the pilot projects on income generation focused on improving productivity and marketing in the agricultural and fisheries sectors. In contrast, the pilot project on infrastructure addressed the needs for rehabilitating and maintaining community roads, which could help improve the living conditions of the community people and distribute products to the markets. These pilot projects are expected to establish an effective mechanism of community development. Secondly, through the planning, implementation, monitoring and evaluation of the pilot projects, the BDA's institutional capacity on the overall management of community development is expected to be strengthened.

Built upon the results of the pilot phase, the extension phase is expected to further strengthen the BDA's capacities to implement community development projects by using the Guidelines and technical manuals developed during the pilot phase. In particular, the BDA is expected to be equipped with the capacities to 1) carry out Farmer to Farmer (FTF) extension, 2) disseminate and institutionalize skills and knowledge of the CD-CAAM model in the BDA, 3) identify and implement a new community development project, and 4) ensure effective financial management and procurement for community development projects.

CHAPTER 2: STRUCTURE OF CD-CAAM MODEL

2.1. Establishment of the overall CD-CAAM model

2.1.1. Major activities during the pilot phase (February 2012 to April 2015)

(1) Formulation of basic policy and the selection of municipalities

The basic policy was formulated in order to guide the overall implementation of the pilot projects in an effective, transparent, and sustainable manner, thereby achieving the overall objectives of the CD-CAAM. Following the criteria and processes set in the basic policy, selection of the target municipalities was carried out through three distinct steps. Firstly, based on the criteria and other considerations determined for municipality selection such as high incidences of poverty, high development needs and potential, conflict affectedness, and regional balance, a shortlist of the target municipalities was developed out of the municipalities in the CAAM. To select the most appropriate municipalities for the project, a field validation survey was carried out to assess the real situation in the short-listed municipalities. A joint team of the BDA and JICA experts visited the short-listed municipalities to assess them by using a simple survey tool. As a result of the field validation survey, two municipalities, namely Sultan Mastura and Matungao were finally selected as the pilot project sites for the CD-CAAM.

(2) Social Preparation 1

Social preparation was aimed to help the major stakeholders, such as the BDA, LGUs, and the communities, prepare themselves in planning and in delivering relevant community development interventions in an effective and sustainable manner. Social preparation was carried out with the full participation of those stakeholders, thus enabling the interventions to properly address the relevant development needs and potentials within the target sites and enhance a sense of ownership among the local stakeholders.

As a first part of social preparation implementation, social preparation 1 was carried out in two tiers of mutually supplemental activities namely, community profiling and a technical survey conducted in Sultan Mastura and Matungao. Community profiling was carried out to deepen the understanding of the municipalities and barangays, a questionnaire survey and semi-structured interviews were carried out, and based on these a resource map and a summary table of the barangays were developed. Parallel to the community profiling, a technical survey was carried out to further emphasize a detailed sector study within the target municipalities, and to identify the most relevant pilot projects. The technical survey included a series of interviews with municipal LGU staff in charge of municipal development, producers of major crops, processors and traders of major products as well as observations of production sites. The technical survey also included consultation with resource organizations which

was able provide technical support in implementing the pilot projects at the field level.

(3) Formulation of the pilot project plan

Based upon the results of social preparation 1, the pilot project plans were formulated to guide the implementation of the respective projects in an effective and sustainable manner. In particular, pilot project sites were selected in line with the barangay selection criteria and processes, thereby ensuring objectivity and transparency in selecting the most appropriate project sites. For the first step, barangay scoring was carried out, in which specific points were allotted to each indicator, and scoring was determined by the BDA through a comparison among barangays (relative evaluations) within the respective municipalities. While the barangays that obtained the largest scores were given special attention, sector feasibility review, as the next step, focused more on development potential by examining the most feasible and suitable barangays for respective pilot projects, thereby maximizing the impact of the interventions. The most suitable barangays for the respective pilot projects were selected based on the results of the above-mentioned steps, as well as careful consultation among partners and stake-holders.

(4) Social Preparation 2

Social Preparation 2 aimed to prepare for the actual implementation of the community development projects, which included selecting the direct beneficiaries of the projects and sensitizing them, the relevant community leaders and stakeholders to the contents, visions and values underlining the pilot projects. For that purpose, the barangay-wide orientation and the sitio/purok[1]-level orientation were organized to inform and mobilize people and the communities at the pilot project sites. Preliminary selection of direct beneficiaries was done during the sitio-level orientation. Social preparation 2 was also aimed at collecting basic data about the direct beneficiaries of each project and making other necessary pre-implementation arrangements such as the signing of Memorandum of Agreement (MOA) with the relevant partners.

(5) Implementation of the pilot projects

A series of training were carried out for three pilot projects through workshop and on-the-job training (OJT) while regular monitoring/follow-ups were also carried out to ensure effective and sustainable capacity building at all levels from the BDA to the target communities. Results of specific activities in each pilot project are elaborated in Chapter 3.

2.1.2. Results of capacity building during the pilot phase

The CD-CAAM aims at strengthening the BDA's comprehensive capacity to lead development

[1] While the Barangays are officially the smallest political divisions, they may be subdivided into smaller areas called "Purok" and "Sitio" as a sub-locality inside a Barangay, especially in rural areas. One Purok may consist of one or more Sitio.

activities within areas in Mindanao that have been affected by conflict. The assessment framework of the BDA's capacity selected appropriate key competencies in line with the nature of the CD-CAAM, and it also introduced the PDCA (Plan, Do, Check and Act) cycle to explain its assessment framework. Assessment of capacities of the BDA was conducted at two levels, namely at the CMO and the RMO.

The CMO played an important role in planning for the CD-CAAM project. Initially, the CMO's contributions were limited to the input of ideas, and the office required substantial supports from the JICA experts to draft any plans. CMO's planning capacities have been gradually strengthened, and for planning of daily activities—field trips, site surveys, and conferences—the CMO greatly contributed to preparing schedules, selecting content, and identifying participants. In addition, the CMO began holding regular pre-meetings among its staff members as well as with the RMOs before conducting activities. These meetings helped facilitate smooth implementation of project activities. Meanwhile, the CMO's data collection capacities improved because its personnel were able to identify where to obtain appropriate data. Further, the CMO established network with different resource persons/organizations in fishery, agriculture, and infrastructure sectors.

For project implementation, coordination skills are necessary if the CMO is to function as a development manager. In this role, the CMO is expected to mobilize and synchronize activities and resources to achieve specific goals. The CMO had opportunities to improve coordination skills since it had to mobilize major stakeholders (e.g., municipal LGUs, barangays, villagers, and resource organizations). Moreover, the CMO regularly coordinated with RMOs to supervise their activities under the CD-CAAM. These experiences equipped CMO staff to coordinate smoothly. At the very beginning of the CD-CAAM, JICA experts often led in coordinating stakeholder consultations with the CMO. However, soon thereafter, the CMO took over the coordinator's role. Regarding monitoring skills, the CMO allocated monitoring staff members for three pilot project sectors: agriculture, fishery, and infrastructure. First, the respective staff accumulated technical expertise related to the applicable sector; for example, CMO staff members worked with RMO staff members at pilot project sites and attended technical workshops to learn new technologies associated with the various sectors. Accumulation of technical knowledge developed expertise to some extent and improved the capacity to monitor pilot projects with an understanding of needed technical validation.

The RMO staff also improved its technical knowledge related to pilot projects, and they began providing important input for pilot project planning after the second production cycles in the agriculture and fishery sectors. Therefore, the RMO staff can play a leading role in designing technical plans (such as the pilot project plans of the CD-CAAM) in the future, provided that advice from technical authorities is accessible when plans require adjustments for new situations.

Additionally, the RMO developed its capacity to coordinate with LGU offices sufficiently. The RMO

staff worked with the Municipal Agriculture Office (MAO) and Municipal Engineer (ME) and learned to communicate appropriately with LGU officers. Ease of communication was based on correct understanding of roles and responsibilities of LGU officers in pilot projects and the establishment of trust between parties. Throughout the project period, the RMO staff adjusted activity schedules jointly with representatives of the LGU office, and LGU officers participated in project activities. The RMO staff developed coordination skills that were useful for mobilizing villagers. The basic strategy for local mobilization was the assignment of a community organizer (CO) who knew target localities very well and who served as a bridge between the RMO and local villagers, beginning with the very first contact at the barangay orientation. The CO was effective at sensitizing villagers so that a regional community operation officer could provide technical instruction to selected beneficiaries of the respective pilot project. The RMO also expanded networks with resource organizations, resulting in increased capacities to coordinate different technical training programs.

The RMO staff members also developed their capacity in risk monitoring to some extent, specifically through pilot projects. Risk monitoring has important components: prediction of risks, preparation of preventive measures and countermeasures, and execution of these measures if necessary. For example, the agricultural team experienced various foreseeable and unforeseeable risks with its demonstration farms. Regarding vegetable production, this team had discussed foreseeable risks, including outbreaks of pests and/or diseases. Thus, they also discussed countermeasures, such as the selection and application of pesticides. By repeating such practices, the RMO staff developed the capability to manage risks. Fishery and infrastructure teams also experienced outbreaks of anticipated risks. Through the experience of identifying and executing preventive and countermeasures, the staff developed its capacities for risk monitoring.

The CD-CAAM provided the basic skills for the BDA to enrich its project management capacity at central, regional and community level. However, to manage development projects independently, the BDA staff members should learn Project Cycle Management (PCM) methodology, which promotes a logical consideration of project frameworks with the participatory approach of stakeholders. The CMO and RMOs became accustomed to monitoring projects during the CD-CAAM. They established a cycle of regular monitoring by obtaining information from activity reports and site visits. In some pilot projects, RMO staff members learned how to use monitoring sheets, which enabled them to consolidate monitoring data systematically. However, the CMO and RMO are yet to apply useful monitoring tools at institutional levels. These tools are, for example, a work breakdown structure and operations. For further development of their capacity building, opportunities for learning these tools should be offered to both CMO and RMO staff members.

2.2. Strengthening and expansion of the CD-CAAM model

2.2.1. Major activities during the extension phase (May 2014-August 2016)

(1) Establishment of the municipality selection structure

The implementation structure was modified to fit the scope of the activities of the extension phase. In particular, the Provincial Management Office (PMO) was newly established in Tawi-Tawi.[2] The municipality of Panglima Sugala was selected in Tawi-Tawi through the municipality selection process/steps specified in the Community Development Guidelines (CDG).

(2) Social Preparation 1

Social Preparation 1 during the extension phase focused on the community profiling and the technical survey, which were carried out by the BDA, particularly by respective RMOs with support from the CMO and the JICA experts. In Tawi-Tawi, a full process of community profiling and a technical survey was carried out by following the steps specified in the CDG. As a part of internal technology transfer within the BDA, the CMO and RMO staffs visited Tawi-Tawi to provide the orientation of activities of Social Preparation 1 as well as on-site guidance to the newly employed staff of the TMO.

(3) Formulation of the project implementation plan and Social Preparation 2

Based upon the results of Social Preparation 1, the project implementation plan for respective livelihood projects have been formulated, and the target barangays were also selected. Based upon the results of Social Preparation 1, a project for seaweed culture, post-harvest improvement, and marketing was determined as the most appropriate project in Panglima Sugala, and its project implementation plan was formulated accordingly. The BDA then carried out Social Preparation 2 in respective municipalities, which included barangay wide orientation, selection of beneficiaries, baseline survey as well as Value Enhancement Training (VET).

(4) Technology transfer through the Farmer-to-Farmer approach (Agriculture and Fisheries)

The FTF approach to technology transfer was already tested in the pilot project for fisheries, and it was also voluntarily carried out by the beneficiary group of the pilot project for agriculture in Sultan Mastura. The activities during the extension phase aim to establish and institutionalize the FTF within the CD-CAAM model as an approach for technology transfer to the wider population.

Activities of the FTF started with the TOT wherein members of the beneficiary groups of the pilot phase were trained as the farmer trainers (FT). The TOT aims to equip FT with necessary planning, communication, and presentation skills to train other farmers effectively. It also provides the FTs with

[2] The RMO Sulu and Tawi-Tawi supervised operation in Tawi-Tawi before the establishment of TMO Tawi-Tawi.

an opportunity to reflect on the specific technologies that they are expected to disseminate to others. Major activities for the FTF are examined in detail in Chapter 3.

(5) Implementation of a new livelihood project

To further promote the CD-CAAM model to the wider areas in Bangsamoro, a variety of community development interventions of the CD-CAAM model must be increased to address diverse development needs/potential of the areas. For this purpose, the project for goat production was implemented as a new livelihood project. Based upon the results of Social Preparation 1 in Panglima Sugala of Tawi-Tawi, a new livelihood project (involving seaweed culture, post-harvest improvement, and marketing) was formulated and implemented as well. As such, during the extension phase, two new livelihood projects have been added to the community development project under the CD-CAAM model. Results of the new projects are examined in Chapter 3.

(6) Internal technology transfer within the BDA through implementation of CD-CAAM in Tawi-Tawi province

To further promote the CD-CAAM model to the wider population, and to address geographically, socio-economically and culturally diverse realities within Bangsamoro, the BDA must make maximum use of its existing resources. In particular, its seven RMOs in the different regions of Mindanao should be fully equipped with sound understanding and skills to carry out the CD-CAAM model of community development in respective areas. During the pilot phase, the CMO and the RMO Cen-Min and Ranaw, which are responsible for project implementation in central Mindanao region and Lanao region (del Norte and del Sur) respectively, were capacitated to carry out the CD-CAAM model. One of the objectives of the extension phase is to establish an effective mechanism to transfer skills and knowledge that are deemed integral to the CD-CAAM model within the BDA, so that the BDA's capacities and functions as a leading agency for effective community development shall be further enhanced.

For the purpose of this project, Tawi-Tawi was selected as a project site given its remote location from the main island of Mindanao, and relatively stable security situation. An internal technology transfer was conducted both in Tawi-Tawi and on the mainland. Staff from the CMO and RMOs visited Tawi-Tawi to build staff capacity on site of the PMO. Meanwhile, staff from the PMO visited the mainland to participate in some of the technical training (for the livestock project), and also participated in a study visit to the pilot project sites in Sultan Mastura and Matungao. Results of the internal technology transfer are examined in the Chapter 3.

2.2.2. Results of capacity building during the extension phase

As mentioned earlier, the primary objective of the extension phase is to strengthen the BDA's

capacities to carry out and promote the CD-CAAM model's own initiatives. To assess to what degree the capacities within the BDA are upgraded before/after the expansion phase more objectively an assessment matrix was formulated. The matrix identifies nine key areas of capacity to promote the CD-CAAM model,[3] and specifies the related tasks/activities during the extension phase as well as several key competencies to carry out those tasks and activities. In particular, key competencies were carefully selected to fit with the specific roles and responsibilities of the CMO, RMOs, and TMO to promote the CD-CAAM model. In the self-assessment by the BDA each competency is scored through consensus within the CD-CAAM counterpart staff of the four BDA offices during the baseline and end-line assessment sessions.

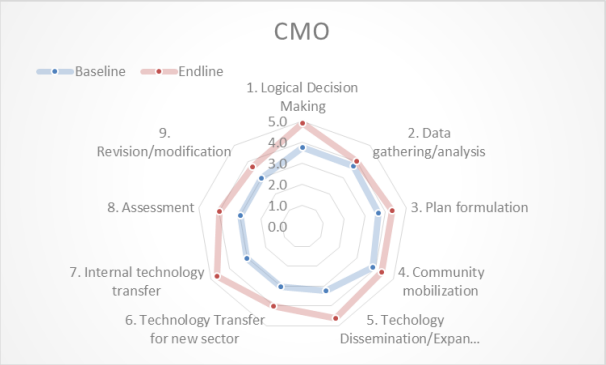

Figure 2.2.2.1 End-line results of CMO

The baseline assessment of the BDA's capacity was conducted in the early stage of the extension phase in June and July 2015, and the end-line assessment was conducted in April 2016. Figure 2.2.2.1 illustrates a comparison between results of the baseline and end-line assessment of the key capacities at the CMO. The end-line self-assessment shows that most of the key capacities have been steadily enhanced after one year of implementation of the extension phase. The results essentially indicate strong confidence among the CMO staff of their capabilities to manage major aspects of the CD-CAAM model.

In particular, their engagement with provincial and municipal LGUs in Tawi-Tawi apparently gave them valuable experiences despite the challenging environment in the remote island province where the staff of the CMO and the RMOs faced cultural and linguistic differences as well as physical hardships. While the JICA expert team took initiative in initial communication with the LGUs in Sultan Mastura and Matungao during the pilot phase, the BDA initiated the efforts in Tawi-Tawi. Although the presence of the BDA was not very strong prior to the CD-CAAM project, it has successfully obtained trust and mobilized strong support from the Panglima Sugala LGU. Eventually, the BDA has become well known among many people not only in Panglima Sugala, but also in other municipalities in Tawi-Tawi.

Meanwhile, the CMO staff perceive that the FTF technology transfer achieved great success, exceeding their expectations, which has a significant implication in order for the BDA to reach the larger population in the future. While all these successes have created a favorable environment for the

[3] 1) logical decision making, 2) data gathering and analysis, 3) plan formulation, 4) community mobilization, 5) technology transfer through FTF approach, 6) technology transfer for new sector, 7) internal technology transfer, 8) assessment and 9) revision and modification

promotion of the CD-CAAM model in Bangsamoro, the CMO staff maintained that they still have to manage high expectations within the communities carefully as there are several areas they would need to further improve to address diverse development needs and their potential in Bangsamoro. Marketability of the products from livelihood projects must be further increased, and choice of livelihood projects also needs to be expanded. The BDA is currently working on a plan to establish a close relationship between the CD-CAAM model and the PLEDGE project funded by the International Labor Organization (ILO), which focuses on value chain management in order to enhance marketability of livelihood projects. Meanwhile, the CMO emphasized the strong need for continuous expert support from development partners, such as the JICA, specifically in these areas.

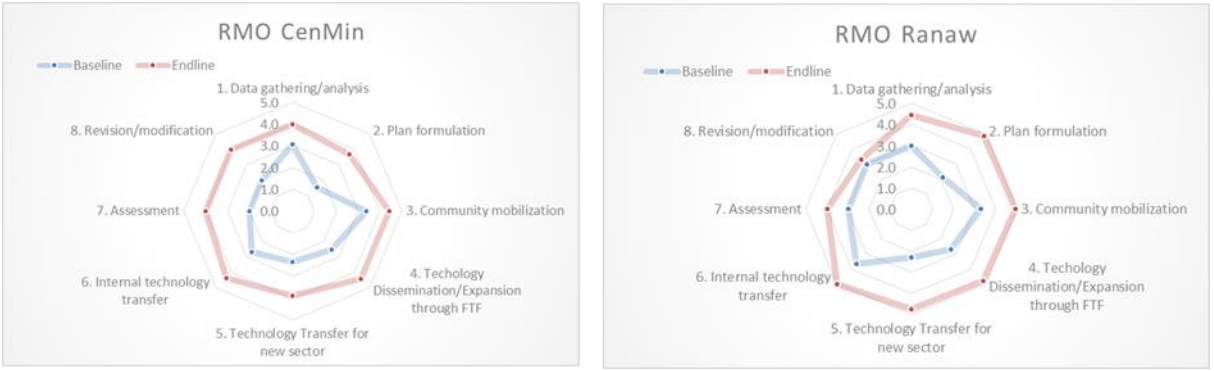

Figure 2.2.2.2: End-line results of RMOs

Figure 2.2.2.2 also illustrates that the key capacities within the two RMOs have been greatly strengthened during the extension phase. Open discussions conducted during the end-line assessment session has also provided us with valuable insights on how much they have achieved over the past several years. As the staff of the RMO CenMin mentioned, it was somewhat difficult to fully understand the significance of balancing development needs and development potential during the pilot phase, as their previous experiences focused more on immediate needs of the war-torn communities. However, they said they have become strong advocates for the principle and were able to articulate it to the LGU and people within the community when they helped the guidance in Tawi-Tawi. Their commitments to the communities were very impressive as well. The staff of the RMOs often stayed at the communities for a long time (and sometimes overnight) to build trust with the community leaders and members of the beneficiary groups, and discuss various issues. The RMO CenMin, on their own initiative, also organized a monthly study circle about the holy Qur'an to strengthen rapport with the beneficiary groups, which, they claimed, has further united and inspired the groups to commit to work together for the success of the project. They had some doubts on the FTF approach in the beginning as they thought that FTs might not be able to work for a nominal honorarium given their own difficult livelihood. In Matungao, they found that some members of the beneficiary group of the pilot phase were quite hesitant to teach the new beneficiary group, as they did not have confidence in their technical knowledge and skills. However, such continuous community

mobilization, they believe, greatly contributed to motivate the trainers to teach other farmers and fellow community people. The RMOs are currently planning to train farmer groups in other municipalities with the support from the FTs of Sultan Mastura and Matungao. Meanwhile, both RMOs felt there is a strong necessity for continuous external expert support to further establish sound technical quality of their technology transfer as well as to increase the variety of livelihood projects to match diverse development needs and potentials in Bangsamoro.

Finally, Figure 2.2.2.3 shows the results of capacity development at the PMO Tawi-Tawi. As the newly established BDA provincial office is in a somewhat remote island province, the CD-CAAM counterpart staff there often faced different challenges during implementation of the CD-CAAM projects. Although most staff had some knowledge and experience in community development, they were not familiar even with the visions and mandates of the BDA as its presence in Tawi-Tawi has been limited, not to speak of the CD-CAAM model. The staff of the CMO and the two RMOs as well as the JICA expert team have provided the necessary guidance and technical supports to the PMO through a series of workshop (both in Tawi-Tawi and on the mainland), OJT, and daily communication through telephone conversations and emails. However, it was found that a trip to and from Tawi-Tawi is both costly and time-consuming (it requires four travel days in total[4]), and the communication infrastructure in Tawi-Tawi remains underdeveloped, all of which have made effective internal technology transfer within the BDA even more difficult. With limited presence of the experienced BDA staffs as well as the JICA expert team members, PMO staffs sometimes found difficulties to have active engagement of some resource organizations in the training and monitoring activities. Nevertheless, it can be said that achievements of the BDA in Tawi-Tawi are remarkable given the very limited budget and time for the extension phase. In particular, although the MILF historically does not have very strong presence in Tawi-Tawi, BDA (particularly the CMO) gradually but successfully established trust among the LGU and local leadership through carefully observating the six pillars of the CD-CAAM model. The BDA eventually obtained acceptance and recognition not only in Panglima Sugala but also in a whole province, which lays a good foundation for future promotion of the CD-CAAM model in the island provinces.

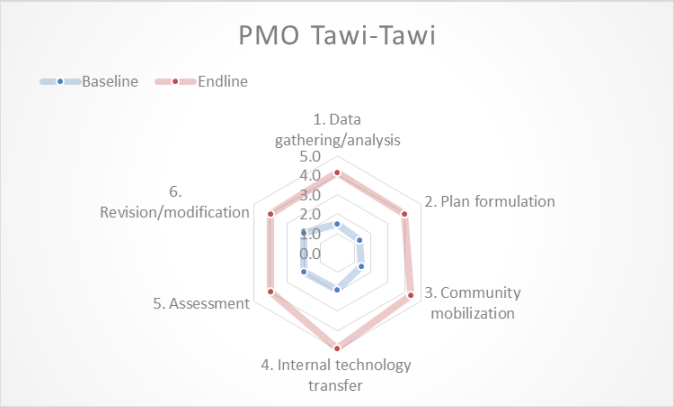

Figure 2.2.2.3: Endline result of PMO

In addition to the assessments above, an assessment of capacity on financial management and

[4] For example, from Cotabato, you have to go to either Davao or Manila, fly to Zamboanga to stay overnight there, and then fly to Tawi-Tawi

procurement was carried. This survey also used a self-assessment approach. The assessment at the CMO level was done for five competencies which relate to the financial management, procurement, and logistics arrangements[5].

In the end-line survey, the CMO scored above 4 in all the competencies. This indicates that the CMO acquired confidence in all the activities related to financial management, procurement, and other logistics arrangements that were dealt with in the training. While the CMO still had delays in the submission of liquidation documents and correcting mistakes in documents, their understanding of financial management and logistics arrangements clearly improved.

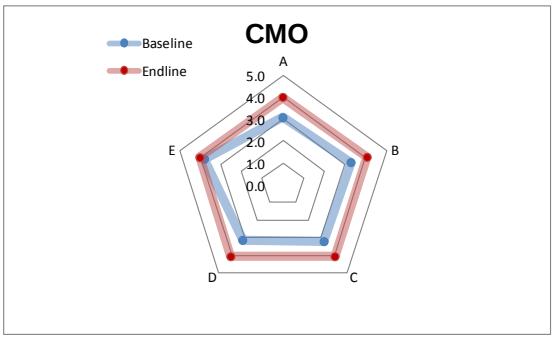

Figure 2.2.2.4: Baseline and end-line results of CMO (financial management and procurement)

Assessment of capacity on financial management, procurement, and other logistics matters were also conducted for the RMO CenMin, RMO Ranaw, and PMO for the seven competencies[6].

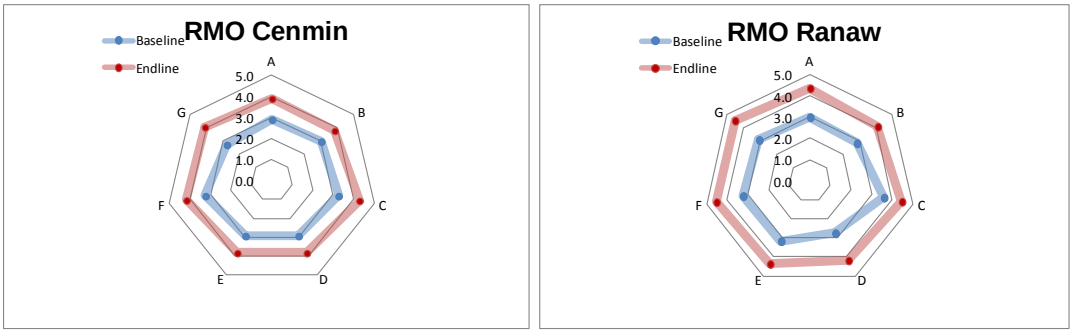

Figure 2.2.2.5: Baseline and end-line results of RMOs (financial management and procurement)

Generally, the RMOs and PMO were all fast learners in terms of budget preparation, disbursement of funds, and liquidation. This is likely because they had more opportunities to deal with activity plans, budget plans, and liquidation through their activities at the project site.

[5] A: Ability to examine an activity plan and schedule formulated by RMO and provide feedback/instructions to RMO if necessary, B: Ability to examine a financial plan formulated by RMO and provide feedback/instructions to RMO if necessary C: Ability to monitor RMO's proper execution of planned activity, and D: Ability to ensure RMO's liquidation in timely manner
E: Ability to keep receipts, working records, activity reports, and budgetary estimation sheets using proper filing

[6] A: Ability to make proper activity plan and schedule, B: Ability to make proper financial plan with an estimation sheet, C: Ability to make arrangements for vehicles and venues, D: Ability to conduct procurement with proper liquidation documents, E: Ability to prepare documents/items for equipment needed for activity according to plan, F: Ability to execute planned activity properly, and G: Ability to present proper liquidation to CMO

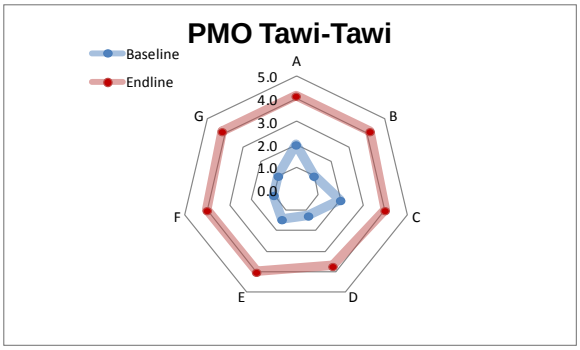

Figure 2.2.2.6: Baseline and end-line results of PMO Tawi-Tawi (financial management and procurement)

It was observed that there were differences in the levels of achievement in financial management, procurement, and other logistics arrangements between the CMO on the one hand, and the RMOs and PMO on the other. The RMOs and PMO, which had more opportunities to deal with financial management and logistics arrangements, experienced greater benefit from the OJT; for them, the training produced an improved sense of the importance of proper management in both areas in an organization. Problems in managing a remote office were found with the establishment of the new office in Tawi-Tawi during the extension phase. At first, the less than desirable communication environment in this remote area caused frequent delays in the submission of documents and made communication difficult. In this situation, it was not easy for the CMO to give instructions to the PMO. In the CD-CAAM project, staff from the CMO and RMOs often visited the PMO to give instructions as a way of compensating for the above-noted negative aspects of the new office. However, this requires a significant increase in funds to cover the added transportation and accommodation costs.

Meanwhile, in the financial management OJT, items dealt with were focused only on the cost of office supplies, the cost of motorcycle fuel, cellular phone fees, and salaries taking into account risks such as a delay in the project's implementation. Given that procedures were frequently delayed even in this small segment of the budget, more training and experience are crucial if the agency is to manage all project funds and make all logistics arrangements without outside help. Reorganization and an increase in staff are also crucial if the BDA is to manage all funds and make all logistics arrangements for the CD-CAAM projects.

2.3. Peacebuilding perspectives

As the CD-CAAM primarily aims to contribute to peacebuilding in Bangsamoro, there are several issues that should be carefully addressed in order to ensure the important principles of "Do No Harm" and "Do Maximum Good". In particular, a recent discourse on so-called 'horizontal conflict' within the Bangsamoro may need to be carefully addressed.

Firstly, the population of Mindanao comprises of Muslim ethnic groups, or Moro, Christians migrant settlers, and Indigenous people (IP), or Lumads. Although such ethno-religious diversity itself may not necessarily be the driver of violent conflict, identity-based groupings can be mobilized into horizontal conflicts, therefore they may have an important implication for peacebuilding and conflict prevention

in the area. Secondly, the persistence of land-based conflict and the inability to undertake an effective land reform have a significant implication for horizontal conflict. It is said that prevailing clan feuding, or Rido, one of the most serious concerns for sustainable peace in the region, is often triggered by land disputes. Land disputes trigger not only inter/intra clan feuding, but also conflicts between different ethno-religious groups involving Moro, Christian, and Lumads. Thirdly, to look at horizontal relationship, gender dimension must be carefully addressed as well. Compared with other region, the income gap between male and female is particularly wide, and rate is quite low among women. Gender mainstreaming would greatly contribute to peace and productivity in the region. Lastly, while the Bangsamoro severely lags behind other regions in terms of socio-economic development, intra-regional disparities must be also addressed to mitigate horizontal conflict. In particular, while island provinces such as Basilan, Sulu and Tawi-Tawi are said to have high development potential, the socio-economic situation of people in those provinces lag behind those in the mainland area. These perspectives are more or less relevant to the selected project sites for the CD-CAAM project, namely, Sultan Mastura of Maguindanao, Matungao of Lanao del Norte, and Panglima Sugala of Tawi-Tawi.

Muslim population is predominant in Sultan Mastura with some Christian residents (around 9%), and ethnic groups include Iranun (66%), Maguinanawon (25%) and Cebuano/Ilocano etc. (there is no record of IP residents in the municipality)[7]. The municipality is within the jurisdiction of the ARMM government, while there are some community residents who are affiliated with the Moro National Liberation Front (MNLF) and others with the MILF. While there were some land issues on the boundaries of family-owned lands and political boundary issues between barangays before, it is said that these issues were somewhat resolved by the LGU. Occurrence of serious violence related to land and political issues is limited in these days (except the incidents took place before the local election in 20016 as mentioned later).

Within the tress municipalities, the selection of project sites and beneficiaries was carried out carefully as it essentially relates to the pillars of the CD-CAAM model, particularly inclusiveness as well as the development potential and the development needs of the community. One should also be aware of the conflict sensitivity of project planning, as it can create antagonism among communities if the selection process is not conducted in a transparent manner. A distinct criteria and process for the selection of barangay and beneficiaries was specified to ensure utmost transparency and objectivity, whereas activity such as the Social Preparation made the best effort to sensitize the community leaders and stakeholders with the contents, visions, and values underlying the project. Selection of barangays and beneficiaries was also done through close consultation with the LGU.

As seen in table 2.3.1 and table 2.3.2, given the necessary “technical” requirements for the project

[7] Sultan Mastura CDP-ELA 2008-2014

sites as well as the beneficiaries of each training, it is fair to say that the selection of barangays and beneficiaries was fairly done in general particularly in view of inclusiveness.

Table 2.3.1: Basic profile of the barangays

Sultan Mastura	Macabiso	Namuken	Tambu	Tariken	Boliok	Solon	Balut	Tapayan	Kirkir
Religion	Islam (50%), Christian (50%)	Islam (95%). Christian (5%)	Islam (79%), Christianity (21%)	100% Islam	Islam (99%), Christian (1%)	Islam (95%), Christian (5%)	Islam (99%), Christian (1%)	Islam (87%), Christian (13%)	Islam (90%), Christian (10%)
Ethnic Affiliation/language	Iranon (40%), Maguindanaon (10%), Bisaya/Cebuano (50%)	Iranon (70%), Maguindanaon (25%), Bisaya/Cebuano (3%), Maranao (1%), Ilocano (1%)	Iranun (51%), Maguindanaon (15%), Bisaya (18%), Tagalog (11%), Ilocano (3%), Maranao (2%)	Iranun (68%), Maguindanaon (30%), Maranao (2%)	Iranun (88%), Maguindanaon (11%), Bisaya (1%)	Iranun (75%),Maguindanaon (20%), Cebuano/Ilonggo (3%), Maranao (2%)	Iranun (70%), Maguindanaon(28%), Bisaya (2%)	Iranun(79%), Maguindanaon (8%), Bisaya (3%), Tagalog (5%), Ilocano (5%)	Iranun (79%), Maguindanaon (8%), Ilocano (5%), Tagalaog (5%), Bisaya/Cebuano (3%)
Land ownership:*Tenant/farm worker/Land-owner/Leaseholder (%)*	20%/75%/5%	45% /35% /20%	55%/30% /15%	80%/20%/0%	38%/60%/2%	50%/30%/20%	33%/40%/27%	65% /35%/0%	60%/10%/30%
Matungao	Bangco	Batal	Cadayonan	Bubong radapan	Puntod	Matampay	Pasayanon	Sta cruz	Somiorang
Religion	Islam (100%)	Islam (100%)	Islam (100%)	Islam (100%)	Islam (100%)	Christian (100%)	Islam (100%)	Islam (100%)	Islam (100%)
Ethnic Affiliation/language/Approx. No. of IP's	Maranao (100%)/15	Maranao (100%)/16	Maranao (100%)/15	Maranao (100%)/5	Maranao (100%)/15	Bisaya/Cebuano (100%)/7	Maranao (100%)/10	Maranao (100%)/7	Maranao (100%)/15
Land ownership:*Tenant/farm worker/Land-owner/Leaseholder (%)*	97%/2%/1%	90%/10%	85%/10%/5%	80%/10%/4%	N/A	35%/45%/20%	50%/45%/5%	25%/70%/5%	85%/10%/5%
Panglima Sugala	Kulape	Buan	Sumangday						
Religion	Islam (90%), Christian (10%)	Islam (95%), Christian (5%)	Islam (90%), Christian (10%)						
Ethnic Affiliation/language/Approx. No. of IP's	Sama, Tausug/412	Tausug, Sama/2,914	Sama,,Tausug/419						

Table 2.3.2: Basic profile of the beneficiaries

Sultan Mastura	Agriculture		Fishery				Livestock
	Macabiso	Boliok	Solon	Tambu	Cage Culture	Pond Culture	Kirkir
Male/Female	19/1	26/4	5/1	16/4	12/3	12/3	15/5
Age	25-67	19-65	36-54	16-52	18-61	20-55	23-70
Islam/Catholic	20/0	30/0	6/0	19/1	30/0	30/0	30/0
Education							
Elementary	6	6	0	7	1	0	2
High School	13	19	3	8	4	11	12
College	1	3	3	4	10	3	6
No School	0	2	0	1	0	0	0
Matungao	Agriculture		Fishery				Livestock
	Puntod	Matampay	Pasayanon	Cadayonan	Sta. Cruz (Purok 3)	Sta.Cruz (Koriod)	Somiorang
Male/Female	12/8	6/24	6/0	18/2	15/0	15/0	11/9
Age	16-59	29-63	19-53	18-57	20-60	18-47	16-55
Islam/Catholic	2/18	6/24	6/0	18/2	1/14	15/0	30/0
Education							
Elementary	2	13	2	4	6	7	7
High School	15	13	3	11	2	1	10
College	3	4	1	5	0	0	3
No School	0	0	0	0	7	7	0
Panglima Sugala	Agriculture	Fishery	Livestock				
	Kulape	Buan	Sumangday				
Male/Female	6/4	7/3	8/1				
Age	23-51	23-48	35-54				
Islam/Catholic	10/0	10/0	10/0				
Education							
Elementary	0	0	0				
High School	5	1	11				
College	2	17	17				
No School	3	0	0				

Generally, the CD-CAAM project has been safely completed without any serious conflicts and incidents that were directly related to, or seriously affected the project implementation in the selected communities. The project established close rapport with the LGU and communities. The project was

also able to mobilize supports from land owners to establish demonstration/practice farms and ponds/cages for tilapia culture not only during the project period, but for a certain duration (3-5 years) after the completion of the CD-CAAM project. Additionally, while many beneficiaries were landless tenant, some land owners lend some parcel of lands for free to some of the landless beneficiaries, thereby enabling them to continue the learned livelihood activities.

The BDA's initiatives such as Value Transformation Training (VTT), VET and a monthly study circle about the holy Qur'an has further ensured supports and commitment of the beneficiaries. While the contents of the VTT and VET are based on Islamic teaching, BDA also shown its abilities to deliver the core messages of the training, i.e. importance of unity and cooperation, to non-Muslim beneficiaries as well. The close relationship between Muslims and Christians established thorough working together in the project in Matungao, has proved the project's potentials in peacebuilding. Women were also encouraged to play important roles in every aspect of activities.

Additionally, one of the remarkable achievements of the project may be its increasing visibility in Tawi-Tawi province where presence of the MILF is historically not very strong. Through their careful coordination and consultation with the provincial government and the municipal LGU of Panglima Sugala, the project has established a partnership with them, and BDA and the CD-CAAM model eventually gain great popularity. Although it is one small step, the experience may show the CD-CAAM model potentially contribute to address issues on prevailing intra-regional disparities within the Bangsamoro.

CHAPTER 3: MAJOR FINDINGS AND RESULTS

3.1. Establishment of CD-CAAM model

3.1.1. Agriculture Sector

(1) Major findings

1) Results of the pilot project

Vegetable production and marketing for the first and second production cropping on 1,000 m^2 of a demonstration farm were conducted in Barangay Macabiso, Sultan Mastura Municipality. The first one started during the dry season, between November 2013 and December 2013 and harvesting occurred from February 2014. The second cycle started in May and June 2014, to avoid coinciding with Ramadhan in July 2014.

In the first cycle, harvested crops were sorted and delivered to markets in Cotabato City. Tomato generated a net profit of PHP 7,289 and the profit margin on sales was 38%, which is relatively impressive in vegetable production. Eggplant and bell pepper failed to produce a positive net profit; they were found to be damaged by pest and disease. About 50% of these harvested crops did not meet certain quality required at wet market. The second cropping resulted in a negative net profit as well. Because of low production volumes, the vegetables were sold directly to traders to minimize transportation costs to Cotabato City. The second cropping of the vegetables was a challenge for the beneficiaries who normally cultivate paddy in wet season. Moreover, rainfall was even higher than normal due to typhoons such as Glenda, Henry, Inday, Jose, and Ompong between July and October 2014. Thus, the demonstration farm was submerged in flood water, causing an increase in soil moisture, making the crops prone to disease. To make wet season production possible, rain shelters were introduced as trial.

Vegetable production and marketing on demonstration farm of 1,000 m^2 in Puntod, Matungao Municipality started in November 2013, with harvesting between January 2014 and March 2014, as first cycle, followed by second cropping.

Crops pechay (leaf vegetable), eggplant, string beans, cucumber, and pumpkin resulted in a positive net profit. Profit margin on the sale ranged from 27% to 56%. It is also remarkable that the beneficiaries could establish marketing linkages with the shopping mall “Gaisano” in Iligan City, a nearby local wet market, adjacent municipalities, and walk-in buyers in Matungao.

The most serious issue during the first cropping was that heavy rain brought on by tropical depression Agaton in January 2014, severely damaging pechay. In second cropping, kangkong, tomato, okra, bell pepper and lettuce were cultivated. Lettuce was trial. Most of them produced a positive net profit

except white cucumber because of oversized fruits that were rejected by the markets. Costs of other inputs could be minimized; spending on synthetic fertilizer in the second cropping could be reduced compared to the first cropping by continuing to use compost. Consequently, expenses should be lower than the first cropping. The market destinations were maintained in the second cropping as well.

2) Outcomes and impacts of the pilot project

Most of the basic technologies on vegetable cultivation were applied to beneficiaries' own farms in Sultan Mastura. The beneficiaries mentioned the following technologies that they adopted: (i) use of burnt paddy husk for nursery bed, (ii) mulching with bio-materials such as lemon grass and paddy straw, (iii) pruning, (iv) soaking seeds to break dormancy, and (v) consciousness of proper farm work sequence. One of the successful dissemination technologies was vermicomposting. Materials for vermicomposting are easily collected on farms, although it takes sometimes before they are ready to be used as an organic fertilizer.

Recordkeeping was difficult to adopt. 70% of the respondents from the beneficiaries had not applied it in their farming businesses. Recordkeeping was revealed to be a significant challenge for them while they understand its importance. Although construction of rain shelters during the wet season was delayed on the demonstration farm, their effectiveness on nursery making in the wet season was recognized by the beneficiaries. Selling status was also improved to some extent because of marketing approach used in the pilot project. 11 participants out of 20 have since acquired market destinations for individual farming. Some buyers came to the demonstration farm to buy vegetable and to find out when the products would be harvested.

Technology transfer to the beneficiaries in Matungao was also successful to a certain extent. Most of the basic technologies on vegetable cultivation were applied to beneficiaries' own farms.

Concoctions such as Oriental Herbal Nutrients (OHN), Fermented Plant Juice (FPJ), and Indigenous Microbial Organism (IMO) were accepted by the beneficiaries in Matungao because they have access to a local material called "kinugay," which is a solid form of one of the non-sugar by-products from sugar cane. Recordkeeping was overwhelmingly adopted by beneficiaries, as more than 60% now practice recordkeeping. Some mentioned the advantages and effectiveness of recordkeeping on their farming business. Some mentioned that they can now clearly track income and expenditures, one assessed that recordkeeping made him cognizant of which vegetables are sellable in-demand and during which month to sell, enabling the production cycle to be planned, and one feels confident when declaring her profit to others.

The pilot project linked the beneficiaries to market destinations such as shopping malls, retailers of wet markets, traders, and walk-in local customers. Through the practice of selling vegetables from the demonstration farm to Gaisano Shopping Mall in Iligan City, eight beneficiaries from the pilot project

and two other non-members signed an agreement with the Marketing Head of Gaisano Mall in September 2014 to collective supply of pechay.

Through questionnaire survey conducted in October 2014, focus group discussion, and interviews, a remarkably positive impact from the pilot project was revealed. In Sultan Mastura, technical improvement on vegetable production, a change in attitude toward farming, confidence in teaching vegetable production technology to other farmers, and a change in the lives of their families were impacts that were recognized by all the beneficiaries. According to them, "attitude toward farming" changed due to the realization of improved farming practices. They became more consolidated. Communication and information exchange among the members became more active. Although some members of the beneficiaries were participated from sitio, the demonstration farm allowed the creation of a peaceful group / gathering, leading to "social cohesion."

In Matungao, beneficiaries supported their "attitude toward farming changed" as an impact created. One female beneficiary disclosed that there was a big change on her farming practice. Before the pilot project, she only knew about chemical fertilizers, and used to apply them on her farm. Now she knows about the effectiveness of organic fertilizer like vermi-compost so that stated that she will continuously use organic fertilizer. Another female member explained about a big change in her attitude toward farming. She previously neglected the maintenance of her backyard garden. After participating in the project, she started to more carefully tend to her garden, practicing weeding, watering, fertilizing as if "nurturing a baby."

In addition to the impacts explained above, the beneficiaries pointed out that another impact created was the establishment of good relationships between Muslims and Christians. The collective work on the demonstration farm, aimed at common objectives, production, and profit, created and fostered a family-like atmosphere among them. Self-reliance was also observed as an impact. After starting second cycle cropping, some beneficiaries began sustaining their backyard gardens by themselves, minimized expenditures, and stopped asking for inputs to continue vegetable cultivation on the demonstration farm. They use their own resources for inputs.

One of the innovative practices of the pilot project in agriculture is the extension activity that was carried out by some direct beneficiaries to other farmers in the municipality of Sultan Mastura under the supervision of MAO. Although extension activities were not planned in the project, according to MAO, a lack of manpower is one of the serious challenges of the Department of Agriculture (DA). As such, MAO and BDA RMO CenMin have mobilized the beneficiaries to disseminate technology as volunteer instructors. While such an extension approach looks similar to the FTF approach, one of the most distinctive characteristics of the CD-CAAM interventions is firmly rooted in the values underlying the development envisioned by the BDA.

The beneficiaries group of Sultan Mastura, Macabiso Vegetable Farmers Group registered itself as a legal cooperative that was authorized by the CDA of ARMM in March 2014. The group is now named Sultan Mastura Vegetable Producer Cooperative. The beneficiaries group of Puntod of Matungao also applied to be an association with the DOLE, Regional Office X, Cagayan De Oro City. In May 2014, the group was officially registered as Puntod Integrated Farmer's Association. These two examples of legal registration as groups is a sign of beneficiary consolidation. The intention of eventually becoming a cooperative or association was gradually fostered during the pilot project, as the project's activities required members to perform collective work on the demonstration farm to produce vegetables, in addition to marketing and recordkeeping that required division of labor specialization.

(2) Results of capacity building of BDA

An evaluation workshop targeting BDA RMO CenMin to recall major activities and extract experiences of problems and difficulty during the planning, implementation, and monitoring stages was held in November 2014. The followings are extracted experiences.

In the planning stage of pilot project implementation, data and information on the current situation as well as problems of agricultural production in the target municipality were gathered. The collected data and information were then used in a SWOT analysis during a workshop-style brain storming session. Through the workshop, some conceptual strategies were produced, then, a plan of operation was developed and documented. However, the technical survey process and the project formulation workshop were not clearly understood by the BDA. Particular tools such as the semi-structured interview for the technical survey and SWOT analysis would benefit from additional experience in agricultural development projects.

During the pilot project implementation, the Regional Project Operation Officer (RPOO) of CenMin of RMO BDA has acquired vegetable production technology at a remarkable level; therefore, he went to teach vegetable cultivation in other municipalities and provinces. This was realized through a request from Political Committee (POLCOM) to the training division of the BDA RMO CenMin Office to implement training. Consequently, the RPOO was appointed to be the lecturer / instructor on trainings. Most of the participants of the training were MILF combatants who wanted to learn vegetable production as a means of income generation.

Similarly to the above for Sultan Mastura, an evaluation workshop targeting BDA RMO Ranaw was held in November 2014 as well. The following description are extracted from the workshop.

During implementation of the technical survey in Matungao, some staffs of the RMO expressed a lack of understanding about the direction of the survey. The JICA expert took initiative and used interviews as a survey tool. The preparation and implementation periods for the surveys were short. A workshop

for pilot project implementation planning was conducted; however, some staffs of the RMO seemed to face difficulty in understanding the strategy because the method was new to most of them and explanation time was short. The pilot project strategy was fine-tuned and documented by the JICA expert.

Interaction with participants in a barangay assembly meeting was found difficult in fully delivering the message to beneficiaries. Those barangays that were not selected as target seemed reluctant to accept the selection results although the selection process was performed according to strict criteria and appropriate transparency. Additionally, there were differences in opinions among the BDA staffs about materials used to establish some facilities on the demonstration farm because a paradigm shift in the community development concept, from "granting things to people" to "fostering self-reliance of people," was not effectively delivered to the stakeholders at the early stage. It took times to achieve the consensus in implementing activities.

(3) Challenges and issues

The following challenges and issues were identified for the agriculture sector based on the results of pilot project.

Firstly, tools used during the planning stage in the agriculture sector in Social Preparation 1 have to be fully taught to BDA RMO staff in order for them to be able to formulate community development. The tools are: Rapid rural appraisal, Semi-structured interview, report writing, and SWOT analysis.

Secondly, the schedule and training periods conducted should coordinate with the schedule of individual farmers' daily farm work in an effort to maximize the participation ratio. During the early stages of the project, there were scheduling conflicts among the farmers; therefore, participation in farm activities did not reach 20 participants. According to the RPOO, 80-90% participation was maintained during the early stages. The farm work schedule of each beneficiary should be shared in advance during the planning stage.

Thirdly, financial literacy training should be fine-tuned to beneficiaries' knowledge level during the planning stage. Financial literacy seemed to be difficult for the beneficiaries to understand because the presentation materials prepared by the resource person (RP) were not fully scrutinized during the planning stage. Thus, a simple record-keeping format for the beneficiaries to practice recording production and sales was developed by the project. The content of financial literacy training requires a long review time, specialized materials, and a longer training session allocation in order for beneficiaries to fully understand the message of this training and to understand how to apply the tools on their individual farming businesses.

Fourthly, a market survey and analysis workshop should be conducted before starting production

activities to strategize the farming plan to maximize profit. A marketing survey should be conducted and finished before dry season cultivation starts in November. Based on the results of this survey, a production plan can be designed.

Fifthly, climate change and natural calamities should be considered as external assumptions for implementing community development. Moreover, community development in agriculture, especially vegetable production, should consider the timing of these typical events before entering production in dry season in November. Vegetable cultivation during wet season, from May to October, is still a challenge for farmers in Sultan Mastura.

Lastly, follow-up advocacy and information sharing should be regularly conducted during implementation of community development project to those barangays that were not selected as target even though the implementers set transparent criteria for the selection process of the target barangay.

3.1.2. Fisheries Sector

The pilot project for the fisheries sector introduced two different types of fish culture: pond culture and cage culture. There are pilot sites for pond culture (at Tambu and Cadayonan) and another pilot site on cage culture (at Solon and Pasayanon) in each of the target municipalities, Sultan Mastura and Matungao.

1) Results of the pilot project

In Sultan Mastura, the first stocking practice of tilapia pond-culture started in December 2013, after the completion of the pond construction and rehabilitation. About one month later, after nursing the fish seeds in the hapa nets, the fish grew to the proper stocking size for growth in earthen ponds (3–4 inches in body length). Once at the proper size, the fish were gradually transferred to earthen ponds for further growth, in January 2014 in Tambu, Sultan Mastura. During the growth period, BDA counterparts regularly visited the pilot sites every 15 days (two weeks) for field monitoring of the fish culture activities. Sometimes technical partners, professors, or researchers from MSU Maguindanao accompanied the BDA counterparts in order to provide support and technical guidance. About five months later, after stocking the fish seeds in earthen ponds, the cultured fish grew to the regular market size, 250g per fish (four fish per kg). The harvest of cultured fish started at the end of June, at the beginning of the 2014 Ramadan. In the case of cage-culture practices, the beneficiary groups constructed one unit floating cages from bamboo at the respective pilot sites during the introductory field training, which was held in March and April 2014. The project transported fish seeds from BFAR hatcheries to the pilot sites in April. During the first two months, the fish seeds were nursed in hapa nets that were set in the bamboo cages. After the fish grew to the proper size, the fish were gradually transferred into the growth cages. The harvest of the cultured fish started in September or October 2014.

In both practices, the feed conversion rate (FCR) was at a reasonable level, which means that the beneficiaries managed to sufficiently feed fish throughout that culture's period. However, compared to the growth rate and FCR, the survival rate is very low, at only 40% and 50% for pond culture. A survival rate of greater than 60–70% could be expected if proper feeding management is employed. The invasion of predatory fish, like catfish or mudfish, may be one of the possible reasons for the low survival rate. Another possible reason for the low rate is the theft of cultivated fish from the ponds.

The beneficiary groups sold most of harvested fish directly to local people in the municipality. In the case of a direct sale to a local person, they could sell fresh fish at reasonable prices: P 100–120/kg. The customers' opinion of their culture fish was very good. Most of the customers admitted that their tilapia had a better taste and was fresher. In terms of the first harvest, the net profit of the pond culture at Tambu was estimated to be about P 5,000. Likewise, the net profit of the cage culture at Solon was about P 6,500. The profit rate for the pond culture was only 14%, which is much smaller than that of the cage culture (34%). The results of the first harvest suggest that the profitability of the cage culture is better than that of the pond culture. The largest portion of the production cost is the feed cost, which accounts for 80–90% of the total production cost. Therefore, reducing the feed costs is the most important issue in the financial management of fish culture.

In the same manner as Sultan Mastura, the beneficiary group in Matungao managed to feed the fish at a rate that was periodically adjusted according to the sampling of cultured fish, and market-size fish were harvested from the first culture. The growth trend of cultured fish at all locations smoothly increased because of the proper feeding management of the beneficiary group. The FCR was also in reasonable range. However, the survival rate in pond culture was 53%, which is smaller than we expected. It is presumed that some predators, such as frogs or aquatic insects, may have accidentally entered the ponds and preyed on the small fish. In addition, there are significant differences in the FCR and survival rate between the pond- and cage-culture practices. As a result of the first harvest, the cage culture demonstrated a higher productivity than the pond culture.

The beneficiary groups sold most of the harvested fish directly to the local people in the municipality. Some of the cultured fish were sold as live fish at the Matungao Municipality anniversary, which occurred at the beginning of September 2014. Because of their efforts to sell fish directly to local people, the farm-to-gate price was reasonable, ranging from P 100 to 120 per kg. This contributed to securing sufficient profits and operational costs for future production. In the first harvest, the net profit was estimated to be about P 12,000 for both the pond and cage cultures. The profit rate for pond and cage cultures account for 26% and 31%, respectively. The profit rate of the cage culture is a little higher than that of the pond culture. Therefore, as was the case in Sultan Mastura, the profitability for the cage culture was better than that for the pond culture in the first harvest.

To add to the variety of fish culture practices, the pilot project introduced red tilapia seeds into the

pilot sites. The project team accidentally encountered red tilapia at a private fish farm in Panabo, Davao del Norte. The red tilapia, from Thailand, was introduced into the program run by the BFAR Regional Fisheries Training Center in Panabo for trial purposes. Generally, in Southeast Asian countries, red tilapia is highly valued because of its bright appearance. This is the first time a red tilapia culture was stocked in the Bangsamoro region, because there are no past records of red tilapia culture. A total of 500 red tilapia seeds were already introduced into the pilot sites, and 250 fish were separately nursed in each target municipality. The first harvest of red tilapia was mainly carried out to produce breeders for future seed-production as Bangsamoro-oriented fish.

Additionally, after selling almost all of their marketable fish, the beneficiary groups tried to process dried tilapia (tilanggit) with the smaller fish, which remained in the ponds. In Tambu, Sultan Mastura, the beneficiary group for the pond culture produced about two kg of dried tilapia. Every 100g of dried fish was packed into a plastic bag using a vacuum sealer, and sold for 50 pesos per pack at the local market. In Matungao, the beneficiary group produced only one kg of dried tilapia through processing practice during the same period. Their dried tilapia was also sold at a local market. According to these processing practices, the net profit of dried tilapia fish reached P 40 per kg of the wet weight of the fish. This result indicates that smaller fish can be sold for a better price by processing them as dried fish. Sometimes it is hard to find customers who will buy smaller tilapia (i.e., with a body weight of less than 100g) fresh. This suggests that the processing of dried fish adds some value to smaller fish that are sold at local market.

Field–training events for community-based tilapia seed production were also held in both target municipalities. In the training program, the hapa-net method of tilapia seed production was introduced to the beneficiary groups. In the hapa-net method, mature male and female fish are mixed in a hapa net to promote mating and spawning. After the field training, the beneficiary group started their first trial of tilapia seed production at the same time that they began their second practice of fish growth. In November, the beneficiary groups successfully produced tilapia seeds at their own sites. Some of the fish seeds were nursed in hapa-nets in preparation of the next fish production cycle (the third harvest), while the other seeds were sold or given to other communities or farmers for their fish culture activities.

During the implementation of the pilot project, many local people in the neighboring communities visited the pilot sites to directly observe the fish culture activities and listen to some advice from the beneficiary groups on preparing for fish culture. A few community groups and families who were stimulated by the pilot project started fish culture activities using their own capital. The beneficiary groups voluntarily supported these beginning fish farmers; for example, beneficiary members visited their fish culture sites to assist in the preparation of fish ponds and cages, as well as to give technical advices on fish culture.

2) Results of capacity building of the BDA

In terms of technical and management capacities in BDA counterparts, the observation and experience of the project experts verifies their achievements at respective evaluation criteria. Generally speaking, the technical and management capacities of BDA counterparts drastically went up through a various experiences in the pilot project. Through the practical extension activities in the pilot project, the development levels of BDA counterparts in technical advices and coordination with local beneficiaries have been greatly enhanced, and they become able to manage necessary activities by themselves basically. However, according to our observation to their field works, there are still a few miscommunication cases to coordinate the arrangement in the organization, especially, a communication between the central office and regional offices. They may need much efforts to improve the internal communication in the organization in the future. Additionally, their presentation skills and performance at seminars and meetings have been drastically improved by many presentation experiences in the project. In terms of field monitoring, the BDA counterparts have mastered a proper knowledge and skill for the regular monitoring activities on fish culture, collected the data of fish growth by sampling and adjusted the feed rate according to fish growth.

3) Challenges and issues

The pilot project has developed the appropriate extension model for developing community-based fish culture, especially adapted to the Bangsamoro region. Based on the experience of the pilot project, the extension model should be extended to other communities. However, to start the fish culture activities, a community group has to prepare the initial capital to cover the construction costs of the fish ponds or cages and the operational costs of fish culture. According to the results of first harvest trials, the necessary initial capital reached P 50,000–60,000 for the pond culture and P 20,000–40,000 for the cage culture. This varies according to the scale of fish culture and the stocking density of the cultured fish. It is not a small amount for the local people and their communities. In the case of fish culture development, the most serious issue is how they acquire the financial assistance needed for the initial capital. Therefore, we should consider not only extension programs for developing fish culture, but also programs for financial assistance for beginning fish farmers. This means that the extension program should be convened alongside a financial program, such as a subsidy, loan, or micro-credit program.

According to the results of the first harvest trial, the feed costs accounted for about 90% of the total operational cost. The reduction of feed costs is an important key to the fish culture operation. Thus, the pilot project advised efficient feeding by regular sampling the population in order to minimize feed consumption. The production of organic feed using local ingredients is the advanced activity in fish culture. Especially for local farmers, it is not easy to constantly and stably procure a sufficient amount of local ingredients needed for fish feed, such as fish meal, rice bran, corn starch, etc. However, when considering the halal certificate, preparing for the production of organic feed is inevitable. Hence, in the near future, the BDA should consider a pilot-based feed production project that uses locally

available ingredients. In that case, the BDA should work together with local technical partners, such as BFARs or MSUs, on this future project.

3.1.3. Road Rehabilitation and Maintenance

The pilot project for LBT included two different types of road works: road rehabilitation and maintenance. There are two pilot roads in Sultan Mastura (at Tariken for road rehabilitation and Namuken for road maintenance) and another two pilot roads in Matungao (at Cadayonan for road rehabilitation and Banco for road maintenance). This section explains the major findings from the pilot projects as well as challenges and issues for further promotion of LBT in CAAM.

1) Results of the pilot project

The pilot roads in Sultan Mastura are composed of Sitio Padian-Kinugkungan Pilot Road Rehabilitation in Barangay Tariken, with a total length of 1.50 km, and Sitio Dungguan-Mareges Pilot Road Maintenance in Barangay Namuken, with a total length of 2.14 km. The final output of the pilot implementation is the improvement of the two roads into all-weather gravel roads, upgrading them to a maintainable level from their currently dilapidated, impassable earth road condition. The completed roads comply with standard Philippine local road specifications of a 4.00 m carriageway with 1.00 m shoulders on each side and the existence of complete drainage canals and structures. The finished road surfaces are made of compacted aggregate base course (Item 201[8]). A two-barrel box culvert was implemented in the rehabilitation of Tariken to accommodate the large volume of flood water flow due to the insufficient capacity of existing pipe culverts. In addition, the single line of pipe culvert in the pilot road maintenance in Namuken was replaced with two lines of pipe culverts to accommodate the large volume of water during rainy season. This will also mitigate the constant flooding in the area during this time of the year. The pilot roads in Barangays Tariken and Namuken generated employment for 186 and 116 skilled and unskilled laborers from the local community, respectively, for an equivalent of 8,038 man-days within a period of about six months.

The pilot roads in Matungao are composed of Cadayonan-Bubong Radapan Pilot Road Rehabilitation in Cadayonan, with a total length of 1.12 km, and Banco-Batal Pilot Road Maintenance in Banco, with a total length of 1.52 km. As in Sultan Mastura, the final output of the pilot implementation is the improvement of the two roads into all-weather gravel roads, upgrading them to a maintainable level from their currently dilapidated, impassable earth road condition. The completed roads comply with standard Philippine local road specifications of a 4.00 m carriageway with 1.00 m shoulders on each side and the existence of complete drainage canals and structures. The finished road surface is made of compacted aggregate base course (Item 201). To mitigate flooding on the low-lying sections of the pilot

[8] Item 201 is the technical item code used for Aggregate Base Course in road construction works.

road maintenance in Barangay Banco, a two-barrel reinforced box culvert was installed to accommodate the large volume of surface run-off during heavy rains. The piloting generated employment for 81 and 102 unskilled laborers from the community for road rehabilitation and road maintenance, respectively, for an equivalent of 3,185 man-days within a period of about four months.

The piloting of road rehabilitation and maintenance for the two target municipalities followed only one implementation process broken into three major stages: *(*1) planning, (2) procurement, (3) implementation, monitoring and supervision. These stages were comprised of interdependent sequential activities that were designed to capacitate BDAs' future roles in the development of the CAAM, specifically the implementation of community-based infrastructure projects. Pursuant to the project's capacity-building concept through OJT, the pilot project established a PMU for the infrastructure sector, comprised of individuals from BDA CMO, BDA RMOs, and the municipal local government unit (MLGU)s that engaged in all of the activities under the three major stages of the implementation process. The project adopted the LBT and do-nou method using the "Pakyaw" contract system.[9] Under this, community members were grouped into work teams and assigned to finish a specific task within a fixed contract amount and specific period of time. A series of technical training on LBT and Do-Nou method was also carried out by the JICA experts.

2) Results of capacity building of the BDA

The overall outcome of the capacity building interventions within the infrastructure sector succeeded in addressing the limited knowledge and skills of the BDA, MLGU, and communities regarding LBT and "do-nou" method. During the pilot implementation stage, one of the impacts was a change in perception of the BDA, MLGU, and community members on the effectiveness of the LBT and do-nou method in road rehabilitation and maintenance. They gradually began appreciating and accepting the concepts as an alternative means to improve and maintain the rural road networks in lieu of the commonly used equipment-based methods. The extensive trainings on LBT and "do-nou" method, coupled with hands-on application through the pilot project implementation, provided the participants with the necessary knowledge and skills to directly apply the technology for the improvement of their dilapidated rural roads. The BDA, MLGUs, and communities in the pilot areas are now well-equipped to identify rural road distresses and deficiencies, their causes, as well as appropriate solutions and work procedures to improve road infrastructure and sustain its usefulness through proper maintenance processes and procedures.

This is against a background of most MLGUs experiencing fiscal difficulties given the limited resources (e.g., budget, technical manpower, equipment) under the government's Internal Revenue Allotment

[9] "Pakyaw" is a system of hiring a labor group for the performance of a specific work and/or service task toward the implementation of an infrastructure project, whereby tools and materials are furnished by the implementing agency. For the specific work/service output, a lump-sum payment is made either through the group leader or divided among the "Pakyaw" workers and disbursed using a payroll system.

(IRA). The application of labor-based road rehabilitation and maintenance has proven to participants that it is an effective method that can be replicated to improve long-dilapidated and even abandoned rural roads in lower-class municipalities, especially in conflict-affected areas. The pilot roads, which either impassable or abandoned due to serious deterioration, are now usable in all weather conditions. These roads were elevated to a maintainable level as a result of feature upgrades to acceptable engineering standards and specifications, complete with necessary drainage facilities to address flooding during the rainy season.

As recipients of the technology transfer, the community LBT facilitators shared their knowledge to other community members who were engaged during the pilot project implementation. In fact, the selected fisheries sector beneficiaries who were included in the training immediately initiated improvements to inaccessible and neglected trails to the Cadayonan fishpond site by using LBT that they had just learned. These facilitators are likely to become the focal persons in the replication of the technology to other barangays within their respective municipalities. Should the MLGUs decide to apply the technology in the maintenance of their local roads, these LBT facilitators can be engaged to train and supervise road maintenance works by community members from other barangays.

3) Issues and challenges

The completed pilot roads are expected to deteriorate significantly faster than concrete roads, especially during the rainy season; however, with the projects' strict implementation of the proper LBT work methods and application of "do-nou" methods, the economic life of the completed pilot roads are expected to last longer than the original dirt road before it was rehabilitated or maintained. This is assuming that the pilot MLGUs and BLGUs will allocate enough budget to the endeavor annually and continue to conduct routine maintenance using LBT. The institutional sustainability of the interventions, therefore, rests upon the pilot MLGUs and BLGUs' recognition and acceptance of the merits of the technology. Unless the BDA continues to advocate the pilot municipalities' technology for replication in other CAAM areas, all of the interventions will not be sustained if the LBT recipients themselves are not convinced of the technology's efficacy.

With the current limited resources and technical personnel available in the pilot MLGUs and BLGUs to monitor and evaluate their road network, the management of community-based road development as a whole is difficult for them to sustain. In addition, the pilot MLGUs' linkage with technical institutions such as DPWH to provide technical and financial support is not yet clearly established under the Bangsamoro entity. Should the local community have its own initiatives to intermittently monitor and maintain their local roads, the guidance of the local LBT facilitators is crucial to ensure that proper work methods and specifications are observed to achieve optimal effectiveness. Thus, the lack of technically capable personnel or the unavailability of trained LBT facilitators might also hamper the sustainability of the interventions.

The roles and responsibilities of the BDA, as the catalyst of the technology, are crucial to the institutional, managerial, and technical sustainability of the pilot projects. With the increasing rate of development interventions funneled thru the BDA, the opportunities for the technology to be adopted in other projects are numerous. The BDA is expected to continue to advocate the application and replication of the technology to other target MLGUs in the CAAM.

3.2. Strengthening and expansion of the CD-CAAM model

3.2.1. Farmer-to-Farmer Extension

(1) Agriculture

In the extension phase of the CD-CAAM, the technology of vegetable production and marketing was expanded to other barangays within Sultan Mastura and Matungao using the FTF approach.

1) Results of FTF extension

Prior to conducting FTF, TOT targeting the 1st beneficiaries in the municipalities was implemented. TOT aims at a) training the 1st beneficiaries of CD-CAAM to be a famer trainer (FT) who teach vegetable production technologies to 2nd beneficiaries in a different barangay in Sultan Mastura and Matungao in order to achieve technology dissemination of vegetable production and marketing; and b) building up teams of FTs. A maximum of 30 new beneficiaries (2nd beneficiaries) is selected and capacitated within their respective municipalities. Figure 3.2.1.1 shows the overall implementation mechanism of TOT and FTF.

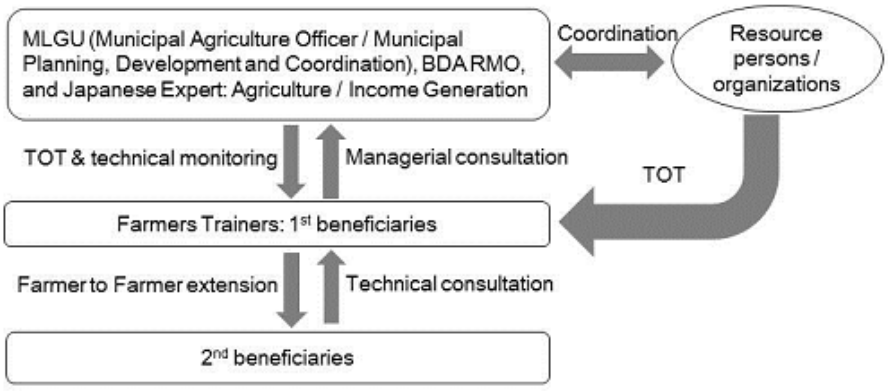

Figure 3.2.1.1: Implementation mechanism of TOT and FTF

FTF aims to supplement the agricultural extension activities of the government. The FTF approach is adopted to enlarge the areas for technology transfer and the number of beneficiaries in an efficient manner. In FTF, 1st beneficiaries as FTs conduct technology transfer as shown in Figure 3.2.1.2 after being provided TOT to the 1st beneficiaries.

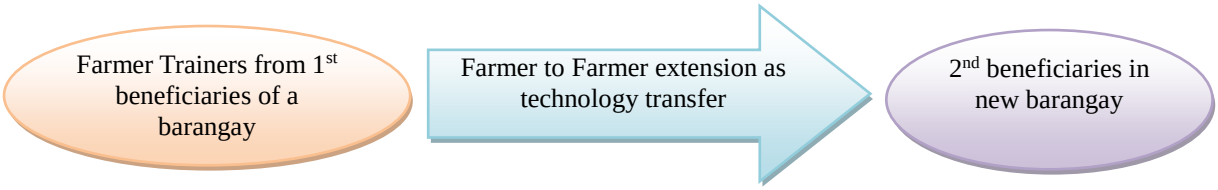

Figure 3.2.1.2: Technology transfer using Farmer-to-Farmer extension

TOT is composed of three steps: a) discussing TOT content and schedule, b) conducting TOT and selecting FTs, and c) building a training team and planning FTF. After TOT, the training team interacts with the target beneficiaries with support of BDA and MLGU, and both parties agree to start FTF. TOT spends approximately 8 days on 8 major topics: a) rule of FTs, b) teaching method, c) reviewing vegetable production technology, d) record keeping, e) evaluation, f) building trainer team and planning FTF extension, g) preparation, and h) dry run. As result of TOT, FTs teams were structured as shown in Table 3.2.1.1.

Table 3.2.1.1: Farmer trainers as a result of TOT

Municipality	Number of participants out of 20 for TOT	Number of trainer teams	Number of members per team
Sultan Mastura	15	9	3
Matungao	17	4	5

Source: Activity report for planning FTF in September 2015 , CD-CAAM

During TOT, extension schedule was planned. Topics of TOT coincide with the subjects described in the Basic Manual for Vegetable Production and Marketing. The target extension sites of Barangay Matampay, Matungao Municipality, Lanao del Norte Province and Barangay Buliok, Sultan Mastura Municipality, Maguindanao Province, were selected prior to FTF. Thirty of the 2nd beneficiaries were selected through the social preparation. The number of males and females is 6 and 24 in Matampay, and 24 and 6 in Buliok, respectively. Farms established for the extension purpose are called “practice farms” to differentiate them from the demonstration farms that were established in the previous phase of CD-CAAM.

2) Evaluation of quantitative outputs in terms of production and sales

Sultan Mastura

The 2nd beneficiaries from Barangay Buliok started cultivating vegetables for the first production cycle in October and November 2015 as FTF activities. They selected seven crops: string beans, bitter gourd, tomato, bell pepper, squash, green chili, and cabbage. These crops were selected based on the results of the market survey. The crops were then cultivated on about 1,600 m^2 of the practice farm. The 2nd beneficiaries harvested the products from December 2015 to February 2016.

The production was poor because of fungus and virus attack after the flowering stage of the crops

when the atmosphere became extremely wet. In addition, contrary to the wet conditions, a dry spell / draught condition affected the plants before and during the harvesting season; thus, only tomatoes produced a positive profit. The profit rate of tomato, which exhibited a positive result, was 76%.

Provinces in Mindanao were officially declared being affected by the natural calamity caused by El Niño. Maguindanao province was among them. According to the official report of the Provincial Agriculture Office (PAO) of Maguindanao in April 2016, in terms of vegetables, about 20 ha farm land with 152 farmers were affected, and 50 tons of vegetable, equivalent to PHP 400,000, were damaged in the Sultan Mastura Municipality.

Marketing was unique component of this livelihood project compared to other projects, according to the beneficiaries. Matchmaking activity provided an opportunity not only to the producers but also to the buyers to learn more about the production capacity of the producers. Through this activity, the relationship between farmers and buyers was strengthened.

The 2nd beneficiaries deemed the following specific technologies important and useful for their farming: a) seed bed making for nursery making, b) fertilizer application, c) trellising, and d) harvesting. Although the technologies introduced during FTF were basic technologies for vegetable production, the farmers appear to not have been previously exposed to the technologies. As the effects of technology transfer became tangibly recognizable, some 2nd beneficiaries began to apply the technologies that they had learned through FTF on their own farms.

Technology transfer using FTF is more understandable and an acceptable extension method by farmers with the following advantages of FTF.

- FTs have more experience and knowledge about vegetable production.
- FTs use the same language as the beneficiaries for easy communication.
- No hesitation to interact with FTs and farmers because they feel free to seek clarifications from each other. Both sides learn from the experience; teaching and learning can be realized.
- FTs teach technology by illustrating how they work practically after a theoretical explanation.
- Creating and maintaining networks among 1st and 2nd beneficiaries will result in boosting agricultural production in Sultan Mastura.

Meanwhile, improvement points were also extracted:

- Female FTs should be encouraged for the practical parts to support female participants.
- 2nd beneficiaries should include representatives from all the Sitios of a Barangay.
- The number of FTs per team from 3 should be increased to at least 5 for every topic to teach 30 beneficiaries for the practical aspects.
- FTs should be provided certificates ascertaining their credibility by authorities.
- Additional TOT is required to improve teaching skills with a dry run during the TOT.

- Review sessions with technical guidance need to be provided before certain topics.

The 2nd beneficiaries of the Buliok of Sultan Mastura will officially establish a cooperative namely Amadio Vegetable Producers Cooperative after training was provided by the CDA of ARMM in March 2016.

Matungao

The 2nd second beneficiaries from Barangay Matampay started cultivating vegetables for the first cycle of production in October and November 2015 as well. They selected five crops: bitter gourd, pechay, string beans, bell pepper, and sweet pepper. The selection of these crops was based on the results of the market survey. The crops were cultivated for approximately 1,500 m^2 of the practice farm. The 2nd beneficiaries started harvesting the products from December 2015 to February 2016. Positive profits were obtained.

Marketing was an important component of the program. Some of the 2nd beneficiaries had already contacted the buyers of the vegetables before the commencement of the FTF. In addition, the matchmaking activity provided a significant and remarkable opportunity to both the farmers and buyers to strengthen their relationship.

Some beneficiaries applied crops and technologies that they learned during FTF in their farming. As examples; a farmer rented land from a land load for production, while another case is that a farmer cultivates in crops in his backyard garden. Although the production scale differs in each case, both duplicated the raised soil bed, enabling them transplant pechay with companion plants, such as lemon grass. The six beneficiaries kept records, from which the effects of FTF can be observed. Their markets are within the municipalities, neighboring municipalities, or cities. Buyers and traders approach the Matungao municipality and it has become well known especially for pechay among traders.

The 2nd beneficiaries of Matampay understood the importance of most technologies that were introduced during FTF, and some beneficiaries tended to apply them. The extent of application of the technologies appears to be dependent on the land tenure situation among the 30 beneficiaries. Four of the 14 tenants applied technologies; land preparation, appropriate application of fertilizer, concoction making and application, sowing/transplanting, record keeping, and pechay production, as of April 2016. Some others are waiting for the rainy season to finish corn production to start applying technologies. They are planning produce pechay and string beans that were introduced during FTF.

Among the beneficiaries, two are landowners. They applied technologies for and engaged in land preparation, sowing/transplanting, appropriate fertilizer application, trellising, concoction making and application, pruning, and record keeping. There are 5 backyard gardeners among the beneficiaries.

They are growing pechay, eggplant, and tomatoes using concoction making and application, pruning, and record keeping. Four participants do not have land; therefore, that they cannot yet cultivate the vegetables.

The 2nd beneficiaries of Matampay also recognized the advantages of the FTF.

- Actual vegetable production on the demonstration farm in Puntod was observed.
- The shared language (Visayas) helps them understand each other.
- FTF practices a two-way learning process: FTs also learn from the good practices of the 2nd beneficiaries by observing the practice farm.
- The combination of lectures and hands-on practice helps the 2nd beneficiaries easily grasp technologies.
- Tenants, who only rely on income from copra, realized that intercropping of vegetable with coconuts trees is an additional income source.
- 2nd beneficiaries are consolidated through FTF which led them to organize a farmers' association.
- The FTF approach provides not only knowledge and skills but also links farmers to markets.
- Uniformity and standardization of vegetable cultivation, particularly organic–conscious farming, can be practiced in Matungao.
- FTF establishes a good network among the 2nd beneficiaries and FTs.
- FTs gained self-confidence so that they become more active vegetable producers.

The following improvement points for FTF were extracted from the FTs.

- More time should be allotted during TOT.
- The same opportunities should be provided to all the FTs to master different topics.
- FTs should follow up and monitor on the days following the lecture and hands-on practice to check the performance of the farmers and growth of vegetables.

The Matampay Vegetable Growers Association (MVGA) was officially established April 1, 2016. The objective of registering their group is to become a legitimate organization, which is part of their sustainability plan to continue their vegetable production and marketing.

The demonstration farm in Barangay Puntod of the 1st beneficiaries, the practice farms in Barangay Matampay for the 2nd beneficiaries, and the newly established demonstration farm by the MLGU under the management of MAO will be accredited as learning sites of Good Agricultural Practices (GAP) by the Agricultural Training Institute (ATI) of Region X. The official process is ongoing as of March 2016.

3) Capacity building of BDA

The staff of BDA RMO carried out TOT and FTF under the supervision of the CMO with the support of JICA experts. Especially, the RPOO and CO committed to the management of activities. Evaluation

workshops were held for BDA RMO CenMin and Ranaw where they reviewed the major activities, and recalled issues and countermeasures taken to solve managerial problems.

RMO CenMin

At the planning of TOT, there were differences in the degree of understanding about TOT among stakeholders. It was proposed that resource persons (RP) of Upi Agricultural School (UAS) and RPOO of CenMin participate in TOT conducted by RPs of ATI in Matungao to maintain an equal quality level across TOT. A flexible model of learning from each other was created and accepted for the successful implementation of TOT.

Flexible countermeasures involving the mutual effort of BDA and RP were observed during the implementation of TOT although it was a very new trial for them because of the differences among 1st beneficiaries, who are FT candidates, on literacy levels, understanding and mastery over topics of vegetable production technologies, and teaching skills. BDA translated verbally the contents of the Manual into Maguindanao dialect during a review of the Manual. The teaching team was structured to include a lecturer who knew a topic thoroughly and two demonstrators to make the training effective. All the 1st beneficiaries are allotted to teaching teams as FTs so as to be given opportunities to teach others.

During the implementation of FTF, some could not participate in the training for certain topics. BDA made efforts to encourage the members of the 2nd beneficiaries to communicate what they learned to those who were absent. Matchmaking was the first trial in the extension phase to strengthen the linkage between the farmers and buyers. Ten buyers were tapped during planning; however, four buyers were afraid of visiting the sites. This issue remains unsolved. BDA as the development organization of Bangsamoro needs to strategize advocacy to mitigate negative image when implementing market linkage activities.

Additionally, the BDA Radio program is aired every Monday from 11:00 am to 12:00 noon and is hosted by the RPOO of CenMin in charge of Agriculture. The program includes topics on vegetable production and a question-and-answer session. The RPOO shared the technology based on the Basic Manual for Vegetable Production and Marketing. This program reaches listeners from Central Mindanao, North Cotabato, and other areas. The program started in February 2016 for 2 months. Because of the insistent demand from listeners and the unanswered questions, the RPOO was called by the station again to answer the inquiries. The RPOO promoted the demonstration and practice farms in Sultan Mastura through the program and encouraged listeners to visit them to learn from the beneficiaries.

RMO Ranaw

During the planning of TOT, incentive mobilization for FTs was raised from the farmers' side. The

issue of the honorarium was taken to CD-CAAM. This issue will always emerge whenever the FTF approach is adopted.

VET targeting the FT candidates conducted by BDA was criticized by the participants who felt it was not in alignment with their religious beliefs. Lecturers using Visaya dialect explained in a comprehensive manner. It is advised that BDA be equipped with advocative approach to explain the training effectively to non-Muslim beneficiaries.

For TOT, the Filipino version of the Manual was not used. Instead, the RP provided lectures by reviewing the English version of the Manual by using the Visayan dialect. Some participants did not attend the practical examination and evaluation because they had never taken an "examination" in their lives. Meanwhile, during team building, the beneficiaries wanted to choose members according to their preference. The RP and BDA analyzed the results of the examination to identify the strengths and weaknesses of participants. Based on this understanding, they proposed better combinations of team member for a more effective implementation of FTF. The beneficiaries followed the proposition.

Regarding VTT targeting the 2nd beneficiaries, the same situation occurred as the VET targeting FTs. Most of the 2nd beneficiaries expressed anxiety that they were forced to abandon their religious beliefs. BDA and lecturer emphasized that the training incorporated Muslim practices for development and was not attempting to convert the religion of the participants.

The 2nd beneficiaries faced difficulties during the market survey. They faced negative attitudes from some retailers who declined to answer questions. They felt that the surveyors were negatively affecting their vending business. BDA explained purpose of the survey to the vendors and it bought some vegetables to placate the vendors.

During FTF implementation, three major problems occurred: FTs could not answer some questions asked by the 2nd beneficiaries, the time for hands-on practice was inadequate for certain topics, and the submission of the document of the activity plan was delayed at times. The RPOO, who has a background of agriculture with farming experience, and MAO office staff followed up on the technical aspects and supplemented the FTF's activities in order for the 2nd beneficiaries to completely understand and acquire the vegetable cultivation technology. Additionally, more time began to be gradually allocated for hands-on session to fulfill the time required to transfer technology effectively from FTs to the 2nd beneficiaries. This countermeasure was also recommended by the BDA based on a field-oriented decision after observing the situation on the site.

Documentation of the activity plan with budget estimation was delayed at times although submission of the plan to the JICA Expert a week before the implementation of an activity was required. As the experiences of the BDA began to increase through guidance and support from the expert, it gradually

managed to meet the deadlines.

Matchmaking revealed the reality of the outside buyers' negative attitude and image of the area because some buyers who were tapped to participate in the matchmaking in Matungao refused to do so despite an official letter from CD-CAAM. Peace and order are the most important factors to implement effective and efficient community development; therefore, such matchmaking activities should be conducted after addressing the security by BDA and MLGU.

The technology transfer of vegetable production was extended apart from the activities of CD-CAAM. In October 2015, the RPOO was invited to provide a lecture on vegetable production on a daily program of a Local ICOM Radio within the Province of Lanao del Sur. He provided the explanation of the technologies based on the Manual of CD-CAAM on every Saturday.

4) Challenges and recommendations on further promotion/expansion

Through the review workshops, group interview with FTs and the 2nd beneficiaries, and reviewing of activity reports submitted by BDA during the extension phase of CD-CAAM, the following challenges and recommendations on future promotion / expansion are extracted.

a) Sultan Mastura

Institutionalization of Farmer-to-Farmer (FTF) approach extension in MLGU

Extension method of FTF can be institutionalized using the budget plan of MLGU's Comprehensive Development Plan – Executive Legislative Agenda (CDP-ELA). Meanwhile, TOT and FTF need to be standardized by drafting an operation handbook between BDA and MLGU. Female FTs should be effectively fostered by considering the gender balance. This FTF can be smoothly implemented under the strong partnership between MLGU and BDA to mobilize farmers.

Stabilizing and securing market linkage activity

Matchmaking should be conducted to further strengthen or establish linkage to new market destinations. It should be conducted in places that all the stakeholders can access without feeling a security risk.

Inclusion of beneficiaries of all sitios in a Barangay during FTF

Representatives of all sitios in a Barangay should be included as beneficiaries to avoid the natural human feeling of jealousy in terms of a barangay-to-barangay extension within a Municipality.

Addressing natural calamities at the planning stage

The natural calamity should have been addressed at the planning stage in order to provide education on environmental/climate change to farmers apart from technical training.

Sensitization of CD-CAAM model to other development partners

BDA should utilize its organizational mechanism for expanding community development. To increase the effectiveness of the activity for wider areas, it needs to organize a conference to disseminate the CD-CAAM model by inviting development partners as well.

Inclusion of high value cash crops with vegetables and food processing

Since the technology dissemination mechanism of BDA is set up in collaboration with MLGU and resource organizations, the technology level can be upgraded by adding a value to target vegetables or diversifying income resources by adding cash crops to intercrop the vegetables. To achieve this, research and development activities related to vegetable processing and intercropping of vegetable with cash crops by experts are recommended.

b) Matungao

Institutionalization of TOT and FTF in the agricultural extension of MLGU

TOT and FTF need to be institutionalized in the agricultural extension activities of MLGU. The FTF's extension plan can be included in the Barangay development plan or Municipality development plan such as CDP-ELA to suit budget. A handbook of TOT and FTF should be drafted for them to maintain this approach. It can be used along with the Basic Manual for Vegetable Production and Marketing.

Securing market linkage by addressing security concerns

MLGU and BDA need to address security concerns to ensure that buyers are linked with producers. Matchmaking can also be conducted in cities such as Iligan to secure buyers and widen market linkage for all vegetable growers in the Municipality.

Activating advocacy of CD-CAAM Model

To expand further the development within the municipality or outside the Municipality, capacity and tools for the advocacy of the CD-CAAM model are required. Pamphlets that can be used on different occasions to explain the CD-CAAM approach to development partners, and media programs such as radio broadcasting will help in disseminating the approach.

Planning farming schedule by accounting for natural calamities to mitigate damage

Rainfall and temperature condition patterns should be researched for implementers to refer to the information when planning the schedule for farming training to mitigate damage from dry spells and heavy rains. Farmers can also be engaged with educational activities for increasing awareness about climate change.

(2) Fisheries

1) Results of FTF extension

The FTF extension provided the opportunity for the 1st beneficiaries to teach and transfer their learned knowledge and experiences to the 2nd beneficiaries. 30 new beneficiaries (2nd beneficiaries) were selected and capacitated through the FTF extension within their respective municipalities. Tilapia culture has been operated by 2nd beneficiaries both in cage and pond in this extension phase as 1st beneficiaries practiced fish farming in the pilot project phase.

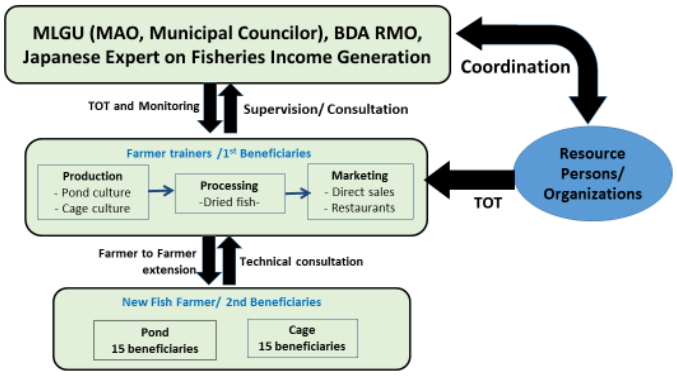

Figure 3.2.1.3: Implementation mechanism of TOT and FTF

Figure 3.2.1.3 shows that the overall implementation mechanism was comprised of two levels; at the top it was composed of the MLGU representative, and the BDA RMO who managed the technical activities with technical supports from a JICA expert in fisheries. They also coordinated with resource persons/organizations (referred as RPs) specifically in the implementation of the project. The role of RPs was to provide lectures and technical guidance during the project. The FTs were tasked with teaching the 2nd beneficiaries primary farm work related to tilapia production during the FTF extension with the support of the BDA to ensure that the knowledge and experiences acquired by the 1st beneficiaries were imparted properly by the 2nd beneficiaries. The FTs consulted the BDA and JICA experts when they faced managerial or operational problems during the FTF extension.

Similar to the agriculture project, TOT was organized prior to the actual implementation of FTF extension activities. The TOT aims to a) train the 1st beneficiaries of CD-CAAM to be FTs who could then go on to teach tilapia production and processing technologies to the 2nd beneficiaries in other barangays in Sultan Mastura and Matungao, processing and marketing; and b) build up teams of FTs.

FTs received the TOTs which were carried out by the technical partners from the MSU-Maguindanao and the MSU-Naawan. TOT was mainly supervised by the respective BDA and or RMO as part of their capacity development and through cooperation with the MLGUs. The TOTs included subject such as; i) the contents of the TOT, ii) conducting TOT, iii) building training teams, the preparation of teaching materials, and mentoring; iii) the practice of teaching and critiquing; iv) the selection of

farmer teachers, v) the planning FTF activities.

At the field level, the selected FTs transferred related technologies through the FTF extension to the 2nd beneficiaries in the other barangays after the TOT. Before the actual FTF extensions, FTs conducted dry-run activities mainly managed by the BDA for further mastery of their assigned topics. By far the FTs have been more efficient in the hands-on transfer of technology to other farmers as opposed to the lecture-type; it was also observed that the level of learning has been high in the hands-on transfer. Besides the FTF, a JICA expert in fisheries provided hands-on training on new technologies such as integrated farming and mono-sex culture.

FTs conducted periodic training courses covering the technical aspects of their work (e.g., tilapia farming, processing, and marketing) and continued to develop the communication skills necessary to complete their tasks. The BDA in cooperation with the MLGU also capacitated the FTs on how to access the essential information they need from the agencies by themselves.

Building an earthen pond is the most difficult and expensive part of fish farming. Ponds should be built using original soil as the primary dike, instead of using excavated soil that is weak and will cause heavy leaks, being susceptible to breakage in the future. As it may not be possible to use such heavy equipment, the beneficiaries had to use basic manual digging tools such as spades, digging blades, and ropes with the supervision of experts, BDA, and MSU Maguindanao and Naawan. In contrast, cage construction is relatively simpler than pond digging. The community uses special tying techniques to join bamboos that were taught by 1st beneficiary FTs. It took only 15 days to complete the construction of a 10m x 10m cage frame and cage bag. Women beneficiaries played a crucial role in the activity by doing net sewing and mending while men engaged in the construction and installation of cage-frame.

The project emphasized on good pond and cage management and best aquaculture practices. BDA counterparts and expert team frequently visited the sites to assess the progress of the fish culture as well as to provide technical guidance to the farmers. A new data sheet was introduced to collect and analyze operation/production data such as ABW, FCR, and daily growth rate (DGR) to adjust the feeding amount appropriately for lowering production costs. Data collection and analysis was likewise practiced by BDA and community with close guidance from the expert team. The project establishes a manner of consultative lecture-type activity to strengthen the capacity of BDA and the community to resolve technical and social issues that resulted in positive outcome in terms of trust and understanding among the 1st and 2nd beneficiaries.

Based on interviews with the FTs[10], their exposure to CD-CAAM has equipped them with the knowledge of how to prepare and deliver lectures in the basic approaches of conducting hands-on

[10] Interview with Amroden Monib, a farmer teacher from Brgy. Pasayanon, Matungao, Lanao del Norte, on May 23, 2016.

training during the farmer to farmer extension with the 2nd beneficiaries. Mr. Abdullah Guro[11] claimed that as farmer teacher he found it quite tough to deliver his lectures to the 2nd beneficiaries compared with his actual work because as a farmer doing the actual work is the most efficient way to retain what has been taught. Meanwhile, to evaluate the capacity of the FTs, FTF extension shows evidence of the effectiveness in the transfer of technologies to the 2nd farmer beneficiaries as well as to the other communities within and outside the target municipalities. This approach should validate the efficiency in the expansion of the geographic coverage of the project and increase the number of farmers who are taught and able to replicate the technology. In the case of Sultan Mastura, the FTs have extended their technical assistance to; Sitio Pahm, Brgy. Tambu (Sultan Mastura); Brgy. Lipawan (Municipality of Barira); Brgy. Gen. Luna (Municipality of Carmen). While the number of production ponds has increased tremendously within the pilot municipalities the FTs have not only shared technical knowledge, but also opened the opportunity to help others understand that tilapia farming can be good business for small-scale farmers using the existing available bodies of water that have been dormant for many years in many cases.

To compensate the FTs' efforts, they were provided with daily allowances based on their individual days of engagement. It is hoped that the FTs will work well even without compensation because such payment may not be sustainable unless regular funding source is established. However, this approach has been observed to boost their morale and motivate them to perform even better.

2) Transfer of the new technologies

Fishery sector has carried out two new approaches in tilapia farming. One is integrated fish farming with locally-available livestock and another is mono-sex culture. The former approach aims to reduce feed cost by utilizing plankton that grows in pond water through fertilization by livestock manure. The integrated farming also aims at diversification of income source. Farmers may have income from both fish and livestock. The latter is for utilizing fast-growing male tilapia by manual selection for grow-out operation.

a) Integrated fish farming with ducks

Integrated fish farming is a fish culture in ponds integrated with duck raising where the manure of animals is collected and applied directly as a fertilizer to the ponds in order to propagate plankton that contributes to fish growth. Ducks are raised in a fenced area or pen for convenience and collecting their manure efficiently. A duck house was constructed inside the pond or within the dikes for easy manure collection. This practice is more sustainable for fish farming with small inputs, specifically for village-based farming. Further, it generates income from both fish farming and livestock raising.

Pond fertilization is an effective method to increase the available natural food called "plankton" for the

[11] Mr. Abdullah Guro, farmer teacher from Brgy. Cadayonan, Matungao, Lanao del Norte, on May 23, 2016.

tilapia. The abundance of natural food in the pond implies a reduction in operational costs, particularly of compounded pellets. Therefore, farmers can practice sustainable operation with less anxiety about the high production cost, and ultimately increase their income. This project uses ducks in its integrated farming project practices. Ducks should be enclosed within a fence around the pond so that their fresh manure can directly be dropped into a pond to fertilize rearing water. One duck can cover a pond area of 10 m² to 20 m². The chart provided below illustrates the possible material circulation for fish farming in villages. Livestock manure is applied to fishpond for fertilizing rearing water for the propagation of natural organisms for fish to feed on. While small/trash fish, such as fry/fingerling can be fed to duck/chicken, excess vegetables, household leftovers, grass, and insects can be fed to fish/tilapia because they are omnivorous. Similarly, fertilized pond water and soil are good materials for vegetable growing. Therefore, fish farming and agriculture can likewise be integrated, and a small-scale irrigation system is a suitable system for this activity.

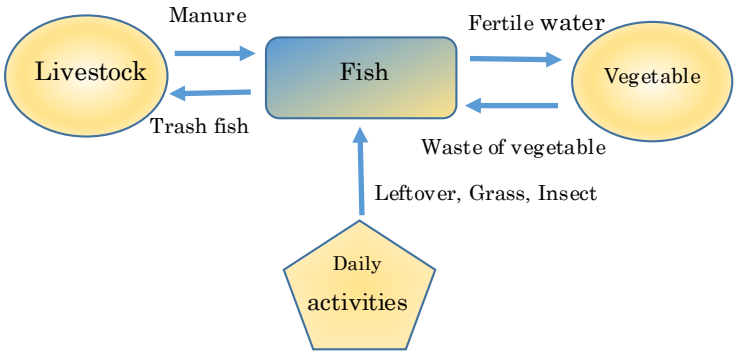

Figure 3.2.1.4: Resource cycle in Integrated Fish Farming

b) The Mono-sex culture

Mono-sex culture in this project refers to the selection of all-male tilapia through manual sexing for the cage and pen culture system. Mono-sex culture can produce a high yield compared to a mixed-sex population. For achieving increased productivity in growing tilapia, it is important to practice mono-sex culture involving mostly male fish. In commercial tilapia culture, fish is treated using hormones to produce all male hatchery-reared fry called sex-reverse treatment. It requires facilities, materials, and technology that are not affordable or practical for a village-based tilapia culture. Therefore, manual selection/sorting of male fish by viewing the genital organ was practiced for the mono-sex culture of village-based small-scale tilapia farming by 2nd beneficiaries both in Sultan Mastura and Matungao.

3) Evaluation of quantitative outputs in terms of production and sales

a) Pond culture

<u>Integrating tilapia culture with duck farming</u>

In the pilot project with the first beneficiaries, production costs per kilogram were comparatively high

with a cost of PHP 85.47/kg for pond culture and PHP 72.61/kg for cage culture. The FCR was 1.86 for pond culture and 1.60 for cage culture. The high production cost was caused by the high FCR. The FCR usually ranges from 1.0 to 1.5 if fish is cultured in a mixed-sex culture.
The Lake Tumingay Aquaculture Marketing Cooperative, the 2nd beneficiaries in Tapayan, practiced integrated farming with duck raising. Because of the duck manure, the color of the pond's water had maintained a green color, indicating that the water was rich in plankton, which that tilapia feed on.

The FCR in integrated farming is extremely low, with a ratio of 0.18. In the pond version of the pilot project, which was non-integrated farming, 1.86 kg of compound feed was used to produce one kilogram of fish.

While both the feed costs per kilogram of fish produced and return on investment (ROI) of non-integrated farming were PHP 65.10/kg and 16.5%, respectively, those of integrated farming were PHP 5.76/kg and 564.8%, respectively. Integrated fish farming with ducks has been proved to be both a lower cost and more sustainable method for tilapia culture. Chickens, goats, and cows can also be used as livestock for integrated fish farming in villages for low-cost operation.

Mono-sex culture

The second beneficiaries in Barangay Balut practiced mixed-sex culture in an earthen pond to compare fish growth between the mono-sex culture in Tapayan and the mixed-sec culture in Balut. The results demonstrated that fish in mono-sex culture grows faster than fish in mixed-sex culture.

There are two major reasons why the growth rate of the mono-sex culture was greater than that of the mixed-sex culture. One reason is the rapid increase in the biomass of fingerlings that were produced by the original fish stock. Crowded pond conditions with a large number of fingerlings retarded the growth of the original stock of fish. Another reason is the peculiar reproductive behavior of the female fish. Tilapia has a high fecundity because female tilapia lays eggs approximately once a month all year round, under ideal conditions. Female fish seldom eat during breeding times. Because of their high fecundity and particular reproductive behavior, the growth of female fish is much slower than that of male fish. Therefore, the mono-sex culture made only of male fish is more productive than the mixed-sex culture. Fish from a mono-sex culture can fetch a higher selling price than fish from mixed-sex culture because they are much bigger.

Results of pond culture in Matungao

Cage culture has not been practiced in Matungao because there was no water source good for cage culture. Therefore, the 2nd beneficiaries practiced earthen-pond tilapia culture. 2 (two) grow-out ponds and 2 (two) breeding ponds were constructed in Barangay Prok3 and 2 (two) grow-out ponds and 1 (one) breeding pond were constructed in Barangay Koriod.

Tow ponds in Prok2 were operated by the integrated farming with duck raising in Prok3 and a pond was operated by non-integrated farming in Koriod. In pilot project phase, FCR and feed cost of pond operation in pilot phase was 1.86 and P65.00/1kg-fish production, respectively. And in Prok3, FCR of Pond 1 and Pond 2 are 0.87 and 0.90 with very low feed cost per 1kg-fish production of P21.84 and P28.85, respectively. FCR of pond in Koriod is relatively high (1.61) because it is non-integrated farming. Low feed costs have been achieved in these two earthen ponds in Prok3, Matungao due to the effect of integrated tilapia farming with duck raising.

b) Cage culture

Cage culture was practiced only by the 2nd beneficiaries in Tapayan, Sultan Mastura. Four cages (50 m^2 each) were constructed. Two were used for mono-sex and two for mixed-sex tilapia culture. After five months, the fish reached a marketable size of 158.9 g/piece (6 pieces to a kilogram). The beneficiaries began harvesting the fish on April 14, 2016. Most of the beneficiaries' customers were community members, teachers, and office workers who became familiar with the site and would often visit.

The FCRs of the mono-sex culture ponds were lower (0.58 and 0.41) than those of mixed-sex ponds (0.85 and 0.70). Therefore, ROI of the mono-sex culture ponds (64.4% and 72.6%) were higher than those of the mixed-sex culture (46.8% and 52.9%). The cost performance of the mono-sex culture was much better than that of mixed-sex culture.

Tilapia culture integrated with livestock, which is very effective method of reducing feed costs in pond culture, cannot be used for cage culture because plankton cannot propagate itself at a large enough scale to be effective. In the case of cage culture, the effectiveness of manure as fertilizer is diluted because the cages are set in open water. Careful feeding, therefore, is an effective way to reduce the amount of feed used, resulting in better cost performance. Farmers were trained to take additional care in feeding the fish.

Comparison in the feed costs between the cage culture of the first beneficiaries in the pilot project and the cage culture of the second beneficiaries in Tapayan. The feed cost per kilogram of fish produced for the second beneficiaries in Tapayan was PHP 18.95 while that for the first beneficiaries in the pilot project phase was PHP 56.00. The reduction of feed cost in cage culture was successfully achieved by the 2nd beneficiaries because they took additional care in feeding their fish.

c) Cost reduction of pond operation in Matungao and Sultan Mastura

Table 3.2.1.2 shows the comparison in results of production and sales between the pilot project phase and the project-extension phase. As mentioned and discussed above, there are 2 (two) new technical approach in the extension phase. One is the mono-sex culture and another is the integrated fish farming. Feed cost of pond operation in the pilot phase was P65.10/1-kg production while that in the

extension phase was only P 5.79/1-kg production. Due to two new techniques, production costs, especially feeding costs, has been sharply reduced.

Table 3.2.1.2: Comparison in results of production between pilot project phase and extension phase

		Pilot project phase		Project/extension phase			
		Cage	Pond	Cage	Cage	Pond	Pond
Integrated framing		None		None		Yes	
Mono-sex culture		None		None	Yes	None	Yes
1.	Production cost (PHP/kg)	72.61	85.47	56.91 - 63.80	32.86 - 42.68	68.21	18.01
2.	Net income (PHP/kg)	37.68	14.15	56.17 - 64.12	73.31 - 87.15	42.79	101.98
	ROI (%)	51.8	16.5	88.0 - 112.5	181.1 - 265.1	62.0	564.8
3.	Feed performance						
	FCR	1.60	1.86	0.70 - 0.85	0.41 - 0.59	0.49	0.18
	Feed cost Per 1kg production	56.00	65.10	22.07 - 27.07	13.09 - 18.40	14.95	5.79

d) Processing of dried tilapia

The selling price of small fish weighing approximately 20g, which was used for processing practice, is roughly PHP 20/kg only in markets where fish is not processed for dry package. It takes one kilogram of raw fish to produce 0.233kg of dry fish. The selling price of processed fish was PHP 500/kg, equivalent to PHP 116.50/0.233kg at the market. The drying process generates additional value of PHP 66.40/kg for small, raw fish.

4) Capacity building of BDA

a) RMO CenMin

During the planning stage of FTF, BDA RMO, particularly the RPOO in charge of fisheries sector was able to lead the preparation for activities in coordination with the technical partner (MSU-Maguindanao) and JICA expert team. Following guidance from JICA expert team and resource organization, the BDA staffs facilitated the TOT, and became able to carry out the training by themselves.

With regard to actual implementation of FTF extension as well as new activities such as integrated farming/mono-sex culture, it is fair to say that the RPOO and others mostly succeeded in facilitating the planned activities in effective manner, which produced satisfactory results given the limited time allocated for the extension phase. The BDA staffs were capacitated not only in technical aspects, but also in administrative/financial aspects of the FTF works such as procurement, fund disbursement and liquidation according to the standard set by the project.

In addition to the planned activities of the extension phase, it is remarkable that the RMO has initiated its own extension work to disseminate technologies of tilapia culture to the wider population. The RPOO and other staffs with the FTs, i.e. the 1st beneficiaries from the pilot project provided technical trainings (as well as initial fingerlings in some cases) to other farmers in Sultan Mastura and other municipalities in Maguidanao.

The RMO also worked closely with the BFAR-Maguindanao in ARMM and Bureau of Fisheries and Aquatic Resources - Mindanao Freshwater Fisheries Training Center (BFAR-MFFTC) Kabacan, Region 12, in providing assistance to the Bangsamoro communities. Based on such experiences, the BDA has launched a program called "Community Empowerment Program for Sustainable Economy and Livelihood (CEPSEL)".

b) RMO Ranaw

The BDA staffs, particularly RPOO in charge of fisheries, have significantly improved their capacity for activity planning and implementation of the FTF and other new activities such as integrated farming and mono-sex culture. The TOT was effectively carried out on with supports from the technical partner (MSU Naawan) and the JICA expert team. The RMO staffs successfully facilitated and mobilized the 1st beneficiaries for actual FTF extension works, while coordinating with different stakeholders. Limited education level among some FTs sometimes hampered effective technology transfer to the 2nd beneficiaries, and the BDA staffs provided supports to them in several occasions. The RMO staffs also became capacitated on administrative aspects of the technology transfer such as procurement, and financial management following the standard set by the project.

The RMO Ranaw has also initiated its extension work to other communities. For example, it conducted the on-site guidance to the farmers in Barangay Cormatan and Daramba in the municipality of Poona Piagapo in Lanao del Norte, and provided them with fingerlings bought from 1st beneficiaries. Remarkably, the RPOO was asked to be a resource person for training on basic tilapia culture of the WFP, for the beneficiaries in the municipality of Masio, Lanao del Sur.

5) Challenges and recommendations on further promotion/expansion

At first, the project team found it difficult to organize fish farmer beneficiaries. It was particularly hard for the team to organize the beneficiaries in manual pond building, which required the beneficiaries to work hard if the ponds were to be built according to technical suggestions and with productivity in mind. Therefore, in the upcoming income generation project, it will be necessary to transform the motivation and values among counterparts. Meanwhile, it is highly recommended to use heavy equipment in order to construct earthen ponds while reducing the burden of manual excavation of ground.

To ensure effective technology transfer, particularly through the FTF, ample time, including time for

social preparations, is needed to practice fish culture at the community level. The fisheries sector practices a multiple tilapia culture technique to improve fish culture in a sustainable manner in the region. The time allocated in the extension phase was not sufficient to fully analyze and implement the lessons learned. In the future, the duration of project implementation should be extended at least 24 months.

The techniques of mono-sex culture and integrated tilapia farming with locally available livestock should be disseminated in a fast and practical manner. It has been proven that the two techniques can reduce the production cost drastically. Therefore, closer cooperation with livestock raising is highly recommended. The recommended animals are duck, chicken, goat, and cow. Additionally, to disseminate tilapia culture more widely, fish farming by backyard pond is recommended. A pond can be constructed near a farmer's house. Fish growth depends on household waste such as leftover food, vegetables from gardens, and compound feed if it is affordable. The production cost is nearly zero with high sustainability. This kind of practice is common in many Southeast Asian countries.

All in all, the project proves that tilapia is a suitable species for small-scale farmers because it is relatively inexpensive to produce and easy to care for. Meanwhile, there are other potential species in the area such as carp, catfish, and freshwater milkfish. It will be necessary to undertake a feasibility study to select profitable species. The feasibility study should target not only freshwater species but also marine species including grouper as well as seaweed. To diversify the cultured species, close cooperation with resource organizations such as the Mindanao State University (MSU) and the BFAR is essential with regard to seed production. They can play an important role in providing hatchery-reared fry and juveniles of both freshwater and marine species because they have hatcheries of those species. They can also provide the project with up-to-date information and data of aquaculture.

3.2.2. Internal Technology Transfer within BDA

(1) Agriculture (Tawi-Tawi)

The agriculture sector conducted vegetable production and marketing activities targeting beneficiaries in the municipality of Panglima Sugala of Tawi-Tawi Province by applying the so-called internal technology transfer method. The BDA RMO CenMin / Ranaw support activities by applying experiences and lessons learned in the municipalities of Sultan Mastura and Matungao.

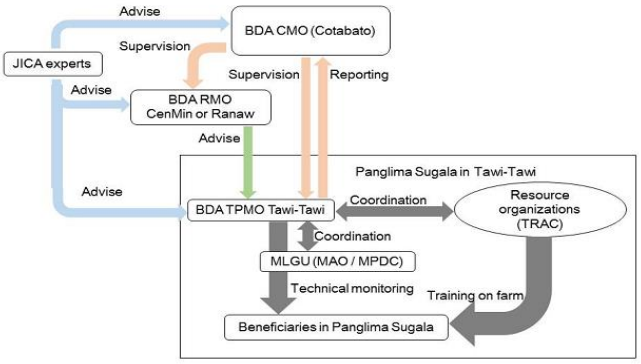

Figure 3.2.2.1: Implementation mechanism in Tawi-Tawi agriculture sector

The implementation mechanism used for the Panglima Sugala municipality was essentially the same as that used in the previous phase. The BDA PMO Tawi-Tawi coordinated with resource organization, the Tawi-Tawi Regional Agricultural College (TRAC) and MLGU, especially the MAO or MPDC. This was supervised by the CMO. However, because of the absence of direct intervention by JICA experts, BDA RMO CenMin or Ranaw provided supportive actions to the BDA PMO Tawi-Tawi, as shown in Figure 3.2.2.1. The stakeholder meetings were held throughout the implementation of vegetable production and marketing activities as shown in Figure 3.2.2.2. These meetings aim to update activities on the site and to monitor the progress of the activities.

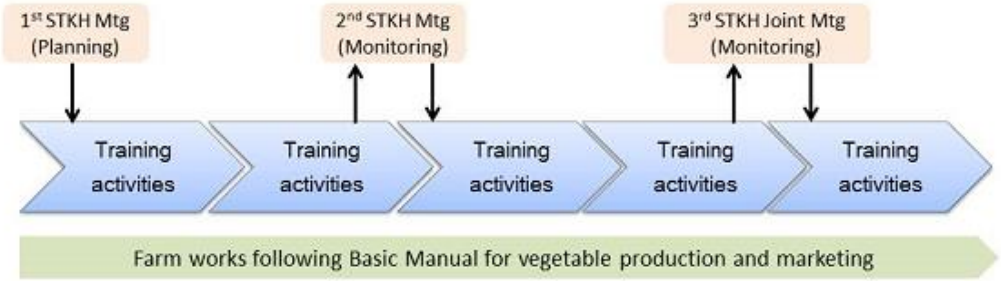

Figure 3.2.2.2: Implementation flow and stakeholder meetings

As one of internal technology transfer opportunities, the first stakeholder meeting, lasting four days, was held for stakeholders of Tawi-Tawi and the staff of the BDA RMO CenMin and Ranaw, MAO or MPDC of both Sultan Mastura and Matungao, and their RPs in order for them to share their experiences during the previous CD-CAAM phase. The objective of the stakeholder meeting was to produce a POO through orientation, explanations of the training, exposure to demonstration farms and practice farms in Sultan Mastura and Matungao, practicing market surveys, and exchanging views and experiences during the previous phase. During the last day of the meeting, stakeholders from Tawi-Tawi planned activities based on what they learned from the meeting. The BDA RMO CenMin and Ranaw supported them in structuring the plan.

1) Evaluation of quantitative outputs in terms of production and sales

The training for vegetable production and marketing, based on the manual and related activities, began in November 2015, targeting 10 beneficiaries. The major technical training activities followed the Manual. With regard to vermi-composting, the technology was first introduced to Tawi-Tawi by transferring African Night Crawler (ANC) to the island. Through a market survey conducted prior to the training on the demonstration farm, the beneficiaries decided to cultivate six crops: hot chili, eggplant, tomato, bitter gourd, string beans, and bottle gourd on 1.000m^2 of demonstration farm.

Matchmaking was also conducted as the harvesting time approached. Seven buyers from the public market in Panglima Sugala participated in the activity. An observation of the demonstration farm was conducted, followed by a business talk. The buyers and the farmers discussed the prices of the commodities.

According to the results of production and sale, profit was produced from hot chili and tomato. Although eggplant, string beans, and bottle gourd were produced, the results were negative. The variety of hot chili available in Tawi-Tawi was resistant to water stress and a particular pest, and tomato had enough irrigation water during the flowering stage in early January 2016. Lemon grass helped the growth of tomato as companion plants.

On the other hand, insects (fruit borer) were transferred from neighboring farms. The use of chemical spray was limited so that the effect of the chemical would not have been observed. As a result, the bitter gourd crop was damaged by the insect. In addition, irrigation water was in short supply from February 2016, before the harvesting season. Thus, the dry spell, caused by El Niño, led to a poor harvest of the other three crops.

The degree of technology transfer shows a positive result. More than 30% of the participants in the group interview had already applied 19 of the 21 technological topics in their farming. However, soil sampling and recordkeeping were not yet adopted by all participants.

With regard to land preparation, a power tiller was demonstrated, although animal draft power using carabao was used to establish the farm. Two methods proved to be first experiences for the beneficiaries. Land preparation still relies on manual labor. Thus, an economical method should be considered by first introducing the animal draft power of carabao, which is often observed in small-scale farming in Mindanao.

Some technologies learned from the training were applied on individual farms of the beneficiaries and used in production for income generation.

Farmers of Barangay Kulape in Panglima Sugala established the Kulape Kaadilan Farmers Association on April 2016, by registering at the DOLE, Province of Tawi-Tawi, ARMM. There are 25 members of the association. Ten (10) of the 25 members are beneficiaries of the CD-CAAM. The long-term goal of the association is to work together to sustain organic vegetable production in the province.

2) Capacity building of BDA

The process of project in Tawi-Tawi was divided into two stages, planning and implementation, and was reviewed to qualitatively evaluate the ability of the PMO, especially the PPOO and CO, in terms of the management of the project on site. To do so, a review workshop was held.

During the technical survey, as social preparation, the PMO conducted interviews with farmers. It was supported by the BDA RMO CenMin and Ranaw. Farmers passing by were interviewed at random because of the inaccessible roads to particular barangays. Potential beneficiaries demanded an allowance to participate in the CD-CAAM project. The PMO patiently explained approach of

CD-CAAM focusing on capacity building, not cash for work. As a result, the number of participants was reduced before selecting the beneficiaries. Ten beneficiaries were finally selected, achieving the purpose of a barangay-wide orientation.

The first stakeholder meeting was effective in that it enabled the PMO to understand the community development project of the CD-CAAM model. During the meeting, a POO was drafted with the support of the BDA RMO CenMin and Ranaw. As usual, the availability of RPs was an issue in creating the schedule. Discussions continued until a compromise was reached. PMO collaborated well with MAO and the resource persons from Tawi-Tawi.

Logistical issued within the BDA were observed before holding the meeting. The CD-CAAM project staff had to reserve accommodation for the stakeholders before they arrived on the main island of Mindanao from Tawi-Tawi. Such arrangement should have been done within the BDA.

Baseline and market surveys were conducted by the BDA PMO staff. They found that most farmers of Panglima Sugala currently practice backyard farming because they are tenants. The PMO confirmed that vegetables sold in public markets mostly originate from Zamboanga City. The PMO could confirm the significance of implementing vegetable production and marketing projects.

During the implementation of the training provided on the demonstration farm, managerial and technical issues occurred. The problems the BDA encountered were typically caused by the location of Tawi-Tawi and its poor infrastructure. Some examples are described below.

While establishing the demonstration farm, it was found that no beneficiaries owned carabao to use for land preparation. In reality, the land preparation was still difficult because no one knew how to prepare land using animal draft power in Tawi-Tawi. This was unexpected and something that the BDA did not experienced in Sultan Mastura and Matungao. Agricultural inputs and tools needed for training could not be procured in Tawi-Tawi. They had to be procured in Cotabato and Davao and transported by CD-CAAM to the island. ANC was also transported to the island because none were available there.

Efficient communication was difficult. Personal Wi-Fi modems were used among the BDA CMO, PMO, and CD-CAAM project staff because internet facilities are poor. On ground level, communication by cell phone was not reliable between the PMO and the beneficiaries. The PMO used a motorcycle to convey training information directly to the beneficiaries.

3) Challenges and recommendations for further promotion/expansion

a) Mainstreaming of vegetable production and the CD-CAAM model marketing training program for community development in the MLGUs of Tawi-Tawi

The MLGU has to mainstream the vegetable production and marketing promotion activities in its

socio-economic development, CDP-ELA. Close coordination between the MLGU, TRAC, and BDA is required in order to sustain the demonstration farm. Beneficiaries need to be encouraged to be FTs to implement the FTF extension.

b) Fostering farmer trainers for FTF

FTF extension approach requires fostering beneficiaries to be FTs. The experience of the BDA CMO, and BDA RMO CenMin and Ranaw will help the PMO, MLGU, and TRAC to plan and implement the TOT and FTF.

c) Technical adjustment, considering the circumstances of Tawi-Tawi, for the effective implementation of the vegetable production and marketing promotion project

Current climate changes should be studied carefully. The results can be used to plan appropriate training schedules for vegetable farming on the island. Several technological adjustments are recommended that consider the circumstances on Tawi-Tawi: a) Securing irrigation water, b) Researching water stress-tolerant vegetable crops, c) Introducing animal draft power for land preparation, and d) Breeding ANC and maintaining vermi-composting technology.

(2) Fisheries (Tawi-Tawi)

Tawi-Tawi is an island province with high potential for development of marine fisheries. Seaweed farming is a family-based enterprise and is considered one of the major sources of livelihood for coastal communities in Southern Mindanao. As the seaweed industry grows and expands, so do the number of farmers and families involved in seaweed farming, and it thus generates direct employment.

1) Implementation of seaweed culture project

The PMO Tawi-Tawi, the PPOO in charge of fisheries in particular carried out technical extension activities with supervision of a JICA expert team and coordination with MSU-Tawi-Tawi, whereas CMO and RMO provide managerial guidance for the efficient project implementation in the island. Figure 3.2.2.3 shows the project implementation flow in Tawi-Tawi

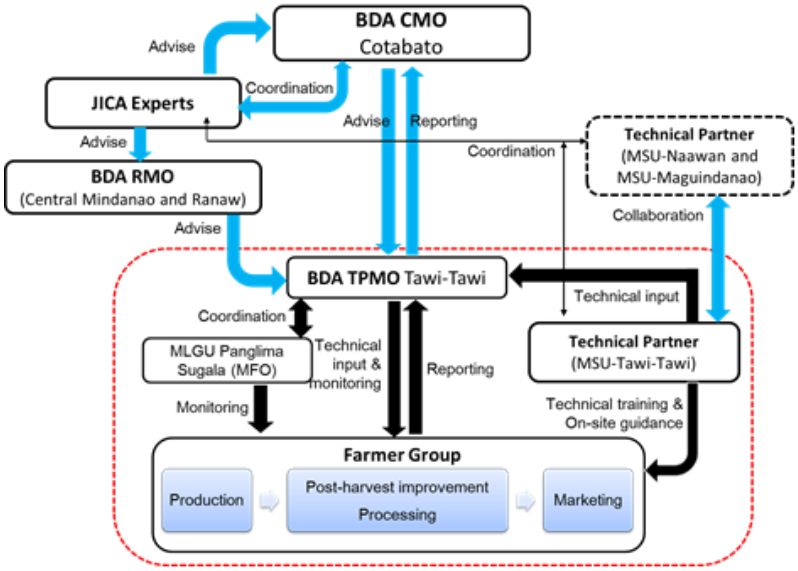

Figure 3.2.2.3: Project implementation flow of CD-CAAM Fishery Sector in Tawi-Tawi

BDA PMO coordinated with a resource institute (the MSU Tawi-Tawi) and the Municipal Fishery Officer of MLGU. The MSU Tawi-Tawi provided technical training and on-site guidance to the PMO and community beneficiaries. As internal technology transfer within the BDA was one of the project purposes in the extension phase, the RMO Cen-Min and Ranaw and Central Mindanao provided advices to the PMO during the preparatory activities such as social preparation. CMO supervised overall activities of PMO, while the latter regularly reported the progress of the project to CMO to get proper guidance. As the project was on a new livelihood activity for the BDA, the JICA expert team in fisheries sector closely coordinated with BDA and MSU Tawi-Tawi, and provided necessary technical supports to BDA.

The project adopted two types of seaweed farming methods, namely the stake-off bottom method and the floating method. The CD-CAAM project applied a modified methods based on practice, applicability, and adoptability, which is locally termed the “patundan,” or the modified floating joint method, and “pasengkang,” or the modified floating triangular method. The main seaweed planting materials, such as polyethylene rope, plastic strap, softie, and recycled pet bottles (floaters), were sourced from local markets in the capital town of Bongao Tawi-Tawi, whilst other materials such as the wooden stake and seaweed seedlings were sourced from within Panglima Sugala and adjacent municipalities. On January 10, 2016, the community started the first culture cycle at two farm sites for the grow-out and nursery seaweed production sites. A total of 2,400 floats were planted in site1 and 600 floats at site 2. In the succeeding cropping after two months, the first re-seedling was conducted, and production sites rose to six sites with about 10,000 float.

Additionally, a training for processing of seaweed-based food products was conducted for the

beneficiary group to build their capacity on processing of seaweed into other food products, and sensitize them with the notion that seaweed is not merely for carrageenan extract for export market, but for value-added products which can be processed at community level. The products are Noodle, jam, cracker, traditional sweets.

Trial of integrated sea cucumber culture with seaweed culture

Sea cucumbers are generally conspicuous in its natural habit and vulnerable to overfishing as apparent in many countries including the Southern Philippines. Due to its high market value that led this fishery product vulnerable to over fishing worldwide.

The MSU Tawi-Tawi, the resource organization for seaweed culture project, is currently developing its own hatchery for sea cucumber, and CD-CAAM Project can complement the partnership with them by supplying broodstock or parent sea cucumber which may be required for future breeding. Therefore, beneficiaries from Barangay Buan and other coastal barangays in Tawi-Tawi could benefits and start sea cucumber culture without depending on unsustainable sourced from wild juveniles.

2) Evaluation of quantitative outputs in terms of production and sales and capacity building of beneficiaries

Table 3.2.2.1 shows the results of seaweed culture: 45-day culture in one block with an area of 600 m². The beneficiaries who managed the culture earned a net income of PHP 2,081 through 45-day operation with a ROI of 284%, which is a sufficiently high rate for sustainable aquaculture business.

Table 3.2.2.1: Results of seaweed culture per block in Buan, Tawi-Tawi (2016)

A.	**Total cost for facility per block (600 m²)**	**4,012**
1	Cost of materials	3,489
2	Cost of handling and transport :15% of material cost	523
B.	**Total production cost**	**2,138**
1	Seedling	1,920
2	Depreciation: 2-year life	218
C.	**Sales/gross income per block with 45-day culture**	**8,232**
1	Harvest: Dried weight, 35% Moisture content (kg)	329
2	Selling price (PHP/kg)	25
D.	**Net income per block**	**6,094**
E	**ROI (%)**	**284%**

(Unit: PHP)

The beneficiaries operate 60 blocks. By September 2016, the scale of seaweed culture will be expanded to more than 100 blocks. They can have seven cropping cycles per year of seaweed culture with 45-day operation. Table 3.2.2.9 shows the expected cost and profit per year in the project site based on the assumption that 100 blocks are in full operation in September 2016.

Table 3.2.2.2: Expected cost and profit of seaweed culture in full operation per year

A.	**Total production cost**	**1,496,600**
C.	**Sales/Gross income per block with 45-day culture**	**5,792,400**
D.	**Net income per block**	**4,265,800**
E	**ROI (%)**	**284%**

(Unit: PHP)

A full-scale operation with 100 blocks will have a major positive impact on income generation in the project area.

Harvesting and processing of cultured sea cucumber was conducted by community beneficiaries in trial basis, using sea cucumber weighing around 300g-400g/individual. The conservative assumption for grow-out period from 15-g juvenile to marketable size of 400g is 8 months[12], therefore, it is expected to have full harvest of sea cucumber cultured by the project on August to September 2016, by this time sea cucumber can also be selected as breeder/parent sea cucumber for hatchery production operated by MSU.

3) Capacity building of BDA

The BDA in Tawi-Tawi, and the PPOO in particular, carried out technical extension activities under the supervision of an expert team and in coordination with MSU Tawi-Tawi. The CMO and RMO provided managerial guidance to ensure the effective project implementation on the ground.

Despite the initially very limited experiences in seaweed culture, the BDA generally demonstrated its ability of quick learning of the new technology. In terms of technical aspects, BDA became familiar with the basic skills necessary for seaweed farming and post-harvest improvement. The PPOO in charge of fisheries became able to provide a technical guidance and proper suggestions to local communities. However, he may need more experience on sea cucumber culturing and processing as there was not enough time for capacity building in the technology.

Meanwhile, the BDA became adept at coordination with different stakeholders. PMO regularly communicated with both beneficiaries and updated the progress with the LGU staffs. While PMO established a good partnership with the MSU Tawi-Tawi, it may need further efforts to work more closely with the BFAR and other agencies.

4) Challenges and recommendations for further promotion/expansion

Given the distance of the island provinces from the mainland Mindanao, a dry-finished products have an advantage in its easier transportation. Abalone, sea cucumber, and seaweed can be processed to be dried products, among which seaweed is the most appropriate and easiest species for aquaculture

[12] Handbook for sandfish farming. Recomap.

because it requires the smallest input and the simplest techniques for raising. As mentioned earlier, the ROI of seaweed was 284% in the first trial in the project. It indicates that, in seaweed culture, farmers can improve their income with a small amount of initial capital (according to the data collected by the project, farmers need capital of PHP 6,150 for one-block (600 m^2) operation of seaweed culture).

To further promote seaweed culture, capacity building on post-harvest management and an effective information campaign could help maintain the quality of dried seaweed in Tawi-Tawi that meets the quality standards of buyers and processors in both local and international markets. For example, local authorities must have seaweed farmers stop using agriculture fertilizer (NPK) completely. In particular, building a strong partnership with the BFAR will benefit farmers through the services of the agency. In the meantime, seaweed farmers often suffer from a monopoly by both exporters and middlemen that dominate domestic markets. Seaweed prices are often slashed for reasons such as moisture content and mixture of foreign matters. Farmers should act in a group rather than individuals, to build stable marketing linkages by establishing marketing contracts with different seaweed entrepreneurs.

Figure 3.2.2.4 illustrates sustainable approach of seaweed farming system developed based on the project experience. Seaweed farming can be more sustainable if seaweed seedling banks/ nurseries are established near the grow-out farm for systematic farming. The purpose of seaweed seedling bank is to provide sustainable supply of seaweed for successive farming cycle, to maintain quality variety of seaweed strains, and to reduce expenses from constantly procuring seaweed seedling from other areas/municipalities. Besides the seedling bank, farmers should establish multiple farm sites to adopt more than one farming techniques with nursery at each sites. In the area, selection of farm sites is increasingly crucial for good growth rate, and having multiple farm sites would be advantageous for farmers to transfer or exchange seedlings from one site to another in case of impurities brought by epiphytes and other environmental factors, which often lead to contamination and diseases called "ice-ice".

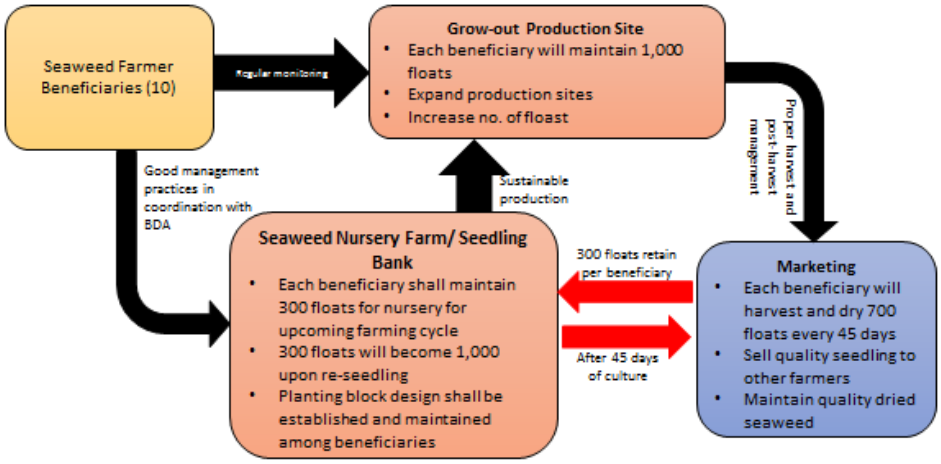

Figure 3.2.2.4: Sustainable cycle of seaweed farming system

Meanwhile, sea cucumber is an appropriate species for integrated seaweed culture because it is a benthic animal that feeds on detritus on the seabed. Given the limited period of the extension phase, the results of a trail sea cucumber culture are not fully analyzed yet, and some follow-ups may be crucial to make the best use of this valuable experience and to further contribute to livelihood improvements for the communities in Tawi-Tawi.

(3) Livestock

In rural areas of the Philippines, the goat is important domestic animals for smallholders, and indispensable for some religious festivities, especially for the Muslim population, who are dominant in Mindanao including the islands of Tawi-Tawi. According to statistics of the nation's total number, 3.6 million in count, almost 40 percent of goats reside in Mindanao. Nevertheless, since the people of Mindanao have long been hit by the cycles of political turmoil, they could neither fully take advantage of the goats as their livelihood resources nor grasp the opportunity to learn practical goat-keeping techniques. Therefore, the implementation of a goat-keeping scheme as a new tool for the CD-CAAM model was newly introduced.

1) Results of technology transfer

Because the project lasts only 15 months, a period which is shorter than the ordinary goat production cycle, special attention was paid to organizing various training courses so that beneficiaries may witness important stages of goat production, such as fattening, breeding, kidding, and selling.

Although the project does not provide the beneficiaries with unreasonably modern equipment, the demonstration farms is still considered an attractive showcase for ordinary goat keepers where they could obtain practically and financially attainable know-how of production systems. For instance, among others, a model goat house is one of them. Since there are many different kinds of farmers, the project showed two types of goat houses, one being a semi-commercial type and the other a backyard type. Also, improved grass pastureland was established. Goats are reputed to be willing to eat a wide variety of plants, being a great advantage of the goat. However, since in Tawi-Tawi the local farmers use only naturally grown plants, which are not nutritionally sufficient to keep their goats healthy, it is ideal for beneficiaries to grow improved grass. Thus, two of the highly renowned and locally available improved grasses (Super Napier and Setaria grass) were introduced.

As complementary instruments to the technology transfer, the project provided some materials for effective and efficient outputs such as water supply system, multipurpose shed. Some items, for instance, goat houses may seem expensive; however, considering the durability and costs per year, they will pay dividends in the long run.

Many training courses for beneficiaries as well as the BDA and the LGU, coupled with other complementary technical meetings, were conducted by emphasizing on business aspects as well as

technical aspects of goat production. In addition, the project conducted a study tour to show beneficiaries practical and advanced goat production activities in the University of Southern Mindanao (USM), Mindanao Baptist Rural Life Center (MBRLC), and some other advanced goat farms. However, unlike those beneficiaries from Sultan Mastura and Matungao, beneficiaries from Tawi-Tawi did not participate because of the distance and duration of the trip. Therefore, staff members from the BDA and the LGU participated firstly and then train the real beneficiaries on the new teachings and practices.

2) Quantitative outputs of production and sales

In Tawi-Tawi, like most parts in the Philippines, the main product for sale associated with goat-raising activities is goat meat. As of June 2016, as the project has only just introduced some goats (13 does and 2 bucks) into the demonstration farms, no output has been registered (a separate report on quantitative outputs will be submitted later).

Apart from main products, goat farmers have other materials that are marketable including vermicompost or cuttings of improved grasses. In this context, it should be mentioned that in April some local farmers, having observed the lush Napier grass at the demonstration farm, visited to buy some cuttings for planting. While the revenue earned was small (200 PHP for 20 cuttings), the fact that a product of the demonstration farm was commercially attractive to local farmers seems promising both for the beneficiaries and for the local community, because those farmers could be the first of many to visit the demonstartion farm to see the technology that the project is providing to enable better livelihoods.

Based on the information gathered during the surveys, the most marketable sizes of goats vary from 15 to 25 kg liveweight with a price range of PHP 1,800 to 5,000 (average PHP 3,000). Then, considering various reports, we have defined the general parameters of native goats in Mindanao as follows: age at first kidding=14 months, litter size=1.5, kidding interval=10 months, mortality of kids to 6 months=20 %, kidding rate=90%, ratio of replacement=20%, and male/femal ratio 1:1, among others. According to this estimation, since we have started with 13 does and 2 bucks, the number of goats for sale per year would be from 12 to 13. Therefore, based on the afore-mentioned price range, the estimated goats sales revenue per year will be from PHP 21,600 (12 goats ×PHP 1,800) to PHP 65,000 (13 goats ×PHP 5,000), with an average being PHP 42,500 (12.5 goats ×PHP 3,400).

Also, Napier grass and vermicompost could be sold as a sideline business. Based on the experiences from other demonstration farms, estimations of monthly revenues were around PHP 6,000 (PHP 15 x 400 cuttings) and PHP 500 (PHP 250 x 2 sacs) for Napier grass and vermicompost, respectively.

3) Capacity building of BDA

A notable method for capacity building of the BDA PPOO for the livestock sector was the internal

technical transfer of practical guidance and coaching from BDA CMO and mainland RMOs to the PPOO, in conducting the ground activities of the sector, from the planning phase to implementation phase. In this manner, the capacity building efforts of the project not only addressed the current capacity of the newly established PPOO but also strengthened the BDA as an institution.

Pursuant to the concept of internal technology transfer, before any training sessions and other activities were initiated, a technical coordination meeting was conducted with stakeholders such as BDA CMO, RMO, PMO, and the MLGU. The efficacy of the meeting was proven in the social preparation activities: (1) technical survey, (2) community profiling, (3) value chain survey, (4) barangay-wide orientation, and (5) baseline survey. During the actual implementation, the OJT approach of the capacity building efforts is highlighted. The BDA PMO has been extensively exposed to the following key competencies: (a) implementation of technical instructions from experts; (b) coordination with beneficiaries and LGU; (c) coordination between and among the BDA personnel; (d) managing ground activities; and (e) monitoring and evaluation activities.

During the implementation, the establishment of the demonstration farm was applied simultaneously along with the technical training sessions that were given to the selected beneficiaries. Thus, the magnitude of activities that the BDA PMO Tawi-Tawi managed to implement was truly hectic and difficult.

One difficulty faced during the implementation is that no existing institution in the province has the capacity to provide technical advice on the establishment of the demonstration farm and the management of goat herds besides the local experts from USM. Despite the remote supervision of the the project, the BDA PMO successfully implemented all the instructions from the experts of USM and JICA. Hence, the efficacy of the technical coordination meeting was again proven by the performance of the BDA PMO. Another difficulty experienced during the implementation was poor Internet connectivity in Tawi-Tawi. Submission of reports from the BDA PMO was frequently delayed due to the poor connection. Availability of biologics (medicines, vitamins, syringes, etc.) was also identified as a constraint because there were no such suppliers. Thus, the materials were procured in the main land and shipped to the beneficiary community occasionally.

4) Challenges and recommendations for further promotion/expansion

In rural areas of Mindanao, including islands, goats are commonly sold through local traders. They travel to farms in vehicles and goats are bought on the hoof. Usually, farmers are paid a sum without much bargaining. However, with more knowledgeable farmers, the price paid would be based on live weight. Besides, even in rural areas, some farmers try to add value to goat meat or goat products. Halal goat meat is one of them, as further discussed in the next section. Nowadays, there are many types of goat meat products such as sausages and cooked meat. Also, in consideration for sex and age is important because they influence meat properties, especially organoleptic ones such as tenderness,

appearance, aroma, juiciness, and palatability. As the beneficiaries usually work in groups, they may take the initiative to set up an organization for processing goat products in the future. In this context, goat milk should also be considered because even in Mindanao, some institutes such as MBRLC are already exploiting goat dairy activities successfully.

To elaborate the challenges of and recommendations for further promotion/expansion of the goat as a commodity in the province, many highlights of the findings of the value chain survey in the municipalities of Bongao, Panglima Sugala, and Tawi-Tawi were defined in terms of acceptability, production practices, marketability, value-adding activities, and programs. Based on the first-hand information gathered from the survey, the current situation of the goat commodity in Tawi-Tawi in a nutshell is that the province has many goats but the demand is still limited due to relatively low acceptability of chevon as a meat dish owing to its foul smell and taste. Many random interviews were conducted to find out as to why the majority of the population thinks the meat has perceived foul smell and taste, and it was found that they lacked knowledge on proper slaughtering and preparation methods of the meat that would eradicate such smell and taste. As no existing restaurants or eateries in the province promote delicious chevon dishes compared to those in the mainland Mindanao, the wrong perception about the meat is yet to be changed. Nevertheless, despite the adverse perception, the meat's cultural and religious value keeps the demand for goats afloat.

In this light, the main challenge faced by the goat farmers regarding the goat commodity in the province is to change the population's negative perception on chevon dishes. Once this perception is swayed to the positive side and more restaurants and eateries serve good chevon dishes, the demand, we think, will increase drastically and the sale of goats will not just be on an occasional frequency. Hence, the intensification of promotion of chevon dishes in the province is highly recommended. Whether it would be efforts from the government sectors such as the Department of Agriculture and Fisheries in the Autonomous Region in Muslim Mindanao (DAF-ARMM) and Provincial Agriculture Office or from the private sector, any promotional activity of popular and delicious chevon dishes such as *kilawin and caldereta* should be encouraged.

3.2.3. Implementation of a new program

(1) Livestock

1) Results of technology transfer

As mentioned in Tawi-Tawi section, the demonstration farm is considered an attractive showcase where ordinary goat-keepers could obtain practical and financially attainable know-how on production system. Unlike in Tawi-Tawi, however, the demonstration farms in both Sultan Mastura and Matungao three models for the goat house: a commercial type, a semi-commercial type and a backyard type, were constructed.

Among the three types of goat houses, there is no difference in production, reproduction, or flock health, including growth rate, fertility, mobility, and mortality. However, the commercial type of goat house attracts more attention from farmers, especially financially capable ones. By contrast, farmers who have less financial resources seem a little bit intimidated by the somewhat sophistication of the commercial type. As such, the BDA staff and the beneficiaries tried to provide visitors with a clear concept of the demonstration farm as a trial of various alternative methods, some of which may be appropriate to their own situations.

Also, Super Napier and Setaria grass were introduced in Sultan Mastura and Matungao. Although the establishment of pastureland was delayed up to two months because of a severe drought, it was impressive to see that the improved grasses have firmly taken root and grown lushly in the new lands.
Since both Sultan Mastura and Matungao had no stable waterholes, the project provided a simple well water system: a shallow water well unit for Sultan Mastura and a water pumping unit for Matungao.
As complementary instruments to technology transfer, especially for demonstration farm activities, the project provided a few materials and equipment for effective and efficient outputs as we did in Tawi-Tawi. Again, items such as goat houses may seem expensive; however, considering their durability and costs per year, they will pay dividends in the long run.

Various training courses for beneficiaries and the BDA and the LGU as well, coupled with other complementary technical meetings, were conducted. Additionally, the project organized a study tour both for the beneficiaries and staff members of the BDA and the LGU in USM, MBRLC and other advanced goat farms.

As shown in Tawi-Tawi, vermi-compost preparation was introduced in both Sultan Mastura and Matungao as part of integrated faming.

Unlike projects for agriculture and fisheries in both Sultan Mastura and Matungao, the goat project originally did not include FTF due to its limited time frame. However, having observed and visited the demonstration farm, some local farmers requested to the BDA for technology extension of goat-keeping. In response to this request, a TOT was conducted at the USM to train the 1st beneficiaries to become a FT to further promote the technologies to other farmers.

2) Quantitative outputs of production and sales

The first batches of goats, 22 does and 3 bucks each, were introduced into the demonstration farm of both Sultan Mastura and Matungao in December 2015, respectively. As of June 2016, the flock composition of the demonstration farms is: 3 bucks, 21 does, and 11 newborn kids for Sultan Mastura, and 3 bucks, 16 does, and 5 newborn kids for Matungao, respectively. During the period from December 2015 to April 2016, many goats suffered the stress caused by the long trip, a transfer from Davao to each demonstration farm, and adaptation to the new environments. Some of them died

especially in the early stages in Matungao. However, the flocks regained their normal conditions.

Worth noting is an initiative that the beneficiaries of Sultan Mastura had in cooperation with the BDA and the LGU. Considering the abundance of Napier grass and room in the goat houses of the demonstration farm, they decided to purchase more goats to fatten and resell on a trial basis because their own growing goats needed more time to be finished for meat. As of April 2016, the beneficiaries bought 10 does, of which five of them were resold yielding a profit of PHP 640 per goat.

In April 2016 the same beneficiary group, under the additional guidance of BDA, formed a farmer cooperative authorized by the CDA of the ARMM. In the near future, the new cooperative, which is comparable to the one previously formed by the CD-CAAM's vegetable group in Sultan Mastura, may receive assistance from the government or private donors. At this moment in time, however, the most laudable result is that the beneficiaries, who had long been divided by conflict, took the initiative to join together to improve the livelihoods of their community.

Concerning the estimated goat revenue in both Sultan Mastura and Matungao, based on the same parameters and calculations used for the Tawi-Tawi flock, since we have started with 22 does and 3 bucks in each farm, the number of goats for sale per year would be from 21 to 22, the output will be from PHP 37,800 (21 goats ×PHP 1,800) to PHP 110,000 (22 goats ×PHP 5,000), with an average being PHP 73,100 (21.5 goats ×PHP 3,400).

Some by-products from goat-keeping or some materials used for goats, which are occasionally abundant, also could be sold in a sideline business. In the two demonstration farms, Napier grass and vermi-compost are two of them. Based on the experiences from local experts, estimations of monthly revenues from Napier were around PHP 12,000 (PHP 15 x 800 cuttings) for Sultan Mastura, and PHP 7,500 (PHP 15 x 500 cuttings) for Matungao. As to vermi-compost, PHP 1,000 (PHP 250 x 4 sacs) was the estimated profit for both demonstration farms.

3) Capacity building of BDA

In implementing a project on the goat sector, the progression of the BDA's confidence, efficiency, and effectiveness in all the project activities has been apparent. Throughout the implementation of the activities of the sector from Social Preparation 1 to Social Preparation 2, the following competencies of the BDA RMOs were improved: (1) carrying out the monitoring activities; (2) reporting the results and findings from the monitoring activities; (3) facilitating financial management, logistics, and procurement; and (4) facilitating farm production in coordination with the sector's resource persons and the partner LGUs. The major activities undertaken by the sector are: basic report writing workshop, technical survey and community profiling, barangay selection workshop, PIP workshop, barangay-wide orientation, confirmation of beneficiaries, establishment of demonstration farm, technical training, TOT, and regular monitoring activities. Also, some selected activities, such as

carrying out monitoring activities, reporting, facilitating financial management, logistics, procurement, facilitating farm production in coordination with partner LGUs and experts, enumeration and community organizing work, were evaluated in this extension phase.

In the light of the apparent improvement of competencies of the BDA RMOs, Sultan Mastura, and Matungao, the project has involved key BDA personnel from both sectors to guide the BDA PMO in conducting its activities in Tawi-Tawi based on their experiences in the first phase of the project. These efforts were meant to transfer the technology from the BDA mainland to the new management office in Tawi-Tawi.

4) Challenges and recommendations on further promotion/expansion

With the high projected production rate and aggressive buying and selling activities, the current forage area will not be sufficient. It is recommended that the beneficiaries expand their forage area and goat houses to accommodate the projected increase of stocks.

With the rising popularity of the demonstration farm as the main source of goats, marketing efforts should be intensified to solidify their take on the market. In addition, value adding activities such as slaughtered goat, goat dishes catering, and processed goat meat are needed. The beneficiaries are also encouraged to apply the technology they have learned in their farms or backyards to supplement the supply of the demonstration farm to take full advantage of the opportunity brought by the rising demand of live goats in the municipality and its neighboring cities.

With the projected increase of production and fattening stocks of the demonstration farm, consistent implementation of proper record keeping is imperative to effectively manage the farm.

Because the demonstration farm has perhaps the best bucks for breeding in the municipality, the beneficiaries are encouraged to charge a reasonable amount from farmers who want their does serviced as commonly practiced in the livestock industry.

Aside from the popularity of the farm as a goat supplier, the technology of the farm that it showcases also attracted many visitors. In addition, the jet water pump installed by the project also brought community people to the demonstration farm to fetch water for drinking because the water source is pure and pristine. Hence, diligence in the implementation of quarantine procedures is also imperative to prevent diseases from coming into the farm. To maintain the farm, it is also recommended to collect an environmental fee or entrance fee from study tour visitors.

With regard to sustainability of the project, thus far, there are five alternative approaches for the demonstration farms in Sultan Mastura, Matungao, and Tawi-Tawi. These alternatives are not necessarily mutually exclusive, meaing that some may be combined with one another;

Alternative I: The same group will maintain the status quo, functioning as a showcase and continually producing goats for consumption as meat. Although this is just a continuation of the project, in regions such as Tawi-Tawi, where small-scale goat production enterprises have not yet been established, the demonstration farm's existence is quite meaningful in and of itself for the people of the community to recognize the goat's usefulness as a commodity.

Alternative II: In addition to maintaining the status quo of the demonstration farm, the beneficiaries will raise some goats, produced at the demonstration farm, under their own management at their homes.

Alternative III: In addition to maintaining the status quo, the demonstration farm will lease out its facilities, including floor space and surplus forage, to people in the local community, including the beneficiaries. Such a management approach, which is common in some communal pasturelands belonging to local governments in Japan, has already been practiced in Sultan Mastura at the initiative of the beneficiaries.

Alternative IV: In addition to maintaining the status quo, the demonstration farm will sell its surplus goats not only for meat but for breeding.

Alternative V: The demonstration farm will scale down its fattening activity in order to function as a small-scale breeding farm, a nucleus farm from which goats that have favorable traits are distributed to local goat-keepers for them to use in breeding. One of the most important missions of this nucleus farm will be to improve genetic traits of local goat flocks and to prevent or mitigate inbreeding. Inbreeding, or breeding between closely related animals, may have many negative consequences, such as low production, low growth rates, and even dwarfism. In fact, this mission is so important that in the majority of countries for which livestock is a mainstay, the government is responsible for it.

CHAPTER 4: CONCLUSION

4.1. Conclusion and recommendations on the CD-CAAM model

The CD-CAAM project tried to establish an approach for community development that addresses the realities in Bangsamoro more effectively. Through the pilot phase, the so-called CD-CAAM model for community development was formulated based on experiences and lessons learned from the field operations, which was further strengthened during the extension phase. As mentioned earlier, the CD-CAAM model is illustrated by the following six distinct characteristics, or the six pillars.

Pillar 1: Balance between development needs vis-à-vis development potentials

The implementation of different types of surveys is an important component of the CD-CAAM model to select the most appropriate program contents, location and beneficiaries to address both development needs and potentials in a balanced manner. Besides the regular components of community profiling, technical survey, and market survey, it is also necessary to carry out other types of survey to ensure the achievement of the first pillar through reconciling diverse perspectives of stakeholders on development of the communities. In the tilapia culture pilot project, a plankton survey and analysis was conducted by the MSU Naawan to reconcile stakeholders' different ideas on the most suitable tilapia culture site. Similarly, an additional field validation survey was conducted by a joint team of major stakeholders and professional surveyors to reach an evidence-based consensus on the scope of a road rehabilitation project. Technical and socio-political factors are often entangled in community development particularly in conflict-affected areas. Thus, a strategic and participatory decision-making process should be applied particularly at the planning stage. While such comprehensive and flexible planning process is an essential part of the CD-CAAM model, it is time-consuming and has a financial implication. Given the somewhat pre-determined contents and scope of the interventions and set-timeframe in many donor-funded development projects, the challenge may be how the planners can maneuver within such constraints to balance development needs and potentials.

Pillar 2: Strong partnership with LGU

The municipal and barangay LGUs play a significant role in community development interventions under the CD-CAAM model. In the CD-CAAM project, the target municipality LGUs assigned their personnel such as MAO, MPDC, engineers, and agriculture and fisheries technicians to support the activities and beneficiaries of each community development project. For example, the Panglima Sugala LGU offered free use of the road grader (with an operator) and provided a water tank for the demonstration farm for livestock. The Matungao LGU established its own agriculture demonstration farm by replicating the one established in the CD-CAAM to promote vegetable production in the municipality.

In road rehabilitation and maintenance, the barangay captain in Sultan Mastura himself became a capable trainer for the LBT, and became able to disseminate the technologies to the residents of his community, which would greatly enhance the sustainability of the intervention. Similarly, a barangay captain with strong support from the municipal LGU played an important role in conflict resolution. Road rehabilitation often creates land-related disputes, and the so-called grievance committee was organized with the barangay captain and a member of the council of elders as co-chairpersons and the barangay councilors as members. Issues on road rehabilitation such as the road right of way and cutting of the coconut tree raised by community residents were discussed and solved peacefully by the committee. In Sultan Mastura, learning from the practice in the municipality Panabo, the LGU enacted an ordinance to promote fisheries in the municipality. The ordinance aims to provide security for private fisheries activities while protecting natural resources through taxing the private fisheries activities in the municipality.

Through regular and continuous engagement, the BDA has successfully built rapport with the target LGUs, and the BDA sometimes played a catalytic role in connecting ordinary community people with the local governments and having the governments hear their voices. Such efforts helped greatly strengthen commitments of the LGUs as the above-mentioned cases suggest. The challenge is how such momentum can be sustained at the LGU without direct engagement by the BDA upon completion of the intervention. Follow-up activities such as periodic monitoring may be required until the good practices seen during the CD-CAAM project will be institutionalized in the municipalities.

Pillar 3: Inclusiveness

Inclusiveness is an important guiding principle of any intervention, especially in conflict-affected areas. By further emphasizing inclusiveness, the CD-CAAM model aims to help connect different socio-cultural and political groups in the communities. Under the CD-CAAM model, groups are formed for separate community development projects, and the model advocates that groups include members with diverse backgrounds with regard to such factors as religion, gender, political affiliation. For example, Christians and Muslims worked together in Matungao in the CD-CAAM project, and their group eventually became a registered PO. A member testified that they realized that they share such values as hard work, love, trust, honesty, respect, and cooperation. As armed conflict often fragments different groups, these success stories, although on a small scale, proved that the CD-CAAM model can help strengthen social cohesion at the grassroots level.

Women are expected to play important roles in every aspect of activities and decision-making. Additionally, it was found that former combatants took part in the various livelihood training sessions in the CD-CAAM project, and actively disseminated the learned technologies to their fellow former combatants. While the Normalization, or decommissioning of the MILF combatants, is one of the most critical components of the current peace process, the CD-CAAM model may enhance it by providing

training and income generating opportunities to former combatants once they become civilians.

Pillar 4: Comprehensive management process

The strong emphasis on marketing and selling sets livelihood projects under the CD-CAAM model a little apart from many other community development interventions in CAAM. In the CD-CAAM project, the agriculture group of Sultan Mastura has gained access to the mega market in Cotabato City, whereas the group in Matungao delivered its products to the large shopping mall in Iligan City.

Meanwhile, to sustain income generation, the beneficiary groups of the CD-CAAM continuously conceptualized ways to innovate and add value to products to market products better as well as maximize the benefit by reducing the production costs. For example, introduction of organic fertilizer such as vermi-cast, and worm tea as well as pest attractants in vegetable production greatly reduced the production cost by decreasing the use of chemical fertilizer and pesticides. Semi-organic production in Sultan Mastura and full organic production in Matungao also added value to the vegetables at the markets: Sellers at a market in Cotabato appreciated the relative longevity of freshness of the products, whereas the organic production process of Matungao vegetables was one of the reasons that a school was attracted to the products for its school lunch. In addition, training on seed production technology under the pilot project aimed to reduce the production costs further by saving the cost of buying seeds from suppliers, and enhance self-sufficiency of the farmer groups. During the extension phase, so-called matchmaking sessions were organized to establish linkages between producers and potential buyers of vegetables. While it remains to be seen to what degree such initiatives can help create new market opportunities for the small-scale farmer groups, dialogue with the buyers and traders gave the farmers a good opportunity to become more familiar with the marketing and selling aspects of their farming endeavors.

In fisheries projects, the processing of the tilapia into dried fish (Tilanggit) was one way of adding value, and production of so-called red tilapia, which can be sold at a higher price, was another. With regard to reducing the production cost, beneficiaries received training on the formulation of organic feeds. As feeds normally comprise 50–60% of the production costs, the application of organic feeds developed from indigenous materials could reduce the feed cost dramatically. A fisheries group also started producing fingerlings, which had been usually brought from an external hatchery. Fingerlings production can not only help reduce the production cost, but also create an opportunity to increase benefit as they can be sold to other tilapia producers in the locality.

Such comprehensive approach on community development, although time consuming, would greatly contribute to sustainable income-generation among community people. Thus far, the CD-CAAM model includes the following five packages of community development projects: vegetable production and marketing; tilapia culture, processing and marketing; road rehabilitation and maintenance through

LBT; goat production; and seaweed and sea cucumber production. Other types of community development package may need to be developed to address diverse development needs and potentials in Bangsamoro.

Pillar 5: Mobilization and networking with locally available resources

The mobilization and use of locally available resources—technical, material, or human—is another characteristic of the CD-CAAM model. By ensuring the relevance of interventions to local contexts, community people could replicate the learned technologies relatively easily in their own livelihood. Although Mindanao has suffered from the prolonged conflict, it has abundant valuable technical resources. The BDA built a partnership with local resource organizations such as the MSU (Maguindanao, Nawaan and Tawi-Tawi campus), the USM, the UAS, and the ATI, which greatly increased the relevance and sustainability of the interventions in the contexts of the CAAM. Networking with resource organization has also created small business opportunities. In Sultan Mastura, the UAS facilitated supply of products from the famer group of Sultan Mastura to a canning factory whereas the ATI introduced vegetable products for school lunch at a school in Iligan. Many valuable technical resources are still untapped in Mindanao. Mapping out potential technical resource organizations and establishing a network with development organizations such as the BDA would be a valuable asset for Bangsamoro.

Pillar 6: Farmer to farmer extension of technologies

Another distinct feature of the CD-CAAM model is based on the innovative experiences of the pilot projects, i.e. volunteer extension work initiated by farmers who took part in the pilot projects. Built on such experiences, FTF was strengthened during the extension phase. The beneficiary group members from the pilot agriculture and fisheries projects were trained as FTs, and provided technical guidance to the new beneficiary groups during the extension phase. Technology transfer through FTF was carried out relatively smoothly and effectively in the agriculture and fisheries projects both in Sultan Mastura and Matungao. Most of the FTs showed a strong commitment although they were provided with only a nominal honorarium for the service, and the quality of the technologies that they transferred to other farmers was as good as the one of the technology transfer directly from the experts to the farmers. Meanwhile, the demonstration farms of the livestock projects have attracted many visitors from neighboring communities, and the beneficiaries group has started transferring their learned skills to others, which was not intended within the scope of the extension phase.

As these cases illustrate, it is fair to say that the FTF approach can be an effective extension strategy in Bangsamoro given the limited human and technical resources within the LGUs. However, those FTs still need technical and financial support to sustain such extension efforts. Further advocacy by the development agencies such as the BDA may be needed to institutionalize FTF extension in the LGU so that the famer trainers' service may be financially supported by the LGU's development funds.

Meanwhile, although technologies can be transferred to the wider community population through FTF, famers often require financial capital to some degree in order to adopt the newly learned technologies. Thus, some types of financial assistance such as subsidy, loan, or micro-credit may need to accompany technical transfer and extension. In the CD-CAAM model, the beneficiary groups were encouraged to register themselves as an official entity such as a cooperative and a registered PO. The registered farmer groups may be eligible for bank loan in the future in Bangsamoro. Through such initiatives and the continuous support from the LGUs, the FTF extension approach should be further strengthened.

As examined thus far, each pillar itself is not necessarily innovative or original, but the uniqueness of the CD-CAAM model is that it combines different approaches and perspectives into something whole. Through carefully ensuring the six pillars throughout the whole process of community development interventions, the model aims to foster the resilience of the communities. Resilience can be defined as "the capability to anticipate risk, limit impact, and bounce back rapidly through survival, adaptability, evolution, and growth in the face of turbulent change,"[13] and some argue that resilience springs primarily from the strength of internal social capital, trust networks, and leadership.[14] Intra-state violent conflict often fragments the population by undermining interpersonal and communal trust, destroying the norms and values that underlie cooperation and collective action for the common good.[15] An implication of the legacy of decades of conflict can be found in the recent trend of increasing 'horizontal conflict'[16] in Bangsamoro. To strengthen social cohesion, different sets of social capital, i.e., norms, values and social relations that bond communities together (such as kinship, ethnicity and religion) may need to be connected horizontally, whereas civil society and the state also need to be brought together on the vertical axis.

The CAAM model can be an effective and sustainable community development model in Bangsamoro, and its impact is not only economical but also social. An assessment of livelihood projects also revealed that some of the beneficiaries experienced positive attitude changes not only toward farming itself but also toward life as a whole. For example, a male beneficiary of an agriculture project did not have a farm and was not engaged in any productive activities before participating in the CD-CAAM training. After a year of training, he started cultivating vegetables at his backyard garden, and keeps himself busy. With the additional money that he earns from his garden, his daughter can go back to school now. Similarly, the husband of a female beneficiary was a coconut climber, and he could not generate a stable income from his work. Now, the couple established a backyard garden in their home

[13] Plodinec, J. (2009). Definitions of resilience: An analysis. *Oak Ridge: Community and Regional Resilience Institute (CARRI)*.
[14] Menkhaus, K. (2013). Making sense of resilience in peacebuilding contexts: approaches, applications, implications. Geneva peacebuilding platform paper 6.
[15] Colletta, N. J., & Cullen, M. L. (2000). Violent conflict and the transformation of social capital: Lessons from Cambodia, Rwanda, Guatemala, and Somalia (Vol. 795). World Bank Publications.
[16] Horizontal conflict: violent struggles between clans, ethnic groups, rival insurgent factions, political parties and private armed groups or shadow authorities for control over land, natural resources, elective and non-elective positions, including government resources and rents (International Alert, 2014).

and started vegetable farming. The husband helps his wife in selling the vegetables by using his motorbike, and they have become able to earn income constantly from their garden. Meanwhile, villagers who were involved in armed struggle for a long time are engaged in livelihood activities, which would facilitate their transition to normal living. In addition, different religious groups, gender groups, and groups with different political affiliations have nurtured friendship and partnership through joint activities on the ground. Cooperation was sometimes extended outside group members to the wider population in the municipality. In sum, if it can be replicated on a larger scale in a proper way, the CD-CAAM model of community development is likely to make a substantial contribution to peaceful and productive Bangsamoro through nurturing community resilience.

4.2. Conclusion and recommendations on the BDA's promotion of the CD-CAAM model

The BDA as a development arm of the MILF is expected to play a leading role in socio-economic development in Bangsamoro, and the CD-CAAM project aimed mainly to equip the BDA with sound skills and knowledge in implementing and promoting the CD-CAAM model. In general, it may be safe to conclude that the BDA successfully carried out all the necessary tasks of the CD-CAAM project. The BDA also succeeded in adhering to all the six pillars of the CD-CAAM model, all of which were time-consuming and delicate tasks given the complex realities in the conflict-affected areas. During the extension phase, the BDA has also proved its flexibility and adaptability to carry out the activities and engage with the new LGU and communities even in a remote island province. The remaining challenges for the BDA are to reconcile the needs for quick and cost-effective implementation of the community development interventions while adhering to the six pillars of the CD-CAAM model, which inevitably requires time-consuming and costly engagement with communities, LGUs and other stakeholders. Additionally, while proper and efficient administrative and financial management should be the foundation of effective implementation of the CD-CAAM model, it remains to be seen whether the BDA's limited involvement in those tasks during the CD-CAAM project can equip the BDA personnel with enough skills to handle larger workload and funds when they are required to manage the CD-CAAM model on a far larger scale in the future.

Meanwhile, it is remarkable that the BDA has already replicated promotional activities of the CD-CAAM model in different locations. For example, the BDA, in cooperation with the Bureau of Fisheries and Aquatic Resources (BFAR)-ARMM, has provided tilapia fingerlings and breeders as well as technical guidance to the fisheries groups in municipalities such as Barira, Buldon and Mamasapano. The RMO CenMin has also started preparing to replicate three livelihood projects in the municipality in North Cotabato with the support from the FTs of Sultan Mastura. Known as a development catalyst, the BDA volunteers who live in the communities play a vital role in initiatives to disseminate the experiences of the CD-CAAM model in various parts of Bangsamoro. The BDA, particularly RMO CenMin, now envisions establishment of provincial FTs and provincial

demonstration farms for agriculture, fisheries and livestock that facilitate promotion of the CD-CAAM model at the provincial level. Another interesting example of the BDA's initiatives is a BDA radio program on vegetable production based on the experiences of the CD-CAAM project. As mentioned earlier, the weekly radio program hosted by the BDA provides practical information on vegetable production, and covers the Central and North Cotabato and other areas. As a de facto leading development agency within the ongoing peace process towards establishment of the new autonomous Bangsamoro government, the BDA is expected to scale up such initiatives and promote the CD-CAAM model to the wider population in the region. It may be fair to conclude that almost five years of engagement with the CD-CAAM project provides the BDA counterpart personnel with enough capacities and confidence to become the vanguard for the CD-CAAM model in Bangsamoro.

Meanwhile, the BDA may still need external support in two major areas. First, while the CD-CAAM model was suggested based on the lessons learned from the field operation of different community development projects in CAAM, the model is still in its infancy has ample room for improvement. For example, choices of community development projects must be increased to match diverse development needs and potentials in Bangsamoro; thus far the CD-CAAM model includes five different community development projects. Additionally, it is necessary to seek new measures to expedite the time-consuming process of technology transfer while maintaining the quality of the interventions. The quick service delivery of so-called peace dividends may help greatly in building a new Bangsamoro government because it increases government visibility and legitimacy among hitherto marginalized communities. To strengthen the relevance and effectiveness of the CD-CAAM model, the BDA still needs to improve its expertise on community development, to which the organizations such as JICA can continue to provide technical support.

Another serious challenge for the BDA may be its still weak financial foundation. The primary task of the CD-CAAM project was to develop technical capacities among individuals, as well as between and within organizations of the BDA. However, there is a growing realization that capacity development must be viewed far more holistically, rather than focusing exclusively on the personal knowledge, abilities, and motivations of personnel[17]. Capacity should be viewed as the combination of skills and professionalism that determines staff quality, but the ineffective use of skills and professionalism because of inhibiting conditions and lack of resources can create an appearance of lack of personal capacity.[18] While the CD-CAAM project developed capacities within the BDA relatively successfully, the lack of sustainable resources is still likely to be a serious obstacle to the BDA's ability to promote the CD-CAAM model. In fact, most of the BDA personnel whose capacity was improved in the CD-CAAM project may leave the organization upon the completion of the project because they are not

[17] Barakat, S.; Chard, M. 2003. "Theories, rhetoric and practice: Recovering the capacities of war-torn societies." In: S. Barakat (Ed.), Reconstructing war-torn societies: Afghanistan (pp. 17–36). Basingstoke: Palgrave Macmillan.
[18] Fitzbein, A. 1997. "The emergence of local capacity: Lessons from Colombia." In *World Development*, 25 (7): 029-1043.

regular BDA personnel and their entire salary are paid by the project. The newly established PMO in Tawi-Tawi may be closed soon after the end of the CD-CAAM project because it depends completely on the financial support from the project. As mentioned earlier, a large pool of development catalysts is one of the valuable assets for the BDA to reach the wider population in the region. However, the BDA may not be able to fully use the asset without sound financial foundation. Continuous resource mobilization that can sustain the momentum created by the CD-CAAM project is one of the key issues. This has no immediate solution given the stalled peace process, but it may be one of the areas where development partners such as JICA may need to continue their support to help build a peaceful and productive Bangsamoro in the long run.

[End of the Summary Report]