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**INTRODUCING *PALAYAMANAN* TO RICE FARMERS IN
PAMPLONA, CAMARINES SUR AND MILAGROS,
MASBATE THROUGH THE CLIMATE FIELD SCHOOL**

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ABSTRACT

This paper presents the experience of introducing *Palayamanan* through the climate field school (CFS). The stages included development of curriculum, CFS site selection, choice of participants, role of resource persons, facilitation, and techno demo farm activities.

The 18-week course curriculum, which is a combination of classroom discussions and actual demonstrations in the techno demo sites, was developed after a series of consultations with stakeholders in the two study municipalities. It allowed flexibility on the part of the facilitators and resource persons to address specific needs under the present conditions in the community. The CFS curriculum development is a continuous process, depending on the needs and priorities of the participants.

A total of 234 farmers completed the CFS and 12 techno demo farms (four in Pamplona and eight in Milagros) were established. The success and challenges of the CFS experience were attributed to several factors, which affected farmer's participation, rice and vegetable yield, and animal production in the techno demo farms. Activities during various stages of implementation of the CFS in the two municipalities have been observed to provide different outcomes.

Vegetable and animal production, organic farming, techno demo and field days were some of the activities most favored by CFS participants.

The frequent engagements through the CFS developed stronger ties between the farmers and agricultural technologists. It not only improved the relationships within the CFS but also provided change in the barangay through some technology interventions.

Keywords: climate field school, Palayamanan, techno demo farms, Camarines Sur, Masbate

TABLE OF CONTENTS

	Page
I. Introduction	1
II. Description of the Climate Field School	1
2.1 Climate Field School Framework	2
III. Implementation of the Climate Field School	2
3.1 Climate Field School Pre-implementation Stage	2
3.2 Climate Field School Implementation Stage	4
3.3 Climate Field School Post-implementation Stage	12
IV. Summary and conclusion	13
4.1 Summary	13
4.2 Conclusion	14
V. References	15

List of figures

	Page
Figure 1. General framework of the Climate Field School	2
Figure 2. Stages of CFS implementation in Camarines Sur	4
Figure 3. Framework of CFS facilitation in Masbate	9

INTRODUCING *PALAYAMANAN* TO RICE FARMERS IN PAMPLONA, CAMARINES SUR AND MILAGROS, MASBATE THROUGH THE CLIMATE FIELD SCHOOL

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I. Introduction

This paper discusses the process of introducing the *Palayamanan* system of farming to rice farmers in Pamplona, Camarines Sur and Milagros, Masbate using the climate field school (CFS) platform. The *Palayamanan* was designed by the Philippine Rice Research Institute (PhilRice) as an alternative system of production that may address some of the major concerns related to intensive rice production (Corrales et al., 2004).

This paper describes the dynamics involved in the implementation of CFS in the provinces of Camarines Sur and Masbate as well as the establishment of the techno-demo farms. It focuses on the development of the CFS curriculum and the implementation of the CFS in the study areas of the CRDES 2 Project namely barangays Veneracion, Tampadong, Tambo, Batang, and Del Rosario in Pamplona, Camarines Sur, barangays Narangasan, Capaculan, Tawad, Cayabon, and Bacolod in lowland Milagros, Masbate, and barangays Matagbac, Sawmill, and San Carlos in upland areas in Milagros.

Data were gathered from the monthly reports of the agricultural technicians and the travel reports submitted by the field-based project team. Personal interviews were conducted to assess the situation and make adjustments during CFS implementation.

II. Description of the Climate Field School

The CFS is a program first implemented in the Philippines through a joint project of the municipality of Dumangas and the Asian Disaster Preparedness Center (ADPC) for farmers in Dumangas, Iloilo in 2007. The program “aims to enhance the capacity of extension workers and farmers to understand and apply climate information to reduce risks in agriculture. It is an innovative way of addressing the problems on climate extremes, essentially through capacity building of farmers” (Golez 2012).

The CRDES 2 project adopted the CFS and implemented it in the municipalities of Pamplona, Camarines Sur and Milagros, Masbate for two seasons from 2015 to 2017. Four CFS in Pamplona and five in Milagros were conducted.

2.1 Climate Field School Framework

The general framework of CFS shown in Figure 1 illustrates the relationship of the three stages of implementation done in study sites in Camarines Sur and Masbate. Each stage involved several activities that were shown in the framework. Some of the activities under the three stages led to outcomes that made each framework unique, doing some adjustments to fit the needs and situations of participants in the project sites. Thus, CFS per se also deals with location-specific activities.

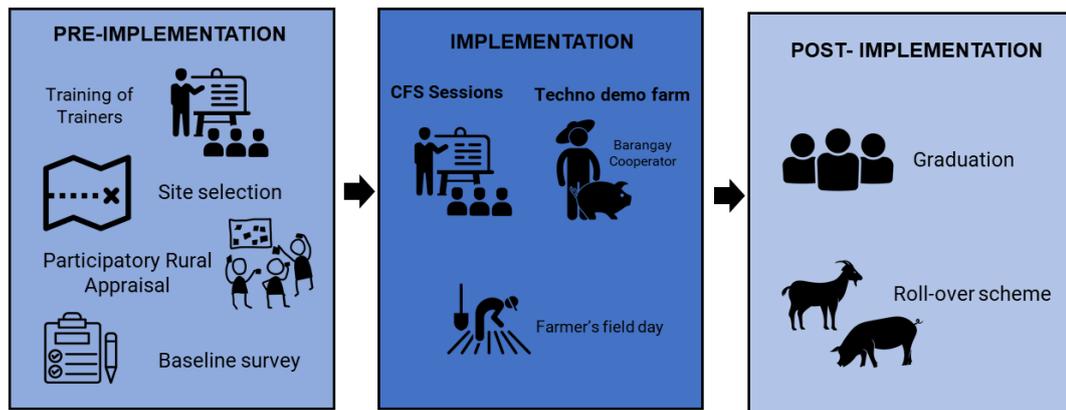


Figure 1. General framework of the Climate Field School

III. Implementation of the Climate Field School

3.1 Climate Field School Pre-implementation Stage

3.1.1 Development of the CFS curriculum

3.1.1.1 *Baseline curriculum*

One of the pre-project activities undertaken by the research team of UPLB was to come up with a CFS curriculum that could be adopted in the project sites. Partner state universities and colleges Dr. Emilio B. Espinosa Sr. Memorial State College of Agriculture and Technology (DEBESMSCAT) and Central Bicol State University of Agriculture (CBSUA) were tapped to collaborate with the Municipal Agriculture Office (MAO) of Pamplona and Masbate to develop a curriculum that would be used in the CFS implementation.

The initial CFS curriculum drafted was a 21-week course that integrates *Palayamanan* topics with climate and animal production and incorporated the community-based participatory action research (CPAR) approach using modules and pamphlets (*The Philippines Recommends*) by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development-Department of Science and Technology (PCAARRD-DOST). The draft curriculum was presented to

agricultural technologists and municipal agricultural extension workers for comments and improvements during the training of trainers.

3.1.1.2 *Training of trainers*

A ToT on CFS implementation was held as one of the preliminary activities. Municipal agricultural extension workers from Camarines Sur and Masbate who attended the ToT were trained on various topics covered by the CFS. The major output of the ToT, a revised curriculum, was made through a series of meetings with participants and SUC partners. Later on, the proposed curriculum was reviewed and edited by the project management team of CRDES based at UPLB.

As part of the training program, the participants visited farm areas in Goa, Camarines Sur, to observe *Palayamanan* farms earlier established.

3.1.1.3 *The CFS curriculum*

The output of the ToT is the revised curriculum, formulated after discussions with the participants and SUC partners. It is an 18-week course that covers several topics related to the *Palayamanan* system and topics on climate change and weather.

The curriculum was divided into four major parts: climate science, rice production, vegetable production, and animal production management. The topics included in this curriculum were rice, vegetable, and root crop production systems; animal and poultry production systems; freshwater fisheries; pest and disease management; and organic agriculture. Marketing and postharvest topics were also discussed to teach farmers proper handling of produce and generating more income. Special topics such as mushroom and *gabi* (taro) production were also included. There was also actual demonstration of farming practices in the techno demo farms and field days/ field trips during the conduct of the CFS.

3.1.1.4 *Site selection*

Camarines Sur

The project site is located in the municipality of Pamplona in Camarines Sur. The Pamplona MAO called for a meeting with the barangay captains of Pamplona and CRDES study leaders to select the sites and conduct site visits.

Barangays Veneracion, Tampadong, Del Rosario, Batang, and Tambo were suggested as study sites. Not strictly upland farms, these are still considered rainfed. During the site visit, the project team members consulted several farmers and convinced them to become barangay cooperators.

Masbate

The study areas in Masbate are located in the municipality of Milagros. The MAO and CRDES project team conducted site visits and the recommended study areas were

the upland barangays of Bangad, Calumpang, Pamangpangon, Cayabon, and Bonbon. However, distance and logistics would pose challenges in monitoring and field visits. Thus, the five lowland rainfed areas of Capaculan, Bacolod, Narangasan, Tawad and Cayabon were considered. Three project sites in the upland areas of Matagbac, Sawmill, and San Carlos, were later added.

3.2 Climate Field School Implementation Stage

3.2.1 Camarines Sur

3.2.1.1 CFS Framework in Camarines Sur

The CFS approach in Camarines Sur followed the general framework of CFS presented in Figure 2. CFS participation in Pamplona was not limited to rice farmers; students also took part in the classes. This was made possible through collaboration between MAO and high school principal.

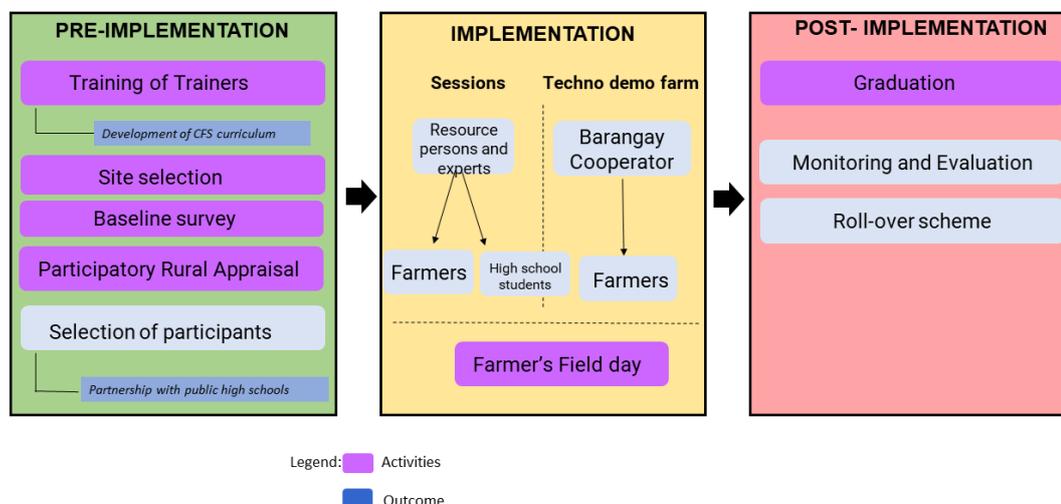


Figure 2. Stages of CFS implementation in Camarines Sur

3.2.1.2 Location and schedule

The CFS was conducted in barangays Del Rosario and Tambo in August 2015; it was implemented in the adjacent barangays, Batang and Tampadong, the following year.

It took 3 to 4 months to complete the implementation of CFS in Pamplona. Classes were held once a week in function halls and makeshift classrooms. For year 1, the CFS in barangay Tambo was conducted every Tuesday morning in the covered hall of the MAO. In Del Rosario, farmers go to the house of the cooperador where classes were held every Wednesday in the backyard, which was adjacent to the techno demo farm.

On the other hand, participants in Batang were creative in choosing their makeshift classrooms. During Tuesday afternoons, farmers convene at the house of the cooperator and listen to lectures in benches under a tree. In Tampadong, classes were held at the porch of the house of the cooperator every Friday afternoon to accommodate the Don Mariano C. Veneracion National High School students.

3.2.1.3 Participants

Initially identified to participate in CFS were the rice farmers who were interviewed during the baseline survey. The main criteria are that they farm in upland and rainfed areas and that they are willing to attend the CFS sessions regularly.

Farmers from the selected barangays were gathered with the help of agricultural technologists and some farmer leaders. During the meeting, project objectives were presented and farmers who showed interest were encouraged to attend the CFS. In year 2, the agricultural technologists went house-to-house, inviting and encouraging more farmers to participate.

During year 1, the CFS in barangay del Rosario had three male and 11 female participants; there were six male and four female attendees in barangay Tambo CFS. Nine Grade 10 high school students from the Del Rosario National High School who were taking up horticulture likewise joined the weekly activity. The agriculture teacher of the school became interested in the project when she saw farmer participants using different agricultural materials during land preparation in barangay Del Rosario. She thought that the CFS experience, especially the one pertaining to vegetable growing, would be a good opportunity for students to learn about new agricultural technologies. The teacher was convinced that the students will learn a lot more about conventional and modern alternative systems of farming by attending the CFS than staying in the classroom. The principal of the school, along with the teacher, went to the MAO and inquired about the possibility of some of the Grade 10 students listening to the CFS lectures and actually engaging in techno demo farming. The meeting led to the signing of a memorandum of understanding formalizing the participation of the students.

On the second year of the project, the CFS in barangay Batang had seven male and eight female participants, whereas barangay Tampadong had 12 male and 11 female participants. They were joined by Grades 9 and 10 students of Don Mariano C. Veneracion National High School. The CFS facilitator of barangay Tampadong and the cooperator encouraged the principal of the school to let the students attend the CFS program.

3.2.1.4 Barangay cooperators

One of the crucial elements in the implementation of CFS in a study area is the selection of a barangay cooperator. The chosen cooperator for each barangay act as manager of the techno demo farm and leader of the farmer-participants during their schooling. The cooperator also manages the agricultural inputs provided such as seed, fertilizer, and livestock. In choosing a cooperator, the following requirements are considered: 1) A cooperator must have at least 1 ha of farm land to be used as a techno demo farm for rice and vegetables, 2) the techno demo farm should be near the cooperator's home, 3) the cooperator must be willing and cooperative in the implementation of the project. It is also the cooperator's duty to report to the municipal agriculture technologists the problems encountered in the techno demo farms and in their CFS sessions.

The techno demo farm in barangay Del Rosario is located along the national road in Pamplona, which is connected to an irrigation system. Adjacent to it is a fish pond for aquaculture projects. The cooperator was the caretaker of the farm. The UPLB team and the rice coordinator of MAO Pamplona talked to the owner of the farm about the project. The landowner gladly gave his permission to use his land as a techno demo farm. On the other hand, the techno demo farm in Tambo does not have an irrigation system. It is located directly in front of the MAO office and solely relies on rain. The techno demo farms in Batang and Tampadong are both rainfed. The one in Tampadong is slightly elevated and rolling, while that in Batang is under a lowland rainfed ecosystem. The barangay cooperators were selected by their respective agricultural extension workers and their co-participants in the CFS. The chosen barangay cooperators were farm leaders and barangay officials.

Almost all the cooperators in Pamplona planted the same variety of rice, which was provided by the project, except in Brgy. Del Rosario where the cooperator chose to plant his home-grown variety of rice called Bulao. He later planted RC222. Upon the advice of an expert in high-value commercial crops in MAO Pamplona and in consultation with CFS participants, the vegetables planted during year 1 were a mix of *pinakbet*-type vegetables. The cooperators received goats, chickens, and ducks. They did not avail of swine because of the high cost of feeds and other inputs for swine production. It was agreed that adult goats will be passed on to the next beneficiary.

3.2.1.5 Resource persons

The resource persons in CFS in Pamplona were a combination of scholars from CBSUA, technical experts from the DA regional field office (DA-RFO), consultants, and practitioners from the private sector and the municipal agricultural technologists.

The selected resource persons from DA-RFO shared their expertise on CPAR, rice production, pest and disease management for rice, harvest and postharvest

technologies for rice, and special topics such as gabi and mushroom production. On the other hand, land preparation and crop establishment, seeding practices, soil nutrient management, fertilizer materials and calculation, nutrient deficiencies, weed management, and water management for rainfed lowland rice areas were discussed by a professor in agronomy from CBSUA during year 1.

The agricultural technologists, high-value cash crop coordinator, and MAO's agricultural engineer respectively led discussions on vegetable varieties, land preparation, production, soil nutrient, water management, pest and diseases, harvesting and postharvest handling; climate science, including basic meteorology, hydrologic cycle, climate forecast, potential benefits from weather and climate information, effects of weather and climate on plant growth; and fabrication and establishment of simple and improved rain gauge and water tubes.

Topics on livestock production, poultry production (housing/shelter and brooding; management practices; feeding; disease prevention and control), and small ruminant production (housing and brooding; management practices; feeding; disease prevention and control) were presented by an animal husbandry consultant and practitioner.

Organic agriculture covered topics on natural farming systems, organic fertilizer production, and vermiculture with an actual demonstration of how to make organic fertilizers.

The resource persons used multiple learning media such as flip charts, posters, video films, and PowerPoint presentations in their lectures.

3.2.1.6 CFS facilitation

The facilitator's role and attitude are key factors in determining the success of a farmers' field school (FFS). His duties include serving as catalyst, encouraging analysis, setting standards, posing questions and concerns, paying attention to group dynamics, serving as mediator, and encouraging participants to ask questions and come to their own conclusions (Braun et al, 2000).

In the conduct of the CFS in Pamplona, the municipal agricultural technologists acted as facilitators responsible for the planning of activities such as consultation meetings with participants for the schedule, identifying resource persons, checking attendance, and making adjustments whenever they are needed. Together with the resource persons, training facilitator, and research assistant, the agricultural technologists go to the session venue to ensure efficiency and productivity of CFS implementation. Lectures were presented first, followed by actual demonstration on the techno demo farms. It is very important to note that, regardless of weather condition, these facilitators were always present during the scheduled CFS because they do not want

participants to wait for them. The diligence and positive attitude of the facilitators earned the respect, cooperation, and support of the participants.

3.2.1.7 Project agricultural technician/research assistant

During year 1, a project agricultural technician or research assistant based in the study sites was assigned to report in CBSUA. Among his regular duties were to monitor the attendance of CFS participants, observe the activities in the techno demo sites, and ask about techno demo requisites as well as problems encountered in the area. He also helped in the canvassing of inputs to the techno demos, in facilitating the CFS, taking care of logistics and food for participant activities such as field trips and graduation. The project agricultural technician submitted monthly reports on the project's weekly activities.

However, after the 1st batch of CFS graduates, it was decided that he be transferred to MAO Pamplona for easy monitoring and better coordination. This move also enhanced the work relationship with MAO.

3.2.1.8 CFS field day

One of the activities in the CFS curriculum is a field day wherein participants and facilitators decide among themselves what they would like to do to further the learning process.

The four CFS in Pamplona decided to visit the Bureau of Fisheries and Aquatic Resources (BFAR) Region 5 in Bula, Camarines Sur. They listened to a lecture on tilapia production and they were given tilapia fingerlings to take home. They were also given a tour of the facilities in the area.

3.2.2 Masbate

3.2.2.1 CFS Framework in Masbate

The CFS framework entailed the conduct of two baseline surveys in the lowland barangays in year 1 and in the upland barangays in year 2. Two PRA sessions were also held to assess the situation and look into the needs of the barangays.

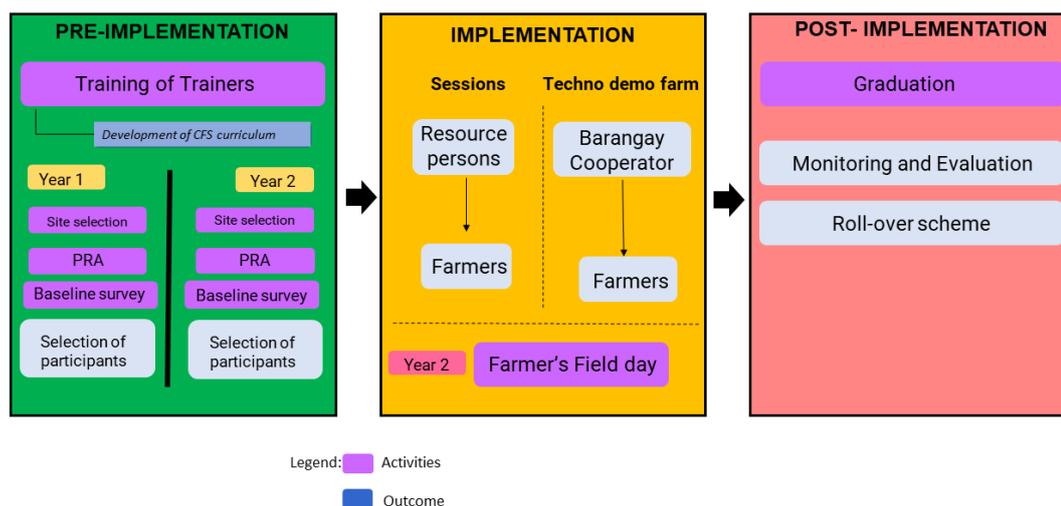


Figure 3. Framework of CFS facilitation in Masbate.

3.2.2.2 Location and schedule

The MAO of Milagros suggested the upland barangays of Bangad, Calumpang, Pamangpangon, Cayabon, and Bonbon as study sites. Farmers in these areas were consulted. However, during initial site visits of the project staff, the Bangad, Calumpang, and Bonbon sites were dropped because they are too far and monitoring would be difficult. The project team and the MAO then decided to choose sites in Cayabon, Capaculan, Tawad, Bacolod, and Narangasan because these barangays are closer to MAO. The CFS schedules in barangays Bacolod, Narangasan, and Tawad had to be cancelled due to very poor attendance. A lot of times, there were no participants in a session. It was thus decided that the three cancelled CFS be conducted in some of the upland barangays instead.

For the second year of implementation, three new study sites were chosen to extend the reach of project intervention. These were upland and rainfed communities that are 2-3 hours away from the areas covered in year 1. Transportation to year 2 sites, barangays Matagbac, Sawmill, and San Carlos, posed a challenge. Motor vehicles or “*habal-habal*” were used for transport and only two jeeps travel daily from the barangays to the city, depending on weather and road conditions.

In year 1, the CFS in Milagros was held every Tuesday afternoon in Capaculan and every Wednesday afternoon in Cayabon. In year 2, the CFS schedules for the three upland barangays were in this order: Tuesday morning in San Carlos, followed by Matagbac in the afternoon, and Wednesday morning in Sawmill.

3.2.2.3 Participants

The agricultural technologists of Milagros asked the barangay officials to gather farmers who may be interested in attending the CFS. Farmers who have attended the FFS on rice and vegetables were also invited so they can supplement what they learned with climate-related information for agriculture. An orientation session

introduced the CRDES project and the differences between CFS and FFS were discussed. Similar to the experience in Camarines Sur, the farmers became interested in the *Palayamanan* concept with techno demo. They were eager to learn about organic agriculture, which is very important in areas with small farms such as theirs. The idea of having an animal to own and care for from the roll-over scheme of livestock (goat and swine) motivated them as well. To encourage active participation, an agreement was made among the CFS participants and the facilitators: instead of drawing lots, those who consistently attend will be given priority in the roll-over scheme for animals. This way, participants are taught that farming is not based on luck; it entails a lot of hard work and perseverance to achieve a good harvest.

3.2.2.4 Barangay techno demo cooperator

In Milagros, the area in Bacolod is a lowland flat terrain ideal for rice techno demo as it is adjacent to a river that serves as source of irrigation. The vegetable demo farm in Capaculan is slightly elevated with irrigation, while that in Cayabon is found in a rainfed flat terrain. On the other hand, both study sites in Tawad and Narangasan are valleys and the rice farm is located in between high-elevation areas. The techno demo farm in San Carlos is an upland area with rocky terrain with a stream near it; the vegetable techno demo is elevated in Sawmill. Both techno demo farms for rice and vegetables in Matagbac were upland rainfed. Most of the cooperators in Milagros were farm leaders and barangay officials selected by the farmer-participants themselves.

The cooperators, participants, and MAO decided to try planting high-value vegetable seeds in techno demo sites in Cayabon, Capaculan, Matagbac, Sawmill, and San Carlos to introduce new vegetable varieties to farmers as well as increase their income. High-value crops such as baguio beans, carrot, broccoli, and cabbage may not grow well in these barangays but, upon request of the farmer-participants, the project allowed them to cultivate such crops if only to convince them that there are only certain crops suited to their soil. Farmers have this attitude of ‘to see is to believe.’ After the harvesting season, it was observed that these high-value crops did not grow well in some areas because of the very dry and hot weather. Only cucumber and sili “*pangsigang*” produced a good harvest, especially in barangay Matagbac. In Cayabon, the cooperator was very proud of having cultivated baguio beans and he was able to sell most of his produce.

Livestock (swine and goat) is given to cooperators in Milagros under a memorandum of agreement between the cooperator and the project. For every head of livestock given to the cooperator, he/she has to provide two head in return. An amendment was made regarding the provision in the return of goats, was decided that, for every goat provided in the techno demo, one head will be returned. In case of livestock casualty, a death certificate should be issued by the municipal veterinarian.

3.2.2.5 Resource persons

The resource persons invited for the CFS in Milagros were the municipal agricultural technologists. With their educational background and training credential, they are well-versed with the subject matter in the curriculum aside from the fact that they also have their own farms where they can ‘walk the talk.’ Rice production, pests and

diseases, and harvesting and postharvest practices were discussed by their rice expert. Two agricultural technologists handled the rest of the topics in the curriculum (e.g., climate change, vegetable production, livestock production, and organic agriculture). There was an attempt to invite representatives from the academe (DEBESMSCAT), but their schedules did not allow them to join the CFS.

3.2.2.6 CFS facilitation

In Milagros, the facilitators of the CFS were the agricultural technologists too. They mediated for participants who have a different understanding of the CFS objectives, repeatedly explaining the roll-over scheme guidelines for the techno demo. In the upland barangays, they arrive in the venue a day before the CFS schedule to monitor the demo farms and make farmers feel their presence in the area, reminding them to attend the CFS the following day. Even during extreme weather conditions, they go to the CFS venue because they know that farmers are expecting them. The attitude, persistence, and commendable conflict management skills of the agricultural technologists made the farmers feel that they have something to look forward to every CFS session.

3.2.2.7 Project agricultural technician/research assistant

It is critical for a project to continuously monitor activities and implement plans on time. The project agricultural technicians were tasked to perform administrative functions, coordinate meetings with project experts, and perform other tasks that may be assigned from time to time by the project leader. They were given monitoring forms for the collection of techno demo data and the documentation of best practices, constraints, and opportunities, which can contribute to an improved understanding of how the CFS can be more effectively implemented.

The agricultural technicians provided monthly reports on weekly activities to the project team. Day-to-day activities were listed down, including the accomplishments in the field.

The project agricultural technician reported for work at the extension office of DEBESMSCAT. She regularly goes to the MAO in Milagros to coordinate the activities in the CFS. She was asked to help in the canvassing of whatever items are needed in the CFS activities (e.g., inputs for techno demo, field trip logistics, food, and venue). She regularly checked the attendance in the CFS, observed the activities and reported on topics discussed in the CFS, and monitored the status of the roll-over scheme for animals.

3.2.2.8 CFS field day

The field day for year 2 of the CFS was originally scheduled immediately after the end of the sessions in November 2016. However, due to typhoon Marce, access roads going to the site were impassable to jeepneys, and the field trip was postponed. The schedule was set for January 2017 since December could be a rainy month as well. The rescheduled field day was held in Fazenda de Esperanca, a drug rehabilitation facility in Masbate that is into organic farming as well. The participants were given a lecture on organic farming and were shown crops grown organically. The farmers were able to compare these with the crops they have planted in the techno demo farm.

This made the participants realize that they have so much to learn about organic farming. They also visited the Department of Agriculture's farm station where they were shown different breeds of goats and other farm animals. It is important to push through with the field day regardless of difficulties because it is one of the activities most farmers look forward to.

3.3 Climate Field School Post-implementation Stage

3.3.1 Camarines Sur

3.3.1.1 CFS Graduation

Graduation ceremonies were also held as the culminating activity for participants who completed the CFS sessions. During graduation, participants were awarded certificates of completion along with the resource persons for their participation in the project. They were also given caps and t-shirts as souvenir. The activity served as a way for LGUs and SUCs to encourage farmers to join programs like the CFS for these can give them opportunities and provide new ways to improve their yield and thereby have a better life. After 2 years of implementation of CFS, a total of 234 farmers have completed schooling, 89 of whom were from Camarines Sur.

In Pamplona, the first CFS graduation ceremony was held at the Barangay Del Rosario multipurpose court. Preparations were done by the MAO of Pamplona before the graduation date. It was attended by the graduates along with their family members and friends, co-farmers, and some municipal officials. The student graduates from the Del Rosario National High School and a participant from Brgy. Tambo prepared a special number. A video presentation of the activities of the CFS was shown as part of the program. The cooperator of Brgy. Del Rosario brought sample vegetables harvested in the techno demo farm as a showcase of the abundance and quality of his produce for that season. The graduation rites in the second year of CFS was held at the barangay hall of Veneracion. The graduates with their families and friends, barangay and municipal officials and other farmers in the area attended the affair. Song and dance numbers were performed by students of the Don Mariano C. Veneracion National High School and some women participants from barangay Tampadong. Also, some participants provided feedback and insights about the CFS program.

The conduct of graduation in the LGUs can be a vehicle for raising awareness and encouraging local officials to be involved in the project.

3.3.1.2 Livestock roll-over scheme

The cooperator in barangay Del Rosario gave back the two parental goats to his co-participant for the roll-over scheme. He maintained the two bucks that were produced from the project. The co-operator in barangay Tambo has already provided one yearling for goat dispersal.

3.3.2 Masbate

3.3.2.1 CFS Graduation

Like the field day, the CFS graduation is one of the most awaited events by the farmers and their families. The 2-year CFS in Milagros produced 145 farmer graduates. In year 1, CFS graduates from barangays Cayabon and Capaculan got their certificates at the BeMonC Hall in Poblacion, Milagros, Masbate. It was attended by CRDES partners from the LGUs (municipal and provincial), DEBESMSCAT, and farmers from Cayabon, Capaculan, and Sawmill. Impressions on the projects were given by participants from Capaculan and Cayabon. CRDES partners gave messages during the program. Presentations were prepared by the CFS participants as well. The second CFS graduation was held at the Barangay Matagbac Multipurpose court. The farmers invited family, friends, co-farmers, and barangay officials from adjacent barangays and sitios. The activity enabled non-participating farmers to understand the objectives of the CFS and to be interested enough to join the program should there be another offering. The insights shared by the participants in the graduation program reflected their appreciation and gratitude toward the project that helped them improve their livelihood. They reiterated how CFS provided them opportunities to learn about vegetable crops suitable to their farms, new technologies, and concepts on weather disturbances, aside from the chance to earn additional income not only from crops but from livestock as well.

3.3.2.2 Livestock roll-over scheme

In barangay Capaculan, the cooperator does not know how to raise and take care of goats before the CFS started. At present, the three head of goats provided to them have already produced 17 yearlings, five of which were already sold. She was able to give back three goats for the roll-over scheme and two goats to co-participants. All CFS cooperators who received swine and goat had already given animals for the roll-over dispersal to other participants.

IV. Summary and conclusion

4.1 Summary

The CFS curriculum underwent a series of consultations before it was finally used in the CFS in the two study areas. Modules tackling the production of different crops and animals were used to build up the topics, integrating the concepts of *Palayamanan* and climate science. It was presented in a training of trainers participated in by the municipal agricultural technologists; comments and suggestions for improvement were solicited. The CFS curriculum, formulated using outputs obtained from the training, was divided into four topics: climate science, rice production, vegetable production, and animal production and management. Special topics such as mushroom production and gabi production were included. A field study/field day was scheduled as part of the CFS. The curriculum was designed for an 18-week course combining discussions and actual technology demonstrations in a particular site. Pre- and post-evaluation of the curriculum was done to improve the topics, materials and methodology used in the conduct of the CFS.

The project sites identified were the municipalities of Pamplona in Camarines Sur and Milagros in Masbate; these have large rice upland areas, adjacent barangays, and high poverty incidence. Adjustments were made for easy project monitoring. Rainfed areas were considered as probable sites too. The MAO called for a meeting in the different barangays to introduce the CRDES project to them. Farmers were asked if they are willing to attend the CFS and schedules were set on their most convenient time.

There were nine CFS and 12 techno demo farms in the two project sites. Four CFS and four techno demo farms were established in Pamplona (barangays Del Rosario and Tambo in year 1 and barangays Batang and Tampadong in year 2). In Milagros, only two CFS were conducted in year 1 at barangays Capaculan and Cayabon, while there were five techno demo cooperators located in barangays Capaculan, Cayabon, Bacolod, Narangasan, and Tawad. CFS schedules in barangays Bacolod, Narangasan, and Tawad had to be withdrawn due to very poor attendance. Thus, the three cancelled CFS were conducted in the upland barangays of San Carlos, Matagbac and Sawmill in year 2. Three techno demo sites were also established in the area.

The participants, upon consultation, provided the inputs for the techno demo farms. They wanted to plant *pakbet* vegetables, gabi, and cucumber. They do not want to raise swine because their capital is not enough to buy feeds. They raised goats, chickens, and ducks instead. Participants in Masbate wanted to try high-value vegetables such as cucumber, broccoli, baguio beans, carrots, cauliflower, and cabbage. But some of these vegetables were not suited in most of the areas, except for cucumber and baguio beans, which did well in barangays Matagbac and Cayabon, respectively. The farmers realized that *pakbet* vegetable crops are more suitable to their soil type.

The resource persons in Pamplona were a combination of technical experts from CBSUA, DA RFO 5, and the MAO of Pamplona. Lectures and techno demo presentations were given by the trained agricultural technologists of Milagros. These resource persons provided an interactive environment for CFS participants who enjoyed the lectures and humor of the resource persons. The facilitators of the CFS were the agricultural technologists of each municipality.

Two project full-time agricultural technicians were hired in each project site to assist in the implementation and monitoring of activities. They provide monthly reports to the project team and coordinate all project activities.

The CFS implementation was not an easy journey. Delayed land preparation due to extended dry periods, occurrence of natural disasters, and poor attendance were only some of the difficulties experienced during the project period.

4.2 Conclusion

The CFS farmers in the areas practiced *Palayamanan* and incorporated climate-related information to enable them to mitigate farming hazards. This project also aimed to identify crops suitable in the areas to help farmers increase their income and productivity.

The curriculum produced during the training of trainers guided the facilitators in the 2-year conduct of the CFS. It gave facilitators flexibility in meeting specific needs and addressing current conditions in the community. The development of the CFS curriculum is a continuous process, depending on the needs and priorities of the participants.

The success and challenges in implementing CFS were attributed to different factors. Among the success factors was the facilitation of agricultural technicians who served as resource persons and the resilience of cooperators in dealing with the vulnerable aspects of farming and raising of animals. Additionally, the 'learning by doing' approach proved to be effective in ensuring farmers' adoption of the technologies. The techno demo farm was used to showcase and demonstrate the proper application of protocols or procedures learned, from land preparation to postharvest techniques. It served as an informal venue through which participants were able to clarify some of the topics discussed.

The frequent engagement between farmers and agricultural technologists brought about by the CFS developed stronger ties between them. Farmers now find it easier to discuss their concerns with their agricultural technologists.

Aside from the success factors and challenges identified during the CFS, the process of farmer participation through barangay cooperators and the use of techno demo farms were also explored. Different varieties of rice and vegetable crops were planted in the different techno demo farms to test the participants' application of the farming concepts they learned from the CFS. Also, it was a way of helping farmers realize that not all type of crops can be cultivated in their areas and that soil testing is important. The animal dispersal and roll-over scheme helped augment farmers' income, especially at times when crop production is unexpectedly low.

The CFS was found to be a catalyst of change in farming communities especially in upland communities that have no access to markets and where the extension system is weak and interventions are minimal.

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