



**Ministry of Agriculture, Livestock and Irrigation
Working Group on Agriculture**

**Letter of Agreement on Green Water Management Project under TA
8163 -REG: Implementing the GMS Core Agriculture Support
Program, Phase II**

First Progress Report from July - December 2016

**Dryland Agriculture Development in Myanmar through the
Implementation of Green Water Management Project**



Implementing Partners: Project Implementation Unit (PIU),

Department of Agriculture

Funded by



**GREATER MEKONG
SUBREGION
CORE AGRICULTURE
SUPPORT PROGRAM**



February 2017

TA Output No 3: Increased Adoption of Gender-Responsive and Climate Friendly Agriculture Project's name: Dryland Agriculture Development in Myanmar through the Implementation of Green Water Management Project		Amount Approved: US\$ 150,000	
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I. Description

a) Background

Under The Greater Mekong Sub region (GMS) Economic Cooperation Program, regional cooperation in agriculture is guided by the Core Agriculture Support Program (CASP) implemented by the GMS Working Group on Agriculture (WGA) and supported by the Asian Development Bank (ADB) and other development partners.

The vision of CASP 2 is for the GMS to be “recognized as the leading producer of safe food, using climate friendly agricultural practices and integrated into global markets through regional economic corridors”.

Under TA8163-REG, ADB and Department of Agriculture, Ministry of Agriculture, Livestock and Irrigation, Myanmar signed a Letter of Agreement (LOA) on 28th July 2016 to implement Green Water Management activities that support the achievement of the TA outputs and to help coordinate CASP 2 activities in Myanmar.

These green water management activities are being implemented under the LOA with the implementation period of 15 months from July 2016 to September 2017 in two townships of Mandalay Region and two townships of Magway Regions. The total financing amount is USD 150,000. The outcome of the project is “increased adoption of climate friendly agricultural (CFA) practices, improved soil quality and income of small holder farmers”.

b) Scope of Green Water Management Project

This project works directly with at least 300 farmers of which 25% are women in the 6 selected villages of 4 target Townships: Yamethin, Pyawbwe, Magway and Natmawk, in order to: (i) create green water management model in dryland areas of Myanmar; (ii) promote green water management awareness and best practices to local staffs and farmers of which 30% are female through the efficient utilization of rainwater as supplementary water for year round crop cultivation; (iii) increase food security, food safety, household income and adaptive capacity of poor rural households to climate change especially water scarcity and irregular rainfall distribution pattern due to global warming and promote market linkages for smallholder farmers; and (iv) recommend policy makers for developing green water management in dryland areas of Myanmar.

c) Implementation arrangements

The Implementing Agency (IA) for the LOA is Department of Agriculture (DOA), Ministry of Agriculture, Livestock and Irrigation (MOALI), Myanmar. This project under the LOA is executed by Land Use Division (LUD) from DOA, MOALI, Myanmar. The Project Team, via Project Implementation Unit (PIU) is comprised of a government officer of the Director level as a team leader from Land Use Division. The Director General (DG)/ Deputy Director General (DDG) is to authorize budget disbursements and ensure all activities are executed according to the projects' activity implementation plans and schedules. Each division from

DOA was coordinated and collaborated with Region, District and Township offices, and the local authority, farmer groups, community levels and private sectors as well for implementation of project activities.

II. Progress and Achievement of the Project Implementation (within the quarter) against Expected Outputs

a) Main in-country activities

- 1. Selection for demo-sites and demo- farmers:** Survey team visited to Mandalay and Magway Regions for site selection and appropriate demo-farmers selection.
- 2. Establishment of the Demonstration Farms:** Established the Demonstration Farms for Green Water Management (GWM) at the respective project townships.
- 3. Inception Workshop on the Project of Green Water Management in the dryland areas of Myanmar:** Held at Hotel ShwePyi Taw, Nay Pyi Taw on 19th September 2016. Participated by ADB WGA Secretariat Mission and totally 34 Staffs from the Department of Agriculture (DOA), Nay Pyi Taw and extension staff from project areas, and Department of Planning (DOP), Nay Pyi Taw.
- 4. Workshop within PIU & PIB:** Held at Meeting room, Department of Agriculture, Nay Pyi Taw. PIU organized discussion & wrap up workshop with PIB group and totally 23 Staffs participated from Land Use Division, Plant Protection Division, Project Planning, Management and Evaluation, and Horticulture, Vegetable and Biotechnology, Township Officers and staffs from Department of Agriculture in the project areas.

5. Capacity Building:

(1) For Ministry of Agriculture, Livestock and Irrigation Staffs:

Participatory monitoring and evaluation of the project: Training Workshop on Participatory Monitoring and Evaluation of the Project was conducted by TA Consultants on 29.11.2016 - 2.12.2016 in Nay Pyi Taw, altogether 34 participants from MOALI including project implementation team and participants from each division under DOA, DOP, Department of Agricultural Research (DAR) and Yezin Agriculture University (YAU) attended the training. The training was conducted by **Ms. Somphavanh Nakhavong, Data & Indicators Specialist and Dr. Apichai Thirathon, Agronomist, WGA Secretariat, ADB TA 8163 REG.**

(2) For Demo-farmers: Implementation Team practically established the demonstration farms with selected demo-farmers and using the technologies of rainfall harvesting, green water saving and management, organic agriculture techniques, and good agricultural practices, soil and water conservation practices (mulching, windbreak plantation, small water storage ponds) for climate friendly agriculture.

(3) For Farmers and Staffs: Conducted the Trainings for farmers from demonstration sites, neighboring villages and for relevant staffs from DOA. These training particularly shared and discussed on Green water management, water

saving technologies, basic of soil and nutrients, fertility improvement, horticultural crops production such as suitable soil types for vegetables, cropping practices and management, pre and postharvest handling practices in the project area in December 2016. Pamphlets of compost making process were distributed. Making of EM compost was practically showed by PIU to farmers and EM was distributed to each farmer.

(4) Project Management & Monitoring: Project Implementation Unit (PIU) frequently visited all demo farms and discussed management and monitoring of the effectiveness of water harvesting and farm management using organic compost and bio-pesticides systematically with the demo farmers. The Project Team also discussed with other interested farmers for the purpose of exchanging knowledge and experiences.

b) Outputs

Output 1.Capacity of extension staffs and small holder farmers to apply CFA technologies improved and knowledge of market linkage developed

1.1. Develop curricula and training materials for extension staff and farmers

Farmer training materials on water harvesting, soil fertility management, soil and water conservation practices, compost making and vegetable production were prepared for distribution to the trainees. Training materials on market linkages have not yet been developed, this will occur in the next quarter (January to June 2017).

1.2. Conduct trainings (10 trainings) and workshops (2 WS) on GWM/CFA technologies and market linkages for extension staff and farmers

The project conducted one workshop with the PIU and PIB in December 2016 to plan training sessions and develop training materials for staff and farmers on techniques for making and using organic compost, rainfall water harvesting and management, soil fertility management, soil and water conservation practices and climate friendly agricultural practices in project the targeted areas. Further trainings will be conducted in the next quarter, including trainings related to marketing of products. The Department of Agriculture established a group of Subject Matter Specialists to conduct these trainings.

The Specialist Training Team is comprised of:

No.	Name	Position	Degree	Division/Dept.
1	Mrs. San San Myint	Deputy Director	M.Agr.Sc	Land Use
2	Ms. Thin Thin Kyi	Assistant Director	M.Sc	Land Use
3	Ms. Lei LeiHtwe	Staff Officer	M.Sc	Land Use

4	Dr. WunnaHtun	Deputy Staff Officer	Ph.D	Horticulture, Vegetable and Biotechnology
5	Dr. KhinZarKyaw	Deputy Staff Officer	Ph.D	Project Planning, Management and Evaluation
6	Ms. Seng Raw	Deputy Staff Officer	M.Sc	Plant Protection
7	Dr. Thin NweHtwe	Deputy Staff Officer	Ph.D	Land Use

List of attendees at the trainings—are:

- 63 farmers (41 male & 22 female) in Saegyi and Theingone villages at Yamethin Township, Mandalay.
 - 52 DOA staffs; 29 from Yamethin Township and 23 staffs from Pyawbwe Township (21 male & 31 female) in Yamethin Township, Mandalay.
- Knowledge on market linkage will be briefly discussed during the training on PGS and Organic Agriculture. More detail on activities related to market linkages for the GWM farmers is reported under Output 3.

1.3. Organize farmer field days and exchange visit (6 times)

These activities are yet to commence.

Output 2.GWM technology adopted and expanded to more farmers in the project sites

2.1. At least 6 GWM demonstration sites established and run by smallholder farmers

- **Established the GWM Demonstration Farms:** Six demonstration farms on Green Water Management have been established through selection of appropriate candidate farmers and application of a participatory consultation process,.
 - The 6 GWM Demo farmers are: Mrs. MyintMyint Mu (about 1ha) in Thanngone Village, Myothit Township, Mr. KyawSoe (about 5 ha) and Mr. TheinHlaing (about 5 ha) in Nakyarhtoo and Shwekwe villages, Natmauk Township, Magway region and Mr. Min Thet (about 5 ha), Mr. MaungMyint (about 2 ha) in Theingone and Saegyi villages, Yamethin Township and Mrs. Tin Tin (about 0.65 ha) in Satcho village, Pyawbwe Township, Mandalay Region. These demo farms are applying green water management techniques and climate friendly agriculture practices (CFA). This project implementation also involves construction of rainfall water harvesting ponds (five ponds) and one check-dam. These ponds and check-dam had been constructed during August and September, and had only two months (September and October) duration to collect rain water although there was different amount of total rainfall intensity for two months among the townships (the highest amount of 18.23" at Yemethin, second highest of 14.71" at Pyawbwe, the relatively lower amounts of 10.06" and 10.98" at Natmauk and Myothit townships, respectively). At present, there was few harvested rain water in the

pond at the Satecho village, Pyawbwe Township, Mandalay region because this demo-farm applied harvested rain water in large amount for planting cash-crops during off-season as soon as the ponds had been collected the rain water. As a result, this Demo-farmer (Ms. Tin Tin) had already obtained net income of benefit (US \$ 1,000) by selling coriander that caught the market demand of high price. This demo-farmer planted cash vegetable crops such as coriander, roselle, tomatoes and bean from December to February. For check-dam at Natmauk township, it has also relatively lower water (not full) compared with other ponds due to significantly low amount of rainfall. The other remaining ponds have fully harvested rain water for growing crops. Therefore, all the demo farms are ready to be used as model farms for other farmers to learn.

In the project areas farmers depend mainly on rainfall for crop production and insufficient water is a major challenge, especially at the reproductive stage of rice cultivation. As a result the expected yields may not be obtained and the quality of rice may suffer. In order to solve this problem of water insecurity for crop production the project sought to develop a green water management model and to promote green water management awareness among farmers in the selected project sites. The project provided the necessary support to dig and construct the ponds in order to collect rainwater and increase efficiency in the use of water including maintenance of soil moisture. The project introduced farm water management practices to demonstration farmers to increase crop productivity and sought to transfer these practices to others in the neighboring villages.

Project Implementation Unit (PIU) Team visited to project sites at least twice per month in August, September, October, November and December 2016 to manage, monitor and guide the extension staff and Demo farmers in accordance with project guidelines. The PIU also sought to support application of technologies concerning green water management and provided inputs such as organic fertilizer, EM, and seed for crops including mango, banana plants and other perennial plants used as windbreaks.

The project delivered knowledge materials on green water management, water saving technology, water management, soil fertility improvement and horticultural crops growing to farmers and extension staffs. After the training sessions neighboring farmers were found to be interested in making their own ponds to collect rain water on the basis of the demo farmers' experiences. The training also enhanced the awareness of the farmers in the efficient use of crop residues. Accordingly, the burning of farm wastes had been reduced. Furthermore, some farmers can now make the compost by themselves.

As a result of these activities the Demo farmers were able to grow perennial plants (mango and banana) and annual horticultural crops and vegetables such as onion, water cress and gourd using efficiently collected rain water. Demo farmer were also able to make the EM Bokashi compost and mulching using water saving techniques guided by the PIU.

Please see Annex 7-12 for the detail of each Demo site.

2.2. At least 25 new farmers in 6 GWM pilot sites implement GWM technology

➤ Increased adoption of gender-responsive and climate-friendly agriculture from visit to demonstration farms and training.

Some farmers around the project areas, especially at Satcho village, Pyawbwe Township, visited the demo farms and expressed interest in green water management and climate friendly agriculture practices having seen these initiatives in practice at the GWM demo farms. Some of these farmers have already attended the training organized by the project. The trained farmers are interested in applying the organic agriculture techniques they learned from visits and discussions with Demo farmers and the project team. Moreover, having attended the farmer trainings on organic techniques, such as the making of EM Bokashi compost, Trichoderma, natural fertilizer and pesticide production etc., they have already produced organic materials and will start to apply these climate friendly agricultural practices in the coming growing season of this year.

Output 3. Access to market for CFA products established

Enhance market linkage for GWM farmers and CFA products. The main activities under this output will commence in the next quarter (January – June, 2017). The project will introduce tripartite cooperation contract farming that involves three parties, the PIU team from Department of Agriculture (DOA), farmers and traders. The PIU will search or inquire the appropriate traders and act as a facilitator between the two parties, farmers (producers/ growers) and traders (Sellers/ buyers) not only in selling farm products to traders but also in buying farm accessories/implements by farmers from traders. Additionally, the project will lead to hold Buyer-Seller meetings by participating PIU-DOA as a facilitator in order to reduce the information gap about the prices of various items (inputs/outputs) between farmers and traders. Then, the PIU will implement business matching through the organized “ buyer-seller” meetings in which the buyers may be retailers, small shopkeepers, traders to encourage development of new and stronger links to output markets access to help the farmers in building their capacity in activity access to the market, connecting to buyers (small and large scale) and traders.

Output 4. Knowledge products produced and disseminated

Knowledge sharing and dissemination has been facilitated through training and visit to GWM demo farms. Knowledge on the following techniques has been disseminated:

- Technology on Green Water Management included rainfall water harvesting technology, crop rotation, mulching, planting cover crops, windbreak plantation, green manure plantation, perennial crop plantation and vegetable crop plantation.

- Integrated Farming System included aquaculture such as perennial plants, seasonal crops, and fish farming techniques.
- Multipurpose biomass management, indigenous microorganism and application of crop residues as the compost and organic fertilizer for soil improvement.
- Quality assurances: organic agricultural aquaculture products which meet standards and demand from domestic consumers. Establishment and application of participatory guarantee systems. Meeting export market requirements. The systematic application of standards and certification of agriculture products, from farm to consumer.
- Using the Climate Friendly Agricultural Practices and pre- and post-harvest technology for safety food

Knowledge Products and Distribution. a) **Hand Notes** for making and applying of natural fertilizers & natural pesticides, Benefits of using natural fertilizers and pesticides; b) **Pamphlets** for making and applying of EM bokashi compost, vermiculture, trichoderma, neem pesticide, natural pesticide, plant organic hormone (Fermented Plant Juice, Procedures for Fish Amino Acid, Organic Foliar Fertilizer), Pamphlets of soil conservation, water harvesting, saving and management, production of vegetable crops; c), **Video** showed on global warming, hazards from hormones and the heavy metals from using of chemicals such as herbicides, fertilizers and pesticides and soil conservation, d) **Awareness raising and knowledge dissemination through SkyNet TV channel** about GWM project from Myothit demo farmer.

Output 5. Policy recommendations on GWM to support national policy makers produced

Conduct of policy review and dialogue. PIU will work with technical departments to conduct the policy review on GWM. Based on the result of GWM implementation at farm level, the experience and lessons learned will be used as basic information to be considered together with the policy review and as reference for the policy recommendation. The policy review will begin in the next quarter (January – June, 2017).

c) Immediate Outcome (by December 2016)

Green water management capacity of and market access for SEAP smallholder farmers increased

- i. % of CFA farmers increased by 30%; of which, 30% are managed by female (baseline 0 in Aug 2016)
At present, CFA farmers increased to 30% which are being managed by female, while the surrounding farmers around the Demo sites are beginning to adopt applying mulching with straw and making EM compost. However, the data for how many farmers are adopting GWM techniques has not yet been obtained and the progress % of CFA farmers will be collected before the end of project period.

- ii. Yield of CFA products increased by 20% compared to conventional practices (baseline rice yield: 1.25 tons per acre in Aug 2016)
At the previous time, farmers could grow only rice as the rain water was only the available water resource for crop production. At present, demo farmers can grow some cash crops such as onion, chili, bean, okra, celery and water cress due to availability of rain water collected in the ponds after harvesting rice. Therefore, yield of CFA products increased by 20% compared to conventional practices.
- iii. Frequency of watering crops reduced by at least 20% (baseline 1 time per day In Aug 2016)
At the current time, the demo farmers are not daily using the harvested rain water from the ponds as they are adopting the soil water conservation practices (mulching and EM compost) under the GWM techniques. Therefore, frequency of watering crops can be efficiently reduced by 20%.
- iv. Population of soil worms increased by 20% compared to conventional farms (baseline about 2 worms per 1ftx1ft)
At present condition, the population of soil worms at the demo sites cannot be precisely obtained.
- v. Income of (Household) small holder farmers who adopted CFA practices increased by 30%; of which, income of 100% female farmers increased at least 20% (baseline 2,690,830 kyats per household per year in Aug 2016)
The Demo farmers who adopted CFA practices are now starting to get income by selling the vegetables and horticultural crops that are grown by efficiently applying the harvested rainwater from the ponds. Therefore, the target income can be successfully achieved at the end of the project.

d) Challenges

One pond in Satcho Village, Pyawbwe Township and one check dam in Nakyarhtoo Village, Natmauk Township could not sufficiently collect the rain water to fill the whole ponds because the construction work for digging the ponds started late in the monsoon season at around September 2016. The stored water was also used for cropping and weather condition especially the rainy season ended soon after the construction was completed. The air temperature was also gradually increased at the project townships and evaporation of water from the ponds which consequently reduced the harvested water quantity. Moreover, the current temperature is also considerably higher than that of the average from the last 30-year period temperature. Therefore, it is urgently necessary to protect or minimize the amount of evaporation from the ponds by decreasing the water surface temperature. It is expected that once the windbreak trees have grown up, this problem should be minimized.

Demo farmers who are adopting CFA practices are now facing difficulty in taking water for applying to the plots as there is no water pumping system at the demonstration ponds. Therefore, the farmers are planning to set up water-pumps at the ponds in order to flow easily the collected water from the ponds to the plots.

In addition, there is another problem in raising fishes at the ponds as both the extension office staffs and demo farmers still had limited experienced in this field of raising fishes in the ponds. The project will be coordinating with the fishery department to provide technical assistance and guidance in the issue.

For construction of a pump irrigation system and increasing of water storage by the check dam under the previous LOA in Tatkone Township, it was not possible to complete them during this quarterly period from July to December 2016 because this check dam was full of water during these months. Therefore, a pump irrigation system will be constructed and the digging of soil for another one meter deeper in the dam will be done in the next quarterly period prior to the monsoon season in early 2017.

e) Key Issues/Problems/Constraints during implementation and Corrective Actions:

Implementation Issue encountered	Intervention and Recommendation
Nowater pumping systems	Support water pumping systems
Little experience raising fish	Contact to Fishery Department
Water losses by evaporation	Use natural floating cover systems (such as growing of water plant)
Late constructing of water pond	Make early construction before rainy season
Less ofexperiences of farmers in vegetable plantation	Support more training onvegetable production

f) Cross Cutting Issues:

Gender Integration

In GWM project especially demo farms, gender issue has been emphasized. The key farm leader (female or male) and their children are all participating in crop production activities and decision-making process especially in farm activities and selling of agricultural products.

The male works on land preparation activities, plant watering and crops management, especially on heavy works and female or their children help and participate in farm activities as they can, such as on mulching, weeding, harvesting, and so on. Finally, female in the households sell their farm products to local market or nearby restaurants and managed the income and outcome. These family labour participation or division in farm activities leads to lower cost on farm inputs, greater acceptability of farm products, smoother implementation and better results. The way of family working together combining with GWM technical support can be a good model to improve economic growth and reduce poverty in the dryland areas of Myanmar.

To be successful in gender integration, all family members (male or female) in the households need to be shared equally on access to resources, service, and have equal opportunity to participate in capacity building and other activities offered by the project.

Environmental Impacts

Compost making by using byproducts from farming and making biochar could help reduce GHG emission. Application of compost, biochar, mulching and water harvesting technologies maintain soil moisture which induces better crop growth and eventually increase carbon dioxide fixation leading to reduction of global warming and climate change effects.

Soil and water conservation practices included water harvesting (construction of water ponds to collect rainfall), water saving methods (small water ponds within the farm, digging the furrow line around the plants, windbreak plantation), planting of perennial crops, cash crops even though after rainy season so called off-season. These conservation agricultural practices applied to the cropland can minimize damage to the environment. On the other hand, the practices are thought to improve soil health, plant growth, water quality, soil quality, water conservation, air quality and finally the overall environmental quality in agricultural landscapes.

Reduction in agro-chemical applications in demo farms has helped farmers' societies and economies to cope with the effects of climate change and socio-economic changes. Farmers who stay surrounding the demo farms have begun to adopt CFA techniques to reduce agro-chemical application in crops production in order to improve the quality of agricultural products and food safety when compared with agro-chemical application.

Market Enhancement

By giving PGS training, farmers are increasing their knowledge about food safety and environmental sustainability, organic products and market access. Marketing of products from demo and pilot farmers will be enhanced through strengthening of cooperation with the private sector during the next quarter implementation. Furthermore, the project will facilitate the establishment of mutually beneficial contractual arrangements between producers and buyers.

g) Major Lessons Learned:

Now the demo farmers raise fish in the harvested water ponds to get more income but they don't have sufficient knowledge about fishery. Therefore, the PIU contacted department of fishery to provide technical support and guidelines for the farmers to improve their fish raising in the water ponds.

Farmers have limited knowledge about horticultural crops such as perennial crops and vegetables because farmers in the dryland areas of Myanmar have only grown

paddy and other season crops and they never grow vegetables in their farms. PIU is therefore providing more training about horticultural crops plantations.

Before project started, farmers were lack of adequate knowledge on proper use of agro-chemical application, lack of awareness among users of health and environmental impacts, lack of extension support to ensure safety, and inadequate regulation by the government. Now GWM project is supporting the implementation of activities and demonstration plots in the demo farmers and giving the training to extension staffs and small holder farmers. Therefore, demo farmers and extension staffs actually learn by doing the project implementation activities. Moreover, the surrounding farmers are seeing the demo farms and attending training, they are now getting more knowledge about GWM.

Therefore, not only demo farmers but also extension staffs actually know more about rainfall water harvesting technologies, soil fertility management, soil and water conservation practices, windbreak plantation, organic pesticides and fertilizer compost making and using in their farms and environment by doing GWM project activities.

By these ways, farmers are raising their knowledge about green water management, climate friendly agricultural practices, sustainable agriculture, agro-ecosystem and the surrounding environment. By doing this project activities, female improved their abilities especially awareness of other off-season income opportunities, production of vegetables, producing and using of organic fertilizers and pesticides from by-farm products, market access such as selling their CFA products to local markets or near restaurants.

h) Recommendations:

Now demo farmers are facing problem about water pumping systems to use for plants watering in their farms. Therefore, solar pump or other manual pumping systems should be supported.

Raising temperature year by year, water in the ponds losses through evaporation, and planted trees that could reduce the evaporation but the trees could not cover the pond within the one year period. Therefore, the project should experiment on the floating cover systems such as with plastic sheet (black and white color), recycling use of drinking water plastic boxes or jute boxes, planting water cress in the water surface areas to prevent evaporation.

For the projects that included water harvesting technologies, that project should be started in the early rainy season because if farmers constructed water ponds in the end of rainy season, they could not collect adequate water for crop plantation in that year.

In order to ensure a better impact from GWM project implementation, the end date of the project should be extended to December 2017.

i) Follow-up and next quarterly actions from January to June 2017:

- Conduct other 8 trainings and 1Workshops of technologies and market linkages for extension staff and farmers in the next quarterly period. CFA technologies training materials will be printed and distributed to extension staff and farmers. Farmer Field Day and exchange visiting for farmers will be organized in the coming months.
- Construct the water pump irrigation system in Tatkone Township.
- Implement at least 25 new farmers in 6 GWM pilot sites to apply GWM and CFA technologies.
- Conduct X buyer forums
- Establish contract farming with private traders for demo farmers.
- Conduct policy assessment on CFA including green water management.
- Organize second discussion & wrap up workshop within PIU & PIB.
- Disseminate GWM and CFA technologies through Farmers Channel and SkyNet Channel.
- Officially request ADB to extend the end date of the project to December 31, 2017.

Annex 1: Progress Against Activity Plan Based on DMF

No.	Main/Sub Activity	Progress
Output 1. Capacity of extension staff and small holder farmers to apply CFA technologies improved and knowledge of market linkage		
1.1	Develop Curricula and training materials for extension staff and farmers	Completed
1.2	Conduct 10 trainings and 2 Workshops of technologies and market linkages for extension staff and farmers	Ongoing (20%)
1.3	Organize farmer field days and exchange visit	Not Yet
Output 2. GWM technology adopted and expanded to more farmers in the project sites		
2.1	At least 6 GWM demonstration sites establish and run by smallholder farmers	Completed
2.2	At least 25 new farmers in 6 GWM pilot sites implement GWM technology	Not Yet
Output 3: Access to market for CFA products established		
3.1	Establish contract farming with private traders	Not Yet
Output 4: Knowledge sharing conducted and knowledge products on CFA including GWM produced and disseminated		
4.1	Organize discussion & wrap up workshop within PIU & PIB	Ongoing (50%)
4.2	Print CFA technologies training materials and distribute to extension staff and farmers (700 pamphlets and 60 posters and vinyl)	Ongoing (20%)
4.3	Produce and disseminate GWM and CFA technologies through Farmer Channel and other media	Sky Net Channel already took video of one of GWM demo farms to disseminate of GWM and CFA technologies (Ongoing)
Output 5: Policy recommendations on GWM to support national policy makers produced		
5.1	Conduct policy assessment on CFA including green water management (June 2017)	Not Yet
5.2	Conduct a national policy forum/dialogue on CFA including green water management (July 2017)	Not Yet

**Annex 2. Directory of Events
From July To December 2016**

No.	Trainings/Workshop	Location	Date	No. of Trainees by type (farmers, government or service providers) (No. of women)	Evaluation feedback
1	Training of Green Water Management and CFA technologies for Farmers	Saegyian Theingone village in Yamethin Township	21 December 2016	Total: 63 farmers (22 women)	Pre test=25% Post test=50% Satisfy= 55% Good=40%
2	Training of Green Water Management and CFA technologies for Extension Staffs	Yamethin DOA office, Mandalay Region,	22 December 2016	Total: 52 staffs (31 women) <ul style="list-style-type: none"> • 29 government officers from Yamethin Township • 23 government officer from Pyawbwe Township 	Pre test=60 Post test=85% Satisfy= 60% Good=34%

**Annex 3. Quarterly Activity Physical Progress and Financial Report
From July To December 2016**

No.	Project Activity	Budget Plan	Status	Weight In %	Weight Assigned	Actual Expense	To December 2016	
		Total					Expense %	Completion %
	Project Implementation							
1	Inception Meeting	\$1,000	Completed	0.67	1	\$1,000.00	100	0.67
2	Site survey for selection of project area (3 times)	\$1,500	Completed	1.00	1	\$1,494.16	99.61	1.00
3	*Soil and Water Test (12 samples x 200)	\$2,400	Completed	1.60	2	\$2,400.00	100	1.60
4	Building the farmer's small farm pond/individual basin/farm bund/small check dam/terracing/contour bund and Demonstration farms' inputs (6 sites x 4,000)	\$24,000	Completed	16.00	16	\$22,749.75	94.79	15.17
5	Building the knowledge centre (6 sites x 1,700)	\$10,200	Not Yet	6.80	7	\$0.00	0	0.00
6	Farm inputs for demonstration farm (6 sites x 1,000)	\$6,000	75% Completed	4.00	4	\$4,350.56	72.51	2.90
7	Training for 200 Staffs (per diem) (200 x 35)	\$7,000	26% Completed	4.67	5	\$1,925.16	27.50	1.28
8	Training for 300 Farmers (per diem) (300 x 10)	\$3,000	21% Completed	2.00	2	\$647.69	21.59	0.43
9	Training for 300 Farmers (travelling) (300 x 5)	\$1,500	21% Completed	1.00	1	\$325.00	21.67	0.22
10	Support the implementation of pilot sites	\$12,000	Not Yet	8.00	8	\$0.00	0	0.00
11	Trainer per diem (10 times x 5 persons x 35)	\$1,750	20% Completed	1.17	2	\$346.19	19.78	0.23
12	Travelling cost for Trainer (10 times x 5 persons x 200)	\$10,000	20% Completed	6.67	7	\$2,256.81	22.57	1.50
13	Travelling cost for staff (of training) (200 staffs x 20)	\$4,000	26% Completed	2.67	3	\$1,011.67	25.29	0.67

14	Workshop, discussion & wrap up with project implementation unit and its body (2 times x 2000)	\$4,000	50% Completed	2.67	3	\$1,905.36	47.63	1.27
15	Knowledge products including project site weekly reports (weekly/monthly)	\$3,000	33% Completed	2.00	2	\$1,150.57	38.35	0.77
16	Biochar, wind break plantation, gardening, cover plantation, livestock etc.(6 sites x 750)	\$4,500	67% Completed	3.00	3	\$3,112.84	69.17	2.08
17	Pamphlets (10times x 300 x 0.5)	\$1,500	33% Completed	1.00	1	\$560.31	37.35	0.37
18	Teaching Aids (Vinyl / hand notes) (500 x 5)	\$2,500	40% Completed	1.67	2	\$1,175.09	47.00	0.78
19	Farmer Field Day (6 times x 50 farmers x 7)	\$2,100	Not Yet	1.40	2	\$0.00	0	0.00
20	Farm Study Visits (per diem + travelling) (2 times x 50 farmers x 35)	\$3,500	Not Yet	2.33	3	\$0.00	0	0.00
21	Reports	\$3,000	33% Completed	2.00	2	\$1,017.68	33.92	0.68
22	Travelling for Supervision & Monitoring (10 times x 4 persons x 50)	\$2,000	80% Completed	1.33	2	\$2,101.17	105.06	1.40
23	Monitoring & Evaluation of Mission	\$2,000	Not Yet	1.33	2	\$0.00	0	0.00
24	National Policy Forum& policy assessment/study report in English	\$8,000	Not Yet	5.33	6	\$0.00	0	0.00
25	Constructing the water solar pumping system	\$20,000	Not Yet	13.33	14	\$0.00	0	0.00
26	Administration cost	\$2,050	49% Completed	1.37	2	\$1,124.51	54.85	0.75
27	Contingency	\$7,500	Not Yet	5.00	5	\$0.00	0	0.00
	Total	\$150,000		100	108	\$50,654.52		33.77

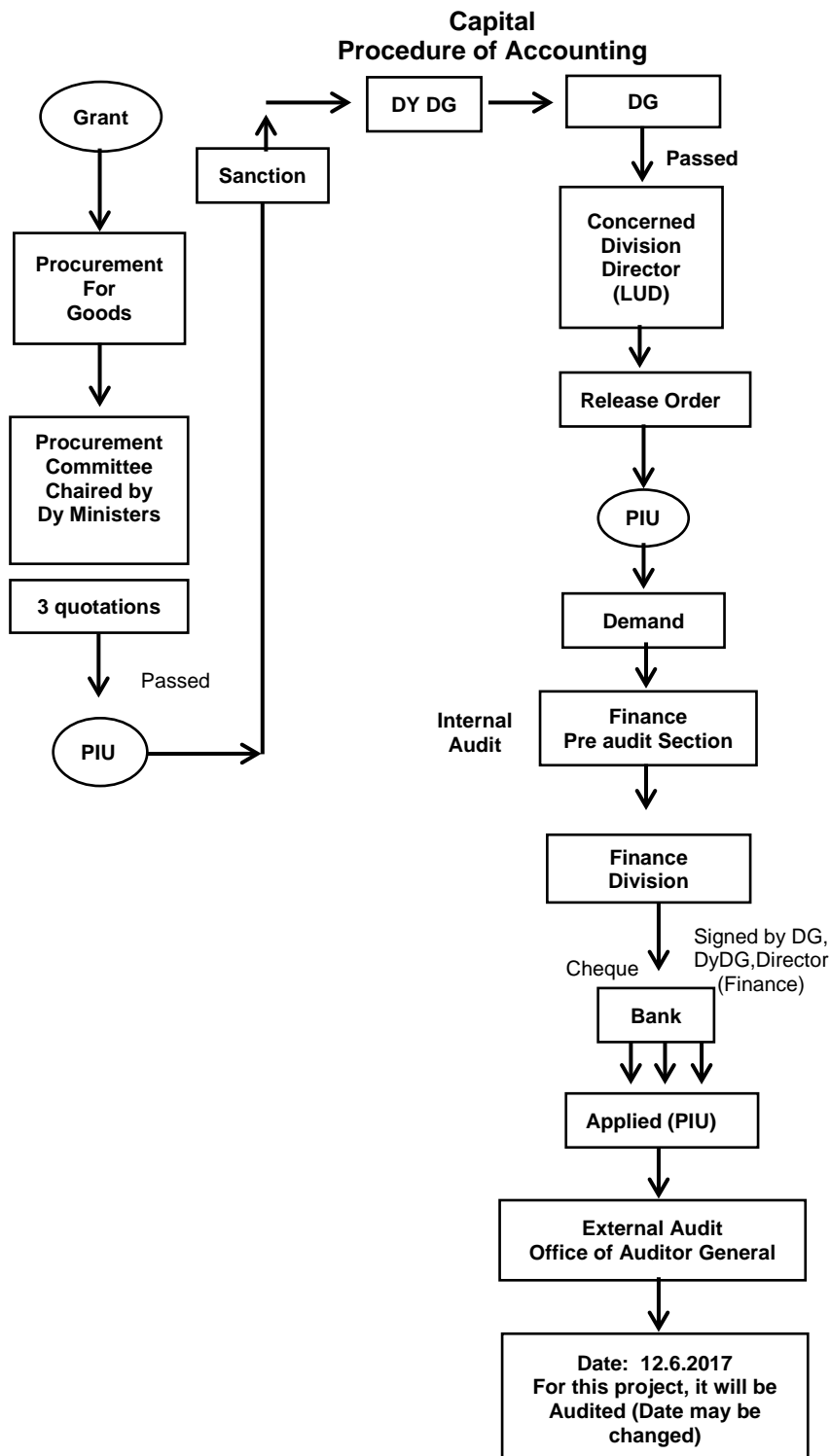
Remark: * The analysis of soil and water samples are carrying on and the results are not yet available as of now.

Annex 4. Next Budget Expenditure Plan from January to June 2017

No.	Project Activity	Budget Plan
		Total
Project Implementation		
For Output 1. Capacity of extension staff and small holder farmers to apply CFA technologies improved and knowledge of market linkage		
1	Building the knowledge centre (6 sites x 1,700)	\$10,200
2	Training for 200 Staffs (per diem) (148 x 35)	\$5,180
3	Training for 300 Farmers (per diem) (237 x 10)	\$2,370
4	Training for 300 Farmers (travelling) (237 x 5)	\$1,185
5	Trainer per diem (8 times x 5 persons x 35)	\$1,400
6	Travelling cost for Trainer (8 times x 5 persons x 200)	\$8,000
7	Travelling cost for staff (of training) (148 staffs x 20)	\$2,960
For Output 2. GWM technology adopted and expanded to more farmers in the project sites		
8	Farm inputs for demonstration farm (6 sites x 250)	\$1,500
9	Biochar, windbreak plantation, gardening, cover plantation, livestock etc.(6 sites x 250)	\$1,500
10	Farmer Field Day (6 times x 50 farmers x 7)	\$2,100
11	Farm Study Visits (per diem + travelling) (2 times x 50 farmers x 35)	\$3,500
12	Support the implementation of pilot sites	\$12,000
For Output 3: Access to market for CFA products established		
13	Travelling for supervision and Monitoring (2 times x 4 persons x 50)	\$400
For Output 4: Knowledge sharing conducted and knowledge products on CFA including GWM produced and disseminated		
14	Workshop, discussion & wrap up with project implementation unit and its body (1 times x 2000)	\$2,000
15	Teaching Aids (Vinyl / hand notes) (200 x 5)	\$1,000
16	Knowledge products including project site weekly reports (weekly/monthly)	\$1,000
Others		
17	Constructing the water pumping system in Tatkone Township	\$20,000
18	Reports	\$1,000
Total		\$77,295

Annex 5. Procurement of Goods and Services

The procurement processes for digging of rainfall water harvesting ponds, for purchasing/supporting vegetable seeds, fruit trees (mango, banana), fishes for raising in the ponds, biochar kiln and the required accessories for daily data recording were carried out by following the Myanmar Government Procurement Guidelines under ADB financial guideline. Moreover, sharing pamphlets, preparing Vinyls, all of which are concerned with the GWM technologies, were also procured under ADB financial guideline and accord with our Ministry's financial rules, regulations and procedure because LOA implementation and orientation training had been conducted by Dr. Apichai Thirathon of WGA Secretariat Manager, ADB and Ms. Amy Estaban, Procurement Specialist from ADB on 24-25 March 2015 in Nay Pyi Taw. In compliance with the LOA following Procurement Guidelines as to the conditions for Payment for these additional TA Activities, the relevant Procurement Status/Progresses are shown in following.



In our country/ any ministry, if any institutes/ organizations, which support to Department, respective Department submits to Parliament for approve to apply national budget as Myanmar currency.

In accordance with the procedure of Government/ Ministry, the fund shall open a loan account and/ or a grant account (as foreign currency) by the name of recipient (DOA) in MEB by agreement and approval of MOF.

ADB-GMS-Account number – ED 600008

Only if approved state/national budget, it can be withdrawn to use loan as well as grant. In this issue, it must be following to the financial procedure of Ministry.

Only if allowed amount of financial, Grant can be withdrew from state Budget, and grant can also be used by Government Procedure. In addition, that used financing is audited by Office of Auditor General.

According to Tender's law and regulations of Myanmar Government released by National Presidency, we don't need to do for tender below 10,000,000 Kyats or US\$ 7782.10 but for over 10,000,000 kyats, we need to do for tender. Therefore, we did all procurement processes for digging of rainfall water harvesting ponds, purchasing vegetable seeds, fruit trees (mango, banana, etc), fishes, biofertilizer, biochar kiln and the required accessories by using Quotations of equipment/contractor obtained from at least three (3) suppliers. After that, we selected the seller or contractor who has the best quality and offer appropriate prices to be done for construction of water ponds and purchased for the required equipments. We have done all required procurement processes in the above Annex 3.

Annex 6. Success stories/best practice/change stories if any

The implementation to introduce GWM techniques to the farmers through establishment of demo farm is successful. The project could efficiently support demo farmers in the construction of water harvesting ponds to collect rainfall water, providing the biochar kiln for burning of field residues and using the valuable ash as soil enrichment material. The demo farmers could successfully grow the cash crops at the off- season, and obtained the significant incomes from selling cash crops. Then, most of the farmers have realized the benefits of growing cash crops after harvesting rice.

Overall, the best practices for demo farmers are rainfall water saving technologies, soil and water conservation practices, making and using of organic fertilizer, compost and pesticides by using byproduct from farm and fish residues, and cash crops production.

ACTIVITY ONE REPORT

Activity/Event Name (1): Establishment of demonstration farm for Green Water Management in Theingone village, Yamethin Township, Mandalay Region

Activity/Event Name (2): Training

Activity (1)

Location : Theingone village, Yamethin Township, Mandalay Region

Demo Farmers : **Mr. Min Thet**

Department of Agriculture Staff - **Mr. Phyo Wai Aung, Assistant Staff Officer, DOA**

Background

The selected township is Yamethin township which is situated in Mandalay Region. Total area of it is about 216,853 ha or 836.915 sq miles. The cultivable land is about 76,428 ha in which the rainfed area is 12,190 ha. The average annual rainfall is 848.36 mm and rainy day is 67 days. In 2016-2017, the average rainfall is 1712.46 mm and rainy is 92 days. The average maximum and minimum temperature are 42.09°C and 9.6°C respectively. Its population is about 258,091 (male 125,361 and female 132,723).

Theingone village located in the Yamethin Township. In Theingone, the cultivated land is about 1,672 ha. Most of the cultivated areas are mainly grown for rice, sesame and legume and the other crops like sunflower and flowers. There are 1,028 households and population is about 4,760 (male 2,259 & female 2,501). In order to implement the project for the Establishment of demonstration farm on Green Water Management, demonstration farms which owned by Mr. Min Thet was selected from Theingone village and activities implementation began in August 2016.

Purpose of the Activity/Event

The objective of the project is to create green water management model, and to promote green water management awareness of farmers in the project sites. Farmers depend mainly on rainfall for crop production. Unless water is sufficient in reproductive stage of rice, the expected yield cannot be obtained and rice quality will be reduced. Therefore, the project provided technical assistance to construct and dig the ponds in project sites. The purpose of construction of ponds and introduction of other agronomic practices is to collect the rain water, to improve efficient use of water including maintain soil moisture, to introduce on farm water management practices, to increase crop production and to transfer the water management practice to other farmers in neighboring villages.

Description of the Activity/Event -1 (DEMO)

(a) Site survey and selection

Project Implementation Unit (PIU) went to the project township with Township DOA Staff Officer and regional extension staffs to select the project village on 10th, 18th and 21st August 2016. The project team surveyed Myin Nar village, Theingone village, Ma Gyi village, Thin Pan Kone village, Saegy village. Among them, Theingone village was selected according to the geographic information and criteria.

(b) Soil and Water Quality Analysis

Soil and water samples were collected from the project sites and sent to Yangon laboratory on 22th August 2016. The content of N, P, K, Mg, Ca, S, pH, OM, Soil Texture and EC of soil sample; and water quality, infiltration rate, water storage capacity, were analysed. The analytical test was done on 5th September 2016. The results of the soil sample analysis are not yet available as of now.

(c) Digging Pond

The rainfall water harvesting pond was constructed on 1st September 2016. The pond was full of water in October 2016.

(d) Field Visit (Management and Monitoring)

PIU visited and monitored the project sites at least (2) times each in September, October, November and December 2016 to manage, monitor and guided the extension staffs and Demo farmers in growing and managing crop according to project guidelines. Moreover Project Implementation Unit visited the demonstration farm to support the technologies and inputs such as fertilizer, EM, seeds for cultivated crops, mango and banana plants.

Outcome

1. Demo farmers can grow variety of crops by using harvested water in farm pond. In Theingone's demo farm (Mr. Min Thet), 20 mango trees that is very popular variety in Myanmar called Sein-Ta-Lone and 20 banana plants were planted around the farm pond. The GWM farmer also grew onion, water cress and gourd with collected rain water.
2. Demo farmer made the EM Bokashi compost and applied mulching and used water saving techniques guided by the PIU.

Description of the Activity/Event- 2 (Training)

In the project area, Technology dissemination group delivered the training courses on green water management, water saving technology, water management, soil fertility improvement and horticultural crops growing for the farmers and extension staffs as follows;

Training on Green Water Management for farmers and DOA staffs in Yamethin Township

Training-To fulfill the project activities, first training for farmers was done at Theingone village, Yamethin Township, Mandalay Region in 21st and 22nd Dec 2016. In the training, the participants were as follow.

No.	Participants	Male	Female	Total
1.	Farmers from Theingone and Saegyí Villages	22	41	63
2.	Extension Staff	21	31	52
3.	Sub total	43	72	115
4.	Instructors	2	2	4
	Total	45	74	119

In this training, Green water management, water saving technologies, basic of soil and nutrients, fertility improvement, horticultural crops production such as suitable soil types for vegetables, cropping practices and management, pre and postharvest handling practices etc. were discussed. Pamphlets of compost making process were distributed. Making of EM bokashi compost was practically showed by PIU to farmers and EM was distributed for each farmer.

Moreover, the team showed the video about Myanmar Good Agriculture Practices, Pre- and Post-Harvest technology of horticultural crops, how to effectively store and use of rainfall water and management to the farmers.

In the training, the farmers asked the questions about the reclamation for saline soil, effective water use for crops, soil pH, and the effect of chemical fertilizers on soil microbes. The instructor answered that the practical techniques are to reduce chemical fertilizers, to apply Gypsum for saline soils, to control continuous flooding. And the staff also discussed mutually on these questions.

Outcome

3. In the training, the farmers and extension staffs were interested in new technologies related to management soil, water, seed, pests and diseases.
4. After training, the neighbouring farmers were interested to make pond to collect rain water by sharing of demo farmers' experience and effective use of rain water.
5. In the training, they all were very interested in the preparation of compost making.
6. It enhanced the awareness of the farmers in the efficient use of crop residues. Now, the burning of farm wastes was reduced.
7. After the training, some farmers can make the compost by themselves with the family' labor. Rice straw and sesame stem which are suitable for bokashi compost making. Rice straw was also used for animal feed in the project area.
8. They demanded to grow more vegetables as cash crops. So PIU supported the vegetable seeds such as gourd, cabbage, coriander, onion, radish, mango plant and banana plants etc.

ACTIVITY TWO REPORT

Activity/Event Name (1): Establishment of demonstration farm for Green Water Management in Saegyi village, Yamethin Township, Mandalay Region

Activity/Event Name (2): Training

Location : Saegyi village, Yamethin Township, Mandalay Region

Demo Farmers : **Mr. Maung Myint in Saegyi Village**

Department of Agriculture Staff - **Mr. Soe Kyaw Myint, Deputy Assistant Staff Officer, DOA**

Background

The selected township is Yamethin township which is situated in Mandalay Region. Total area of it is about 216,853 ha or 836.915 sq miles. The cultivable land is about 76,428 ha in which the rainfed area is 12,190 ha. The average annual rainfall is 848.36 mm and rainy day is 67 days. In 2016-2017, the average rainfall is 1712.46 mm and rainy is 92 days. The average maximum and minimum temperature are 42.09°C and 9.6°C respectively. Its population is about 258,091 (male 125,361 and female 132,723).

Saegyi village located in the Yamethin Township. In Saegyi Village, there are 200 households and population is about 894 (male 420 & female 474). The cultivated land is 772ha. In order to implement the project for the Establishment of demonstration farm on Green Water Management, demonstration farms which owned by Mr. Maung Myint was selected from Saegyi village and activities implementation began in August 2016.

Purpose of the Activity/Event

The objective of the project is to create green water management model, and to promote green water management awareness of farmers in the project sites. Farmers depend mainly on rainfall for crop production. Unless water is sufficient in reproductive stage of rice, the expected yield cannot be obtained and rice quality will be reduced. Therefore, the project provided technical assistance to construct and dig the ponds in project sites. The purpose of construction of ponds and introduction of other agronomic practices is to collect the rain water, to improve efficient use of water including maintain soil moisture, to introduce on farm water management practices, to increase crop production and to transfer the water management practice to other farmers in the neighboring villages.

Description of the Activity/Event -1 (DEMO)

(a) Site survey and selection

Project Implementation Unit (PIU) went to the project township with Township DOA Staff

Officer and regional extension staffs to select the project village on 10th, 18th and 21st August 2016. The project team surveyed Myin Nar village, Theingone village, Ma Gyi village, Thin Pan Kone village, Saegyí village. Among them, Saegyí village was selected according to the geographic information and criteria.

(b) Soil and Water Quality Analysis

Soil and water samples were collected from the project sites and sent to Yangon laboratory on 22th August 2016. The content of N, P, K, Mg, Ca, S, pH, OM, Soil Texture and EC of soil sample; and water quality, infiltration rate, water storage capacity, were analysed. The analytical test was done on 5th September 2016. The results of the soil sample analysis are not yet available as of now.

(c) Digging Pond

The rainfall water harvesting pond was constructed on 7th September 2016. The pond was full of water in October 2016.

(d) Field Visit (Management and Monitoring)

PIU visited and monitored the project sites at least (2) times each in September, October, November and December 2016 to manage, monitor and guided the extension staffs and Demo farmers in growing and managing crop according to project guidelines. Moreover Project Implementation Unit visited the demonstration farm to support the technologies and inputs such as fertilizer, EM, seeds for cultivated crops, mango and banana plants.

Outcome

1. Demo farmers can grow variety of crops by using harvested water in farm pond. In Saegyí's demo farm (Mr. Maung Myint), 15 mango trees and 15 banana plants were grown. He can also grow corn, long bean, coriander, brassica, okra by using harvested water.
2. Demo farmer made the EM Bokashi compost and applied mulching and used water saving techniques guided by the PIU.

Description of the Activity/Event- 2 (Training)

In the project area, Technology dissemination group delivered the training courses on green water management, water saving technology, water management, soil fertility improvement and horticultural crops growing for the farmers and extension staffs as follows;

Training on Green Water Management for farmers and DOA staffs in Yamethin Township

Training-To fulfill the project activities, the first training for farmers was done at Theingone village, Yamethin Township, Mandalay Region on 21st and 22nd Dec 2016. In the training, the participants were as follow.

No.	Participants	Male	Female	Total
1.	Farmers from Theingone and Saegyí Villages	22	41	63
2.	Extension Staff	21	31	52
3.	Sub total	43	72	115
4.	Instructors	2	2	5
	Total	45	74	119

In this training, Green water management, water saving technologies, basic of soil and nutrients, fertility improvement, horticultural crops production such as suitable soil types for vegetables, cropping practices and management, pre and postharvest handling practices etc. were discussed. Pamphlets of compost making process were distributed. Making of EM bokashi compost was practically showed by PIU to farmers and EM was distributed for each farmer.

Moreover, the team showed the video about Myanmar Good Agriculture Practices, Pre- and Post-Harvest technology of horticultural crops, how to effectively store and use of rainfall water and management to the farmers.

In the training, the farmers asked the questions about the reclamation for saline soil, effective water use for crops, soil pH, and the effect of chemical fertilizers on soil microbes. The instructor answered that the practical techniques are to reduce chemical fertilizers, to apply Gypsum for saline soils, to control continuous flooding. And the staff also discussed mutually on these questions.

Outcome

3. In the training, the farmers and extension staffs were interested in new technologies related to management of soil, water, seed, pests and diseases.
4. After training, the neighbouring farmers were interested to make pond to collect rain water by sharing of demo farmers' experience and effective use of rain water.
5. In the training, they all were very interested in the preparation of compost making.
6. It enhanced the awareness of the farmers in the efficient use of crop residues. Now, the burning of farm wastes was reduced.
7. After the training, some farmers can make the compost by themselves with the family' labor. Rice straw and sesame stem which are suitable for bokashi compost making. Rice straw was also used for animal feed in the project area.
8. They demanded to grow more vegetables as cash crops. So PIU supported the vegetable seeds such as gourd, cabbage, coriander, onion, radish, mango plant and banana plants etc.

ACTIVITYTHREE REPORT

Activity/Event Name (1): Establishment of demonstration farm for Green Water Management in Satcho village, Pyawbwe Township, Mandalay Region

Location : Satcho village, Pyawbwe Township, Mandalay Region

Demo Farmers : **Mrs. Tin Tin**

Department of Agriculture Staff -**Ms. Phyo Phyo, Deputy Assistant Staff Officer, DOA**
- **Ms. Su Yin Han, Deputy Assistant Staff Officer, DOA**

Background

The selected township is Pyawbwe township which is situated in Mandalay Region. Total area of it is about 165,427 ha and 638.6 sq miles. The cultivable land is about 76,428 ha in which the rainfed area is 12,189ha. The average annual rainfall is 837.44mm and rainy day is 61 days. In 2016-2017, the average rainfall is 1143mm and rainy is 71 days. The average maximum and minimum temperature are 42.09°C and 8.6°C respectively. Its population is about 269,049 (male 127,416 and female 141,633).

Satcho located in the Pyawbwe Township. In Satcho, the cultivated land is about 3,142 ha. Most of the cultivated areas are mainly grown for rice, sesame and legume and the other vegetables. There are 1,268 households and population is about 5,990 (male 2,756 & female 3,234). To implement the project for the Establishment of demonstration farm on Green Water Management, the farm which owned by Mrs Tin Tin selected from Satcho was selected and implementation began in August 2016.

Purpose of the Activity/Event

The objective of the project is to create green water management model, to promote green water management awareness of farmers in the project sites. Farmers depend mainly on rainfall in crop production. Unless water is sufficient in reproductive stage of rice, the expected yield cannot be obtained and rice quality will be reduced. Therefore, the project provided support to construct and dig the ponds in the project sites. The purposes of construction of ponds and introduction of GWM agronomic practices are to collect the rain water, to improve efficient use of water including maintain soil moisture, to introduce on farm water management practices, to increase crop production and to transfer the water management practice to other farmers in neighboring villages and to provide more income for farmers.

Description of the Activity/Event -1 (DEMO)

(a) Site survey and selection

Project Implementation Unit (PIU) went to the project township with Township DOA Staff Officer and regional extension staffs to select the project village on 10th, 18th and 21st August 2016. The project team surveyed Yang Aung village, Satcho village and SabeKone village and selected Satcho village according to the geographic information and criteria.

(b) Soil and Water Quality Analysis

Soil and water sample were collected from the project site and sent to Yangon laboratory on 22th August 2016. The content of N, P, K, Mg, Ca, S, pH, OM, Soil Texture and EC of soil sample; and water quality, infiltration rate, water storage capacity, were analysed. The analytical test was done on 5th September 2016. The results of the soil sample analysis are not yet available as of now.

(c) Digging Pond

The rainfall water harvesting pond was renovated on 5rd September 2016. The pond was getting rainwater until October 2016 but this pond did not get the full water because the demo farmer used water 3 times per week for watering the cultivated plants.

(d) Field Visit (Management and Monitoring)

PIU visited and monitored the project sites at least (2) times each in September, October, November and December 2016 to manage, monitor and guided the extension staffs and Demo farmers on growing and managing crop according to project guidelines. Moreover Project Implementation Unit visited to the demonstration farm to support the technologies and inputs such as fertilizer, EM, seeds for cultivated crops.

Outcome

1. Demo farmer applied the water effectively to grow crops. With the harvested water, he can now grow onion, tomato and coriander more than the previous year and he has earned more profit than before. In this year, the demo farmer got the net benefit about US\$ 1,000.
2. Demo farmer made EM bokashi compost, applied mulching and used water saving techniques as guided by the PIU.
3. 15 mango trees (Sein-Ta-Lone) and 15 banana plants were grown.
4. In the dry season of 2017, especially February, March and April, there is a little water in ponds because of high temperature.

ACTIVITYFOUR REPORT

Activity/Event Name (1): Establishment of demonstration farm for Green Water Management in Nakyarhtoo village, Natmauk Township, Magway Region

Location : Nakyarhtoo village, Natmauktownship, Magway Region
Demo Farmers : **Mr. Kyaw Soe**
Department of Agriculture Staff - Mr. Win Thurain Soe, Assistant Staff Officer, DOA

Background

The selected township is Natmauk township which is situated in Magway Region. Total area of it is about 231,022 ha and 891.60 sq miles. The cultivable land is about 118,565 ha. The average annual rainfall is 756.92 mm and rainy day is 60 days. In 2016-2017, the average rainfall 954.53mm and rainy is 70 days. The average maximum and minimum temperature are 44°C and 17°C respectively. Its population is about 207,000 (male 95,968 and female 111,032).

Nakyarhtoo village is located in the Natmauk Township. In Nakyarhtoo village, the cultivated land is about 1,067 ha. Most of the cultivated areas are mainly grown for rice, corn, sesame and groundnut and the others crops like sunflower and flowers. There are 310 households and population is about 1,403 (male 673 & female 730). To implement the demonstration farms, Mr. Kyaw Soe from Nakyarhtoo village was selected as demo farmers and implementation began in August 2016.

Purpose of the Activity/Event

The objective of the project is to create green water management model, and to promote green water management awareness of farmers in the project sites. Farmers depend mainly on rainfall for crop production. Unless water is sufficient during the reproductive stage of rice, the expected yield cannot be obtained and rice quality will be reduced. Therefore, the project provided support to construct and dig the ponds in the project sites. The purposes of construction of ponds and introduction of GWM agronomic practices are to collect the rain water, to improve efficient use of water including maintain soil moisture, to introduce on farm water management practices, to increase crop production and to transfer the water management practice to other farmers in the neighboring villages.

Description of the Activity/Event -1 (DEMO)

(a) Site survey and selection

Project Implementation Unit (PIU) went to the project township with Township DOA Staff Officers and regional extension staffs to select the project village on 11st, 19th and 22nd August 2016. The project team surveyed the villages in Natmauk Township and selected

Nakyarhtoo village according to the geographic information and criteria.

(b) Soil and Water Quality Analysis

Soil and water sample were collected from the project site and sent to Yangon laboratory on 26th August 2016. The content of N, P, K, Mg, Ca, S, pH, OM, Soil Texture and EC of soil sample; and water quality, infiltration rate, water storage capacity, were analysed. The analytical test was done on 5th September 2016. The results of the soil sample analysis are not yet available as of now.

(c) Digging Pond

In Nakyarhtoo village, the check dam was constructed on 2nd October 2016. The check dam was getting rainfall water until October 2016 but this dam did not get the full water in this year.

(e) Field Visit (Management and Monitoring)

PIU visited and monitored the project sites at least (2) time each in August, September, October, November and December 2016 to manage, monitor and guided the extension staffs and Demo farmers on growing and managing crop according to project guidelines. Moreover, Project Implementation Unit visited to the demonstration farm to support the technologies and provide inputs such as fertilizer, EM, seeds for cultivated crops.

Outcome

1. Mr. Kyaw Soe, demo farmer can now grows vegetables such as tomato, radish, roselle, pumpkin, gourd and banana after using GWM techniques. Previously, he could grow only paddy, sesame and pigeon pea. He is now raising about 1,000 fishes in the pond.
2. Demo farmers made EM bokashi compost, applied mulching and used water saving techniques as guided by the PIU.

ACTIVITYFIVE REPORT

Activity/Event Name (1): Establishment of demonstration farm for Green Water Management in Shwekwe village, Natmauk Township, Magway Region

Location : Shwekwe village, Natmauk township, Magway Region
Demo Farmers : **Mr. Thein Hlaing in Shwekwe Village**
Department of Agriculture Staff - **Ms. Aye Aye Nyein, Deputy Assistant Staff Officer, DOA**
- **Mr. Min Thu, Deputy Assistant Staff Officer, DOA**

Background

The selected township is Natmauk township which is situated in Magway Region. Total area of it is about 231,022 ha and 891.60 sq miles. The cultivable land is about 118,565 ha. The average annual rainfall is 756.92 mm and rainy day is 60 days. In 2016-2017, the average rainfall 954.53mm and rainy is 70 days. The average maximum and minimum temperature are 44°C and 17°C respectively. Its population is about 207,000 (male 95,968 and female 111,032).

Shwekwe village is located in the Natmauk Township. In Shwekwe Village, there are 163 households and population is about 681 (male 326 & female 355). The cultivated land is 528 ha. To implement the demonstration farm, Mr, Thein Hlaing from Shwekwe village was selected as demo farmers and implementation began in August 2016.

Purpose of the Activity/Event

The objective of the project is to create green water management model, and to promote green water management awareness of farmers in the project sites. Farmers depend mainly on rainfall for crop production. Unless water is sufficient during the reproductive stage of rice, the expected yield cannot be obtained and rice quality will be reduced. Therefore, the project provided support to construct and dig the ponds in the project sites. The purposes of construction of ponds and introduction of GWM agronomic practices are to collect the rain water, to improve efficient use of water including maintain soil moisture, to introduce on farm water management practices, to increase crop production and to transfer the water management practice to other farmers in the neighboring villages.

Description of the Activity/Event -1 (DEMO)

(c) Site survey and selection

Project Implementation Unit (PIU) went to the project township with Township DOA Staff Officers and regional extension staffs to select the project village on 11st, 19th and 22nd August 2016. The project team surveyed the villages in Natmauk Township and selected Shwekwe village according to the geographic information and criteria.

(d) Soil and Water Quality Analysis

Soil and water sample were collected from the project site and sent to Yangon laboratory on 26th August 2016. The content of N, P, K, Mg, Ca, S, pH, OM, Soil Texture and EC of soil sample; and water quality, infiltration rate, water storage capacity, were analysed. The analytical test was done on 5th September 2016. The results of the soil sample analysis are not yet available as of now.

(c) Digging Pond

In Shwekwe village, the pond was renovated on 5th October 2016 and it was full of water on 30th October 2016.

(f) Field Visit (Management and Monitoring)

PIU visited and monitored the project sites at least (2) time each in August, September, October, November and December 2016 to manage, monitor and guided the extension staffs and Demo farmers on growing and managing crop according to project guidelines. Moreover Project Implementation Unit visited to the demonstration farm to support the technologies and provide inputs such as fertilizer, EM, seeds for cultivated crops.

Outcome

1. Mr. TheinHlaingcan grow tomato, mung bean and chilli with the harvested water. Previously, he could grow only paddy and chili. He is now raising about 1,000 fishes in the pond.
2. Demo farmer made EM bokashi compost, applied mulching and used water saving techniques as guided by the PIU.

ACTIVITY SIXREPORT

Activity/Event Name (1): Establishment of demonstration farm for Green Water Management in Thanngone Village, Myothit Township, Magway Region

Location : Thanngone Village, Myothit Township, Magway Region
Demo Farmers : **Ms Myint Myint Mu**
Department of Agriculture Staff - **Ms. Myint Myint Cho, Deputy Staff Officer, DOA**
- **Ms. Thu Zar Aung, Deputy Assistant Staff Officer, DOA**

Background

The selected township is Myothit township which is situated in Magway Region. Total area of it is about 158,751 ha and 612.68 sq miles. The cultivable land is about 76,428 ha in which the rainfed area is 12,189 ha. The average annual rainfall is 905.26 mm and rainy day is 69 days. In 2016-2017, the average rainfall is 1136.65 mm and rainy is 88 days. The average maximum and minimum temperature are 44°C and 13°C respectively. Its population is about 174,998 (male 86,420 and female 88,568).

Thanngone located in the Myothit Township. In Thanngone, the cultivated land is about 626 ha. Most of the cultivated areas are mainly grown for rice, sesame, legume and pigeon pea. There are 380 households and population is about 1,492 (male 524 & female 968). In order to implement the project for the Establishment of demonstration farm on Green Water Management, demonstration farms which is owned by Ms. Myint Myint Mu was selected and implementation began in August 2016.

Purpose of the Activity/Event

The objective of the project is to create green water management model, to promote green water management awareness of farmers in the project sites. Farmers depend mainly on rainfall for crop production. Unless water is sufficient during the reproductive stage of rice, the expected yield cannot be obtained and rice quality will be reduced. Therefore, the project provided support to construct and dig the ponds in the project sites. The purposes of construction of ponds and introduction of GWM agronomic practices are to collect the rain water, to improve efficient use of water including maintain soil moisture, to introduce on farm water management practices, to increase crop production and to transfer the water management practice to other farmers in the neighboring villages.

Description of the Activity/Event -1 (DEMO)

(a) Site survey and selection

Project Implementation Unit (PIU) went to the project township with Township DOA Staff Officers and regional extension staffs to select the project village on 11st, 19th and 22nd August 2016. The project team surveyed Thanngone, Laeluu and Thee Pin and selected Thanngone villages according to the geographic information and criteria.

(b) Soil and Water Quality Analysis

Soil and water sample were collected from the project site and sent to Yangon laboratory on 26th August 2016. The content of N, P, K, Mg, Ca, S, pH, OM, Soil Texture and EC of soil sample; and water quality, infiltration rate, water storage capacity, were analysed. The analytical test was done on 5th September 2016. The results of the soil sample analysis are not yet available as of now.

(c) Digging Pond

The pond was constructed and completed on 25th September 2016 and was full of rain water on 26th October 2016.

(d) Field Visit (Management and Monitoring)

PIU visited and monitored the project sites at least (2) times each in September, October, November and December 2016 to manage, monitor and guided to extension staffs and Demo farmers in growing and managing crop according to project guidelines. Moreover Project Implementation Unit visited to the demonstration farm to support the technologies and provide inputs such as fertilizer, EM, seeds for cultivated crops.

Outcome

1. Demo farmer can now grow tomato, Roselle, chilli, gourd, pumpkin, papaya, drum stick, coriander, mango, long bean, egg plant and banana by using the collected water in the pond.
2. Ms. Myint Myint Mu has earned approximately \$80 additional income so far.
3. Now, she is raising 500 fishes in the pond.
4. Demo farmers made EM bokashi compost, applied mulching and used water saving techniques and planted windbreak trees as guided by the PIU.

Annex 13: Photos of Field Survey, Inception Workshop, Training Workshop and Demo farms and Activities and Training

**Field Visit for Site Selection at Yamethin and Pyawbwe Townships in August 10-19, 2016
Director, LUD, and Director of Project Planning, Monitoring and Evaluation**



**Field Visit for Site Selection at Natmauk and Myothit Township in August 10-19, 2016
Director, LUD, and Director of Project Planning, Monitoring and Evaluation**



At Theingone Village Demo farm In Yamethin Township, Condition of Digging Pond, Water harvesting and Growing of crops



At Saegy Village Demo farm In Yamethin Township, Condition of Digging Pond, Water harvesting and Growing of crops



At Satcho Village Demo farm In Pyawbwe Township, Condition of Renovated Pond, Water harvesting and growing of crops



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At Nakyarhtoo Village Demo farm In Natmauk Township, Condition of construction of check dam, Water harvesting and growing of crops



At Shwekwe Village Demo farm In Natmauk Township, Condition of Renovated Pond, Water harvesting and growing of crops



At Thanngone Village Demo farm In Myothit Township, Condition of Digging Pond, Water harvesting and growing of crops



**Inception Workshop on the Project of Green Water Management in the dryland areas of Myanmar:
Hotel Shwe Pyi Taw, Nay Pyi Taw**



Training Workshop on participatory Monitoring and Evaluation of the Project in November 29- December 2, 2016 In Nay Pyi Taw



Farmer trainings for making and using methods of organic compost, rainfall water harvesting management and climate friendly agricultural practices in 21st December 2016 at Saegyi Village and Theingone Village, Yamethin Township





Extension Staffs trainings for green water management, Soil Fertility Management and climate friendly agricultural practices in 22nd December 2016 at Yamethin DOA Office from Yamethin and Pyawbwe Townships

