



GREATER MEKONG
SUBREGION
CORE AGRICULTURE
SUPPORT PROGRAM



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

Letter of Agreement

**TA-REG 8163 Implementing the GMS Core Agriculture Support
Program, Phase II**

**Improving the Efficiency of Nitrogen Cycle Management
in Rice and Maize Cropping Systems in the Central
Myanmar**

Progress Report from November – December 2017

Implementing Partners: Department of Agriculture

January 2018

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Abbreviations

ADB	: Asian Development Bank
CASP	: Core Agriculture Support Program
CFA	: Climate Friendly Agriculture
CSA	: Climate Smart Agriculture
DOA	: Department of Agriculture
DOP	: Department of Planning
DMF	: Design and Monitoring Framework
GMS	: Greater Mekong Sub-Region
LOA	: Letter of Agreement
LUD	: Land Use Division
MOALI	: Ministry of Agriculture, Livestock and Irrigation
NDF	: Nordic Development Fund
NFP	: National Focal Point
N ₂ O	: Nitrous Oxide
NSS	: National Secretariat Specialist
NSSU	: National Secretariat Support Unit
NUE	: Nitrogen Use Efficiency
PGS	: Participatory Guarantee System
PIU	: Project Implementing Unit
TA	: Technical Assistance
ToT	: Training of Trainers
WFPP	: Water Finance Partnership Facility
WGA	: Working Group on Agriculture
USDA	: United States Department of Agriculture

PROJECT DESCRIPTION

1. Because of the need to feed and clothe the increasing human population, agricultural production has been increasing worldwide. This increased agricultural production would not be possible without the increased input of plant available nitrogen. The use of synthetic fertilizer increased from near zero six decades ago to about 450 million tons annually today. However, the nitrogen added is not used efficiently and large losses can occur (Freney, 2011). Much of losses occur in the form of nitrous oxide (N₂O) emission through biological nitrification and de-nitrification processes, ammonia volatilization especially in alkaline conditions, leaching where rainfall exceeds evapotranspiration, and run-off. It was estimated that the inefficiencies and overuse of synthetic fertilizer in the agricultural systems of some GMS countries cause as much as 18% of global N₂O produced by the fertilizers that enters the atmosphere. Nitrous oxide is an important long-lived greenhouse gas and its atmospheric life-time is 120 years. It has heat-trapping ability 289 times greater than that of carbon dioxide. Thus, the governments of the Greater Mekong Sub-region (GMS) are increasingly concerned about the risks posed by rising and inefficient use of synthetic nitrogen fertilizers and its impact on climate change as well as on soil, water, and the environment. To reduce the impact of N₂O emission from agricultural sector, it needs to manage the application of fertilizer nitrogen very efficiently. Thus, the “Improving the Efficiency of Nitrogen Cycle Management in the GMS” project has been proposed.
2. The project is being implemented under ADB TA 8163 REG: Implementing the GMS Core Agriculture Support Program Phase 2 (CASP 2) and funded by ADB, Government of Sweden (Sida), Nordic Development Fund (NDF) and Water Finance Partnership Facility (WFPP), Switzerland. It is a short term technical support, research and demonstration project. The focal implementing partner in Myanmar is DoA. The DoA has acquired the guidance by NSSU and technical support by NIRAS’ expert at Working Group on Agricultural Secretariat in Bangkok in the implementation of LoA activities.
3. Under the output 3 of CASP 2: Increased adoption of gender-responsive and climate friendly agriculture, the Nitrogen Use Efficiency (NUE) Management project focuses on integrated nutrient management system to mitigate nitrogen nutrient losses due to N₂O emission in crop production through improving the efficiency of nitrogen cycle management. Furthermore, it also focuses on improving crop productivity and enhancing market access for NUE farmers.
4. The project has been implemented in two regions such as Dakhina Thiri, and Pokhathiri Township in Nay Pyi Taw and Shwebo Township in Sagaing Region. Firstly, the project conducted preliminary survey to understand the current status of nutrient management

practices and gender issues on decision-making process, gender roles and gender needs in farming system of targeted regions. To disseminate knowledge regarding potential economic benefit through efficient nitrogen management practices, twenty model demonstration farms (at least 20% women managed model farms) for rice crop and 30 demonstration farms (at least 20% women managed model farms) for maize were conducted in those two regions. These demonstration farms will be linked to market network. To promote the market access, contract-farming system was developed in collaboration with the private sector under the project. Among the 50 model demonstration farms, 2 model farms for rice crop and 2 model farms for maize crop have been selected to be experimental sites and established to become the long-term model farms on NUE. In addition, in order to prove how integrated nitrogen nutrient management improve nitrogen use efficiency of crop and reduce nitrous oxide emission from rice field, practical field measurement of nitrous oxide in rice field was conducted. To strengthen knowledge of climate friendly agriculture and efficient nitrogen management practices to improve nitrogen use efficiency in cropping, training to trainers, training to farmers and exchange visits are also included in the project's activities. From the findings and achievement of preliminary survey, research, field days and exchange visit relating to nitrogen fertilizer management issues, plus a policy study and national dialogue, the recommendations for policy support to promote NUE will be identified and submitted to MOALI for endorsement.

INTRODUCTION AND BASIC DATA

ADB Regional Technical Assistance	RETA 8163
Project Title	Improving the Efficiency of Nitrogen Cycle Management in Rice and Maize Cropping Systems in the Central Myanmar
Executing Agencies	Working Group on Agriculture Secretariat (WGA-S)
Implementing Agencies	MAFF/GWS/WGA-NSSU
Implementing Partners	Department of Agriculture (DoA)
Total Project Cost	100,000 USD
Project Financing	ADB, SIDA, NDF and WFPF TA 8163:
Date of LOA-NUE Approval	June 2017
Date of Signing of Contract	20 July 2017 (ADB side) and 17 October 2017 (DOA side, for processing internal approval)
Date of Effectiveness of LOA-NUE	June 2017
Closing Date of LOA-NUE	February 2018 (request for an extension for the project to end on May 31, 2018 is being processed)

Date and Amount of Disbursement	First disbursement: <ul style="list-style-type: none"> • Date: 27December 2017 • Amount: US\$ 40,000 (40%)
Amount Utilized (As of December 2017):	\$30,457
Project Outcome	Crop productivity, production and income of small holder farmers improved through promotion of Nitrogen Use Efficiency (NUE) technologies
Project Outputs	<ul style="list-style-type: none"> - Output 1. Capacity of extension staffs and small holder farmers to apply NUE technologies improved and knowledge of market linkage developed - Output 2. NUE experimental plots conducted and maintained as long-term NUE model/demonstration plots - Output 3. NUE technology adopted and expanded to more farmers in the project sites - Output 4. Access to market for NUE products established - Output 5. Knowledge products on NUE produced, shared and disseminated - Output 6. Policy recommendations on NUE produced and endorsed by MOALI
Project Area	The Project covers 3 villages, 1 township of Sagaing Region and 3 villages,3 townships of Nay Pyi Taw. Direct target beneficiaries are 300 small holder farmers and 50 government officials.

III. PROJECT OUTCOME AND OUTPUTS

5. It is expected that the project's introduced best Nitrogen (N₂) management practice by applying chemical nitrogen fertilizer together with biochar and other organic sources will: 1) increase number of NUE farms by 30%; of which, 30% are managed by female farmers; 2) increase yield of NUE farms by 15% compared to conventional practices; 3) increase nitrogen fertilizer use efficiency by 30% which result in an increased income of 20 % for crops/land benefiting from NUE. Results by the end of February 2018 (or by end of project) will be compared with the baseline estimates made early 2017, prior to the start of the project.

6. There are 6 main outputs with 12 indicators to be achieved, by the end of project as shown in Table 1.

Table 1. Outputs Indicators and Targets

Indicator	Target
<p>Output1: Capacity of extension staff and small holder farmers to apply CSA technologies improved and knowledge of market linkage developed</p>	<p>(1) At least 300 farmers and 200 of government staffs (30% women) will be trained on NUE technologies. Among them a total of 50 officers will be selected for training to become trainers in NUE techniques.</p> <p>(2) 100% of trained farmers applied appropriate NUE practices in their farms.</p> <p>(3) At least 30% of trained farmers could negotiate for contract initiation, discuss and bargain prices with traders</p>
<p>Output 2: NUE experimental plots conducted and maintained as long-term NUE model/demonstration plots</p>	<p>(4) At least 4 NUE model farms established and functioned</p> <p>(5) At least 10% of N₂O gas emission from NUE farms reduced</p>
<p>Output 3: NUE technology adopted and expanded to more farmers in the project sites</p>	<p>(6) At least 50 new farms that applied NUE technologies fully established as pilot farms</p> <p>(7) At least 2 pilot projects involving 50 pilot farmers (30% women-managed farms) adopted NUE practices and linked to market through collaboration with the private sector.</p>
<p>Output 4: Access to market for NUE products established</p>	<p>(8) At least 30% of NUE farmers in project sites (30% women) signed contract farming with private enterprises (baseline 0)</p>
<p>Output 5: Knowledge products on NUE produced,</p>	<p>(9) Number of NUE knowledge products produced and distributed to farmers (1,000 pamphlets, 100 posters and vinyls)</p>

shared and disseminated	(10) At least 35% of farmers applied NUE techniques learned from knowledge products which distributed by the NUE project
Output 6: Policy recommendations on NUE produced and endorsed by MOALI	(11) One policy assessment report completed (12) At least 2 policy recommendations submitted to national policy makers endorsed by MOALI

Project Immediate Outcome:

7. As the Project commenced in October 2017, the achievement of project outcome cannot be seen yet. However, NUE farmers have got knowledge on how to effectively utilize by-products of milling rice such as rice husk through making biochar instead of burning. Farmers realize that leaf colors of plants consistently show green color under the application of chemical fertilizers together with organic sources. Achievement of specific stated outcome will be assessed and discussed in the next progress report.

IMPLEMENTATION PROGRESS

A. PROJECT FINANCIAL STATUS

Table 2: Project Disbursement of Fund and Expenditure.

Project	Amount Disbursed by ADB		Actual Expenditure by Project		
	Amount Contract	% of Total ADB disbursement	Actual Amount Expense	% against actual disbursement (40%)	% against amount contract
NUE	\$ 100,000.00	40% (\$ 40,000)	\$30,457	76	30

B. PROJECT PREPARATION

8. The main accomplishments during project preparation are listed as follows:
 - DoA started to develop project proposal in January 2017. The project proposal was finalized and submitted to ADB in April 2017. ADB reviewed final proposal and approved the NUE project in April 2017.
 - ADB approved total budget of 100,000 USD for NUE project. Letter of Agreement (LOA) Second Round was amended to include NUE in February 2017. Official LOA amendment was signed on 17 October 2017.
 - DoA started to develop inception report for NUE project. By end of October 2017, the development of inception report and Project Design and Monitoring Framework (DMF) and Monitoring Tools was finalized and submitted to WGA-S and ADB. After reviews,

comments and edit of WGA-S and ADB, the inception report was endorsed in November 2017.

- Although project implementation was officially started in October 2017 after signing LOA, some preparatory works were initiated since June 2017 after the NUE project proposal was endorsed by the expert team.
- DoA established the project implementation team composed of 6 members: Project Team Leader, Project Coordinator and Project Implementers. There are currently a total of 6 staffs (3 women officers) deployed at the field level.
- The inception meeting was organized in June 2017 before officially starting the project. The Director General and Deputy Director General of DoA, the representative from WGA-Secretariat of ADB, government officials from target regions, soil and nutrient management technicians and private sectors participated in this meeting and discussed about NUE project concept, activities, timeframe, challenges that encountered during implementation and explored possible solutions for them.
- Three project officers attended regional capacity building workshop on integrated management to improve nitrogen use efficiency (NUE) for GMS countries in PR.China from 15th to 19th May 2017. The training course provided China's policies and actions on: integrated nutrient and soil management for sustainable agricultural development; essential plant nutrients and their functions on plant growth and development; factors influencing efficiency of nutrient application, including status of synthetic fertilizer application and its impacts (crop production, crop quality, soil health, socio-economic, environment, etc.); safe-food production, and ecological conservation, N-cycle management and its impacts on GHG emission, etc.

C. PROJECT PROGRESS BY OUTPUTS AGAINST DMF / M&E PLAN

9. As of December 2017, NUE project completed site selection, baseline survey to assess the conventional farming practices, and market access of farmers. After that, project established experimental and demonstration plots, conducted exchange visit and created market links for farms products.

Output 1: Capacity of extension staff and smallholder farmers to apply CSA technologies improved and knowledge of market linkage developed

10. The project selected the sites and farmers within the biochar hot spot area. Women headed active smallholder households were given first priority to be selected as project beneficiary.

Beside this, the major crops grown by these selected farmers must include rice or maize crop in one season.

11. Three hundred smallholder farmers and 200 government staffs (at least 30% women) from the target sites will be selected to be trained on NUE technologies. Among 200 trained government staffs, 50 staffs will be selected to become trainers in NUE technologies. Project already selected 300 farmer beneficiaries of two target regions in August 2017.
12. Firstly, the structured questionnaires were developed for baseline survey. In the questionnaire form, the following data were included such as:
 - (a) conventional farming practices
 - (b) nitrogen fertilizers management practices
 - (c) amount of farm inputs
 - (d) cost and benefit from farming activity
 - (e) yield of crops
 - (f) storage methods of farm products
 - (g) prices and market linkage
 - (h) major constraints and opportunity in current farming practices
 - (i) gender involvement
13. The objective of baseline survey is to understand about the current status of crop production and value chain for rice and maize crops in the two target regions as well as gender issues on decision-making process, farm activities and labour management. The total of 100 respondents (50 for rice and 50 for maize) (50 per project area, of which, at least 35% women working in fields such as farm, business entrepreneurs and selling of farm's products) which include farmers, village leaders, stakeholders, input suppliers, sellers and buyers, Traders and retailers, small business entrepreneurs were selected for the interview.
14. Based on findings from the baseline survey, research and demonstration farms were established. As the sowing time is based on season, the trainings for extension staffs and farmers were shifted to January 2018.
15. After that, the training materials for Extension staffs and farmers were prepared at the end of September 2017. The subject of the trainings is "Integrated soil- plant nutrient management and climate smart agriculture" for rice and maize based on site-specific nutrient management concept. The curriculum for this course includes soil identification using the USDA classification system, soil fertility, water resources management and plant nutrition.

Output 2: NUE experimental plots conducted and maintained as long-term NUE model/demonstration plots

16. Site visit for the selection of 4 experimental plots/ long-term model farms (2 for rice and 2 for maize) and 50 demonstration farms (20 for rice and 30 for maize) were conducted in May 2017. As the project starting date was delayed, site selection was conducted again in July 2017.
17. By the end of July 2017, soil samples were collected and sent to soil and fertilizer-testing laboratory of Land Use Division in Yangon to test the soil parameters of pH, EC, organic C, total N, P, K of each site and pH, EC, ESP of irrigation water.
18. In early August 2017, NUE experimental farms for rice crop were established in Zetaw, Chipa and Minkone Villages in Shwebo Township. The rice variety, Shwebo Paw San was grown in this area with the spacing of 15cm x 20 cm.
19. On 15th September, NUE experimental farms for rice crop were established in Kyakuu Villages in Nay Pyi Taw Township. The rice variety, Manawthukha was grown in this area with the spacing of 15cm x 20cm. Before establishing the rice research plot in Nay Pyi Taw, preparation for gas collection chambers and other necessary materials for measuring N₂O emission were prepared. Nitrous oxide gas samples were collected one time per month (total of 4 times) owing to the limited availability of gas collected vacuumed vials. Air temperature and soil temperature were detected at every N₂O gas sampling times.

For Rice experimental farms,

20. The treatments for rice crops are as follows:
 - T1 - control (0 Nitrogen) with (Biochar + Cowdung)
 - T2- control (0 Nitrogen) without (Biochar + Cowdung)
 - T3- Recommended nitrogen fertilizer rate with (Biochar + Cowdung)
 - T4- Recommended nitrogen fertilizer rate without (Biochar + Cowdung)
 - T5- 1/2 of recommended nitrogen fertilizer rate with (Biochar + Cowdung)
 - T6- 1/2 of recommended nitrogen fertilizer rate without (Biochar + Cowdung)
 - T7- Nitrogen rate with Leaf Color Chart (LCC) and with (Biochar + Cow dung)
 - T8- Nitrogen rate with LCC and without (Biochar + Cowdung)

21. All experimental units were assigned as randomized complete block design with 4 replications.
22. The recommended rates of P (T-super 62 kg ha⁻¹) and K (Murate of Potash 62 kgha⁻¹) were applied as basal. The urea fertilizer (124 kg ha⁻¹) was applied as three times splits (37 kg ha⁻¹ at 10-15 Days After Transplanting (DAT), 50 kg ha⁻¹ at 30-35 DAT, 37 kg ha⁻¹ of Urea and 62 kg ha⁻¹ of Potash at EPI stage). Biochar(2 ton ha⁻¹) and cow-dung (3 ton ha⁻¹) were incorporated. The nutrient content of biochar and cow-dung were as follows:

Table 3. Nutrient contents in biochar and cow-dung (Nay Pyi Taw)

Sr. No.	Sample Name	Moisture %	Total N %	Total P ₂ O ₅ %	Total K ₂ O %	Organic Matter %	Carbon %	C:N	pH (1:2.5)
1	Biochar	46.599	0.35	0.067	0.172	40.85	23.69	67.69	7.30
2	Cowdung	14.765	0.945	0.934	0.765	17.805	10.33	10.93	7.37

23. Maize experimental farms were conducted in Nay Pyi Taw. They were established in Tharyarkonevillage of Pobathiri Township in November 2017. Hybrid variety (GT-722) was grown with the spacing of 60 cm x 25 cm by contracting with Big M company. The duration of this variety is about 110-120 days. The company agreed to buy the products of these demonstration and research farms with the price which is about 500 kyats higher than the market price at the selling time.
24. Descriptions of treatments for maize in NUE experiment are as follows:
 - T1- NPK (recommended rate)
 - T2- NPK+ biochar
 - T3- NPK+ FYM
 - T4- NPK+ neem cake
 - T5-PK+ N (20% of recommended fertilizer N when LCC ≤4)
25. The recommended rates of P (T-super 62 kg ha⁻¹) and K (Murate of Potash 62 kgha⁻¹) were applied as basal. For all treatments, recommended P and K were also applied as basal. The recommended rate of Nitrogen fertilizer (Urea 247 kg ha⁻¹) was applied in three splits (47 kg ha⁻¹ as in 20 Days After Sowing (DAS), 100 kg ha⁻¹ in 30 DAS, 100 kg ha⁻¹ in 45 DAS) for T1, T2, T3 and T4. For T5, nitrogen was applied by using Leaf Color Chart (LCC) reading. LCC readings were started from 20 days after transplanting and done regularly 10 days

interval. When the LCC values of the top youngest leaves show ≤ 4 , 20% (47 kg ha^{-1}) of recommended rate of Nitrogen fertilizer was applied.

26. The results of experimental farms will be discussed and presented in the second progress report.

Output 3: NUE technology adopted and expanded to more farmers in the project sites

27. Although it was intended to select 50 farmers from the farmers' training to be NUE demonstration/pilot farmers, selection of demonstration/pilot farmers were conducted during site selection visit because of limited time frame for implementation of project NUE. Three types of treatments were applied in each demonstration farmers' farms in order for them to be able to identify the best Nitrogen management practices by themselves. The soil sampling and establishment of demonstration farms were conducted at the same time with experimental farms.
28. Three rice demonstration plots were established in Kyaku village, Nay Pyi Taw and 17 rice demonstration farms were established in Chipa village, Minkone village and Zetaw village of Shwebo township, Sagaing Region.
29. Descriptions of treatments for rice demonstration farms are as follows:
 - 0 Nitrogen + (Biochar + Cow dung)
 - Full Recommended Nitrogen fertilizer rate + (Biochar + Cow dung)
 - 1/2 Recommended Nitrogen fertilizer rate + (Biochar + Cow dung)
30. The results of those demonstration farms will be discussed and presented in the second progress report.
31. The total 30 Maize demonstration farms were conducted in Nay Pyi Taw in which 15 farms were in Kayankine village of Lewe township and 15 farms were in Tharyarkone village of Pobathiri township.
32. The description of treatments for maize demonstration farms were as follows:
 - Full Recommended Nitrogen fertilizer rate
 - 1/2 Recommended Nitrogen fertilizer rate + (Biochar + Cow dung)
 - 20% of recommended fertilizer N when $LCC \leq 4$
33. All of the demonstration farms will be harvested in the middle of April 2018.

Output 4: Access to market for NUE products established

34. In November 2017, a meeting with farmers and traders were arranged in Nay Pyi Taw and Shwebo to make contract for selling NUE farm products. For maize crops, the Big M Company Ltd. sold the seeds with credit system and they agreed to buy all of the NUE farm products with the price of 500 kyats per basket over the current price.

35. 76% (or 38 farmers) of NUE farmers in project sites signed contract farming with private sectors.

Output 5: Knowledge products on NUE produced, shared and disseminated

36. 1,000 Pamphlets have been prepared. These knowledge products were distributed to farmers at the time of trainings. Video recording were done during extension staffs and farmers training to disseminate NUE technologies through farmer channels in January 2018.

Output 6: Policy recommendations on NUE produced and endorsed by MOALI

37. Methodology of the policy study on Nitrogen Use Efficiency has been developed. The Policy assessment was planned to start in January 2018. However, it is supposed to conduct after harvesting maize demonstration and experimental plots, which can be harvested in the Middle of April 2018. So, policy dialogue/ policy recommendation forum would be held after analyzing the results of demonstrations and experimental plots.

Additional Outputs: Project Management

38. Project Implementation group participated in regional capacity building workshop on integrated management to improve nitrogen use efficiency (NUE) for GMS countries in China from 15th to 19th May 2017.
39. Project hosted the mission of Dr. Apichai Thirathon, Agronomist, Working Group on Agriculture Secretariat (WGA –S), TA 8163 REG CASP 2 from Thailand in June 2017. The officers and technicians from DoA: Daw Thin Thin Kyi, Dr. Thin Nwee Htwe, Dr. Khin Myat Soe and Dr. Ei Ei Theint joined Dr. Apichai's visit to Kyaukse Township for the site selection of NUE project from 8th -9th June 2017.
40. Project hosted the mission of Dr. A.G. Tony McDonald, Environment & Climate Change Specialist, Working Group on Agriculture Secretariat (WGA –S), TA 8163 REG CASP 2 from 22nd October to 6th Nov. The National Coordinator: Dr. Thanda Kyi, officers from Department of Planning: Daw Yu Yu Than, and the technicians from DoA : Daw Thin Thin Kyi, Dr. Ei Ei Theint joined Dr. Tony's visit to Shwebo Township for the field monitoring of NUE project.
41. Project made field trip to Sagaing region in August 2017. Participants of the field trip were: Dr Thin new Htwe and Dr. Ei Ei Theint, Daw Zar Zar Min, Daw Thida Swe and Daw Naw Thwe Thwe Tunto advise rice farmers of demonstration activities and plan, and collect soil samples.

42. Project made field visit to Nay Pyi Tawin September 2017. Participants of the field trip were: U Tun Tun Lin, Dr. Thin Nwee Htwe and Dr. Ei Ei Theint to explain and advise rice farmers of demonstration activities and plan, and collect soil samples.
43. Project made field visit to Nay Pyi Taw region in November 2017. Participants of the field trip were: U Tun Tun Lin, Dr Thin new Htwe and Dr. Ei Ei Theint to explain and advise maize farmers of demonstration activities and plan, and collect soil samples.

Table 4: Summary of Output Achievement

Outputs/Indicators	Achievement	Baseline	Target	Milestone (date)	Status
Output 1. Capacity of extension staffs and small holder farmers to apply NUE technologies improved and knowledge of market linkage developed					
Indicator 1: At least 300 farmers trained on NUE technologies by the NUE trainers (government staff)	Curricula and training materials for extension staff and farmers have been prepared.	Around 21% of farmers had experience to attend the soil and nutrient management training	At least 300 smallholder farmers (30% women) and 200 government officers (30% women) in the target areas will improve their capacity in order to apply Nitrogen Use Efficiency management in farms	Nov-Dec 2017	Delayed to January - February

Indicator 2: 100% of trained farmers applied appropriate NUE practices in their farms	Not yet	20% or less of total farmers understand on how to use nitrogen nutrients on crops efficiently	100 % of trained farmers applied appropriate NUE practices in their farms (including 30% women managed farms)	Nov and Dec 2017	Delayed to January 2017.
	Not yet		At least 30% of NUE trained farmers could negotiate for contract initiation, discuss and bargain prices with traders		
Output 2: NUE experimental plots conducted and maintained as long-term NUE model/demonstration plots					
Indicator 1: At least 4 NUE model farms established and functioned	Four research farms/ model farms have been established.	0	4 research farms/ model farms (including 20% women owner)	November 2017 – February 2018	

Indicator 2: At least 10 % of N ₂ O gas emission from NUE farms reduced (baseline: to be measured in T4 for rice, T1 for corn)	About 14% of N ₂ O gas emission were reduced in Biochar treated plot in NUE research /model farms	0	8 model farms/farmers (25% women)	November 2017 – February 2018	
Indicator 3: At least 2 pilot projects involving 50 pilot farmers (30% women) adopted NUE practices and linked to market through collaboration with the private sector	In progress A meeting with traders and 50 demo/pilot farmers were conducted in each region to make contract for selling of NUE products	0	50 pilot farmers (30% women) adopted NUE practices and linked to market	November 2017 – February 2018	
Output 3: NUE technology adopted and expanded to more farmers in the project sites					
Indicator 1: At least 50 new farms that applied NUE technologies fully established as demo/pilot	Fifty demo/pilot farms with NUE technology	0	Fifty demo/pilot farms applied NUE technology	Nov and Dec 2017	As the project's duration is just enough for one

farms	gies have been established. (including 35% women managed farms)		(including 30% mainly women managed farms)		crop growing season, 50 demo farms were established at the same time with research /model farms
Indicator 2: Crop productivity increased by 15% through improving soil organic matter content and sustaining nitrogen nutrients in soil	In progress	3.9 tons per ha for rice; and 3.7 tons per ha for maize	Crop productivity increased by 15%	Nov and Dec 2017	
Output 4: Access to market for NUE products established					
Indicator 1: At least 30% of NUE farmers in project sites signed contract farming with private enterprises	76% of NUE farmers in project sites (38 farmers) signed contract farming with private sectors	0	Thirty percent of NUE farmers in project sites signed contract farming	Nov 2017	
Output 5: Knowledge products on NUE produced, shared and disseminated					
Indicator 1: Number of	1,000 pamphle	0	target 1,000	Nov and	

NUE knowledge products produced and distributed to farmers (baseline 0; target 1000 pamphlets, 100 posters and vinyls)	ts have been produced and not distributed yet		pamphlets, 100 posters and vinyls)	Dec 2017	
Indicator 2: At least 35% of farmers applied NUE techniques learned from knowledge products which distributed by the NUE project	Not yet implemented	0	Thirty five percent of farmers applied NUE techniques learned from knowledge products of NUE project		
Output 6. Policy recommendations on NUE produced and endorsed by MOALI					
Indicator 1: One policy assessment report completed	Not yet implemented	0	One policy assessment report submitted to MOALI	January 2018	
Indicator 2: At least 2 policy recommendations submitted to national policy makers and endorsed by MOALI	Not yet implemented	0	At least 2 policy recommendations submitted to national policy makers and endorsed by MOALI	February 2018	

I. Cross Cutting Issues

1. Gender Integration. In this quarter, most of project activities were related to research/long term model farms and pilot farms. It was noted that women headed households were actively participated in this activity; around 31% of participants were women. So, it was found that women become in major role in farming activity.
2. Climate change issue, Climate Smart Agricultural (CSA) technologies were included in the training manual to suggest adaptable practices under climate change situation. NUE or CSA technologies such as Biochar, applying Nitrogen fertilizer together with organic materials such as compost or cow-dung, Nitrogen fertilizer application with LCC cards to ensure all applied N are taken up by plants were introduced in all experiments and pilot farms for improving nitrogen use efficiency of plants, soil health and clean environment.

II. Issues/Problems/Constraints during implementation:

Implementation Issue encountered	Interventions and Recommendations
Starting time: Delayed project commencement caused inconvenient timing to establish demonstration on season. In some cases, this may affect crop growth and yield.	Need good understanding and commitment among project partners
Project duration: As the project starting date is late and duration is short, it has time to grow crop for only one season.	Research/model farms and demo/pilot farms were established at the same time.
Pests and disease: More pests and disease infestation occurred in rice research/model farm in Nay Pyi Taw due to late sowing time.	Organic pesticides were recommended to minimize the effect of chemical residues in foods.
Regarding biochar making, the type of biochar kiln (Kuntan charring apparatus) was not convenient for users. It took about 3 hours to get about 10kg of biochar. Sometimes, rice husk is completely burned and became ash if people cannot watch for all time.	Need more efficient method

III. MAJOR LESSONS LEARNED:

The project starting date was delayed so that the activities in the proposal should be revised at the beginning to be able to complete all activities on time.

IV. FOLLOW UP AND NEXT QUARTER ACTIONS AND FINANCIAL PLAN

Project plans activities below for the next quarter.

- Collect crop performance data and N₂O emission data in model farms; (January 2018)
- Conduct farmer and extension staff training on NUE (6 courses, 300 farmers, 200 staffs);
- Conduct end-line survey on rice and maize value chains; (February)

Annex 1: Progress of Project Activity Implementation (as of December 2017)

No.	Work Schedule	Progress
	2. OUTPUT 1. Capacity of extension staff and small holder farmers to apply NUE technologies improved and knowledge of market linkage developed	
1	1.1 Develop curricula and training materials for extension staff and farmers (Oct & Nov 2017)	Completed (100%)
2	1.2 Conduct trainings (8 trainings) and workshops (2 WS) on NUE technologies and market linkages for extension staff and farmers (Nov and Dec 2017)	(0%)
3	1.3 Organize farmer field days and exchange visit (4 times) (Dec 2017 and Jan 2018)	Completed (25%)
	OUTPUT 2. NUE experimental plots conducted and maintained as long-term NUE model/demonstration plots	
1	2.1 Site visit and selection of 4 farms, 2 for rice and 2 for maize (October 2017)	Completed (100%)
2	2.2 Collection of soil samples and conduct laboratory analysis (November 2017)	Completed (100%)
3	2.3 Carry out NUE experiments based on experimental design (November 2017 – February 2018)	Completed (100%)
4	2.4 Measurement of N ₂ O emission from different treatments of the experimental plots	Completed (100%)
5	2.5 Harvesting and laboratory test for soil and plant analysis	On-going plan
6	2.6 Provide continue supports to establish the experiment site as a long term NUE demonstration/model farms	On-going plan
	Output 3: NUE technology adopted and expanded to more farmers in the project sites	
1	3.1 Select 50 farmers during the farmer training (in Output 1) to become NUE pilot farmers	100% (Conducted during site selection)
2	3.2 Collection of soil samples from these selected 50 farms	100%
	3.3 Conduct socio-economic survey of the 50 selected farmers	100%
	3.4 Provide necessary supports to establish 50 NUE pilot farms	100%
	3.5 Regular visit to 50 NUE pilot farms to provide additional technical guidance and assistance	50%
	3.6 Harvesting and data collection	On going plan
	3. Output 4: Access to market for NUE products established	
1	4.1 Organize a meeting and field visit for traders to visit NUE farms	0%
2	4.2 Facilitate contractual arrangement between traders and NUE farmers	50%
	4. Output 5: Knowledge products on NUE produced, shared and disseminated	
1	5.1 Organize discussion & wrap up workshop within PIU & PIB (Oct and Nov 2017)	On going plan

2	5.2. Print NUE technologies training materials and distributed to extension staff and farmers (1000 pamphlets and 100 posters and vinyl) (Nov and Dec 2017)	On going plan
3	5.3 Produce and disseminate NUE technologies through Farmer Channel and other media (Dec 2017 and Jan 2018)	On going plan
5. Output 6: Policy recommendations on NUE produced and endorsed by MOALI		
	6.1 Conduct policy study on crop value chains, and recommended strategy to improve nutrient use efficiency for rice and maize production (January 2018)	On going plan
	6.2 Conduct a national policy forum/dialogue on NUE management (Feb 2018)	On going plan
	6.3 Recommended NUE policy submitted to MOALI for endorsement (Feb 2018)	On going plan
Project Management Activities:		
Planning and Reporting		
	- Conduct inception meeting (June 2017)	Completed (100%)
	- Develop and submit Draft Inception Report (Oct 2017)	Completed (100%)
	- Finalize and submit Inception Report (Nov 2017)	Completed (100%)
	- Prepare and submit Physical and Financial Progress Report (Jan 2018, March 2018)	On going plan
	- Prepare and submit Project Completion Report (March 2018)	On going plan
	- Submit final evaluation report (March 2018)	On going plan
	- Acquire monthly project site report (to PIU)	On going
Monitoring and Evaluation		
	- Design M&E system (Oct 2017)	Completed (100%)
	- Conduct baseline survey (Oct 2017)	Completed (100%)
	- Conduct regular project coordination and review meeting (Oct and Dec 2017 & Feb 2018)	On going (75%)
	- Conduct end-line project assessment (Jan 2018)	On going plan
Procurement		
	- Training materials and farm inputs and materials (Oct 2017 to Feb 2018)	Completed (100%)

Annex 2. Activity Physical Progress Report (as of December 2017)

As shown in the table below, there are a total of 53 activities delivered under the outputs. The Project Implementer rated each activity using assigned weight average. From November to December 2017, the physical progress of activities 26.36% completed. The details are shown in below table:

No.	Project Activity	Status	Weight Assigned	Weight in %	To Dec 2017	
					Completion % to 31 Dec 2017	Progress % to 31 Dec 2017
1	Conduct baseline survey, selection of beneficiary farmers	Completed	2	3.77	100%	3.77
2	Develop curricula and materials for TOT, extension staff and farmer training	Completed	1	1.88	100%	1.88
3	Conduct TOT course on NUE in Mandalay region (3 days)	Not Yet	2	3.77	0	0
4	Conduct TOT course on NUE in Naypyitaw region (3 days)	Not Yet	2	3.77	0	0
5	Conduct 2 training courses on NUE for 200 extension staffs and 4 training courses on NUE for 300 farmers (2 days per course)	Not Yet	6	11.32	0	0
6	Establish four model farms (for rice and for maize) in two districts including N2O emission measurement	Completed	1	1.88	100%	1.88

7	Establish pilot/demonstration plots	Completed	4	7.54	100%	7.54
8	Laboratory test for soil and plant analysis from 4 model farms (30 plots) and 50 demo farms	Completed	2	3.77	25%	0.94
9	Organize study tour/exchange visit for farmers	Completed	2	3.77	50%	1.88
10	Facilitate and support contractual arrangements between farmers and SMEs	Completed	1	1.88	100%	1.88
11	Conduct farmer field day events	Not Yet	4	7.54	0	0
12	Enhance Market Linkage	Not Yet	4	7.54	0	0
13	Conduct policy study on crop value chains, and recommended strategy to improve nutrient use efficiency for rice and maize production	Not Yet	1	1.88	0	0
14	Conduct national dialogue on NUE policy recommendations	Not Yet	1	1.88	0	0
15	Develop, publish and disseminate leaflets	Not Yet	1	1.88	0	0

16	Develop, publish and disseminate vinyl	Not Yet	1	1.88	0	0
17	Develop Video in farmer channel	Not Yet	2	3.77	0	0
18	Inception Report, Physical and Financial Progress Report and Project Completion Report	Completed	4	7.54	25%	1.88
19	Supervision & Monitoring	On-going	10	18.86	25%	4.71
20	Conduct project monitoring and evaluation	Not Yet	1	1.88	0	0
21	Conduct end-line survey	Not Yet	1	1.88	0	0
Total			53	100.00	-	26.36

Annex 3. Detailed Project Expenditure (as of December 2017)

No.	Description	Total Budget	Expense	Total Expense	Ending Balance		Explanation for Variation
			July-Dec 2017	Total (\$)	Total (\$)	Percentage (%)	
1	Conduct Baseline Survey, end line Survey and farmers selection	\$ 7,300.00	\$ 5,132.00	\$ 5,000.00	\$ 2,168.00	68.00%	End line Survey not completed
2	Develop curricula and materials for TOT and farmer training	\$ 2,750.00	1,500.00	\$ 1,500.00	\$ 1,250.00	0%	TOT and Farmer training not completed
3	Conduct One TOT courses on	\$	-	-	\$	0%	Not completed

	NUE in Mandalay region	2,550.00			2,550.00		
4	Conduct One TOT courses on NUE in Nay Pyi Taw region	\$ 2,550.00	-	-	\$ 2,550.00	0%	Not completed
5	Conduct 6 training courses on NUE for 200 extension staffs and 300 farmers	\$ 14,745.00	-	-	\$ 14,745.00	0%	Not completed
6	Establish four model farms (2 for rice and 2 for maize) in two districts	\$ 7,000.00	\$ 6,928.00	\$ 6,928.00	\$ 72.00	100.00%	Completed
7	Establish 50 farmers pilot/demonstration plots (25 in each district)	\$ 1,0500.00	\$ 1,0397.00	\$ 1,0397.00	\$ 103.00	100.00%	Completed
8	Laboratory test for soil and plant analysis (Samples from 4 model farms 50 demos)	\$ 19,000.00	\$ 5,000.00	\$ 5,000.00	\$ 14,000.00	13.16%	Plant samples not completed
9	Organize study tour/exchange visit for farmers	\$ 2,450.00	\$ 600	\$ 600	\$ 1,850.00	0.00%	Not completed
10	Facilitate and support contractual arrangements between farmers and SMEs	\$ 920.00	\$ 900	\$ 900	\$ 20.00	0.00%	Buyer and sellers meeting (one time) was completed
11	Conduct 2 farmer field day events	\$ 3,840.00	\$ -	\$ -	\$ 3,840.00	0.00%	Not completed
12	Enhance Market Linkage	\$ 4,000.00	\$ -	\$ -	\$ 4,000.00		Not completed
13	Conduct policy study on crop value chains, and recommended strategy to improve nutrient use efficiency for rice and maize crop production	\$ 3,000.00	\$ -	\$ -	\$ 3,000.00	0.00%	Not completed
13	Conduct national dialogue on NUE policy recommendations	\$ 3,985.00	\$ -	\$ -	\$ 3,985.00	0.00%	Not completed
15	Develop, publish and disseminate 1000 leaflets, 100	\$ 2,000.00	\$ -	\$ -	\$ 2,000.00	0.00%	Not completed

	vinyl/posters and videos						
16	Physical and financial progress report and project completion report	\$ 1,500.00	\$ -	\$ -	\$ 1,500.00	0.00%	Not completed
17	Supervision and Monitoring	\$ 4,590.00	\$ -	\$ -	\$ 4,590.00		Not completed
17	Monitoring and Evaluation	\$ 4,400.00	\$ -	\$ -	\$ 4,400.00	0.00%	Not completed
19	Contingency (Lump sum)	\$ 2,920.00	\$ -	\$ -	\$ 2,920.00	0.00%	Not completed
Total		\$ 100,000.00	-	-	\$ 69,543.00	30.45%	
	First Installment 40%	\$ 40,000.00	\$ 30,457.00	\$ 30,457.00	\$ 9,543.00	76.14%	

Annex 4. List of Demonstration Farms

1. Rice Demonstration farmers in Nay Pyi Taw

No.	Name of farmer's owner	Sex	Location				Contact (Tel#, if any)	Farm size (m ²)	Type of crop
			Province	District	Commune	Village			
1	U MyintMaungHtwe	Male	Nay Pyi Taw	Dakhinathiri	Mantaw	Kyaku		2000	Rice
2	DawKhinWai	Male	Nay Pyi Taw	Dakhinathiri	Mantaw	Kyaku		2000	Rice
3	U MyintAung	Male	Nay Pyi Taw	Dakhinathiri	Mantaw	Kyaku		2000	Rice

2. Rice Demonstration Farmers in Sagaing Region

No.	Name of farmer's owner	Sex	Location				Contact (Tel#, if any)	Farm size (m ²)	Type of crop
			Province	District	Commune	Village			
1	U Chit Thein	Male	Sagaing	Shwebo	Min Kone	Min Kone			Rice (Shwebopawsan)

2	U Lu Tin	Male	Sagaing	Shwebo	Min Kone	Min Kone		2000	Rice (Shwebopawsan)
3	U Kin Sein	Male	Sagaing	Shwebo	Min Kone	Min Kone		2000	Rice (Shwebopawsan)
4	Daw Ma Ma Lay	Female	Sagaing	Shwebo	Min Kone	Min Kone		2000	Rice (Shwebopawsan)
5	U MyintAung	Male	Sagaing	Shwebo	Min Kone	Min Kone		2000	Rice (Shwebopawsan)
6	Daw San Kyi	Male	Sagaing	Shwebo	Min Kone	Min Kone		2000	Rice (Shwebopawsan)
7	U Soe Tint	Male	Sagaing	Shwebo	Min Kone	Min Kone		2000	Rice (Shwebopawsan)
8	DawHtayMi	Female	Sagaing	Shwebo	Min Kone	Min Kone		2000	Rice (Shwebopawsan)
9	U AungThein	Male	Sagaing	Shwebo	Min Kone	Min Kone		2000	Rice (Shwebopawsan)
10	DawHla Paw	Female	Sagaing	Shwebo	Min Kone	Min Kone		2000	Rice (Shwebopawsan)
11	U Min Swe	Male	Sagaing	Shwebo	Chipa	Chipa		2000	Rice (Shwebopawsan)
12	DawKhinMyint	Female	Sagaing	Shwebo	Chipa	Chipa		2000	Rice (Shwebopawsan)
13	U Tun Yi	Male	Sagaing	Shwebo	Chipa	Chipa		2000	Rice (Shwebopawsan)
14	U Win Nyunt	Male	Sagaing	Shwebo	Zeetaw	Zeetaw		2000	Rice (Shwebopawsan)
15	Daw Lone	Male	Sagaing	Shwebo	Zeetaw	Zeetaw		2000	Rice (Shwebopawsan)
16	U KyawOhn	Male	Sagaing	Shwebo	Zeetaw	Zeetaw		2000	Rice (Shwebopawsan)
17	U Mya Aye	Male	Sagaing	Shwebo	Zeetaw	Zeetaw		2000	Rice (Shwebopawsan)

3. Maize Demonstration Farmers in Nay Pyi Taw

No.	Name of farmer's owner	Sex	Location				Contact (Tel#, if any)	Farm size (m ²)	Type of crop
			Province	District	Commune	Village			
1	U Kyaw Lay	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
2	U KyawShein	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
3	U AungMyint	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
4	U Soe Lin	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
5	U TheinSaung	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
6	U HlaThein	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
7	DawKhin Mar Nyo	Female	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
8	U TunMyint	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
9	U Bo Win	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
10	U Tin Ohn	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
11	U KyawThaung	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
12	U MyintThein	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
13	DawMyaWai	Female	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
14	U MyintShwe	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
15	U SeinHtay	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
16	U AungMyintKhin	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
17	U Swe Win	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
18	U MyintLwin	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
19	U Win Tint	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
20	DawHtay	Female	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
21	U MyintNaing	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
22	U Win Zaw	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
23	U Chit San Mwe	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
24	U MyaTunAung	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
25	Daw Win Mar	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
26	DawMyint	Female	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
27	DawSuNandar	Female	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
28	Daw Yi	Female	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
29	DawOhnHla	Female	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize

30	U Win Tint	Male	Nay Pyi Taw	Dakhinathiri	Kayankine	Kayankine		2000	Maize
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Annex 5: Design and Monitoring Framework

Results Chain	Performance Indicators with Targets and Baselines	Data and Reporting	Risks
Impact: Productivity, production and market access of CFA products in Central Myanmar improved			
Outcome			
Crop productivity, production and income of small holder farmers improved through promotion of Nitrogen Use Efficiency (NUE) technologies	<p>By February 2018:</p> <p>Number ofNUE farms increased by 30%; of which, 30% managed by female farmers (baseline 0 in Oct 2017)</p> <p>Yield of NUEfarms increased by 15% compared to conventional practices (baseline rice yield: 3.5 tons per haand maize yield: 5.4 tons per hain Oct 2017)</p> <p>Nitrogen fertilizer use efficiency increased by 20% (baseline 0 In Oct 2017)</p>	<p>Baseline survey</p> <p>End-line survey</p> <p>Farm records</p> <p>Project Progress Reports (PPR)</p> <p>Project Completion Report (PCR)</p> <p>Project Site Reports (PSR)</p> <p>Laboratory records and reports</p>	<p>Irregular weather condition (heavy rainfall, drought) which affecting quality of NUE crops (pro. – medium; sev. – medium)</p> <p>Knowledge gap (pro. – medium; sev. – medium)</p> <p>Fluctuated market prices for NUE products (pro. – medium; sev. – medium)</p> <p>High inflation rate (pro. – low; sev. – medium)</p>

	Net income of NUE small holder farmers (including female farmers) increased by 30% (baseline to be measured in Oct 2017)		
Outputs			
1. Capacity of extension staff and small holder farmers to apply NUE technologies improved and knowledge of market linkage developed	At least 200 extension staffs and 300 farmers (30% of them are female farmers) trained on NUE technologies, and among the trained extension staffs, about 50 of them became trainers on NUE technologies (baseline 0). 100% of trained farmers applied appropriate NUE practices in their farms (baseline 0) At least 30% of NUE trained farmers could negotiate for contract initiation, discuss and bargain prices with traders (baseline 0)	Baseline survey Endline survey Training reports PPR PCR PSR	Farmers are busy with routine farm works and don't have time to join training (pro. – low, sev. – low)
2. NUE experimental plots conducted and maintained as long-term NUE model/demonstration plots	At least 4 NUE model farms established and functioned (baseline: 0) At least 10 % of N ₂ O gas emission from NUE farms reduced (baseline: to be measured in T4 for rice, T1 for corn)	Baseline survey Endline survey Farm records PPR PCR PSR	Irregular weather condition (heavy rainfall, drought) which affecting production of treatment crops (pro. – medium; sev. – medium) Pest and Disease condition (pro. – medium; sev. – medium)

3. NUE technology adopted and expanded to more farmers in the project sites	At least 2 pilot projects involving 50 pilot farmers (30% women) adopted NUE practices and linked to market through collaboration with the private sector(baseline 0).	Baseline survey End-line survey Farm records PPR PCR PSR	Out-migration of farmers to work in urban areas (pro. – medium, sev. – medium)
4. Access to market for NUE products established	At least 30% of NUE farmers in project sites signed contract farming with private enterprises (baseline 0)	PPR PCR PSR List of contract farming signed	Limited market opportunity for premium prices of CFA products (pro. – medium; sev. – medium)
5. Knowledge products on NUE produced, shared and disseminated	Number of NUE knowledge products produced and distributed to farmers (baseline 0; target 1,000 pamphlets, 100 posters and vinyl)	PPR PCR PSR List of knowledge products Farm records	None
6. Policy recommendations on NUE produced and endorsed by MOALI	One policy assessment report completed (baseline 0) At least 2 policy recommendations submitted and endorsed by MOALI (baseline 0)	Project reports Policy assessment report	None

Key Activities (with Milestones):

Output 1: Capacity of extension staff and small holder farmers to apply NUE technologies improved and knowledge of market linkage developed

- 1.1 Develop curricula and training materials for extension staff and farmers (Oct & Nov 2017)
- 1.2 Conduct trainings (8 trainings) and workshops (2 WS) on NUE technologies and market linkages for extension staff and farmers (Nov and Dec 2017)
- 1.3 Organize farmer field days and exchange visit (6 times) (Dec 2017 and Jan 2018)

Output 2: NUE experimental plots conducted and maintained as long-term NUE model/demonstration plots

- 2.1 Site visit and selection of 4 farms, 2 for rice and 2 for maize (October 2017)
- 2.2 Collection of soil samples and conduct laboratory analysis (November 2017)
- 2.3 Carry out NUE experiments based on experimental design (November 2017 – February 2018)
- 2.4 Measurement of N₂O emission from different treatments of the experimental plots
- 2.5 Harvesting and laboratory test for soil and plant analysis
- 2.6 Provide continue supports to establish the experiment site as a long term NUE demonstration/model farms

Output 3: NUE technology adopted and expanded to more farmers in the project sites

- 3.1 Select 50 farmers during the farmer training (in Output 1) to become NUE pilot farmers
- 3.2 Collection of soil samples from these selected 50 farms
- 3.3 Conduct socio-economic survey of the 50 selected farmers
- 3.4 Provide necessary supports to establish 50 NUE pilot farms
- 3.5 Regular visit to 50 NUE pilot farms to provide additional technical guidance and assistance
3. Harvesting and data collection

Output 4: Access to market for NUE products established

- 4.1 Organize a meeting and field visit for traders to visit NUE farms
- 4.2 Facilitate contractual arrangement between traders and NUE farmers

Output 5: Knowledge products on NUE produced, shared and disseminated

- 5.1 Organize discussion & wrap up workshop within PIU & PIB (Oct and Nov 2017)
- 5.2. Print NUE technologies training materials and distributed to extension staff and farmers (1000 pamphlets and 100 posters and vinyl) (Nov and Dec 2017)
- 5.3 Produce and disseminate NUE technologies through Farmer Channel and other media (Dec 2017 and Jan 2018)

Output 6: Policy recommendations on NUE to support national policy makers produced

- 6.1 Conduct policy study on crop value chains, and recommended strategy to improve nutrient use efficiency for rice and maize production (January 2018)
- 6.2 Conduct a national policy forum/dialogue on NUE management (Feb 2018)
- 6.3 Recommended NUE policy submitted to MOALI for endorsement (Feb 2018)

Project Management Activities:

Planning and Reporting

- Conduct inception meeting (June 2017)
- Develop and submit Draft Inception Report (Oct 2017)
- Finalize and submit Inception Report (Nov 2017)
- Prepare and submit Physical and Financial Progress Report (Jan 2018, March 2018)
- Prepare and submit Project Completion Report (March 2018)

- Submit final evaluation report (March 2018)
- Acquire monthly project site report (to PIU)

Monitoring and Evaluation

- Design M&E system (Oct 2017)
- Conduct baseline survey (Oct 2017)
- Conduct regular project coordination and review meeting (Oct and Dec 2017 & Feb 2018)
- Conduct end-line project assessment (Jan 2018)

Procurement

- Training materials and farm inputs and materials (Oct 2017 to Feb 2018)

Inputs:

Government of Sweden, NDF, ADB and Water Financing Partnership Facility: \$100,000.00

Government of Myanmar in-kind contribution: \$30,000.00

Cost Items:	Amount \$
Staffing	0
Administration support costs	0
Local transportation and per diems	7,820
Farm inputs and materials	21,950
Laboratory test	19,000
Training, workshops, field days and exchange visits	30,135
Policy Study and Forum	6,985
M&E and reporting	11,190

Contingencies (5%)	2,920
Total	\$ 100,000

Assumptions for Partner Financing:
NA – Financing has been finalized

Annex 6: Project Photos

Activity 1: Conducting Baseline Survey



Baseline Survey in Tharyarkone Village, Pobathiri Township, Nay Pyi Taw
(1.10.2017)



Baseline Survey in Minkone Village, Shwebo Township, Sagaing (5.11.2017)

Activity 2: Setting up demonstration farms and research farms

Step 1. Collecting and Making Organic products

Collecting Bio-resources and Making Composts



Making Rice husk Biochar





Step (2) Preparing demonstration farms and research farms

(a) Rice demonstration and research farms in Kyaku Village, Dakhinathiri Township, Nay Pyi Taw Region



Land Preparation for demonstration farms in Nay Pyi Taw



Making Plots and adding fertilizer inputs in research farm in Nay Pyi Taw



Rice research farm in Nay Pyi Taw



NUE rice demonstration and research farms in Nay Pyi Taw



N_2O gas emission collection in rice field in Nay Pyi Taw

(b) Rice demonstration and research farms in Shwebo Township, Sagaing Region



Rice experimental farm in Mikone Village, Shwebo Township



Rice demonstration and experimental farm in Mikone Village, Shwebo Township



Rice demonstration farms in Chipa Village, Shwebo Township

(c) Maize demonstration and research farms in Nay Pyi Taw Region



Providing fertilizer inputs to farmers



Providing costs for irrigation to demonstration farmers



Establishing maize research farm in Nay Pyi Taw



Establishing maize demonstration farms in Nay Pyi Taw



Harvesting maize research farms in Nay Pyi Taw

Activity 3: Exchange Visit and Farmers' field day Event



Exchange visit at rice research and demonstration farm in Nay Pyi Taw