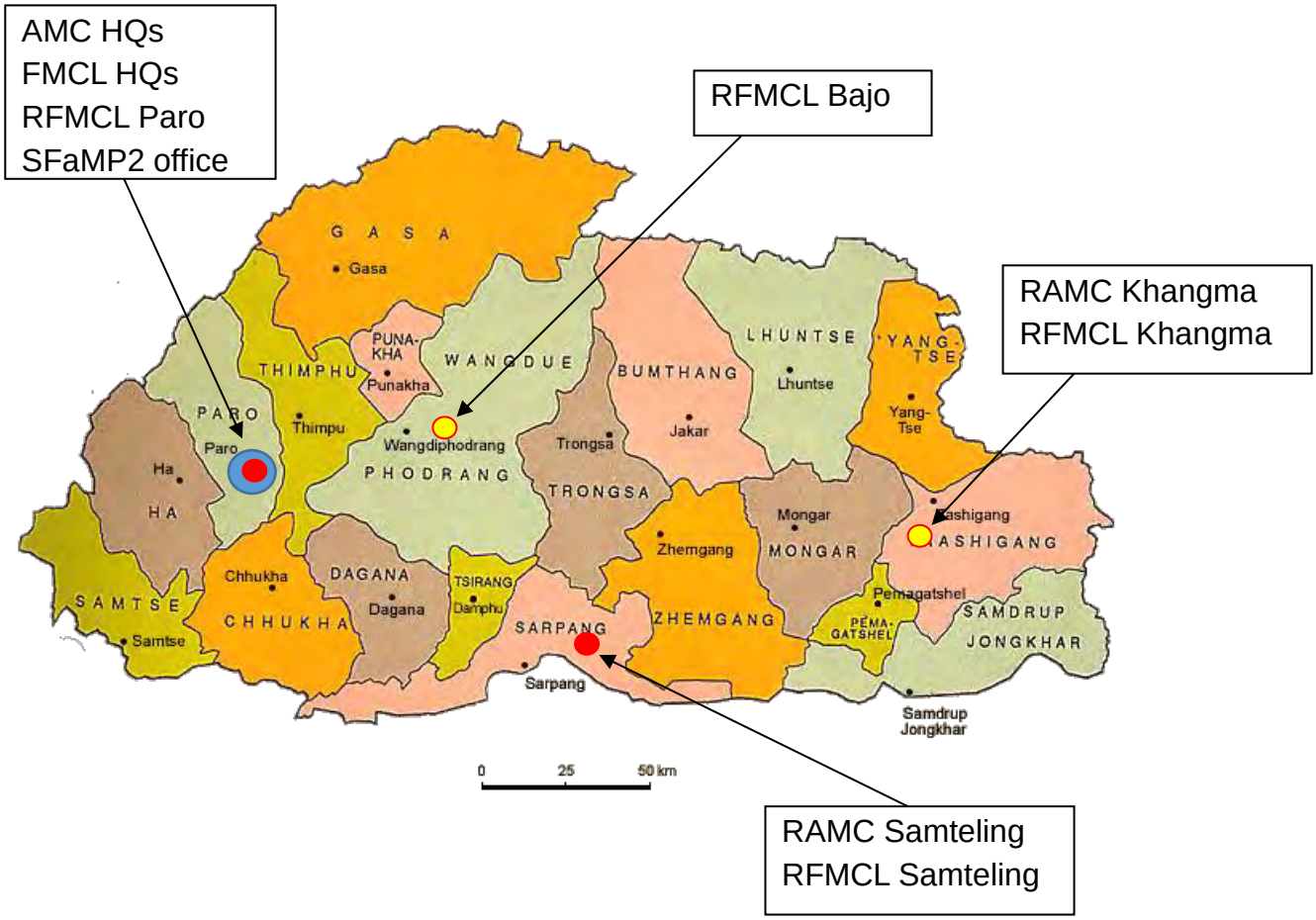
Project Completion Report
On
The Strengthening Farm Mechanization Project - Phase II

August 2018

Japan International Cooperation Agency

PROJECT SITES MAP



Abbreviations

AMC	Agriculture Machinery Centre	**IAM**	Institute of Agricultural Machinery
AMCS	Agriculture Machinery Certification Section	**ICT**	Information and Communication Technology
AMDC	Agriculture Machinery Development Centre	**IQCC**	Inspection and Quality Control Centre
AMRS	Agriculture Machinery Research Section	**JCC**	Joint Coordinating Committee
AMSC	Agriculture Machinery Supply Centre	**JICA**	Japan International Cooperation Agency
ANTAM	Asian and Pacific Network for Testing of Agricultural Machinery	**MAFF**	Ministry of Agriculture, Forests and Fishery (of Japan)
AMTC	Agriculture Machinery Training Centre	**MoAF**	Ministry of Agriculture and Forests (of Bhutan)
BBS	Bhutan Broadcasting Service	**MoF**	Ministry of Finance (of Bhutan)
BSB	Bhutan Standard Bureau	**Nu.**	Ngultrum (Bhutanese currency)
BTS	Bhutan Standards	**PCWG**	Project Coordination Working Group
CAD	Computer Added Design	**PD**	Programme Director
CEO	Chief Executive Officer	**PDM**	Project Design Matrix
CHS	Central Hiring Services	**PO**	Plan of Operation
CPF	Counterpart Fund of 2KR	**PMU**	Project Management Unit
DoA	Department of Agriculture	**RAMC**	Regional Agriculture machinery Centre
FAO	(United Nations) Food and Agriculture Organization	**RCSC**	Royal Civil Service Commission
FMCL	Farm Machinery Corporation Limited	**RD**	Record of Discussion
FMSD	Farm Mechanization Service Department	**RGoB**	Royal Government of Bhutan
FSAPP	(World Bank) Food Security and Agriculture Productivity Project	**RFMCL**	Regional Farm Machinery Corporation Limited
FY	Fiscal Year	**SFaMP**	Strengthening Farm mechanization Project
FYP	Five Year Plan	**SMEs**	Small and Medium-sized Enterprises
GPS	Global Positioning System	**SOP**	Standard Operating Procedures
GPT	Geog Power Tiller	**STD**	Standards
HP	Horsepower	**TC**	Test Codes
HQs	Headquarters	**TC-08**	Technical Committee No.8 of BSB
HRD	Human Resources Development	**2KR**	Second Kennedy Round
HS	Hiring Services		

Table of Contents

I. Basic Information of the Project

1. Country

The Kingdom of Bhutan

2. Title of the Project

The Strengthening Farm Mechanization Project – Phase II ("SFaMP2" as a short name)

3. Duration of the Project

Planned: August 2014 – August 2017 & **Actual:** August 2014 – August 2018

Duration of the Project was extended for one year by considering the separation of a counterpart organization into two organizations; Agriculture Machinery Centre (AMC) and Farm Machinery Corporation Limited (FMCL), which is a newly established state own enterprise in August 2016 carrying out all the commercial activity which were earlier done by AMC.

4. Background

(The followings are cited from the Record of Discussion (RD) signed on 22nd April 2014)

Agriculture is the prime industry of the Kingdom of Bhutan. Agriculture production contributes to approximately 16% of the country's Gross Domestic Products (GDP) in 2011, and approximately 60% of the national population relies on agriculture for their living in 2012; on the other hand, farming productivity is generally low, mainly due to steep geographic terrain and the self-sufficiency ratio of rice, which is staple food in this country, is only about fifty percent achieved. Besides, rural to urban migration of young people and aging in rural areas have been becoming serious recently and enhancing efficiency of farming is urgently required.

The Royal Government of Bhutan has promoted farm mechanization in order to tackle those issues and Agriculture Machinery Centre (AMC) has been facilitating the supply of farm machinery as well as back-up service delivery after sales; however, those activities have still been heavily dependent on power tillers supported by "the Japanese Grant Assistance for the Food Security Project for Underprivileged Farmers" (2KR).

Under such situation, the Royal Government of Bhutan (RGoB) in collaboration with Japan international Cooperation Agency (JICA) implemented "Strengthening Farm Mechanization Project" (June 2008 to May 2011) that aims at strengthening the capacity of AMC toward sustainable farm mechanization. As a result of this project, farmer support service is improved through trainings for extension officers and farmers and through introduction of Farmer Support Service Units (FSSUs) to reach support services in rural areas. Test codes and prototypes of several machines were also developed in this Project.

AMC is currently working for developing quality and safety standards for farm machinery, which are based on test codes developed in the Project above. Considering sustainable farm mechanization, it will contribute to assure and control the quality of farm machinery that is to be imported to the country.

Under 11th Five Year Plan, Ministry of Agriculture and Forests (MoAF) aims at improving cereal production for food self-sufficiency and give high development priority on the Southern Belts, especially on Sarpang District which has favourable terrain and good climate conditions with easy access to market. Recognizing the potential of this area, MoAF plans to promote farm mechanization with irrigation development, such as Taklai Irrigation Rehabilitation Project supported by Japanese Grant Assistance.

Based on the background above, RGoB had requested the Government of Japan for a technical cooperation project named "Promoting Appropriate Agriculture Mechanization Systems Project

(Strengthening Farm Mechanization Project Phase II)" that aims at making farmers have better access to farm machinery through quality and security standardization as well as through enhancing AMC's capacity of research and development for farm mechanization in Sarpang District.

5. Overall Goal and Project Purpose

Overall Goal: Farmers have better access to appropriate farm machinery in Bhutan

Project Purpose: Farmers have better access to appropriate farm machinery in the sites

6. Implementing Agency

a) Agriculture Machinery Centre (AMC), Department of Agriculture, Ministry of Agriculture and Forests

b) Farm Machinery Corporation Limited (FMCL), Ministry of Finance

The inclusion of FMCL into the implementing agency was proposed and approved at the second JCC meeting held on 31st August 2016.

II. Results of the Project

1. Results of the Project

1.1 Input by the Japanese side

1.1.1 Amount of Input by the Japanese side

Financial input amount for the whole project period is estimated at approximately 260 million Japanese Yen, which is equivalent to approximately 153 million Bhutanese Ngultrum (BTN 1.00 = JPY 1.71 as of July 2018).

1.1.2 Dispatch of Experts

In the RD, the following fields of experts were mentioned but no clear duration of their activity because it was supposed to determine the necessary fields and duration of short-term experts after the commencement of the Project.

Table 1: Dispatch of Japanese Expert (Planned)

Fields of assignment	Duration
a) Long-term expert	
1. Chief Advisor / Test & Evaluation of Agricultural Machinery	One (3 years)
2. Project Coordinator / Agricultural machinery	One (3 years)
b) Short-term expert	
Hiring services, etc.	Unfixed

Long-term experts were assigned as per the project duration which was extended for one year

from August 2017. Short-term experts' dispatch were determined by the long-term experts based on the annual requirements. The actual dispatch is shown in the table below as well as Annex 1.

Table 2: Dispatch of Japanese Expert (Actual)

Sr. No.	Title of Assignment Background of dispatch	Duration
a) Long-term expert		
1	*Chief Advisor / Test & Evaluation of Agricultural Machinery*	
	As planned	One (2 years & 3 months)
2	*Chief Advisor / Agricultural Machinery*	
	Assigned during the extended project period	One (1 year)
3	*Project Coordinator / Agricultural machinery*	
	As planned	One (3 years)
4	*Project Coordinator / Monitoring*	
	Assigned during the extended project period	One (1 year & 3 months)
b) Short-term expert		
1	*Monitoring and Evaluation*	
	Result of Human Resource Development needs assessment showed a weakness of monitoring capacity of counterparts	One (30 days x 2 times) in JFY 2015
2	*Capacity Assessment of State owned enterprises*	
	Corresponding to the establishment of FMCL in order to assess its capacity	One (50 days) in JFY 2016
3	*Die mould making*	
	Result of problem analysis of hiring services showed a necessity for improving production of fast-running spare parts of hiring machines	One (30 days x 2 times) in JFY 2015
4	*Die mould making / Production Management*	
	Continuation of the above "Die mould making" and for improvement of production capacity	One (90 days x 7 times) in JFY 2016 - 2018
5	*Agricultural machine Research & Development Methods*	
	Un-covered areas by long-term experts (post-harvest machinery)	One (30 days x 2 times) in JFY 2016 and 2017
6	*Machine Test & Evaluation*	
	Supplementary dispatch after a long-term expert's return to Japan	One (30 days) in JFY 2017
7	*Agricultural machine Research & Development Methods / Machine Test & Evaluation*	
	Supplementary dispatch after a long-term expert's return to Japan. Also as finalising the past expert's dispatches	One (3 weeks) in JFY 2018

1.1.3 Training

It was initially planned only as "Agricultural Machinery", etc. During the project duration, it was planned annually and the following counterparts attended trainings mentioned below. Effects in the project activity after the training programme are mentioned in respective sections and the detailed training course and progress of action plans of each training participants are mentioned in the ANNEX 1.

Table 3: Training Programme in Japan

Title of training programme	Duration	Participants
Output 1 & 2 (Farm machine standardization and test)		
Enhancing SMEs support capacity through learning Quality and Productivity Improvement (KAIZEN)	05/Oct/2016–03/Nov/2016	1 staff (AMCS)
Agricultural Machinery testing & Evaluation Methods	05/Feb/2018-09/Mar/2018	2 staff (AMCS)
Output 3 (Farm machine Research & Development)		
Public-Private Joint Cooperation Training on Development and Extension of Agricultural Machinery for Small-Scale Farmers with Japanese Monozukuri Style" (JFY 2014)	09/Mar/2015-06/Nov/2015	1 staff (AMRS / Former AMDC)
Development of Farm machinery for small scale farmers (JFY 2015)	06/Mar/2016-12/Nov/2016	2 staff (AMRS)
Development and Improvement of Agricultural Machinery for small scale farmers (JFY 2016)	05/Mar/2017-30/Sep/2017	2 staff (AMRS and RAMC)
Output 4 (Hiring service model)		
Sustainable Rural Development by Biomass	21/Sep/2016-03Dec/2016	1 staff (Geog hiring & farming / FMCL)
Enhancing SMEs support capacity through learning Quality and Productivity Improvement(KAIZEN)	27/Sep/2017-26/Oct/2017	1 staff (production unit / FMCL)
ICT for Agriculture Information Use (JFY 2016)	20/Feb/2017-26/May/2017	1 staff (store section/ FMCL)
ICT for Agriculture Information Use (JFY 2017)	18/Feb/2018-25/May/2018	1 staff (store section/ FMCL)

Apart from the training programme in Japan, the following study programme was implemented by visiting the third countries.

Table 4: Technical discussion & Study Programme in Third Country

Title of training programme (Country)	Duration	Participants
Output 1, 3 & 4		
Technical Discussion on YANMAR power tiller	22 Jan – 31	1 staff (IQCC), 1 staff (AMTC),

engine (TF110ML) model and spare parts testing (Indonesia)	Jan 2016 (10 days)	2 staff (AMDC), 1 staff (RAMC)
Output 3		
Technical Discussion on large Cardamom curing methods in India (Sikkim, India)	19 Apr – 27 Apr 2017 (9 days)	2 staff (AMDC), 1 staff (RAMC). 1 staff (NPHC)
Output 3 & 4		
Preparatory visit for formulating third country study programme (Sri Lanka)	14 Nov – 25 Nov 2015 (11 days)	1 staff (PD of AMC), and 1 Japanese Expert
Study Tour in Sri Lanka (Sri Lanka)	06 Feb – 15 Feb 2016 (10 days)	1 staff (AMDC), 1 staff (AMTC), 6 staff (RAMC), 1 staff (Admin), 1 Japanese Expert
Output 4		
Technical Discussion on Reaper spare parts in India (India)	14 Sep – 21 Sep 2015	2 staff (AMSC), 1 staff (IQCC), 1 staff (Admin),

1.1.4 Equipment provision

According to the RD, the equipment were supposed to be determined after the long-term experts' arrival. At the beginning of the Project, it was planned to procure some measuring equipment (for output 1, 2 & 3) and sample machines (for output 3). After identified spare parts problems of hiring machines (for output 4), additional procurement plan was prepared along with short-term experts such as fabrication machines and special service tools.

Finally a total of 19 shipments of equipment with a value of approximately 59 million Japanese Yen were procured from Japan. On the other hand, commonly available items such as hand tools or workshop equipment have domestically been procured in Bhutan as much as possible. The detailed list of equipment is in the ANNEX 1.

1.1.5 Overseas activities cost

Japanese side provided the overseas activity cost which cannot be borne by Bhutanese side only, such as experts' direct activity cost, materials & equipment, project vehicle expenses and so on. The detailed list is in the Annex 1.

Table 5: Amount of Overseas activity cost

Japanese Financial year (from April to March)					Total Amount
FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	
1,330,231	4,391,126	4,609,427	4,409,198	906,460	Nu. 15,646,442
0	14,695	0	0	0	USD 14,695

1.2 Input by the Bhutanese side

1.2.1 Counterpart assignment

There was no clear plan of counterpart assignment at the beginning of the Project. According to job responsibility of AMC's sections who are supposed to be involved in each Project output activity, responsible components were determined in October 2014 and staff of each component was nominated as follows. Since there are significant changes of organizational structure and sections in 2016, the detail of individual counterpart's changes can be referred to the List of counterpart in ANNEX 1.

Table 6: Counterpart assignment

Components of project	Responsible Sections / Organizations	
	October 2014 – June 2016	July 2016 – August 2018
Output 1	Inspection and Quality Control Centre (IQCC) / AMC	Agriculture machinery Certification Section (AMCS) / AMC
Output 2		
Output 3	Agriculture Machinery Development Centre (AMDC) / AMC	Agriculture Machinery Research Section (AMRS) / AMC
Output 4	Hiring Unit, Regional Agriculture Machinery Centres (RAMCs), AMSC (spare parts supply), AMDC (production of spare parts), AMTC (training of operators) / AMC	Farm Mechanization Service Department (FMSD), Regional Farm Machinery Corporation Limited (RFMCL), Procurement section, Main store Production unit / FMCL
Overall Coordination	AMC Administrative section, Monitoring & Evaluation Unit / AMC	AMC & FMCL Administration sections, M&E sections & focal persons who are nominated for PCWG (since June 2017)

1.2.2 Provision of offices

Project office space was allocated on the 1st floor of AMRS building from the beginning of the Project period. It was shifted to other room on the same building in 2017. Additional working spaces in AMCS and FMSD (in FMCL) were also provided for the convenience of Japanese experts.

Some facilities of these work spaces such as electricity, water, telephone (landline) and internet (in FMCL) have been arranged by the implementing agencies.

1.2.3 Other items borne by the Bhutanese side

Expenses related to the project activities such as overall running cost of the implementing agencies including counterpart personnel's salary and travelling allowances, materials for machine test & research, vehicle expenses (excluding the project vehicle), office expenses have been borne by the implementing agencies.

Since it is difficult to separate the project expenses from the annual budget amount of implementing agencies, the amount of annual overall expenses is mentioned in the table below.

Table 7: Amount of Implementing Agencies' annual expenditure & budget (overall)

Budget Items	Bhutanese Financial year (from July to June)					Total Amount (Nu)
	FY 2014/15 Expenditure	FY 2015/16 Expenditure	FY 2016/17 Budget	FY 2017/18 Budget	FY 2018/19 Budget	
AMC (capital)	23,290,739	50,736,488	9,055,000	976,000	4,316,000	88,374,227
AMC (recurrent)	49,989,192	51,666,761	45,586,000	36,554,000	41,322,000	225,117,953
FMCL (capital)			18,275,000	55,238,647	72,011,902	145,525,549
FMCL(recurrent)			2,000,000	189,218,601	261,725,601	452,944,202
Total	73,279,931	102,403,249	74,916,000	281,987,248	379,375,503	911,961,931

1.3 Activities

1.3.1 Project Management

1.3.1.1 Project Management System

Project Director (in Bhutanese side) has changed three times in the project period. At the beginning of the project, Project Director was an officiating Director General (DG) of the Department of Agriculture (DoA). Then from June 2015 to July 2016, the DG of the DoA was steadily involved as Project Director, but again transferred to a different Ministry. New Director took her place in December 2016 and has continued till now.

The project commenced in August 2014 and the initial Chief Advisor and Project Coordinator were changed in 2017. A short-term expert in Monitoring & Evaluation was dispatched two times in 2014 and 2015 in order to clarify monitoring system of AMC and conducted a basic training in monitoring. As a necessity of further strengthening the capacity of monitoring, the second Project Coordinator has an assignment of monitoring.

Based upon assignment of Project Manager of SFaMP2 dated on 1 June 2017, SFaMP2 reorganized the management structure of Project in order to reinforce the management of Project and monitoring of activity toward the completion of cooperation period in August 2018.

1.3.1.2 Project Management Unit (PMU)

For the above purpose, the Project Management Unit (PMU) was set-up dated on 30 June 2017 which is consists of Project Manager, FMCL CEO, Heads of working group, JICA Expert team and other related staff. The function of PMU is to monitor the progress of activities on Project Design Matrix (PDM) and Plan of Operation (PO). PMU meeting was presided by Project Manager to receive the reports and plan from each output. The meeting was held a total of five (5) times during the extension period.

Concept Diagram of Monitoring System for SFaMP2

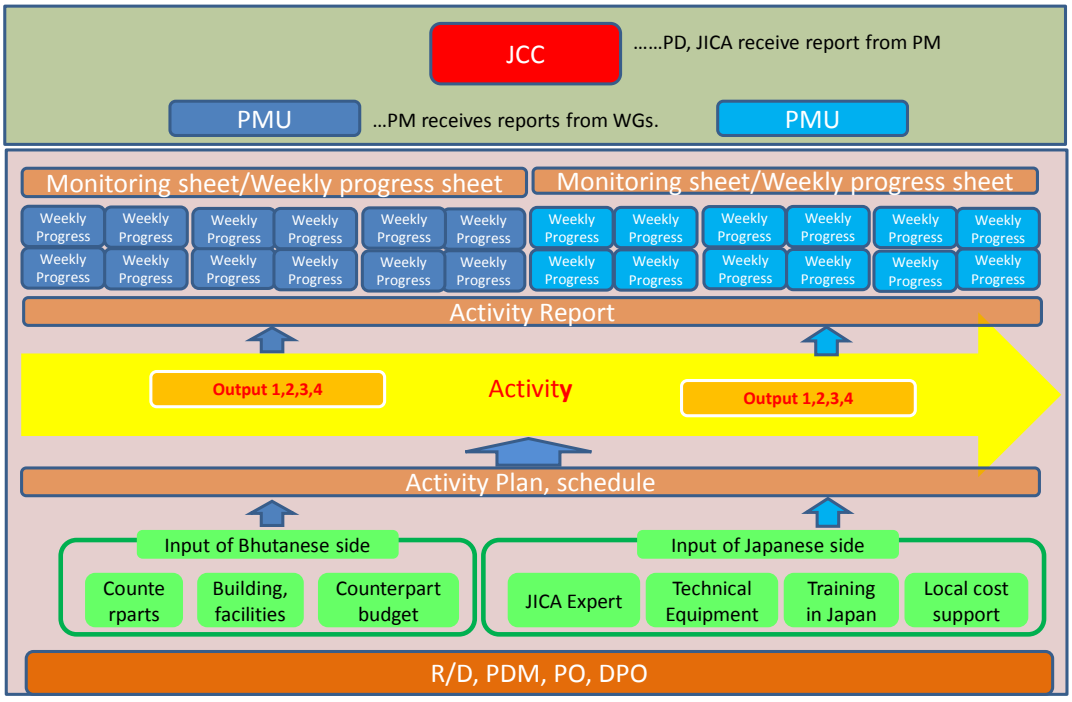


Figure 1: Concept diagram of monitoring systems for SFaMP2

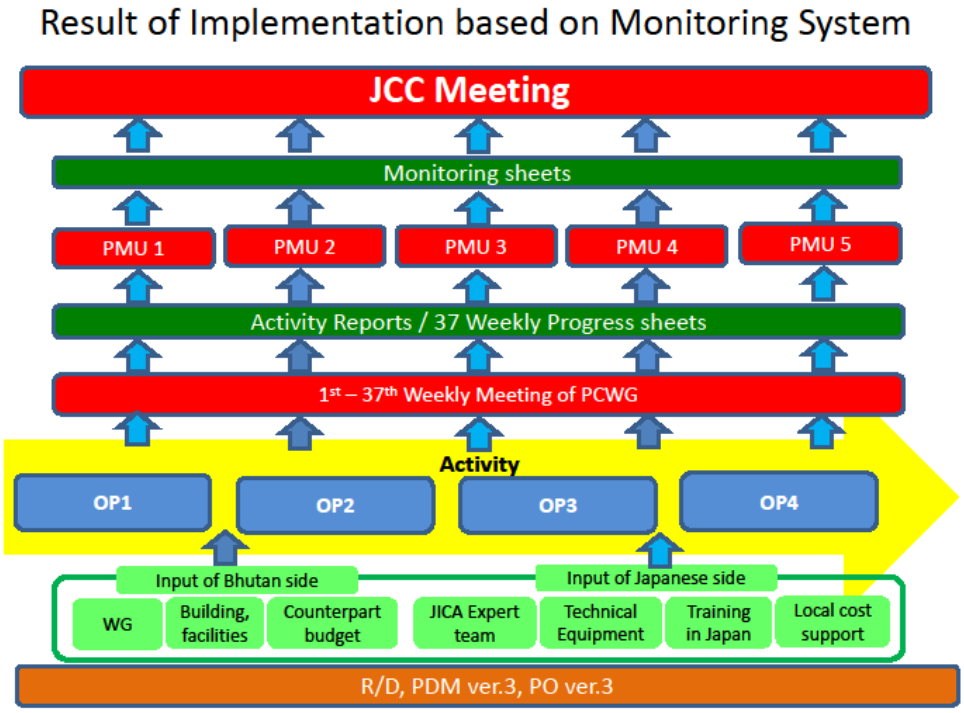


Figure 2: Result for Implementation based on Monitoring System

1.3.1.3 Project Coordination Working Group (PCWG)

With relation to the reorganization, the Project Coordination Working Group (PCWG) was also set-up dated on 14 July 2017 for the purpose to assist the Project manager to monitor the Project activities based upon PDM and PO. The PCWG consists of Administrative Officer (ADM) of AMC and FMCL, staff members and monitoring focal person of AMC, JICA Project Coordinator and Project assistant, a total of nine (9) members. The PCWG held the weekly meeting at Project office to share the progress of each output and discuss necessary coordination for further progress. The meeting were held a total of thirty nine (39) times in the extension period.

1.3.1.4 Joint Coordinating Committee (JCC)

Joint Coordinating Committee meeting was planned to be held once in a year and it was actually held a total of five time in four years of the project period. Date and main discussion points were mentioned in the table below.

Table 8: Record of JCC meeting

	Plan	Actual		Main discussion points (except for regular agenda)
		Date	Venue	
0	August 2014	N/A		• Agreed with JICA Bhutan office that it was not necessary to hold because Chief Advisor's arrival was in October 2014 and no major issues to discuss immediately.
1	August 2015	5/October 2015	DoA, Thimphu	• Progress update • Modification of PDM because of indicators setting.
2	August 2016	31/August 2016	DoA, Thimphu	• Regular progress update • Proposal for extension of project duration and inclusion of FMCL as another counterpart organization • Restriction of work permit more than 3 years
3	August 2017	17/April 2017	AMC, Paro	• Nothing special except for the regular progress update and some technical discussions
4		9/October 2017	AMC, Paro	• Regular progress update • Projection of achieving project targets
5		10/August 2018	AMC, Paro	• Finalisation of project achievement and completion • Confirmation of way forward after the project

	
First JCC at DoA conference hall in 2015	Third JCC at AMC in 2017

Figures 3: Photos of JCC meetings

1.3.1.5 Submission of Project Monitoring Sheet

Project Monitoring Sheet was supposed to be produced by the project team and submitted to JICA Bhutan Office every six months as official progress report to the Ministry of Agriculture and forests in Bhutanese side and JICA Head Quarter in Japanese side.

It was actually submitted a total of six times. A little different pf submission date from the plan was because of time consuming for finalising it among project team in Bhutan. The progress information of the Weekly Progress Information Sheet and Evaluation Grid (reflected to the Section 2.1.1 and 2.2.1 on this report) were referred into the Monitoring Sheet as the periodical summary of the Progress of Project.

Table 9: Record of submission of Project Monitoring Sheet

Plan		Date of Actual submission	
1	August / 2014		No submission but only documents compilation by the Project team
2	February / 2015	1	20 / April / 2015
3	August / 2015	2	30 / October / 2015
4	February / 2016	3	30 / May / 2016
5	August / 2016		Submission was not needed because of JICA mission's physical visit Bhutan
6	February / 2017	4	20 / February / 2017
	No plan (extended periods)	5	20 / September / 2017
		6	28 / February / 2018

1.3.2 Activities by Output

1.3.2.1 Output 1

Planned activity of output 1 is given in the flowing table which was described in the PDM

Table 10: Planned activities of output 1

Output	Planned Activities
Output 1: Objective basis for farm machinery selection are introduced	1-1 Draft test codes and standards 1-2 Submit the draft test codes and standards to BSB 1-3 Give the technical advice to the BSB technical committee activities for certification of farm machinery standards

Actual activity was done along with the plan. Here the detailed activity is given.

[Activity 1-1: Draft test codes and standards]

Following test codes and standards (basic requirement) of farm machines were drafted by AMCS staff under guidance from long-term Japanese experts and short-term Japanese experts of the Project.

Table 11: Drafted standards and Focal person in AMCS

SL No	Test code & Standard of farm machines	Status	Focal Persons
1	Power tiller (10.5 – 14HP): Basic requirement and test code	Drafted	All AMCS Staff
2	Walk behind power reaper: Basic Requirement and test code	Drafted	Chimmi Dema
3	Rice mill: Basic requirement and test code	Drafted	Sangay Choden
4	Cereal flaking machine: Basic requirement and test code	Drafted	Jigme
5	Oil expeller: Basic requirement and test code	Drafted	Uygen Dorji
6	Mini tiller: Basic requirement and test code	Drafted	Sangay Lhendup

Aside from test codes and standards, the procedures for operation test, verification of structure, safety test and handling test, other procedures of farm machinery has been developed to carry out the test.

Standard discussion at BSB (TC-08)

Chemical Composition test of machine parts

Figure 4: Photos of standards development activities-1

[Activity 1-2: Submit the draft test codes and standards to BSB]

Following test codes and standards were submitted to Bhutan Standard Bureau for further deliberation and endorsement as a Bhutan Standards (BTS). The first standard of power tiller (10.5 – 14 HP) was actually drafted and submitted to BSB before the project period, however, it was not so mature and required a lot of improvement because of a lack of knowledge and experience in BSB technical committee members. Then it was improved with technical advices of Japanese experts and it was resubmitted to BSB in 2015.

Table 12: Submitted Standards (STD and Test Codes (TC)

SL No	STD & TC of Farm machines	Status	Date of submission	Status of endorsement	BSB approved documents
1	Power tiller (10.5 – 14HP)	Submitted	Sep/2015 (Resubmission)	Endorsed at BSB board	STD: BTS 34:2017 TC: BTS 35:2018
2	Walk behind power reaper	Submitted	09/Aug/2016	Endorsed at BSB board	STD: BTS36:2018 TC: BTS 37:2018
3	Rice mill	Submitted	09/Aug/2016	Endorsed at Ministry level	STD: BTS38:2018 TC: BTS 39:2018
4	Cereal flaking machine	Submitted	30/Mar/2017	Endorsed at Ministry level	(go for a wide circulation)
5	Mini tiller	Submitted	31/Aug/2017	Endorsed at Ministry level	(go for a wide circulation)
6	Oil expeller	Submitted	15/Sep/2017	Endorsed at Ministry level	(go for a wide circulation)

All submitted test codes and standards have deliberated at Technical Committee -08 (TC-08) under the Mechanical Engineering Committee of BSB. One of the important aspects in the standards of rice mill, cereal flaking machine and oil expeller is that shall be made from food grade material for the food contact parts. It has been clarified with a large numbers of reference documents and incorporated into the standard documents by a team work of the section staff and a Japanese expert.

[Activity 1-3: Give the technical advice to the BSB technical committee activities for certification of farm machinery standards]

The first TC-08 meeting was held on 6th September 2013 (before the Project period) and during the Project period, eleven (11) times of TC-08 meetings were conducted by BSB. In such forum, following technical advisory and support from Japanese experts to TC-08 members and sub-committee/working group are as follows.

i. It was advised how to make criteria of standards and testing procedures

ii. Diesel engine power reduction (30%) means which the engine power shall not be lower by 30% in AMC testing conditions as compared to the manufacturers' specifications
iii. Noise level (100 db (A)) as per Health Hazard Occupational Regulation
iv. Vibration Level (15 m/s^2)
v. Rice milling recovery index[1] (Rice mill) as per the test data analysis of AMC
vi. Flaking recovery index (Cereal flaking machine) as per the test data analysis of AMC
vii. Oil recovery index (Oil Expeller) as per the test data analysis of AMC
viii. Total grain loss (Walk behind Power Reaper) as per the test data analysis of AMC
ix. Slippage distance should be less than (>) 5m when the brake is applied (Power tiller)
x. The parking brake was carried out at 18% gradient or 10.2 degree slope

Technical advices on how to make criteria of standards and procedures power reaper were given to AMC/IQCC staff for verification of structure, accuracy test (reference test), capacity test, noise level test and handling test.

Technical advices on how to make criteria of standards and procedures rice mill were given to AMC/IQCC staff for verification of structure, recovery test, capacity test, noise level test, handling test and laboratory test (reference test).

Technical advices on how to make criteria of standards and procedures of cereal flaking machine were given to AMCS staff for verification of structure, recovery test, capacity test, noise level test, handling test and laboratory test (reference test).

Technical advices on how to make criteria of standards and procedures of oil mill were given to AMCS staff for verification of structure, recovery test, capacity test, noise level test, handling test and laboratory test (reference test).

Technical advices on how to make criteria of standards and procedures for petrol engine power, capacity test and noise level test of mini tiller.

Technical advices has provided from a short-term expert on the engine performance curve for petrol engine in the month of November 2017.

	
Engine test with Dynamometer	Sound level test

[1] Milling Recovery Index: It is the total milling recovery from the test rice mill over the laboratory rice mill (Bhutan Standard BTS 38).

	
Service brake test	Waterproof test

Figure 5: Photos of standards development activities-2

1.3.2.2 Output 2

Planned activity of output 2 is given in the flowing table which was described in the PDM

Table 13: Planned activities of output 2

Output	Planned Activities
Output 2: Awareness of farm machinery safety and quality is enhanced	2-1 Apply the developed test codes and standards 2-2 Provide technical advice for machines as necessary 2-3 Conduct awareness programs on developed standards (private sector, farmers and extension officers, etc.)

Actual activity was done along with the plan. Here the detailed activity is given.

[Activity 2-1: Apply the developed test codes and standards]

Followings are the applications of developed test codes and standards submitted to BSB.

Table 14: Applied Test Items in each type of farm machinery

SL No	Test code & Standard	Test items	Application	Result sheet & Report
1	Power tiller: Basic requirement (Part 1) - BTS 34:2017	1.Verification of structure 2.Safety test 3.Capacity test (operation test) 4.Engine test (operation test) 5.Handling test 6.Noise test 7.Vibration test 8.Service brake test 9.Parking brake test 10.Water proof test	-KUBOTA RT125 -YANMAR YZC-D -SIAM Kubota PEM 125DI	Compiled: 3 test results and 3 reports
2	Power tiller: Test code (Part 2) - BTS 35:2017			

3	Walk behind power reaper: Basic requirement (Part 1) - BTS 36:2018	1.Verification of structure 2.Safety test 3.Accuracy test (operation test) 4.Capacity test (operation test) 5.Vibration test 6.Noise test 7.Handling test	-YANMAR YAP 120 -INGS-90(SWDD reaper)	Compiled:-2 test results and 2 reports
4	Walk behind power reaper: Test code (Part 2) - BTS 37:2018			
5	Rice mill: Basic requirement (Part 1)	1.Verification of structure 2.Safety test 3. Recovery test (operation test) 4.Capacity test (operation test) 5.Noise test 6.Handling test		
6	Rice mill: Test code (Part 2)			
7	Oil Expeller: Basic requirement (Part 1)	1.Verification of structure 2.Safety test 3.Recovery test (operation test) 4.Capacity test (operation test) 5.Handling test 6.Noise test 7.Duration test	-DK-119 (KOSS oil expeller)	Compiled: 2 (Test result and report)
8	Oil Expeller: Test code (Part 2)			
9	Cereal Flaking Machine: Basic requirement (Part 1)	1.Verification of structure 2.Safety test 3.Recovery test (operation test) 4.Capacity test (operation test) 5.Noise test 6.Handling test		
10	Cereal Flaking Machine: Test code (Part 2)			
11	Mini tiller Basic requirement (Part 1)	1.Verification of structure 2.Safety test 3.Capacity test 4.Engine test 5.Noise test 6.Vibration test 7.Handling test 8.Water proof test	-MM658 (Mitsubishi)	2 (Test result and report)
12	Mini tiller Test code (Part 2)			
Total		44 test items	7 models of	14 test results

		machines were tested	and reports adopted

There are 44 test items in total which have applied during the test of farm machinery. However, some of the tests are replications of same test items. These were carried out as per the standard and test codes drafted which needs confirmation in actual field wherein data collection and analysis have been done.

Example:

Some of test item like verification of structure and specifications of tested machines as follows:

Rice Mill:

i) Model: **Raja No.4**
ii) Type: **Dual purpose type**
iii) Specified capacity: **475kg/hr**
iv) Driven method: **Flat belt**
v) Prime mover: **Electric motor**
vi) Rated power: **5.5 KW/1491 rpm**

One of the applications from drafted test code and standard, the section has tested in the field and laboratory and produced AMC level test reports for;

i) Medium Size Power Tiller (MITSUBISHI MS88A)
ii) Power reaper (Vijay VVPR -01)
iii) Power reaper (TNS, 4S -120)
iv) Rice mill (Raja No. 4)
v) Power tiller (KUBOTA RT125)
vi) Power tiller (YANMAR YZC–D)
vii) Table oil mill
viii) Four bolt oil mill
ix) Six bolt oil mill
x) Indian corn flake machine
xi) Kama mini tiller
xii) MITSUBISHI mini tiller (MM658A)
xiii) YANMAR mini tiller (YG85)
xiv) Karma One Stop Shop's rice mill
xv) Karma One Stop Shop's mini oil mill

The test reports and test result sheets has been produced based on Bhutan Standard and Ministry level standard for nine farm machinery namely;

i) KUBOTA power tiller (RT125)

ii) YANMAR power tiller (YZC-D)
iii) Chinese power Reaper
iv) YANMAR reaper
v) Mini oil mill machines
vi) Karma One stop Shop's rice mill
vii) MITSUBISHI mini tiller
viii) SIAM KUBOTA power tiller
ix) Raja rice mill.

	
Verification of structure (Power Tiller)	Walk behind Power Reaper Test

Figure 6: Photos of machine test activities

[Activity **2-2: Provide technical advice for machines as necessary]**

During the implementation of National and Ministry level test codes and standards, the machines which do not meet the minimum requirement, following technical and recommendations were advised to the machine suppliers, who appraise for the test.

i) Technical issues and recommendation report of INGS-90 model, walk behind power reaper was shared to Sonam Wangchuk Drongphen Dealer (Private Firm- Test appraise) and recommended to modify and change for applying protection covers to moving parts such as chain sprockets based on the minimum requirement (Standard))
ii) Similarly for DK-119 model oil expeller supplied by Karma One Stop Shop (Private Firm) was requested to modify and change for pasting caution labels in either English or Dzongkhag as per the minimum requirement (Standard))

Field test of different power reapers were conducted for developing the test codes and standard in future. Handling test of micro-power tiller was conducted. The technical advised has been provided on the power reapers, micro-tiller, electric motor, oil mill, cornflake making machines and motor starter.

The technical advices was given on the calibration of different laboratory equipment such as measuring cylinders, steel cup, electronic balance, steel scale, steel tape, Fibre glass tape, electronic digital calliper, Vernier-calliper, micrometre. To develop the application forms for

testing of farm machinery was advised by project expert and Ministry of Agriculture and Forests. Thus, it was completed and implementation of testing has been carried out.

	
Calibration of Measuring tools	Mini Power Tiller Test

Figure 7: Photos of other machine test activities

[Activity 2-3: Conduct awareness programs on developed standards (private sector, farmers and extension officers, etc.)]

Within the project period, following awareness were made;

i) General awareness to Private Entrepreneurs to **"appraise for test with available test code and standard"** in Bhutan Broadcasting Service

ii) General awareness on **"test codes and standard of power tiller"** to farmers, Extension officers and private Entrepreneur were commenced in **AMC/AMCS**

iii) General awareness on **"Farm Machinery Standard"** to Private Entrepreneur in consultation with Bhutan Standard Bureau was commenced.

iv) Awareness on endorsed and satisfactory result after implementation of test code and standard was commenced in **"Bhutan Broadcasting Service"** for YANMAR power tiller (YZC-D model) and DK-119 oil Expeller.

v) Safety pamphlet (3,500 copies) for safe use of power tiller was developed, printed in March 2015 and distributed to divisions (extension officers, farmers, private sectors) and created awareness programs to RAMCs staff.

vi) Awareness was conducted or created through the means of surveyed the trainees (farmers) on the safety, performance and affordability (price), durability prior and end of the training at Agriculture Machinery Training Centre.

vii) The field test result on service brake test of different power tillers was also presented in the technical session of AMC annual meeting in 2015.

viii) The field test result on service brake test, operation test, noise test, etc. of different power tillers was also presented in the technical session of AMC's mid-term review meeting from 19th to 21st January 2016.

ix) An awareness workshop on **"Discussion and Awareness on Farm Machinery Standard (Power Tiller 10.5 – 14 HP)"** was conducted on 24th and 25th December 2015 with the following mandates:

- ✧ To familiarize core stakeholders of standardization of farm machines with the testing facilities and methodology adapted by AMC/IQCC. The test includes engine, safety confirmation, noise and parking brake test, service brake test and waterproof test.
- ✧ To build co-linkages with other enterprises and stakeholders.

x) 1000 numbers of both wall-type and desk calendars were produced in 2016 as awareness tools for safety & quality of farm machine and distributed to stakeholders.

xi) The formats of the test result sheet were prepared which to be published at the AMC website[2] for the KUBOTA RT 125 and YANMAR YZC – D.

xii) AMC web site was renewed because the earlier one was static page and it was difficult to maintain and not possible to set an access counter. Since AMC planned to publish the machine test result through web site in future, this renewal was a part of preparation for it.

xiii) Safety awareness programme were continued as a part of training programme of AMTS and regional AMC from 2016.

xiv) Vibration test result and working procedure were presented to AMC staff during the mid-term review meeting of AMC (from 11th to 13th January 2017) with the mandate to familiarize the usage of the equipment.

xv) Result of calibration and working procedure of Opacimeter (smoke meter) under technical guidance from a long-term expert was presented during the mid-term review meeting technical session in January 2018.

xvi) A day long awareness and consultative discussion on "Farm Machinery Standards and Implementation Strategy" to the public and private firms was carried out in Paro on the date of 21st June 2017.

xvii) Also the consultation discussions were carried with individual private firms who didn't attend the above-mentioned national awareness and the consultative discussion held in June 2017. Most private firms appreciated such approaches of standardization and expressed their interest in bringing their sales items to the test in AMC, and now standard testing procedure has been confirmed and agreed.

xviii) Furthermore on 28th and 29th August 2017 AMC announced to public and private firms of farm machinery through the media (TV) that AMC was inviting them to test their machine based on the standard available in AMC. AMC announced end-users, especially farmers, to buy machines which are tested by AMC, through the media (BBS on TV) on 14th and 15th September 2017 in both Dzongkha and English.

xix) The safety awareness and training were given to trainees of Technical Training Institutes and also given safety awareness to trainees of farmers. Effects of the training programme was evaluated through a questionnaire survey and the result showed the majority of respondents had become aware about farm machinery safety and quality, for example

[2] AMC website: http://www.amc.gov.bt/index.php?r=type/download&id=13

importance of safety devises (ex. guards, net) to be properly equipped in the machinery.

xx) Presentation about machine test codes and standards was given to participants of AMC exhibition held on 31st May 2018.

Awareness on safety at BBS

Explanation of engine test at Exhibition

Figure 8: Photos of standards awareness activities

1.3.2.3 Output 3

Planned activity of output 3 is given in the flowing table which was described in the PDM

Table 15: Planned activities of output 3

Output	Planned Activities
Output 3: Machine performances and operation patterns are improved in the sites	3-1 Analyse needs of machinery improvement for rice production in Sarpang 3-2 Prioritize the needs to be dealt with 3-3 Improve the performance of machinery to meet the needs 3-4 Verify improved field performance and operation patterns of machinery

Actual activity was done along with the plan. Here the detailed activity is given.

[Activity 3-1: Analyse needs of machinery improvement for rice production in Sarpang]

Later changed to **[Activity 3-1: Analyse needs of machinery improvement]**

A team, consists of research section head and Japanese experts, visited Paro, Wandue, Tsirang and Sarpang in November 2014 for verifying ground situations and research needs. It adopted the need to work on mechanised area coverage and cost of cultivation of rice production for Paro, Punakha and Sarpang which provides a basis for future planning in the project activities. The team also felt the need to work on potato digger, harvesting options for small and stiff terrain terrace and improvement in the cardamom drying.

Each topic of research activities was updated and needs were analysed at AMC's Mid-term review meeting in January and Annual review meeting in July every year.

Comprehensive cost of cultivation of rice production was studied by conducting survey in Paro

for western region, Punakha for central region and Sarpang for southern region respectively in 2015. The report was generated for Paro and Sarpang by 2016 itself. For the Punakha region it was completed by December 2017 due to data punching errors. Now these document reports shall be a basis for interventions especially from the cost reduction alternatives.

AMC staff and Japanese expert also worked on the farm mechanization need assessment survey for the whole country from 2017. This approach and obtained results shall be used as a tool every year for proper planning and also to draw farm mechanization programme in the 12th Five Year Plan. The survey questionnaire had been developed after series of thorough discussion in AMC. The report which is now ready for printing as of June 20 2018 shall be a guide for the 12th plan activities planning.

[Activity 3-2: Prioritize the needs to be dealt with]

The prioritizing of the research activities has already been done earlier and verified at Mid-term Review meeting of AMC in January 2017. At least three research technologies which shall improve field efficiency executed under the project guidance are

i) Modified harvesting conveyance and harvesting through hedge cutter
ii) Improved off grid cardamom dryer
iii) Potato Digger implement attached with power tiller

The other research technology generation activities done technically and also through the counterpart training in Japan and subsequent implementation through action plans are;

iv) Stone picker equipment to be attached with tractor
v) Drum seeder technology for direct seeding for paddy cultivation
vi) Corn sheller
vii) Plough, fingers, shears modifications
viii) Improved wheat thresher
ix) Improved buckwheat thresher

A short-term expert for "Agricultural Machinery Research and Development Methods" visited Bhutan from 1st to 20th February 2017 and assessed needs of mechanization especially in post-harvest technology including drying and threshing and shared his findings with AMRS staff during his lecture for 3 days. The same expert visit again in October 2017 to do the follow-up activity of February visit.

[Activity 3-3: Improve the performance of machinery to meet the needs]

Progress of machine development is mentioned below based on the prioritized activity

1) Hedge cutter for high terrain (small rice/wheat harvesting machine):

A few samples had been procured from Japan and a series of comparative tests had been conducted in paddy and also involved farmers on field feedback collections. The result was good and has been compiled and presented in Mid-term technical review meeting of AMC in January

2017. As planned, the final results based on Mid-term technical review meeting have been compiled. A technical discussion of this technology was held at Departmental level at Lemithang, Mongar on 12-14th February 2018 and endorsed. Finally a farm machinery technology display was held at Paro on 31st May 2018. Private sectors, farmers and Agriculture Extension Officers were all invited. Already other sectors under the Department of Agriculture are buying such hedge cutters for distribution on cost sharing basis. They ordered 46 numbers of such hedge cutters. AMC also ordered 10 additional sets for promotional programme. Now AMC released this technology after its successful results.

	
Hedge cutter	Cardamom dryer

Figure 9: Photos of Developed prototypes (Hedge cutter & Cardamom dryer)

2) Improved off grid Cardamom dryer:

AMC installed two sets of improved dryers in 2015, one in Dagana and another in Tsirang with field evaluation and promotions at Dzongkhag level conducted. Farmers showed keen interest in using this technology and AMC with the financial Support of the Project promoted a total of 40 sets in 2016. Also Dagana Dzongkhag through their own funding supported 26 numbers of such improved dryers in Dagana Dzongkhag. Locations of installation are at geog level in Dagana, Tsirang, Chukha, Samtse and other Dzongkhags on cost sharing basis with the farmers. At the same time, data collection and analysis at laboratory level recommended by a short-term expert who visited in February 2017 and AMC conducted the test. A team of AMC staff visited Indian Cardamom Research Institute in May 2017 in order to clarify the internationally recognised quality of dried cardamom as well as collect the latest information of cardamom curing technology. The installation of cardamom dryers, 20 sets from AMC, 20 from the Project and 26 from Dzongkhag budget are all completed and handed over to the farmers after conducting the field day programmes involving many farmers as coordinated by Dzongkhag Agriculture Sector. A technical discussion of this technology was held at Departmental level held at Lemithang, Mongar on 12-14th February 2018 and endorsed. Finally a farm machinery technology display was held at Paro on 31st May 2018. Private sectors, farmers were all invited. Already other sectors under DoA are ordering the improved cardamom dryer for distribution on cost sharing basis. AMC is now supporting as technical advisor and AMC has released this technology after its successful results.

The standard for the cardamom dryer is also drafted and submitted to AMC technical committee for deliberation on 11th June 2018 at ARDC, Bajo meeting.

3) Mechanization in Potato digging (Power tiller type):

Based on the potato digger which was developed by a staff during training at JICA TSUKUBA centre in Japan in 2015, a series of modifications and tests have been conducted. Another digger attachable to the most popular power tiller in Bhutan (KUBOTA 12 HP) was also developed and tested in actual fields in harvesting season in 2016 and 2017.

The tests involving farmers to evaluate the potato digger are all completed. Also the standards for the digger is being drafted and submitted for AMC technical committee deliberation held at ARDC Bajo on 11th June 2018.

A technical discussion of this technology was held at Departmental level at Lemithang, Mongar on 12-14th February 2018 and endorsed. Finally a farm machinery technology display was held at Paro on 31st May 2018 and private sectors and farmers were all invited. Already farmers are coming to avail the samples available with AMC as private sector is planning to produce their product targeting coming harvesting season.

Potato digger for power tiller

Drum seeder

Figure 10: Photos of Developed prototypes (Potato digger & drum seeder)

Again many other technology improvements and modifications have been continued based on the need and as planned in AMC's activities. The details are as follows.

4) Drum seeder

This is not a developed technology by AMC research section but an idea of direct seeding with drum seeder was brought when a team visited Sri Lanka in 2016. A few drum seeder with funds of AMC was procured and tested in some areas in Sarpang Dzongkhag in 2017. Direct seeding practices are now expanded from Sarpang Dzongkhag to other 2 Dzongkhags with a total of 14 locations and these are at the dissemination stage involving key farmers of the areas as of June 2018.

5) Corn sheller:

The farmers' feedback level collection for this technology was completed by Khangma office of AMC and report submitted. A technical discussion of this technology was held at Departmental level at Lemithang, Mongar on 12-14th February 2018 and endorsed. Finally a farm machinery technology display was held at Paro on 31st May 2018 and private sectors and farmers were all invited. The standards for corn sheller were also presented to the AMC technical committee discussion held at Bajo on 11th June 2018. Now AMC had released this technology after its successful results.

	
Corn sheller	Stone picker prototype (rotary type)

Figure 11: Photos of prototypes (Corn sheller & stone picker)

6) Stone picking machine:

Now a research staff is concentrating on this operation rather than potato harvesting mechanism because of the difficulties of separation of potato from stones and soil clods in the field. For mechanization to be improved, first the stone from the fields need to be removed. It is under tests and also modifications phase. There are two designs simultaneously being pursued. The first design which is collection of stone and soil together had been tested in Sarpang area by RAMC, Samteling. It can be operated when the weather condition is dry. This technology is also proven effective and tested in farmers' fields. A technical discussion of this technology was held at Departmental level at Lemithang, Mongar on 12-14th February 2018 and endorsed. Finally a farm machinery technology display was held at Paro on 31st May 2018 and private sectors and farmers were all invited.

The second model which is only collection of stone and not soil is still under improvement in AMC, Paro. Since the stone picking has become as a requirement in the need assessment report of AMC and also government placing it as an important requirement at the start of 12th FYP, AMC shall release this technology for operation in the first year of 12th plan itself.

7) Slope manoeuvrability of power tiller:

The field evaluation test involving farmers were now carried out with the results recorded and

compiled till date. Now a few samples of the extension shafts were also purchased to be distributed to farmers to carry out the further field evaluation.

The test in fields of Pematgatshel and Khangma (Trashigang) had been carried out and report compiled. The same test had also been carried out in Pangmetse (Paro) for both power tiller and mini tiller and reports compiled. A technical discussion of this technology was held at Departmental level at Lemithang, Mongar on 12-14th February 2018 and just presented. Finally a farm machinery technology display was held at Paro on 31st May 2018 and private sectors and farmers were all invited. However since technology is more required in central and eastern Bhutan, a separate awareness shall be conducted.

8) AMC made plough, mouldboard plate and shares:

Five samples based on the problems associated with Japanese plough had been fabricated and tested in fields. A few sample parts from this design had been incorporated to be make the die in the die making training executed by a short-term expert. A modifications and test on replacement of finger with flat mould board plate is also completed with the plough. Also a smaller and far simpler plough designed as part of the JICA training at JICA TSUKUBA centre in 2016 is also under field evaluations and it will be tested for smaller power tiller.

Both the ploughs are at field tests and series of modifications and simultaneous tests are in full swing and continued as AMC own activity even after the project period.

Two types of prototype

Field test

Figure 12: Photos of On-going prototypes (plough)

9) Die mould making for mass fabrication (training with Short term expert):

Dies for the mass fabrication is one of the important activities to take forward the research prototypes that are being generated by the research team for use by the farmers. A short-term expert successfully completed the two batch of die mould training and installation of fabrication machine at the centre in 2017. Similarly the expert is again involved in basic design, drawing and development of press die mould of reversible plough, farm machinery design and production plan. Since machine or parts drawings had not been properly written and saved in AMC, the short-term

expert has been emphasizing the importance of drawing to AMC technical staff. Together with CAD (Computer Aided Design) training supported by the Project, most training participants have become able to write machine design drawings using a computer software. The expert also guided to prepare daily check list for each fabrication machine in AMC and FMCL workshops. The third training also recently completed on 23rd June 2018. The participants for the trainings were from AMC and FMCL respectively for all above trainings.

	
Training of metal processing	Die mould produced through training
	
Improved AMC workshop with 5S concept	FMCL production unit workshop

Figure 13: Photos of Die mould training by Short-term Expert and Improved workshops

[Activity 3-4: Verify improved field performance and operation pattern of machinery]
Later changed to **[Activity 3-4: Verifying improved field performance of machinery]**

The three research prototypes and also other research activities simultaneously carried out in AMC as a part of its plan with technical supervision and also a series of discussions was held on standards procedures from the requirements to design concept and implementation. All research activities were presented at every Tuesday technical discussion in AMC and some technical issues and also updates were being discussed. Standard test formats were prepared for laboratory tests and field tests. Once confident, these were taken to fields involving farmers with survey questionnaires. Modifications and tests were again conducted based on the feedbacks received from the farmers.

1.3.2.4 Output 4

Planned activity of output 4 is given in the following table which was described in the PDM

Table 16: Planned activities of output 4

Output	Planned Activities
Output 4: Improved service provision model of farm machinery is proposed	4-1 Review the situation of existing farm machines and hiring services 4-2 Design an improved service provision model(s) of farm machinery 4-3 Test hiring service provision model(s) in a pilot area

Actual activity was done along with the plan. Here the detailed activity is given.

[Activity 4-1: Review the situation of existing farm machines and hiring services]

1) Analytical meeting

After the observation of hiring activity of harvesting in 2014 by a Japanese expert, a situational analytical meeting was held in Paro on 4th December 2014 with hiring coordinator and regional manager of AMC Paro. Another analytical meeting was held in Bajo for three days in June 2015 with 20 key staff involved in the hiring services of all the four regional centres as well as AMC headquarters. The result realised us that there were so many factors related to the hiring services such as repair & maintenance, supply and production of spare parts, spare parts inventory, capacity of hiring field staff (means of transportation, skills of deployment, standard procedures, etc.) and so on. The result of this three days problem analysis became a basis of planning for hiring service improvement for the Project.

Analytical meeting at Bajo in 2015

Meeting for detail planning at FMCL HQs

Figure 14: Photos of Discussion for Hiring Services

A team consists of AMC staff engaged in mainly hiring services visited Sri Lanka in February 2016 in order to study a different type of hiring services including farmer's organizations and government front-line offices set-up. The team learnt not only different types of hiring services arrangements but also a comprehensive government support for farming community. Because of separation of AMC in July 2016, a half of participants of the visit is now engaged in the hiring services in FMCL and others are involved in research activity in AMC.

At the initial stage of FMCL's establishment, a short-term expert was invited for capacity assessment of FMCL and produced a report with some recommendations such as the necessity of Company Secretary and HRD officer, focusing on the core mandates, understanding of financial viability of FMCL among stakeholders. Based on the report, some staff were recruited and a systematic subsidy approach through price fixation committee was established.

2) Periodical review

AMC has periodical review practices such as Mid-term review meeting in January and Annual review meeting in July. The hiring services were updated and reviewed through such reviewing practices and also continued by FMCL from 2017.

In order to verify and update all the hiring items' conditions, a system of physical verification of hiring services machinery and implements was established and conducted twice in the year 2017. It is also to disclose lost and damaged assets occurred in the process of implementation and stimulate better management in order to maximize hiring services provision to the customers.

3) Technical paper

Chief Advisor submitted a technical paper titled "Hiring Rate Analysis and Recommendation on Hiring Services in Bhutan" to the Director of the DoA in December 2017. The submission was a response to the requests from the Director at the time of the 4th JCC meeting. This paper was utilised by the DoA and AMC for subsidy policy making of hiring services as a reference.

[Activity 4-2: Design an improved service provision model(s) of farm machinery]

1) Model development

Two models of hiring services were developed in 2017 based on the past field experiences and are actually being implemented. One is "Central hiring services" and the other is "Geog hiring services", and through these hiring models the implementers shall be aware of the types of hiring services programme as well as machine deployment system of FMCL hiring services. The FMCL hiring models and deployment systems are as shown below.

Table 17: Developed hiring models

MODEL	STATION	DEPLOYMENT SYSTEM
A. Central Hiring Services (FMCL direct hiring services)	a. **Normal hiring**	(1) Scattered deployment system
		(2) Clustered deployment system
	b. **Mobile hiring**	(1) Scattered deployment system
		(2) Clustered deployment system
B. Geog Hiring Services	a. **Normal hiring**	(1) Scattered deployment system

In regards to "Deployment System", when hiring machines are deployed one by one to customers, it is called "Scattered deployment system". This system is a normal pattern and executed in many areas. When hiring machines are deployed in a cluster/group in the same area, it is called "Clustered deployment system". This system is executed in peak season such like paddy harvesting season in Paro areas and required areas should be nearby locations.

Methods with some formats for the detailed planning of hiring services was developed by FMSD (Farm Mechanization Service Department in FMCL) in September 2017 and the harvesting in Paro was planned and implemented based on the developed methods. The harvesting was done from the middle of October to the beginning of November 2017 as a trial of "Clustered deployment system". It was successfully completed with 489 acres with more than Nu. 10 lakh of revenue in three weeks' time, and also gained a lot of experiences. The same will be done in the next harvesting season.

Cropping calendar in each regional centre was developed and repairing schedule was made according to the developed cropping calendar. With the help of cropping calendar it can easily know the schedule of spare parts procurement according to the season of field preparation, transplanting and harvesting activities.

AMC tried a group farmers hiring services, which provide a set of machinery as a package to a group of farmers and run by themselves, in May 2015. A good progress of machine deployment was observed but at the same time there were some issues especially about handling or taking care of machines. AMC had a similar bad experiences in Sarpang Dzongkhag in the past. Such types of group farming is not much developed in the country. Therefore the group farmers hiring services was not included in the models and can be concluded just one of the ideas for future.

2) Guideline/ Standard Operational Procedure (SOP) development

At the beginning of the Project, a guideline of 2013 existed in AMC and was revised annually by the Project team. After the experiences of Geog hiring services in the eastern Bhutan in 2015, two separate guidelines, one for central hiring and other for Geog hiring services, were produced.

Guideline of FMCL central hiring services was drafted in November 2017 as the latest version and distributed to staff involved in hiring services while the document is still under review of Internal Auditor of FMCL. The main objectives of guideline are to avoid the issues like misuse of machines and hiring revenue, misinterpretation of responsibilities etc. at ground level. Also the

roles and responsibilities of hiring focal person, hiring coordinators, technicians, operators and other staffs who are involved in hiring activities are reflected very clearly in the guidelines.

Guideline of Geog hiring services was also developed and distributed to regional centres. The purpose of Geog power tiller guideline is to ensure that machines are properly utilized as per the demand and also to avoid the issues such as misinterpretation of responsibilities among FMCL officials, Geog Extension Officers and local government officials like Gup and Tshogpa. It also facilitates the implementers on hiring procedures, terms and conditions of hiring services, and stimulates better management in order to maximize hiring services provision to the customers.

Fig.- 1: Flow of Hiring Services with Repair-Maintenance and Sales-Spare Parts

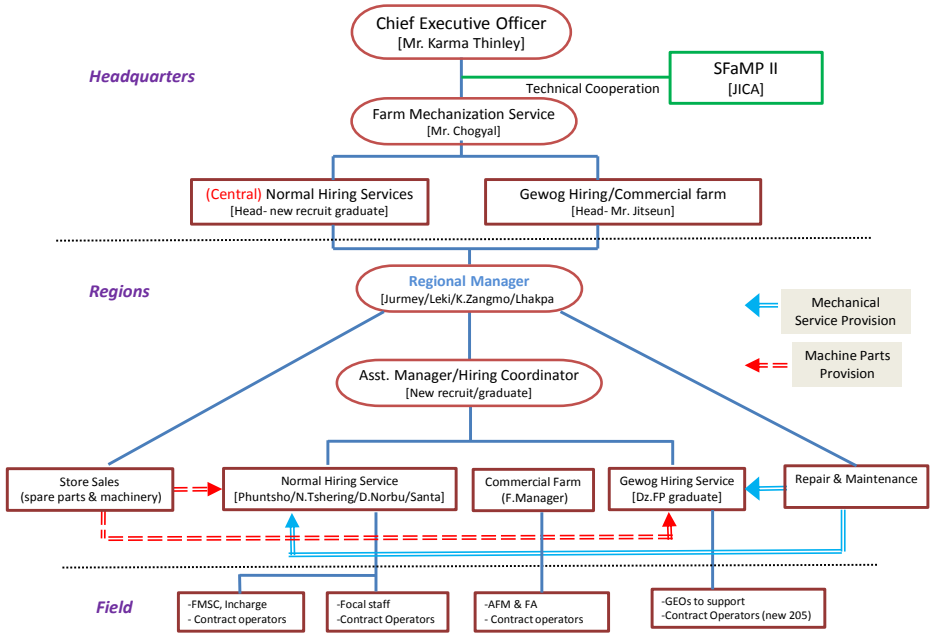


Figure 15: Flow of Hiring Services

Manual for bill closing of Geog hiring services was developed and distributed to Dzongkhag Focal Persons in soft copy. This is to keep accountability in the proper use of Geog power tiller, and also to know the progress of the use of power tillers in each Geog through the amount of revenue collected and the amount and kinds of expenditure spent by Geog Extension Officers. And it also helps to know what types of issues or challenges facing at the implementation level in the field. The Terms of Reference of operators to avoid unprecedented circumstances from operator's side during the operation of the machine, and it serves as an accord between operator and FMCL management in the implementation of machines.

Standard operating procedures (SOP) of job card, which is a written job instruction to operators as well as a receipt to customers, was developed to ensure the standardization of hiring services reporting system and enhance the hiring services programme.

Standard operating procedure (SOP) of physical verification of hiring machinery was drafted.

The physical verification is to verify and update all the hiring items' conditions and the SOP of physical verification is to make sure the verification team members, consist of FCML staff, are clear about the physical verification procedures, terms and conditions, responsibilities of the team members and reporting system after verification is completed.

Detail hiring report formats of central as well as Geog hiring services were developed and circulated to all the regional offices, Dzongkhag Focal Persons and other staffs who are involved in the hiring activities. This is to ease the concern staffs in terms of documentation for future references and also to formalize the hiring services reporting system.

3) Spare parts activity

On 8th and 9th June 2015, analytical workshop for improvement of spare parts was held with key staff from all the four regional centre of AMC and HQs. Quality and on-time supply of spare parts for hiring machines was one of major challenges identified by the workshop and various activities based on the result of the workshop have been carried out throughout the Project period.

3-1) Procurement and Inventory management

A series of discussions on proper procurement planning were conducted from June 2016 till February 2017 with FMCL procurement staff as well as regional staff mainly for sharing procurement and sales experiences of AMC period and discussing planning methods.

Spare parts inventory computer system had been developed by a JOCV about ten years ago and it was functioning well in AMC but the system itself became out of date (standalone type and unable to update through online, etc.). Therefore the Project hired an IT consulting firm to develop an online database system in 2016. The newly developed system was installed in the main store of FMCL HQs as well as FMCL regional centres in January 2018 and it has been working well and improved on time inventory checking and reporting as well as sales work to customers.

Parts catalogues of some machines had not been used because some manufacturers in the third countries didn't provide their parts catalogues, especially paddy reaper. AMC had different models of paddy reaper (1 model from China, 2 models from India and 1 model from Vietnam) and some parts were interchangeable among models. In July and August 2015, a special team of AMC had thoroughly studied these models and produced a comprehensive parts catalogue (4 models in 1 catalogue). Based on the experience, a team of AMC went to India to visit a paddy reaper manufacturer to have a technical discussion.

Parts catalogues available only in Japanese language have been translated into English by Japanese expert and shared with main store and regional centres of FMCL.

One staff from FMCL main store section went to Japan to attend a training "ICT for Agricultural Information use" from February 2017 till May 2017 and he is now playing a major role of procurement and inventory with the developed online system.

Another staff from FMCL main store section went to Japan to attend the same training course in February 2018 till May 2018. He is now dealing with FMCL regional centres for proper documentation of procurement by using his knowledge and experiences gained in Japan and also

plans to use GPS for tracking hiring machines movement in the field.

Two sets of desktop computers were provided to AMC (later to FMCL) main store in Paro and one each to regional centres for inventory use. One server was provided to FMCL main office to store important data files.

3-2) Production of first moving spare parts

While farm machine should be repaired with genuine spare parts from manufacturers, some fast-running parts of implements, such like plough shear and fingers can be fabricated in Bhutan in order to save time and cost. The Project has been strengthening such parts fabrication function in AMC then later FMCL Production unit. It was done through (a) Short-term expert dispatch (Die mould making & Production Management), (b) Provision of equipment (ex. Shearing machine, plasma cutting machine), (c) Training (ex. Die mould making training, Production management training), (d) Improvement of work environment (ex. improved work space & layout, electric wiring, etc.).

By enhancing capacity of Production unit of FMCL, some fast-running spare parts have been continuously produced in large scale. As an example, AMDC earlier produced approximately 500 plough shears a year and now FMCL Production unit can produce more than 7000 pieces per year with better quality.

One staff from FMCL production unit went to Japan in September 2017 till October 2017 to participate in the "Enhancing SMEs support capacity through learning Quality and Productivity improvement (KAIZEN)" and he is now working as a production unit manager.

	
Welding work for producing parts of PT	Repairing work of hiring machines

Figures 16: Photos of spare parts activities

4) Repair & Maintenance of hiring machines

A long-term Japanese expert has continuously been giving some technical advices on repairing farm machinery to technical staff in repairing workshop.

Tool sets and some special service tools were procured and distributed to FMCL regional workshops in order to solve a shortage of repairing tools for technicians.

Training of farm machinery repair & maintenance has been done by AMC training section in several times. This training benefited FMCL's technician in learning additional knowledge other than their daily job and they can carry out repairing activities without any obstacles.

As a part of activities for human resource development in repair & maintenance, some technical manuals and parts catalogues of existing farm machines with FMCL have been printed and shared with technical staff in RFMCL. Most hardcopies were scanned and digitalised for easily sharing among technicians of FMCL. These manuals can be used as a reference in case technicians encounter difficulties as they work.

Standard Operation Procedure (SOP) for repair and maintenance was drafted to standardize the daily repairing activities and it also helps to identify the job responsibilities of every individual who are involved in the repairing works. Trial SOP has been testing in Paro RFMCL and received positive feedback so far, and it plans to be applied in other regional centres by FMCL.

5) Others

In order to solve a lack of transportation for hiring field staff, 12 units of motorbikes were procured and allocated to FMCL HQs and 4 regional centres.

For supporting efficient documentation work of hiring services, one each photocopy machine to Paro and Samteling (Sarpang), a set of desktop computer to each regional centre, one set of desktop to repairing workshop in Paro and one laptop to FMCL hiring coordinator (later Deputy Manager in Farm Mechanization Service Department) were provided.

In regards to develop a commercial sense and practical knowledge of FMCL staff who were involved in hiring services and other related sections of hiring customers deals, the Project hired a training institute for giving a "Client Care Training" and a total of 168 staff completed in 8 batches from September 2016 to August 2017. By now most of the FMCL staffs can easily deal with the daily customers and provide effective services every time.

A total of 42 staff completed "Advance Office Management Training" in 4 batches from March 2017 to August 2017 to enhance the knowledge and skills of proper office management of newly recruited FMCL management staff who were also involved in hiring related activities.

One staff from Contract & Commercial Farm went to Japan to attend the "Sustainable Rural Development by Biomass Training" in September 2016 till December 2016 and he applied some knowledge into his farm land cleaning and development work.

[Activity 4-3: Test hiring service provision model(s) in a pilot area]

Hiring service provision models were designed and tested time to time in AMC period but after the separation of AMC it needed to do it from the beginning with newly recruited staff while some key staff joined FMCL from AMC. FMCL was established in August 2016 and it spent almost one year for transition and development of implementation structure. Therefore an actual test was able to do in the final year only, i.e. from July 2017 to June 2018.

Testing the developed hiring models was to be proved through expansion of service area coverage (in acre). The final achievement according to output and project purpose indicators are

described in the section 2.1.5 and 2.2.3 respectively. Therefore the detailed physical progress in acreage are mentioned here.

1) Progress of FMCL central hiring services and Geog hiring service in project sites

The physical progress of project site (Paro & Sarpang Dzongkhag) of central hiring services and Gewog hiring services of the last 4 years is as shown below.

Table 18: Physical achievement in acreage in the project sites

Particular	2013/14 (baseline)	2014/15 by AMC	2015/16 by AMC	2016/17 by FMCL	2017/18 by FMCL	Target (acre)
Central Hiring- Paro	1,200.00	2,449.00	2,229.00	1,337.31	2,184.58	
Central Hiring- Sarpang	1,028.00	1,801.00	2,626.00	2,091.00	3,484.25	
Geog Hiring- Paro	-	-	-	495.38	402.78	
Geog Hiring- Sarpang	-	-	37	362.15	226.88	
Total	2,228.00	4,250.00	4,892.00	4,285.84	6,298.49 [3]	7,602.00
Achievement to 7602 ac	---	55.9 %	64.4 %	56.4 %	82.9 %	(100%)
All cultivated Areas	53,742.00	53,742.00	53,742.00	53,742.00	53,742.00	53,742.00
Area Ratio (%)	4.1%	7.9%	9.1%	8.0%	11.7%	14.1%

Physical progress in 2017/18 (6,298 acres) was a significant expansion comparing to the previous years. One of the improvements in 2017/18 was that the central hiring had a large area expansion in Paro and Sarpang where AMC/FMCL had never deployed before. SIAM KUBOTA power tiller, which was provided through Japanese General Grant Aid, were recently distributed and contributed for such expansions.

[3] There were observations by farmers that the field capacity of Grant machine (SIAM KUBOTA power tiller) is almost similar to 18HP tractor (2.2 acre per day) because of fast rotavator speed and rotary blades performances. If we use the higher field capacity for calculation, the total achievement can be 6,612.68 acres (87% of the target).

Hiring services for paddling in Paro	Hiring services of grant machine in Sarpang

Figures 17: Photos of Hiring machine deployment in the fields

2) FMCL overall hiring services (Central & Geog hiring services in all the 4 regions)

Achievement of Overall Hiring Services of FMCL and Geog since 2013/14 along with AMC Five Year Plan is shown below.

Table 19: Physical achievement in acreage of the whole areas in Bhutan

Particular	Region	FY 2013/14 by AMC	FY 2014/15 by AMC	FY 2015/16 by AMC	FY 2016/17 by FMCL	FY 2017/18 by FMCL
AMC / FMCL Central Hiring Services	Paro	1582.25	3853.12	2243.36	2408.20	3406.30
	Bajo	1080.00	2384.66	1699.68	1906.22	2387.53
	Khangma	333.97	1166.30	1329.00	1210.56	1708.61
	Samteling	1087.43	2710.00	2678.00	3018.30	3841.95
	Sub total	4083.65	10114.08	7950.04	8543.28	11344.39
Gewog power tiller hiring services	Paro	---	---	754.75	898.50	680.22
	Bajo	---	---	806.42	932.75	642.53
	Khangma	---	687.00	1461.65	1097.40	1056.12
	Samteling	---	---	395.36	601.87	561.35
	Sub total	0.00	687.00	3418.18	3530.52	2940.22
TOTAL (acres)		4083.65	10801.08	11368.22	12073.80	14284.61

Note: Some areas of GPT hiring services achievement are not included in the above table because of late bill closing process.

3) Gewog Power Tiller distribution

Geog hiring services commenced in 70 Geog in the Eastern Bhutan in 2015 by the initiatives of the MoAF and later it was improved as the Project activity.

Up to the date, FMCL distributed a total of 887 units of power tillers including machine purchased by the RGoB fund and 353 units of SAIM KUBOTA power tillers provided by the Japanese General Grant Aid in 2018, whose distributions are still going on.

Region wise power tiller distribution in the Gewogs since 2015 until date is shown below.

Table 20: Summary of Geog power tiller distribution

Region	1st Supply (2015)	2nd Supply (2016)	3rd Supply (2017)	4th Supply (2018)	Mini tiller supply (2018)	Total
Bajo	39	31	36	60	0	166
Khangma	70	18	83	110	57	338
Paro	50	0	35	98	9	192
Samteling	46	3	44	85	13	191
TOTAL	205 units	52 units	198 units	353 units	79 units	887 units

1.3.2.5 Human resource development needs assessment

In early 2015, a team of the project conducted a survey titled "Human Resource Development Needs Assessment of AMC" in order to (a) document the current situation of AMC's staff capacity, (b) obtain information to measure effectiveness of the project activity as baseline survey and (c) obtain basic material for the project to make a strategy and approach in the activity of capacity development. Through the survey, some weaknesses of technical skills of AMC's staff were identified, for example, data analysis, calibration of measuring instruments, needs assessment, lathe machine operation, or die making work. These findings were used for planning of training programme hereafter.

Interim assessment was done in August 2016 and final assessment was done in May 2018 respectively. The results showed the effects of Project interventions for improving staff awareness and performance and these are also shown in the section 2.1.3.3.

2. Achievements of the Project

2.1 Outputs and indicators

2.1.1 Summary of Achievement of Outputs

The summary of progress and result are mentioned on the evaluation grid below.

Table 21: Achievement of Indicators in each output

Objectively verifiable indicators	Means of verification	Outcomes (Progress)	Result
Output 1: Objective basis for farm machinery selection are introduced			
1-1At least 6 types of farm machines' test codes and standards are drafted and submitted	AMC report	Developed Standards and Test codes	Achieved: 6 types of farm machines' test codes and standards are drafted and submitted to BSB
Output 2: Awareness of farm machinery safety and quality is enhanced			
2-1 At least 12 test items are tested with developed test codes and standards	AMC report	Test report	Achieved: A total of 44 test items are tested with developed test codes and standards
2-2 Awareness of farm machinery of safety and quality of trainees (private sectors, farmers and extension officers, etc.) is raised	AMC survey	AMC survey AMC report	Achieved: Awareness of farm machinery safety and quality of trainees is raised through several training & awareness programmes.
2-3 More than 50% of AMC staff	AMC	Report on	Achieved:

realise that their awareness of "Inspection & Quality Control" is improved	survey	HRD needs assessment of AMC	100% of AMC staff realised that their awareness is improved.
Output 3: Machine performances are improved in the sites			
3-1 At least 3 farm machinery modifications are proposed and applied	AMC report	Technical report	Achieved: 3 farm machinery modification & development are completed.
3-2 Field capacity of specific operation(s) through modification / development of machines is improved by 30%	AMC report	Technical report	Achieved: Field capacity & performance of specific operations is improved by 70-100%.
3-3 More than 50% of AMC staff realize that their performance of "Research & Development" is improved	AMC survey	Report on HRD needs assessment of AMC	Achieved: 100% of AMC staff realised that their performance is improved.
Output 4: Improved service provision model of farm machinery is proposed			
4-1 Farm mechanization prioritizing is conducted	AMC/FMCL report	AMC report	Achieved: Land preparation work is prioritised
4-2 Service providing schedule is planned and practiced in pilot areas (project sites)	AMC/FMCL report	Flow structure of HS & Detailed work plan of FMCL	Achieved: HS has been planned and practiced in pilot areas till date
4-3 Hiring service ~~model(s)~~ is(are) drafted	AMC/FMCL report	Guidelines of Central & Geog hiring services	Achieved: Two models for hiring services are drafted

2.1.2 Detailed achievement of Output 1

[Indicator 1-1: At least 6 types of farm machines' test codes and standards are drafted and submitted]

It was assumed at the beginning of the Project that it might take approximately a 6 month time for drafting a set of standards and test codes of one farm machinery based on the capacity of counterparts. Hence it was set 6 types of farm machines by considering the project period of three years. Later the project period was extended for one year but the indicator of "6 farm machines" remained as the same because the first standard took much longer than the assumed period till the re-submission of the draft to BSB and also transition period for establishment of the new AMC administration in 2016 affected regular work.

During the first phase of the "Strengthening Farm Mechanization Project", some basic

documents had been developed but these needed to be improved further for actual implementation.

As mentioned in the above summary, six types of farm machinery's test codes and standards has drafted and submitted to BSB. The technical advices to the BSB technical committee was provided for different types of farm machinery. Six types of test code and standards are 1) power tiller (10.5 -14 HP), 2) walk behind power reaper, 3) rice mill, 4) cereal flaking machine, 5) mini tiller (less than 10.5 HP), and oil expeller.

The endorsement by BSB is out of the Project scope, but out of six farm machinery's test codes and standards, three documents have been already endorsed by BSB as national Bhutan standards and other three documents will be on wide public circulation in August 2018 (for 90 days as per BSB time line). There may be a few changes on the documents after the circulation but they will be endorsed within 2018.

2.1.3 Detailed achievement of Output 2

2.1.3.1 Indicator 2-1

[2-1: At least 12 test items are tested with developed test codes and standards]

It was assumed that at least 2 test items, which is not "machine types" but a set of tests, for example "engine test" or "noise test", should be done per machine type. "Six types of farm machine's test codes and standards" were supposed to develop under output 1, therefore, it was set a total of 12 test items. (2 test items x 6 types = 12 test items)

Furthermore, test items can be count as one although the same test items are repeated, for example, the same test items are done as preliminary tests during test codes development, verification tests for finalisation, and actual tests during the implementation in different models.

Finally 44 items from the developed test codes and standards of farm machinery have tested. Actually AMC staff engaged in this activity have done the tests so many times.

2.1.3.2 Indicator 2-2

[2-2: Awareness of farm machinery of safety and quality of trainees (private sectors, farmers and extension officers, etc.) is raised]

This indicator was set for measuring the effect of awareness through training and other related awareness programme in terms of machine safety and quality. As mentioned in the section 1.3.2.2 Output 2, Activity 2-3, the various awareness programmes of farm machinery safety and quality was delivered to the trainees (farmers, operators, Extension Officers, students of Vocational Training Institute and private firms' staff) and even to the public. Since it was not easy to evaluate the change of awareness level of general public, a team of IQCC/AMCS conducted several surveys at the time of training (2015 & 2018) and workshops (2015) and the result showed positive improvements of knowledge and understanding of safety and quality. For example the result in 2018 showed that;

(a) Awareness of importance of safety and performance was improved from 68-87% (before the training) to 77-100% (after the training)

(b) Knowledge of the reasons of safety devices (ex. guard in moving parts) was increased from

18% (before) to 98-100% (after)

(c) Knowledge of AMC's standards development was increased from 45% (before) to 75-83% (after)

(d) Knowing of AMC's test implementation was increased from 45-47% (before) to 75-100% (after)

2.1.3.3 Indicator 2-3

[2-3: More than 50% of AMC staff realise that their awareness of "Inspection & Quality Control" is improved]

As mentioned in the section 1.3.2.5, the Human Resource Development Needs Assessment of AMC was conducted 3 times during the project period. Since AMC structure was drastically changed in 2016 because of the separation of AMC and FMCL, it was not possible to conduct the same scale of the assessment later on. Therefore, the interim and the final assessment were done only with the staff who has been directly engaged in output 2 and 3 in the project sites.

The result of the final assessment showed that all the 5 staff (100%) of IQCC/AMCS realised the importance of activities of 'Inspection and Quality Control and improved the knowledge and skill for testing and analysing of farm machines. Average of self-assessment point of 2.9 has increased to 3.7 (out of 5.0) in the final. The detailed results can be referred to the reports in ANNEX 2.

Also commendable outputs are seen in development of standards and testing activities and these have been done by an initiatives with team work spirit of which many of the activities were always done, discussed and adopted together. Ever weekly technical discussion and technical deliberation by AMC Technical Committee always made staff of AMC under different three technical sections well versed on all three major activities of AMC. Also occasional trainings were imparted to staff from other sections to enhance their capacities. Rare cases occurred of staff transfer but that is within AMC and hence shall not affect the project activity even in future. New staff are also provided specific training on each activity on the onset of joining and also involved in the team on above technical work. Hence the strength and capacity of the staff are automatically enhanced and increased.

In regards to some new technologies, AMC can utilise some linkages with other institutions outside the country in the same fields such as IAM Japan or ICRI India and also support staff for short training in same fields.

2.1.4 Details of Output 3

2.1.4.1 Indicator 3-1

[3-1: At least 3 farm machinery modifications are proposed and applied]

It was assumed that 3 types of farm machinery modification is appropriate based on the number and capacity of the staff in research section of AMC in 2015. On the other hand, this "3" types as a physical number may not be very important because experiencing the process of research activity should be more useful for AMC staff. In the other words it can be said that completing 3

types may not be difficult if we would assign very capable staff only. However, each of 10-11 staff in the research section had their own research topics and they have been doing research activity respectively.

During the previous phase of SFaMP and also before the project started, research section of AMC were doing some sort of research activities but there were no remarkable research products adopted in the field. It may be because of the research section in previous AMC (AMDC) had both research function and production function and was unable to concentrate research oriented activity thus very ad hoc research planning.

As mentioned in the above summary, 3 technologies are modified, i.e. one is a harvesting conveyance and reaping by hedge cutter, the second is an improved off grid cardamom dryer and the third is a potato digger attached to power tiller. These were presented during the technical presentation of the DoA in February and "Farm mechanization technology display and field day programme" in May 2018 to conclude.

The other technologies like the drum seeder for direct seeding, corn sheller are also completed and full scale expansion programmes are going on.

2.1.4.2 Indicator 3-2

[3-2: Field capacity of specific operation(s) through modification / development of machines is improved by 30%]

This indicator was set in order to evaluate technical performance of prototypes developed under the activity 3-3. It can be said that the above indicator 3-1 (3 types) is quantitative indicator of developed farm machines and 3-2 (30% improvement) is qualitative indicator of the same.

The field efficiency of the technology promoted compared to traditional method are as follows;

i) **Hedge cutter**: Harvesting time with the Hedge cutter is **79.3% shorter** than manual harvesting. The head loss of the grains during the harvesting is also below the minimum standards of Bhutan Standard Bureau (≤ 3%).

ii) **Improved cardamom dryer:** Quality of the cardamom is 100% improved because of smoke free in colour and smell. It is very safe comparing to the guarding which is required for manual drying as cardamom practiced by farmers.

iii) **Potato digger:** The potato digger picking time is **70.4% shorter** than manual digging. Also there is no damage to the potato during machine digging as compared to manual digging.

2.1.4.3 Indicator 3-3

[3-3: More than 50% of AMC staff realize that their performance of "Research & Development" is improved]

Conditions of indicator is the same as the section "1.2.3.3 Indicator 2-3". Indicator was set as "***More than 50% of AMC staff realised that their performance of Research & Development is improved***" as the indicator 3-3 under output 3. The final result showed that all the 11 staff (100%) realised their improvement of their performance. Average of self-assessment point of 2.3 has increased till 3.5 in the final assessment.

Continuation of staff capacity development is the same as the above section 2.1.3.3 Indicator 2-3.

2.1.5 Details of Output 4

2.1.5.1 Indicator 4-1

[4-1: Farm mechanization prioritizing is conducted]

At the beginning of the project, several review meetings on AMC hiring services were conducted and it realised that land preparation should be the first step and main mechanised operation, and the most important for many crops. Therefore the land preparation was prioritised and it includes "ploughing", "rotavating (or soil clods breaking)", "puddling" and other land preparation work such like stone picking. It was usually done by either power tiller or tractor. Through this process, it can be said that Indicator 4-1 was achieved.

2.1.5.2 Indicator 4-2

[4-2: Service providing schedule is planned and practiced in pilot areas]

At the beginning of the project, there was no clear plan and schedule of hiring services activity in each AMC regional centre, except the overall target values set by AMC management. It might be because of a trial basis. In order to make sure the hiring services to be implemented based on proper planning and scheduling, this qualitative indicator was set.

After the establishment of FMCL, annual planning with cropping calendars and detailed planning methods, field deployment with some guidelines and SOP were developed and practiced. FMSD played a major role of these arrangements as a department in charge in FMCL. Therefore, it can be said that the indicator 4-2 was achieved.

On the other hand, a quantitative indicator is set at the project purpose level and physical achievement of hiring servicers is mentioned in the section 2.2.

2.1.5.3 Indicator 4-3

[4-3: Hiring service model(s) is (are) drafted]

Two models of hiring services have been developed, as mentioned in the section 1.3.2.4 Output 4, Activity 4-2. Therefore, the indicator 4-3 of "Hiring service model(s) is (are) drafted" can be concluded as achieved.

2.2 Project Purpose and indicators

2.2.1 Summary of Achievement of Project Purpose

Summary of the result of project purpose level is mentioned on the evaluation grid below.

Table 22: Evaluation grid of Project Purpose

Project Purpose: Farmers have better access to appropriate farm machinery in the sites			
Objectively verifiable indicators	Means of	Outcomes	Result

	verification	(Progress)	
1. At least 4 types of farm machines with certificate of AMC are distributed	AMC report	Test Result Sheets	Achieved: 4 types of farm machinery (a total of 7 models) are distributed.
2. "Farm mechanized Area Ratio" of "Land preparation" increases by 10 points from 4.1% in the sites (7602 acres = 14.1% to total cultivated land size)	AMC (FMCL) survey and report	FMCL report	Almost achieved: 7.6 points increased from 4.1 % (6299 acres = 11.7% to total cultivated land size = 82.9% achievement)
3. Machines modified / developed by AMC are introduced in the sites	AMC report	Technical reports	Achieved: Machines developed by the Project are introduced in the sites.

2.2.2 Details of Indicator 1

[1: At least 4 types of farm machines with certificate of AMC are distributed]

1) Indicators setting

This indicator is related to the farm machinery testing & certification and is supposed to be achieved through (1) development of standards and test codes (output 1), (2) several tests to be done (output 2), and (3) awareness activity of safety and performance (output 2).

In the initial PDM, this indicator was *"More than (X)% of machinery satisfying AMC safety standards are distributed with proper labelling by 2020"*. However, the labelling for certification was not realistic in Bhutan because there was no legal basis for accreditation of AMC as a farm machinery testing laboratory in the country, and so many external factors were still existed to materialise it. As a conclusion from a series of discussions between Japanese experts and AMC in 2014/15, it was concluded that once "a certificate of AMC", which could be defined as a test result sheet, had been issued, it could be recognised to have achieved this indicator. Distribution of some machines from private suppliers is also defined as achievement with issuing test result sheets while actual distribution or sales is the external factors from the Project.

Test codes and Standards developed by AMC will finally be endorsed by BSB but it takes time due to BSB's standard procedure. Therefore, MoAF approved a proposal for the Ministry level testing implementation in 2017, which can be done once the standards documents have been submitted to BSB TC-08, and it leads quick and timely implementation of machinery testing.

As a principle of market economy, market of farm machinery in Bhutan is open and anyone can bring any types of machinery to the country. The above mentioned tests in Bhutan are not mandatory but voluntary ones. Therefore traders/dealers may freely sell their goods without doing the test. On the other hand, machinery users are always looking for better quality machinery and sharing test results will help them to find their best choice in purchase.

2) Achievement

At the end of the Project period as of June 2018, the following types of farm machinery's tests

were conducted and the test result sheets have been issued. Also some passed machines were advertised through media and websites of MoAF and AMC.

Table 23: Machine Tests conducted during the project period

	Types of Farm Machinery	No. of models	Detailed model	Applicant of Test
1	Power tiller	3	KUBOTA (K120) YANMAR (YZC-D) SIAM KUBOTA (PEM125DI)	(AMC)/FMCL FMCL FMCL
2	Walk behind power reaper	2	YANMAR (YAP120) Chinese model (INGS-90)	FMCL Private firm
3	Oil expeller	1	Chinese model (DK119)	Private firm
4	Mini tiller	1	MITSUBISHI (MM658)	FMCL

Since 4 types of farm machinery were tested, the first indicator of project purpose can be concluded as achieved. There are still many machines from private firms are in pipeline for the test.

As an example of machinery quality improvement through test results, one of the above mentioned machines had the pasting name & caution labels written only in the manufacturer's country's language but they have been replaced by the ones in English after the recommendation on the test result sheet submitted to the machine supplier. Many more improvements can be expected through the machinery test implementation and this is exactly the project purpose of "better access of appropriate machinery" to be achieved.

Also AMC set a preliminary test arrangements for private firms for the sake of easy test application if they don't have enough confidence on their sample machines. AMC made a flexible arrangement as a preliminary test of two models so far (one is grain mill and other is micro power tiller), which is a non-formal test with a limited test items in case that applicants don't have enough confidence on their sample machinery. And So far these all the test are free based on the government subsidy policy.

Test Result Sheets	Oil expeller test at AMCS

Figures 18: Photos of Implementation of testing and certification

2.2.3 Details of Indicator 2

[2: "Farm mechanized Area Ratio" of "Land preparation" increases by 10 points from 4.1% in the sites (Total: 14.1% = 7602 acres)]

1) Indicators setting

The indicator 2 is mainly related to the hiring services model and it was intended to set a numerical (quantitative) indicator for measuring physical acreage achievement. Explanations of the indicator setting are given below;

- Land preparation was prioritised for model development. AMC covered a total of 2228 acres in the Project sites (Paro and Sarpang Dzongkhag) in 2013/14 and it is equivalent to 4.1% of the total cultivated land size of these two Dzongkhag and this was used as a baseline data.

Table 24: Baseline of hiring service in the project sites

Dzongkhag	Total cultivated areas (acre)	A: Doubled areas (acre) [4]	B: Land preparation of hiring in 2013/14	Farm mechanization area ratio (= B/A (%))
Paro	13,132	26,264	1,200	4.6
Sarpang	13,739	27,478	1,028	3.7
Total	26,871	53,742	2,228	4.1

- In regards to measuring expansion of the services, AMC hiring was given on a daily basis and actual acreage used by machine differs field by field a little. However, it is possible to estimate the mechanised (deployed) areas with the amount of revenues collected, daily hiring charges and an average field capacity. The calculation can be done by the following formulas.

(Revenue collected / Daily hiring charges) x Field capacity = Mechanized area (acre)

Ex. (Nu.2, 800,000 / Nu. 1,400) x 0.75 [acre/day] = 2000 acres

(Mechanized area / Total cultivated areas) x 100 = Farm mechanization area ratio (%)

Ex. (2000 [acre] / 53742 [acre]) x 100 = 3.7%

- In order to understand a potential areas for expansion of hiring services, a Project team conducted a sample survey in the selected Geog of Paro, Sarpang and Phunakha Districts in 2015. Result of the survey in Paro showed that almost 85% of land preparation work was already mechanised (including own machine, borrowed, hired) while only 26 % of area was mechanised in Sarpang Dzongkhag. Thus it was concludes that another 10 to 15% could be

[4] Doubled areas: Farmers generally do land preparation work two times in a year on the same land. Therefore the "Total cultivated areas" should be a double of the actual land size.

increased by the Project activity.

- Considering the existing machines resources in AMC, it was estimated a target acreage with some assumptions such as number of machines, annual working days, and some expected additional power tillers from 2KR machine or other sources.

Table 25: Estimated hiring areas in project sites

	Types of machine	No of machine	Working Days	Capacity (ac/day)	Area (acre)	Total (acres)
Paro	Existing PT	19	60	0.75	855	3702
	Additional PT	10	60	0.75	450	
	Tractor	17	60	2.35 [5]	2397	
Sarpang	Existing PT	19	60	0.75	855	3792
	Additional PT	12	60	0.75	540	
	Tractor	17	60	2.35	2397	
					Ground total	7494

- The above estimated area size is almost equivalent to 14% of the total land size of the Project sites (7494 / 53742 x 100 = 13.9%). Therefore, 10 points increase from the baseline data in 2013/14, which is equivalent to 14.1% of total cultivated areas of two Dzongkhag (=7602 acres), was concluded as a target.

2) Achievement

Achievement of hiring services can clearly be shown in the table below. Area coverage of hiring services has been increased up to 82.9% as shown in the table below.

Table 26: Achievement of Indicator of Output 4

	2013/14	2014/15	2015/16	2016/17	2017/18
Central Hiring- Paro	1,200.00	2,449.00	2,229.00	1,337.31	2,184.58
Central Hiring- Sarpang	1,028.00	1,801.00	2,626.00	2,091.00	3,484.25
Geog Hiring- Paro	-	-	-	495.38	402.78
Geog Hiring- Sarpang	-	-	37.00	362.15	226.88
Total (acres)	2,228.00	4,250.00	4,892.00	4,285.84	6,298.48
Progress to Target value (7,602 acres)	baseline	55.9%	64.3%	56.3%	82.9%
Total cultivated Areas: 53,742 acres, Target value: 7,602 acre (=14.1% of total areas)					
Progress to total areas (14.1%)	4.1%	7.9%	9.1%	8.0%	11.7%

As already mentioned in Section 1.3.2.4, machine allocation was properly done by keeping more

[5] Average of different horsepower of tractor (18HP: 2.2 acre/day, 34HP above: 2.5 acre/day).

numbers of tractor to Sarpang areas where land size s are relatively bigger than other areas. A total number of allocated machines at the beginning of 2018 has been almost reached the plan with additional power tiller to Geog.

For increasing machine's annual working days, the detailed deployment planning methods have been developed based on cropping calendars of each area. Spare parts procurement and production were also much improved than the beginning of the project period. However, annual working days of Geog power tiller (10 – 15 day per year) were much lower than the estimate (60 days per year) because Extension Officers have so many other works and frequent change of operators happened while the annual working days of FMCL central hiring services were maintained almost at the planned level. This is the one of the causes of non-achievement.

For the sake of stable and quality service provision to customers, service provider side has to keep some back-up / stand-by machines in case of technical trouble of deployed machines to the field as replacement (around 20-30 % of machine are required, depending on type of machines). The initial estimate of target indicator didn't consider such replacements. FMCL has now learnt it through the past experiences. In this context, the project team estimated 5800 acres as a possible achievement at the time of JCC in October 2017 but a decision was made as to expand as much as possible with additional power tillers provided by the General Grant Aids and the indicator was kept as the same. Then FMCL hiring sections tried to expand it with some additional power tiller but the achievement was limited because the season was only one time and time was limited. The indicator might be too high if considering such replacement. This is the other reason of non-achievement.

2.2.4 Details of Indicator 3

[3. Machines modified / developed by AMC are introduced in the sites]

1) Indicators setting

This indicator was added during the modification of PDM because AMC side wanted to add a separate indicator related to research activity. It can be clarified that developing prototypes is at the level of output 3, and introduction/adaptation of the developed prototypes is at project purpose level.

The developed prototypes are supposed to be introduced or used in the fields at the end, however, the numerical indicator was not set because the introduction/adaptation is achieved by not only technical factors but also many other factors, such as manufactures technical capacity, manufactures business plan, buyer's economic conditions, etc. Therefore, it is analysed mainly qualitatively here.

2) Achievement

After the separation of AMC and FMCL, a mandate of research was remained in AMC but there was no clear strategy for promotion and dissemination of developed prototypes nor clear roles & responsibility among stakeholders including private sectors. Then a series of discussions on so-called "Exit strategy" of AMC research products were held from November 2017 and finalised it

by February 2018. The flow of the exit strategy is mentioned below.

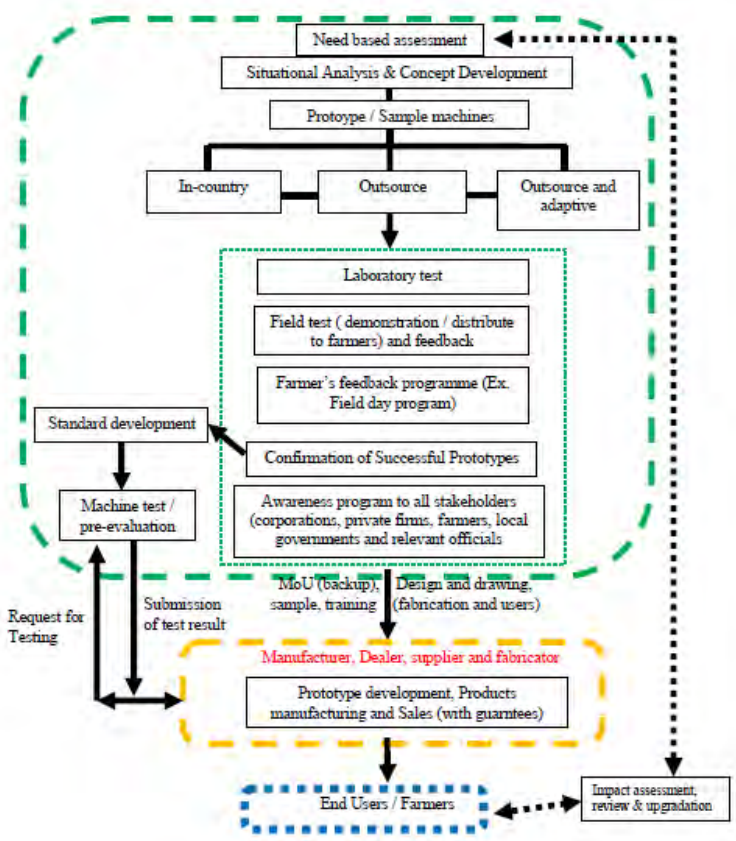


Figure 19: Flow of Exit strategy of AMC research products

The 3 technologies were displayed at the technical coordination meeting of DoA in Mongar on 12-14th February 2018 and at "Farm Mechanization Technology Display and Field Day Programme" held at AMC on 31st May 2018. Technical reports are also complemented and some are ready to post a Ministry journal.

	
Technical coordination meeting in February	Technical display at AMC in May

Figures 20: Photos of Display of completed prototypes

Forty-six (46) numbers of hedge cutter are under the arrangement for selling to farmers on a cost sharing basis between farmers and the financial support from FSAPP project (World Bank funded) and another 10sets through FAO funding. On the other hand, some private firms are already planning to bring their own prototypes to the country.

In regard to cardamom dryer, a total of 66 sets were already installed in the several locations in 6 Dzongkhags and demonstrated to farmers of the areas. Now some Dzongkhag proposed a budget to further increase the installation. Past fabrications of the dryers were done by private firms and the expansion can be expected with a collaboration with such private firms.

The potato digger was demonstrated to participants of the field day programme in May 2018. Some private firms were interested in fabricating such a prototype and planning to sell to other potato cultivated areas in the harvesting season of this year (September – November).

The direct seeder is also on a huge dissemination programme in 2018.

3. History of PDM Modification

PDM was modified two times from the beginning of the project period until now as shown in ANNEX 3.

3.1 First modification of PDM

The first modification was done in order to establish indicators in the initial PDM and proposed indicators were approved by the first JCC meeting held on 5th October 2015. The details of modifications were mentioned below.

Table 27: First Modifications in PDM

Before	Modified version
Overall Goal (Indicators only)	
1. More than (X)% of machinery satisfying AMC safety standards are distributed with proper labelling by 2020 2. Farm mechanization rate increases by (X)% in southern area	1. Deleted 2. Average of "Farm mechanized Area Ratio" increases by 10 points from 7.8% in Bhutan by 2020
Project Purpose (Indicators only)	
1. More than (X) types of farm machines are distributed with proper labelling 2. Farm machinery operation rate increases	1. At least 4 types of farm machines with certificate of AMC are distributed 2. "Farm mechanized Area Ratio" of "Land

by (X)% in the sites 3. There was no third indicator	preparation" increases by 10 points from 4.1% in the sites 3. Machines modified / developed by AMC are introduced in the sites
Output 1 (Indicators only)	
1-1 More than (X) types of test codes and standards are drafted and submitted	1-1 At least 6 types of farm machines' test codes and standards are drafted and submitted
Output 2 (Indicators only)	
2-1 More than (X) machines are tested with developed test codes and standards 2-2 Awareness of farm machinery of safety and quality of trainees (private sectors, farmers and extension officers, etc.) is raised	2-1 At least 12 test items are tested with developed test codes and standards 2-2 Awareness of farm machinery of safety and quality of trainees (private sectors, farmers and extension officers, etc.) is raised 2-3 More than 50% of AMC staff realise that their awareness of "Inspection & Quality Control" is improved
Output 3 (Activity and Indicator)	
[Activity 3-1] Analyse needs of machinery improvement for rice production in Sarpang [Indicator] 3-1 Operating efficiency of machine(s) is improved by (X)% 3-2 Operating/deployment patterns of machine(s) are improved	[Activity 3-1] Analyse needs of machinery improvement [Indicator] 3-1 At least 3 farm machinery modifications are proposed and applied 3-2 Field capacity of specific operation(s) through modification / development of machines is improved by 30% 3-3 More than 50% of AMC staff realize that their performance of "Research & Development" is improved
Output 4 (Indicators only)	
4-1 Farm mechanization prioritizing is conducted	4-1 Farm mechanization prioritizing is conducted

4-2 Hiring service model(s) is(are) drafted	4-2 Service providing schedule is planned and practiced in pilot areas (project sites) 4-3 Hiring service model(s) is(are) drafted

3.2 Second modification of PDM

The second modification was done because of mainly the extension of project period and inclusion of FMCL as another implementing agency. RD for the amendment was signed on 23rd December 2016.

Table 28: Second Modifications in PDM

Before	Modified version
Implementing Agency	
Agriculture Machinery Centre (AMC)	Agriculture Machinery Centre (AMC) and Farm Machinery Corporation Limited (FMCL)
Target Group	
AMC staff members	AMC and FMCL staff members
Period of Project	
Aug. 2014 – Aug. 2017	Aug. 2014 – Aug. 2018
Activity 3	
Activity 3-3: Improve the performance and operation patterns of machinery to meet the needs Activity 3-4: Verify improved field performance and operation patters of machinery	Activity 3-3: Improve the performance of machinery to meet the needs Activity 3-4: Verify improved field performance of machinery

4. Others

4-1 Results of Environmental and Social Considerations

Not applicable

4-2 Results of Considerations on Gender/Peace Building/Poverty Reduction

Farming is one of the major occupations in Bhutan and this project has contributed improvements of farm machinery performances and hiring services model development that are supposed to be used by small scale or poor farmers. However, it may be still too early to conclude

its contribution to poverty reduction.

III. Results of Joint Review

1. Results of Review based on DAC Evaluation Criteria

Opinions of key project members are collected through self-evaluation with a questionnaire and main opinions are mentioned below.

Table 29: Opinions through Self-evaluation of Project key members

Criteria	Main opinions from Project key members
1. Relevance	• The consistency of project was kept in line with the development policy, mechanization strategy and 11th FYP (2013-2018). • There was a minor change in policy during delinking of AMC & FMCL due to commercial mandates and government mandates. However it further supported on achieving and streamlining the activities of the project too and for the overall achievement of the government policy. • With farm mechanization receiving top priorities in the Department, the project purpose was indeed consistent with development needs of the country. Many private sectors are also coming in promotion and standards and tests has become very timely and relevant. It supports farmers and also private sector to ensure win for all. • AMC and FMCL, project implementing agencies, are main actors for farm mechanization in Bhutan and the approach to strengthen them is appropriate. • Realizing the problems and issues of farming through survey (conducted under the project activity), AMRS are developing the prototypes and for those machines, test codes and standard are drafted by AMCS to maintain the consistent safe and efficient production.
2. Effectiveness	• The project purpose for output 1 & 2 are fully achieved as per the set indicators/ project monitoring reports. • The project purpose for output 3 is high. However more awareness programme and private sector participation needs to be further strengthen to make the programme very successful in the field. • The project purpose in the indicator for output 4 hasn't achieved by 100 % but hiring activity is in implementation and will be achieved or even further expanded with additionally added resources in future. • The project output 1 & 2 has importance existence in enriching the safe and efficient farm machines to the farmers with improvise technology sourcing relative to private entrepreneurs by referencing the standard and test codes as per the

	requirement at national level • The project output 3 had indeed led to the overall achievement of the project purpose. The technologies has now been disseminated to the field too. Research activity such as cardamom dryer with timely financial and technical support rendered during the implementation and dissemination phase immensely helped in achievement. • The Project output 4 directly contributed that farmers have a better access to appropriate farm machinery through hiring services since the implementation of the Project.
3. Efficiency	• Japanese side allocated the necessary budget even for extended project period and Bhutanese side allocated when required necessary inputs for the Project. • The Project period was extended by one year because the Project target could not be achieved mainly due to bifurcation of FMCL from AMC and all the commercial nature activities of AMC were taken by the FMCL. Therefore, there were some lapses in implementing the Project activities during FMCL's transition period. • During the Project phase, experts are deputed, providing timely appropriate methods in developing standard and test codes as per international practices and guidance from Bhutan Standard Bureau are lay down as per the request at all time. • All the inputs were provided timely and there has never been any issues regarding the requirements for the inputs. Most of activities had external agencies involvement such as BSB or even farmers and it took a little time. Even the research inputs required season matching and finding progressive farmers and their fields etc. • Equipment and tools [such like fabrication machines, computers, special workshop tools, motorbike, tools, etc.] provided by the Project are well utilised for the Project activities
4. Impact	• Overall goal did not deviate from the Project purpose. It has indeed been very beneficial to both the organization AMC and to all stakeholders like farmers and private sector in the country. • Overall goal for output 1 to 4 is expected to be achieved. However the same momentum and pace is needed with many new activities under the same outputs to have overall goal achieved • Activities of the Project are expected to continue and expand to whole areas in Bhutan. However, the present indicator of overall goal does not reflect the present situation where two different organizations are executing different nature activities under different ministerial framework. • Standardization activity by AMC is well recognised by MoAF and the Secretary

	of MoAF insisted other agencies to have such standard in their products, for example seeds. • Method of presentation at the Department meeting in February 2018 as well as at AMC such like poster, display panels are very much appreciated by DoA and the Director instructed making such arrangements for future Department conference and workshops. • Price fixation committee was established and government subsidy policy making and planning are done in more systematic manner for not only hiring subsidy but also other central agencies activities.
5. Sustainability	• The activity will continue and the organization AMC has indeed become very professional and systematic. The mandates are all very important for the promotion of the farm mechanization programme in the country and the activities shall be continued. • As per the review of achievement of set indicators of output 1 & 2, the laying of foundation is strengthen and well established. • The structures for the organizations are well established and activities will be taken forward and continued. • Key staff of FMCL are employed as a permanent staff but some supporting staff (office assistant, hiring Dzongkhag focal persons, and machine operators) are employed by 2 years scheme of Ministry of Labour that will terminate in 2019. This should be ensured otherwise FMCL will face staff shortage problems. • The project activities are clearly allocated in AMC/FMCL annual plan as their own activities. • During the implementation of Project activities, expertise are deputed to strengthen the skills of project activities working members and as per the HRD evaluation report, its improved and it will be taken forward • FMCL is confident enough to continue with the Project activities. However, there is no end for improving technical skill because technology is advancing day by day. • As per the AMC plan, AMC have incorporated the activities and estimated the budget in the proposal which has been submitted for further approval and allocation from RGoB. It seems the prospects are high since those activities benefits to nation and society as well. • FMCL budgeting will be improved because of more systematic subsidy budgeting and the Government's supports. The subsidy budget provision from the Government was also mentioned in the 12th five year plan.

Based on the above opinions and physical achievement of indicators of the Project purpose, the project team concluded the result of joint review below.

Table 30: Result of Review based on DAC Evaluation Criteria

Criteria	Result	Justifications
1. Relevance	High	• Farm mechanization is still one of the key areas of MoAF in the 11th FYP (2013-2018) and 12th FYP (2019-2023). • Project approaches (targeted implementing agencies, data-based planning through survey/workshop, timely input (expertise, equipment and so on)) were appropriate.
2. Effectiveness	High	• Both Output level and Project purpose indicators related to Output 1 & 2 have been achieved. • Output 3 indicators have been achieved. There is no numerical indicators set for project purpose level, however, two types (out of three) of completed prototypes are under a certain scale of dissemination and a few more technologies are in pipeline based on the AMC's strategy. Therefore it can be concluded as achieved. • The indicator of Output 4 didn't achieved 100% but 82.8% and it can be concluded as "high".
3. Efficiency	High	• Project period extension was properly utilised because the non-achieved indicators in Project purpose at the end of 2016 were successfully achieved at the end of the extended period. • Most Input of equipment and training were actively used for producing output of the Project.
4. Impact	High	• The Project activity has concreted and strengthened three main components, i.e. (a) certification, (b) research and (c) hiring services, and these activities are expected to expand to all over the country. • Some activities (ex. research and hiring services) have already executed outside the project sites but private sector participation needs to be further strengthening for research prototypes promotion and dissemination in future. • Some Project activities (standardization, display, price fixation) brought a few positive impact to DoA and MoAF at policy level.
5. Sustainability	Fair	• All the activities of the Project are expected to continue and further expanded along with the new Five year Plan (12th FYP) started from this July 2018 • Mandates are all clear for both AMC & FMCL. • Structure of both AMC and FMCL are well established. • Structure for hiring services provision is widely covered most areas of the country.

		• Ministry of Labour's scheme which enable to employ some supporting staff (office assistants, Dzongkhag focal persons, machine operators) of FMCL will terminate in 2019 and there is no confirmation of renewal so far. • Key staff in AMC and FMCL are confident enough and will continue their activities because there will be no major staff transfer. • More number of academically qualified (graduate) people are joining AMC • Staff of AMC & FMCL need to lean some new / advancing technology by themselves and this can be done through a team work such as AMC technical committee and weekly technical discussion, and also utilizing the existing network with other institutes. Test implementation strategy at Ministry level and national level and also the exit strategy of prototype promotion and dissemination have become clear for staff of AMC. • Staff in production unit of FMCL have well gained knowledge and experiences for spare parts fabrication. • Budget for activities by AMC & FMCL are expected to allocate constantly from the RGoB as usual. • FMCL budgeting is improving because of more systematic subsidy budgeting and the RGoB's supports.

2. Key Factors Affecting Implementation and Outcomes

In the report of project detailed formulation survey (April 2014, in Japanese language only), the following key points for project implementation were mentioned. The points were verbally shared with implementing agency at the beginning of the project period. Here these points, which were extracted from the detailed survey report, are mentioned.

1) Detailed survey period

Field survey for output 3 and 4 in order to clarify the detailed problems and prioritise the needs was planned. Output 3 was mainly about farm machinery itself as well as operation patters. Output 4 was mainly about appropriate quantity of farm machines in a village or irrigation/water user community and efficient deployment addition to the business model of service providers.

Since project commencement might fall in a season after paddy transplanting, the above survey needed to complete by winter cropping season.

2) Project duration

Project duration had already been confirmed as three years but one year extension could be

discussed later based on the detailed survey result done by the project team as necessary because farm machinery activity had seasonal limitations.

3) Certification of standard of agricultural machinery

It was requested that AMC should maintain an appropriate cooperative relationship with BSB in order to proceed the certification process. Standards approval itself by BSB could be recognised as an external factor but the project was able to take part in the certification process because the most members in technical committee (TC-08) was from AMC.

4) Equipment

There was a request from Bhutanese side about fabrication machines for research activity in RAMC Samteling. It might be useful to have the minimum required items because it is unnecessary to travel from/to Paro every time for farm machine development. It is recommended to examine the necessity and required items during the detailed survey period.

5) Security risks in Sarpang

It was decided with JICA Bhutan office that the project experts stay in Sarpang up to 2 weeks because security risks of kidnapping in the area. It was advisable to collect security information from JICA Bhutan office, police offices, District office as well the team of "The Project for the Rehabilitation of Taklai irrigation System in Sarpang District". It was also important to pay attention to safety travel because road was narrow and time travel taken might be more than 9 hours from Paro.

3. Evaluation on the results of the Project Risk Management

For the key points mentioned in the above section "2. Key Factors Affecting Implementation and Outcomes", the following countermeasures have been taken till now. Other risks and countermeasures mentioned in the past Project Monitoring Sheet are also examined here.

1) Detailed survey period

Two project experts together with AMDC in charge visited Sarpang, Wandue, Tsirang areas in November 2014 as the first field survey. The survey result was (a) tractor sinking is not a major problem in Sarpang Dzongkhag (Chusagang area), (b) stony field condition is one of the most serious problems in Sarpang area, (c) potato is one of the potential cash crops and mechanization of potato harvesting might have a huge impact, (d) mechanization by smaller power tiller or reaper needed to be considered for sloping areas. These findings became a basis of research topics under the project activity. At the time of AMC's periodical review meetings held twice in a year (Mid-term is held in January and Annual meeting is held in July), research topics have been reviewed.

There was no clear analysed information about hiring services at the beginning of the project and a detailed survey was supposed to conduct in order to analyse the problems. Problem

analytical discussions were held two times, as mentioned in the section 1.3.2.4 [Activity 4-1].

2) Project duration

Project duration was extended for one year.

3) Certification of standard of agricultural machinery

AMC has been maintaining a cooperative relationship with BSB. The project organised a joint workshop two times, one was in December 2015 and the other was in June 2017 as mentioned in the section "1.3 Activities" under Chapter II and also a total of 11 times TC-08 meeting were held during the project period.

4) Equipment

Because of security risks in Sarpang area, the project experts decided to carry out activities mainly in Paro including prototype development. Therefore equipment support for RAMC Samteling was not prioritised.

5) Security risks in Sarpang

Security precautions have been taken and the project experts have minimised their staying period in Sarpang area.

6) Delay of fabrication machines

After identifying a necessity for improving spare parts production capacity of AMC in November 2014 and May 2015, a list of necessary fabrication machines was prepared by a short-term expert in "Die mould making" in March 2016. Although a request of equipment was submitted to JICA Tokyo in April 2016, shipment finally arrived at the end of May 2017 by taking more than one year mainly due to finalising technical specifications with available manufacturers in Japan. This delay caused rescheduling of short-term expert activity as well as production schedule of spare parts for hiring services.

4. Lessons Learnt

Through the Project implementation, there are so many lesson learnt which may be useful for both project team in future activity and JICA in similar types of project in other countries.

1) Standardization and test implementation of farm machinery

Technically the system establishment for farm machine standardization and test implementation is one of the unique approaches with donor supports of (a) equipment, (b) Japanese experts, (c) training programme and also input from Bhutan side as (d) building as testing laboratory (e) technical staff and (f) some running costs. This approach could be referred by other developing countries who have a similar idea of establishing such a system for standardization and test implementation of farm machinery. With further progress of AMC with self-efforts, it can be

recommended to such countries to visit AMC to see a good example.

To develop standards, it needs to conduct a basic research to get data as own references as well as to obtain and refer to the standards of other organizations / countries such as ISO, Indian Standards, and Japan Industrial Standards to harmonising with them.

The Project implemented some test codes and standards but for the strong certification system in the country, AMC needs to become an accredited testing laboratory. In this context, AMC needs to work with BSB and other relevant organizations for creating a legal basis in the country.

Becoming a member country of ANTAM may help AMC to obtain technical guidance and advices for further development of standards. The counterpart fund of 2KR will also support AMC financially for improving testing laboratory facilities. See some more explanation on this point in the section 3 “Recommendations for Bhutanese side” in the Chapter IV below.

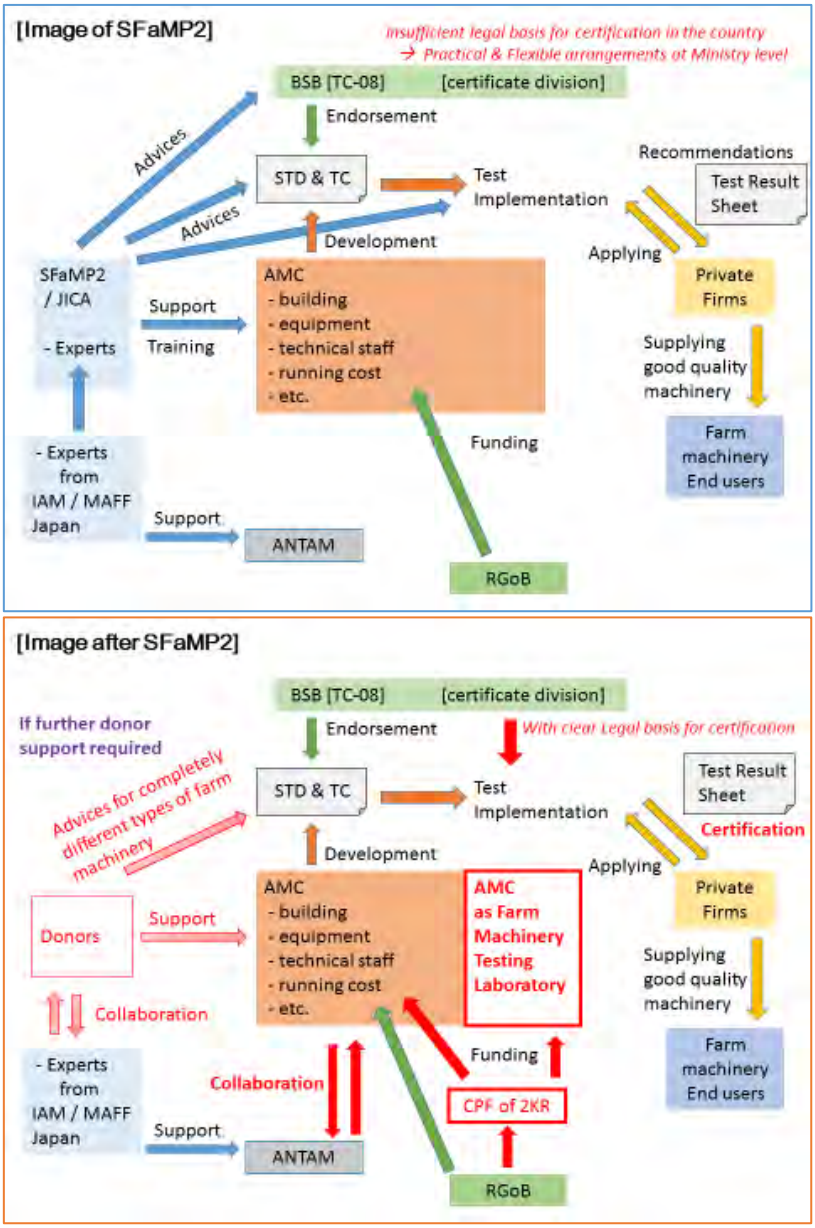
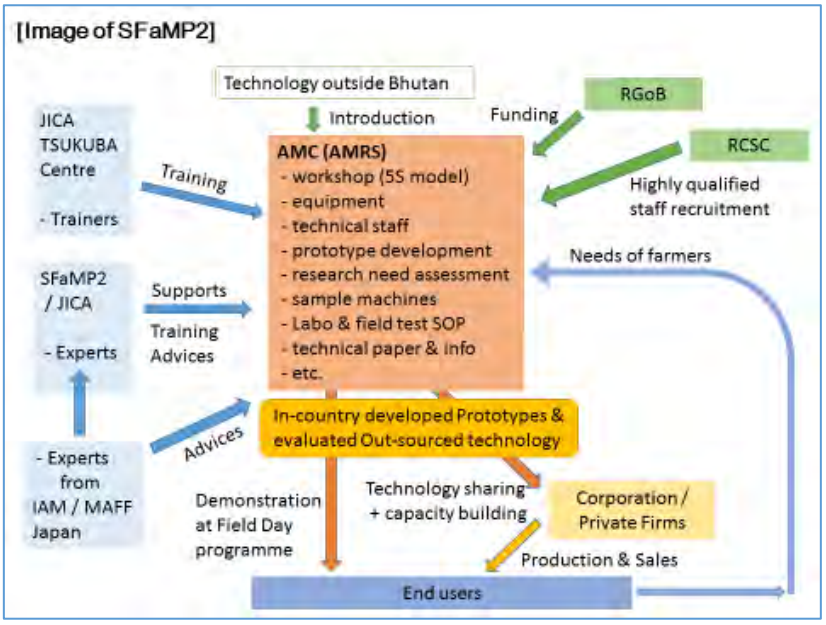


Figure 21: Image of SFaMP2 and future in standardization activities

2) Partnership with private firms for Research activity

As clarified in the AMC exit strategy, future partnership with private firms is very essential, addition to the needs assessment practices since 2018. Images of the Project and future are mentioned below.



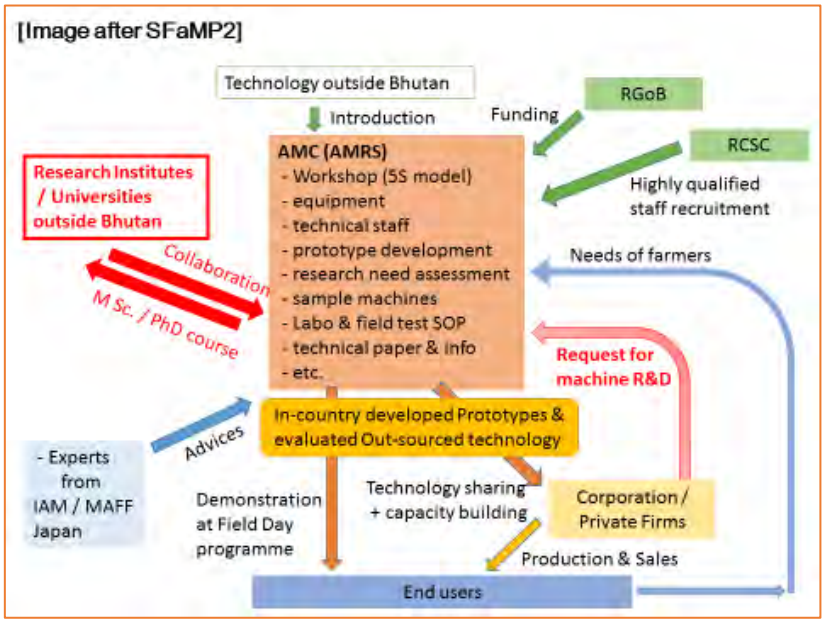


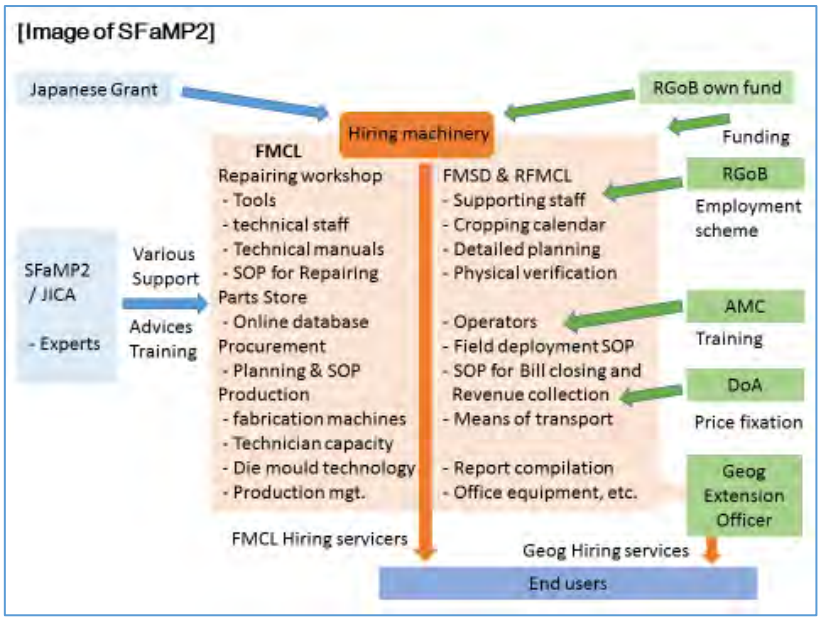
Figure 22: Image of SFaMP2 and future in research activities

3) Hiring services

FMCL is practicing Custom Hiring services, operated with the donor supports and there are so

many technical experiences gained through the implementation. Amongst them management system of hiring services is very important to have some strategies/policies for future sustenance. Here, the role of Japanese expert is really fundamental, since FMCL and its staff were not so familiar with hiring services of farm machinery before the Project.

Hiring services in FMCL central hiring and Geog hiring services have been expanded. At the same time, it has been realised that FMCL cannot cover all the areas because of capacity limitations. Therefore, a diversification of hiring services in the collaboration with private machine owners or farmer's cooperatives, which may be with leasing-out or rental of hiring machinery or implements from FMCL, is a keyword for further expansion Components for hiring services and such future image are mentioned below.



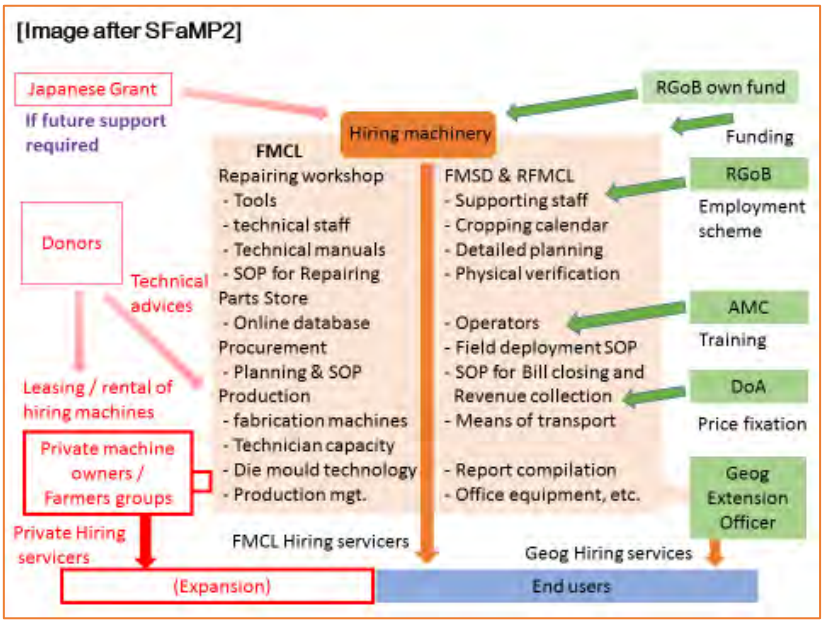


Figure 23: Image of SFaMP2 and future in hiring services

4) Others (mainly from Bhutanese project team members)

- The Project team members learned how to manage the project and how to do the human resources development.
- It is also really important to concentrate on the limited business program to easily achieve the goal.
- This project is one of the useful to strengthen the organization in terms of knowledge gain from experts and even skill development. AMC needed a lot of measuring equipment to carry out test and research, however, the organization received very important measuring equipment and still then, it will require a lot to become as farm machinery testing institute.
- The project was different from the phase 1 executed. It was more systematic and achievements are laudable. The greatest achievement is in the upgrading the facilities for standards and tests and enhancing the capacity of the staff in tests and test formats settings. Now AMC is going ahead with tests and it will benefit the farmers and country at large. Secondly the research facilities are also fully supported and so is the methods to carry the research. Most of the research technology developed by the Project are now in the field.

IV. For the Achievement of Overall Goals after the Project Completion

1. Prospects to achieve Overall Goal

The overall goal of the project is "**Farmers have better access to appropriate farm machinery**

in Bhutan" with an indicator of "Average[6] of Farm mechanization area ratio" increase by 10 points from 7.8% in Bhutan by 2020 (this 10 points is equivalent to 74,252 acres).

As mentioned earlier, the hiring services as Output 4 activity have been taken by FMCL in August 2016. We didn't change the indicators of overall goal at the time of PDM revision in 2016 (i.e. Inclusion of FMCL into the Project framework) because it was not sure how these two organizations would function after the separation of AMC. Now AMC and FMCL executes each of their activity based on their mandates under different Ministry framework, thus it is not appropriate to measure their performance with the present one indicator for overall goal.

The overall goal of the Project is to expand the project activity from the project sites to the whole country. Therefore, what can be proposed here is to set overall goal indicators separately for AMC and FMCL along with the project purpose and these are expanded figures based on AMC's 12th Five Year Plan and FMCL's future plan as mentioned below.

Table 31: Indicators for overall goal

	Indicator in Project Purpose	Proposed Indicators in Overall Goal
1	At least 4 types of farm machines with certificate of AMC are distributed	12 numbers of Quality and safe farm machineries and spare parts are ensured by the end of 2022/23.
2	Machines modified / developed by AMC are introduced in the sites	12 numbers of Appropriate technologies for farm machineries are developed and disseminated through R&D activities by the end of 2022/23.
3	"Farm mechanized Area Ratio" of "Land preparation" increases by 10 points from 4.1% in the sites (which is equivalent to 7,602 acres).	68,300 acres is covered by hiring services by the end of 2021 and 122,000 acres by 2023 respectively as a yearly accumulated acreage in the whole country from 2019.

Justification of the above indicators:

1) Farm machinery standards development

AMC plans to complete 12 numbers of standards development in the 12th Five Year Plan (2018/19 – 2022/23) and AMCS is the section in charge for it. This activity is exactly an expansion from the project activity. The mandate on standards and testing has tremendous achievement as this is a technical activity and external support requirement. The facilities especially equipment provided by the project shall be made full use for the testing of farm machinery in the country. Now even private sector has understood and are availing the tests. However AMC may be able to continue the relatively easier tests for end machines and continue with the test for standards already adopted and expertise and experienced enhanced. However for newer and complicated machines like tractor, combine harvester

[6] Actual understanding by project team about the word of "Average" is just an area ration of all types of machines and it is not a statistical average.

may require some supports from institutes outside the country.

2) Research and Development

AMC also plans to complete 12 numbers of prototype development in the 12th Five Year Plan and AMRS is the section in charge for it. AMRS will also try to bring some technologies from sources outside the country. AMC shall continue the activities under the past project support and also the additional mandate which is imparting of trainings to all stake holders. Now AMC had made ready the 12th FYP report which shall be the basis for the activities. The capacity building and the facilities supported by the Project shall be made use to carry forward the under research activities and also the new activities which require interventions.

3) Hiring services

FMCL is already deploying different types of machinery and also covering some other areas rather than the project sites. FMCL has achieved a total of 14,284 acres (11,344 acres: Central Hiring services, 2,940 acres: Geog Hiring services) in 2017/18 while FMCL set a target of 21,022 (12,413 acres: CHS, 8609 acres: Geog HS) in 2018. It can be expected to continue further expansions in next five years with considerations of additional power tiller provided by Japanese Grant Aids as well as RGoB own fund. The target figures are based on the tentative plan (as of 25st July 2018) of FMCL for coming five years.

2. Plan of Operation and Implementation Structure of the Bhutanese side to achieve Overall Goal

The followings are the plans of AMC and FMCL for coming five years and the Plan of Operation can be along with the five year plan of AMC in the Table 32 and FMCL in the Table 33 below.

Table 32: AMC's targets in the 12th Five Year Plan

indicator	Unit	2018/19	2019/20	2020/21	2021/22	2022/23	Total
Quality and safe farm machineries and spare parts are ensured.	Nos	2	3	2	3	2	12
Appropriate technologies for farm machineries are developed and disseminated through R&D activities	Nos	1	1	4	2	4	12
	Technology outsource	1	2	2	2	2	9
Appropriate training courses on farm machineries are provided for farmers and other stakeholders.	Nos	593	578	593	598	638	3000

Table 33: FMCL's targets in the coming Five Year Plan (tentative)

Farm Machinery	Annual operating days	No of FM	Field capacity (ac/day)	2019	2020	2021	2022	2023
Power tiller	70	93	0.8	2604	2864	3021	3125	3125
Tractor (50HP)	70	3	2.4	252	277	292	302	302
Tractor (34HP)	70	30	2.0	2100	2310	2436	2520	2520
Tractor (18HP)	70	40	1.5	2016	2218	2339	2419	2419
Transplanter	20	28	2.4	672	739	780	806	806
Reaper	20	99	2.4	2376	2614	2756	2851	2851
Thresher	20	28	1.0	280	308	325	336	336
Combine	50	15	2.4	900	990	1044	1080	1080
CHS Sub total				11200	12320	12993	13439	13439
Machine utilization efficiency (considering back-up)				0.50	0.55	0.58	0.60	0.60
Geog Power tiller	70	800	0.8	8960	10752	12096	13440	13440
Machine utilization efficiency (considering back-up)				0.20	0.24	0.27	0.30	0.30
Ground Total				20160	23072	25089	26879	26879

According to FMCL's plan, CHS is to be increased in annual working days up to 70days and improve machine utilisation efficiency till 60%. In case of GPT HS, the present efficiency is low but it is expected to increase by directly stationed and handled some Geog power tiller at FMCL regional centre or other FMCL branches.

3. Recommendations for the Bhutanese side

1) Implementing Agencies level

1-1) To AMC

- Although AMC staff, who are engaged in standardization, have gained their knowledge and experiences through the Project, they must continue learning new technology for different types of farm machinery. This may be done through;
  - Maintaining a cooperative relationship with Institute of Agricultural Machinery Japan (IAM) where Japanese experts involved in the Project work and two AMCS staff attended training programme.
  - Becoming a member country of "Asian and Pacific Network for Testing of Agricultural Machinery (ANTAM)", which is a platform consists of 19 countries for gaining and sharing experiences of farm machinery test. The Japanese expert, who is also involved in the ANTAM activity, have already supported AMC to obtain the information on ANTAM membership, thus AMC has to take an action with the

DoA/MoAF for further steps.

- In order to set-up a stronger certification system in the country, AMC needs to become an accredited farm machinery testing laboratory supported by a legal basis of the country.
- Partnership with private sector is a key for promotion and dissemination of standards and prototypes developed by AMC. Based on the experiences gained in the Project period, AMC should continue and further expand such activity in the 12th FYP. Various and flexible supports for local manufacturers and arrangement for local importers/dealers may bring visible outputs.
- Ex-training participants, especially farm machinery training in JICA Tsukuba and testing & evaluation training at IAM, should play more major roles in respective sections. Some ex-participants have already conducted training programmes to their colleagues as "In-service training" and it is recommendable to AMC management to make necessary arrangements for continuing such activities.
- As mentioned FMCL part below, a successful achievement of the General Grant Aids project is very essential to seek for future support by the Government of Japan. AMC should continue to make necessary arrangements for the Grant project while ground operation should be done by FMCL.

1-2) To FMCL

- General Grant Aids power tiller were now in the field for hiring services. As FMCL planned, FMCL must utilise these machines effectively and efficiently, and make a good achievement. There are some expectations of further support of power tillers from the Government of Japan but technical discussion will be depending on the progress in Bhutan side.
- FMCL took over the commercial nature activity from AMC including sales of Japan brand farm machines. Utilising this as an advantage, it is recommendable to FMCL to develop further business relationship with Japanese farm machinery manufacturer and trading firms. It may bring a good impact to farming community in the country with a good quality machines as well as increase of revenue generation of FMCL.

2) Department and Ministry level

- Once AMC will have taken an action to become a member country of ANTAM as mentioned above, an immediate ministerial or even higher diplomatic supports may be required. AMC can be a focal organization for it.
- It is recommended to DoA/MoAF to make AMC and FMCL carry out the above mentioned recommended activities successfully through RGoB own fund and may be with donor supports.
- Limitations in basic academic abilities (ex. math or physics) in Bhutanese counterparts were observed by Japanese experts. More academically qualified staff, especially in machine test and research sections are required. A few such qualified persons have joined AMC recently but continuous recruitment is very important.

- In order to produce internationally qualified researchers in AMC, a few master degree holders are recommended to continue or resume their research activities at higher level (PhD). For this, support from DoA and Ministry in order to encourage them is very necessary.
- Government's initiative for price fixation committee exercise is very much appreciated and it should continue periodically in full participation of AMC, FMCL, MoF and other relevant Department/Ministry in order to maintain accountability of hiring rate fixation as well as to consider the increase of hiring rates. .
- It is very essential to ensure the employment scheme of Ministry of Labour for retaining some supporting staff (office assistant, hiring Dzongkhag focal persons, and machine operators). Since it will be terminated at the beginning of 2019, it is very much advisable to renew it with new government administration soon after the general election.
- It is very important to maintain the record of the Counterpart Fund with accuracy in order to make the procedure for approval smooth.

4. Monitoring Plan from the end of the Project to Ex-post Evaluation

1) Monitoring Plan

Overall monitoring will be done through;

- Submission of AMC's mid-term review meeting minutes and annual reports along with the above Plan of Operation upon AMC's 12th Five Year Plan (can be divided into annual basis plans) and their monitoring system format.
- Submission of Grant project progress report (quarterly basis) by AMC and FMCL activity progress tracking reports. The Grant project covers only main machines (power tiller and main implements) supply and other implements (trailers and paddy wheels) are to supply by Bhutanese budget. The main machines were handed over to RGoB in January 2018 but they were not in used immediately because it took some time to supply the other implements to the field (trailer has not supplied yet as of July 2018 due to technical problem in tender). Therefore, the timing of evaluation can should be considered based on the progress rather than exactly after one year from handing/taking of equipment.
- AMC and FMCL to collaborate with JICA Bhutan office even after the SFaMP2 completion including sharing information on situations of farm mechanization in the country.

2) Recommendation to JICA Bhutan Office

- It is very important to obtain the Counterpart Fund (CPF) utilization plan approval from the Government of Japan because it includes especially (a) Testing laboratory building and equipment, and (b) revolving fund for procurement of farm machines and spare parts. It is advisable to JICA Bhutan office to follow it up for obtaining an approval as soon as possible.

End

Lists on Input Management (Bhutanese side / Japanese side) **Annex 3**

1. Assignment of Counterpart Personnel

SFAMP2

Updated: 10 August 2018

No	Name of Counterpart Personnel	Position / Organization	Field of Expertise	Output	Duration of Assignment		JFY 2014	JFY 2015	JFY 2016	JFY 2017	JFY 2018	Name of Training Course in Japan *	Remark
					From	To	8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8		
1	Mr. Sangay Lhendup	Head of IQCC	Quality control & standard	1 & 2	2014/9	up to date			Training in Japan Training in Japan			Enhancing SMEs support capacity through learning Quality and Productivity improvement (KAIZEN) (B), Training on Quality Management.	
2	Mr. Ugyen Dorji	Staff in IQCC	Quality control & standard	1 & 2	2014/9	up to date		Training at AMC Training at AMC		Training in Japan		Training on Steel and Heat Treatment at AMC, Training on Press Die Mold, Agriculture Machinery Testing & Evaluation Methods in Japan	
3	Mr. Tomba Singh	Staff in IQCC	Quality control & standard	1 & 2	2014/9	2016/6			Joined FMCL				
		Manufacturing unit (FMCL)	Manufacturing of spare parts	4	2016/7	up to date			in FMCL			Training on Development Process(1), Training on Development Process 2, Training on cost management.	
4	Mr. Jigmi	Staff in IQCC	Quality control & standard	1 & 2	2014/9	up to date			Training in Japan	Training in Japan		Training on Quality Management, Agriculture Machinery Testing & Evaluation Methods.	
5	Ms. Sangay Choden	Staff in IQCC	Quality control & standard	1 & 2	2014/9	up to date							
6	Ms. Chimi Dema	Staff in IQCC	Quality control & standard	1 & 2	2014/9	up to date							
7	Mr. Kinga Norbu	Head of AMDC	Research & development	3	2014/9	up to date		Training at AMC Training at AMC	Training at AMC			Training on Steel Iron and Heat Treatment, Training on Press Die Mold, Training on Design Process of Press Die Mold	
		Officiating Program Director	Project Management	Mgt	2016/7	up to date							
8	Mr. Chopel Dukpa	Staff in AMDC	Research & development	3	2014/9	2016/6			Joined FMCL				
		Manufacturing unit (FMCL)	Manufacturing of spare parts	4	2016/7	up to date			in FMCL	Training at AMC	Training in Japan Training at FMCL	Training on design and practice of power tiller plow, Training on design process of Press Die Mold and making family tree, load map and swot map table	
9	Mr. Kharka Bdr. Subba	Staff in AMDC	Research & development	3	2014/9	up to date		Training in Japan	Training at AMC	Training at AMC Training at AMC		Training on development and extension of agricultural machinery for small scale farmers in Japan, Training on design and practice of power tiller plow, Training on development Process, Design process of press die mold and	
10	Mr. Chencho Tshering	Staff in AMDC	Research & development	3	2014/9	up to date		Training at AMC	Training at AMC	Training in Japan		Training on Press Die Mold and design process of press die mold, Training on making family tree, laod map and swot map table, Training on Development Process (2) and cost management training, Agriculture machinery design-	
11	Mr. Kinley Tshering	Staff in AMDC	Research & development	3	2014/9	up to date			Training at AMC			Training on Design Process of Press Die Mold and making family tree,Load map,and swot map table/Transferred to AMTC in July 2017	
12	Ms. Zangmo	Staff in AMDC	Research & development	3	2014/9	up to date		Training at AMC Training at AMC	Training at AMC	Training at AMC	Training at AMC	Training on Steel Iron and Heat Treatment, Training on Press Die Mold, Training on design and practice of power tiller plow, Training on Development Process, design process of press die mold and making family tress, load map	
13	Ms. Sonam Peldon	Staff in AMDC	Research & development	3	2014/9	up to date			Training at AMC	Training at AMC	Training at AMC	Training on Development Process and design process of die mold, Training on making family tree, laod map and swot map table, Training on Quality Management and Production Management, Agriculture machinery design-2 and	
14	Ms. Dema Tshering	Staff in AMDC	Research & development	3	2014/9	up to date			Training at AMC			Training on Development Process(1) and Training on Development Process 2, Training on cost management.	
15	Mr. Jom Norbu	Staff in AMDC	Research & development	3	2014/9	up to date		Training at AMC	Training in Japan	Training at AMC	Training at AMC	Training on Steel and Heat Treatment at AMC, Development of farm machinery for small scale farmers in Japan, Training on Quality Management.	
16	Mr. Dechen Wangchuk	Reginal Manager (Paro)	Hiring services	4	2014/9	2014/10	Transferred to National Hiring Unit						
		National hiring coordinator	Hiring services	4	2014/11	2016/2			Resigned				
17	Mr. Chogyal Dukpa	Senior Extension Supervisor (RAMC Samteling)	Hiring services	4	2014/9	2015/1							
		National hiring coordinator / M&E section in charge	Hiring services	4	2016/2	2016/6			Joined FMCL				
		Natrional hiring coordinator (FMCL)	Hiring services	4	2016/7	up to date			in FMCL				
18	Mr. Tshering Dorji	Reginal Manager (Paro)	Hiring services	4	2014/11	2015/12		Transferred to Research & Development section					
		Staff in AMDC	Research & development	3	2016/1	up to date			Training in Japan	Training at AMC		Development of farm machinery for small scale farmers, Training on Quality Management.	
19	Mr. Lhakpa Dorji	Reginal Manager (Paro)	Hiring services	4	2016/1	up to date		Training at AMC		Joined FMCL		Training on Steel Iron and Heat Treatment	
		Reginal Hiring Coordinator (Paro FMCL)	Hiring services	3	2016/7	up to date			in FMCL				
20	Mr. Kinzang	Reginal Manager (Bajo)	Hiring services	4	2014/9	2016/6							
		Staff in IQCC	Research & development	3	2016/7	up to date		Transition in 3 months				Training on Development Process and design process of press die mold /Transferred from RAMC Bajo to RAMC Khanema	
21	Mr. Leki Dung	Reginal Manager (Khangma)	Hiring services	4	2014/9	2016/6			Joined FMCL				
		Reginal Manager (Khangma)	Hiring services	4	2016/7	up to date			in FMCL				
22	Mr. Ugyen Dukpa	Reginal Manager (Samteling)	Hiring services	4	2014/9	2016/6			Training at AMC			Training on Development Process and Training on design process of press die mold.	
		Staff in AMDC	Research & development	3	2016/7	up to date		Transition in 3 months					
23	Ms. Dorji Tshomo	Reginal Hiring Coordinator (Paro)	Hiring services	4	2014/11	2016/6							
		Staff in M&E	Monitoring & Evaluation	3	2016/7	up to date		Transition in 3 months		Training at AMC		Agriculture machinery design-2 and practice of potato digger design and cag wheel design, Training on Quality Management, Training on Production Management.	
24	Ms. Puntsho Dema	Reginal Hiring Coordinator (Bajo)	Hiring services	4	2014/11	2016/6							
		Coordinator (RAMC Bajo)	(under discussion)	3	2016/7	up to date		Transition in 3 months		Training in Japan		Development and Improvement of Agriculture for Small Scale Farmers.	
25	Mr. Chhophel	Reginal Hiring Coordinator (Khangma)	Hiring services	4	2014/11	2016/6							
		Staff (training) in RAMC Khangma	Training	(4)	2016/7	up to date		Transition in 3 months					
26	Ms. Kinley Zangmo	Reginal Hiring Coordinator (Samteling)	Hiring services	4	2014/11	2016/6			Joined FMCL				
		Reginal Hiring Coordinator (Samteling FMCL)	Hiring services	4	2016/7	up to date			in FMCL				
27	Mr. Jurmi Tenzin	Staff (training) in RAMC Samteling	Training	(4)	2014/9	2016/6		Training at AMC	Joined FMCL			Training on Press Die Mold	
		Reginal Hiring Coordinator (Bajo FMCL)	Hiring services	4	2016/7	up to date			in FMCL				
28	Mr. Jitshen Wangchuk	Contract farming coordinator (FMCL) / Head of Geog hiring services	Hiring services	4	2016/7	up to date		Joined FMCL from District Agriculture sector		Training in Japan		Sustainable Rural Development by Biomass	
29	Mr. Sandip Gurung	Staff in AMTC (spare parts)	Hiring services	4	2016/5	2016/6			Joined FMCL				
		Store in charge (FMCL)	Hiring services	4	2016/7	up to date			in FMCL	Training in Japan		ICT (Information and Communication Technology) for Agriculture Information Use	
30	Mr. Karma Thinley	Programme Director of AMC	Project Management	Mgt	2014/9	2016/6			Joined FMCL				
		Chief Executive Officer of FMCL	Project Management	4	2016/7	up to date			in FMCL				
31	Ms. Sonam Pem	Head of M&E section	Monitoring & Evaluation	4	2014/9	2015/5		on 2 years-leave			Resigned		
32	Mr. Tshering	Staff in M&E	Monitoring & Evaluation	4	2014/9	2015/2	Resigned						
33	Mr. Lobzang Sherub	Staff in M&E	Monitoring & Evaluation	4	2014/9	2017/1			Joined FMCL				

1. Assignment of Counterpart Personnel

SFAMP2

Updated: 10 August 2018

No		Name of Counterpart Personnel	Position / Organization	Field of Expertise	Output	Duration of Assignment		JFY 2014												JFY 2015												JFY 2016												JFY 2017												JFY 2018								Name of Training Course in Japan *	Remark
						From	To	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	
			Procurement (FMCL)	Hiring services	4	2017/2	up to date																													in FMCL																																			
34	Ms.	Tshering Lhamo	Staff in AMSC	Spare parts	4	2014/9	2016/9												Training at AMC									Training at AMC									Training at AMC																																	Training on Steel Iron and Heat Treatment, Training on Development Process, Training on Development Process(2) and cost management training, Training on Quality Management and Production Management	
			Staff in AMDC	Research & development	3	2016/10	2017/5																																																																				
35	Ms.	Leki Dema	Head of Central hiring service	Hiring services	4	2017/2	up to date																													Joined FMCL																																			
36	Mr.	Sonam Tobgay	Worksho in charge in RAMC Paro	Hiring services	4	2014/11	2016/6																											Joined FMCL																																			
			Worksho in charge in RFMCL Paro	Hiring services	4	2016/7	up to date																											in FMCL																																			
37	Mr.	Dechen Wangdi	Worksho in charge in RAMC Samteling	Hiring services	4	2014/11	2016/6																											Joined FMCL																																			
			Worksho in charge in RFMCL Samteling	Hiring services	4	2016/7	up to date																											in FMCL																																			
38	Mr.	Kelzang Namgay	Finance Officer	Hiring services	4	2014/11	2016/6																																																																			
			Deputy General Manager	Hiring services	4	2016/7	up to date																																																																		
39	Ms	Kinley Wangmo	Finance Officer	Hiring services	4	2016/11	up to date																																																																		
40	Mr.	Tenzin Wangdi	Administration Officer	Coordination Head	PCWG	2017/11	up to date																																																																	
41	Mr.	Thinley Dorji	Store in charge (FMCL)	Hiring services	4	2018/2	up to date																																																																	
42	Ms	Tshewang Lhamo	Assistant ADM (FMCL)	Coordination	PCWG	2017/10	up to date																																																																	
43	Ms.	Sonam Pelden	Project Assistant	Coordination	PCWG	2017/9	2018/8																																																																	
44	Ms	Pema Wangmo	Agriculture Engineer, AMC	Quality control & standard	1 & 2	2018/2	up to date																																																																
45	Ms	Chime Wangmo	Mechanical Engineer, AMC	Research & development	3	2018/3	up to date																																																															
46	Mr.	Ugyen Phuntsho	Mechanical Engineer, AMC	Research & development	3	2018/6	up to date																																																															
47	Mr.	Sonam Geley Dorjee	Mechanical Engineer, AMC	Research & development	3	2018/3	up to date																																																															
48	Ms.	Choki Wangmo	M&E, FMCL	Monitoring & Evaluation	PCWG	2017/8	up to date																																																															
49	Ms.	Kinga	Assistant ADM (FMCL)	Coordination	PCWG	2017/8	2017/11																																																															
50	Mr.	Namgay Wangchuk	General Technician, FMCL	Manufacturing of spare parts	4	2018/2	up to date																																																														
51	Mr.	Tula Ram	General Technician, FMCL	Manufacturing of spare parts	4	2017/3	up to date																																																													
52	Mr.	Sonam Dorji	Junior Engineer, FMCL	Manufacturing of spare parts	4	2017/3	up to date																																																											
53	Ms.	Pema Choki	General Technician, FMCL	Manufacturing of spare parts	4	2018/5	up to date																																																										
54	Mr.	Roshan Sharma	Junior Engineer, FMCL	Manufacturing of spare parts	4	2017/1	up to date																																																									
55	Mr.	Tashi	General Technician, FMCL	Manufacturing of spare parts	4	2017/3	up to date																																																									
56	Mr.	Rabi Lal Dhital	Welder	Manufacturing of spare parts	4	2018/2	up to date																																																										
57	Ms.	Punam Das	Welder	Manufacturing of spare parts	4	2018/7	up to date																																																									
58	Mr.	Sonam Wangchuk		RAMC, Khangma		2016/2	up to date																																																									
59	Mr.	Karma Wangchuk		RAMC, Bajo		2016/2	up to date																																																									
60	Mr.	Arjun Rasaily	General Technician, FMCL	Manufacturing of spare parts	4	2016/10	up to date																																																									
61	Mr.	Ashok Gurung	General Technician, FMCL	Manufacturing of spare parts	4	2017/2	up to date																																																									
62	Mr.	Tshering Nidup	Junior Engineer (RAMC,Samtenling.)	Hiring services	3	2017/9	up to date																																																									
63	Mr.	Namgay	Mechanical Engineer, AMC	Research & development	3	2016/12	up to date																																																											
64	Mr.	Sandeep Darji	General Technician, FMCL	Manufacturing of spare parts	4	2018/3	up to date																																																											
65	Mr.	Sonam Tenzin	General Technician, FMCL	Manufacturing of spare parts	4	2018/3	up to date																																																										

2. List of Land, Building and Facilities by Bhutanese side

SFAMP2

Updated on 10 August 2017

AMC

No.	Item	Location	Output Group
1	Project Office	AMRS Buidling	PMU, PCWG
2	PCWG Office	Administration Office	PMU, PCWG
3	Certification office	AMCS Office	OP1, OP2
4	Testing Laboratory	AMCS Office	OP1, OP2
5	Research workshop	AMRS Buidling	OP-3
6	Research Office	AMRS Buidling	OP-3
7	Hiring Service Office	FMCL Paro and all regionals	OP-4
8	Office equipment and furniture	With counterpart personnel	OP1-4
9	Regional Site Office	RAMC Samtenling	OP1-4

FMCL

No.	Item	Location	Output Group
1	Office space for Output 4 working group	Store building	OP4
2	Office space for project coordination group	Main building	PCWG
3	Office space	Production unit	OP4
4	Workshop	Production unit	OP5

3. Operation Budget

updated on 10 August 2018

Local cost support of JICA

Unit: Nu.

Budget Item	Japanese Financial Year (from April to March)					Total Amount
	FY2014	FY2015	FY2016	FY2017	FY2018 (plan)	
Air Ticket	0.00	646,054.00	0.00	19,235.00	0.00	665,289.00
Travel Allowance (local)	19,700.00	95,800.00	0.00	323,700.00	101,200.00	540,400.00
Consultant / Contractor	0.00	732,575.00	1,519,500.00	469,000.00		2,721,075.00
Salary (no staff)	123,500.00	180,000.00	0.00	3,597,262.94	805,260.26	4,706,023.20
Activity Expenses (local)	1,187,031.00	2,736,696.57	3,089,927.24			7,013,654.81
Total	1,330,231.00	4,391,125.57	4,609,427.24	4,409,197.94	906,460.26	15,646,442.01

Unit:US $

Budget Item	Japanese Financial Year (from April to March)					Total Amount
	FY2014	FY2015	FY2016	FY2017	FY2018	
Air Ticket	0.00	0.00	0.00	0.00	0.00	0.00
Travel Allowance	0.00	14,385.00	0.00	0.00	0.00	14,385.00
Misrenious	0.00	310.00	0.00	0.00	0.00	310.00
Total	0.00	14,695.00	0.00	0.00	0.00	14,695.00

Operation budget of AMC/FMCL (Total amount spent for AMC & FMCL activities)

Unit: Nu.

Budget Item	Bhutanese Financial Year (from July to June)					Total Amount
	FY2014/15 Expenditure	FY2015/16 Expenditure	FY2016/17 Budget	FY2017/18	FY2018/19 proposed	
AMC (Capital)	23,290,739.28	50,736,487.89	9,055,000.00	976,000.00	4,316,000.00	88,374,227.17
AMC (Recurrent)	49,989,192.25	51,666,760.67	45,586,000.00	36,554,000.00	41,322,000.00	225,117,952.92
FMCL (Capital)			18,275,000.00	55,238,647.33	72,011,901.78	145,525,549.11
FMCL (Recurrent)			2,000,000.00	189,218,600.92	261,725,601.45	452,944,202.37
Total	73,279,931.53	102,403,248.56	74,916,000.00	281,987,248.25	379,375,503.23	911,961,931.57

4. Dispatch of JICA Expert

SFaMP2

updated on 10 August 2018

Long-term Expert

No	Name of Expert	Field of Expertise	Duration of Assignment	JFY 2014												JFY 2015												JFY 2016												JFY 2017												JFY 2018				
				4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8
1	Takahashi Hiroyuki	Chief Advisor / Machine Test & Evaluation	2 years + 3 months							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																			
2	Oishi Tsuneo	Project Coordinator / Agriculture Machinery	3 years					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■													
3	Koji Kanemaru	Project Coordinator / Monitoring	1 year +3 months																																			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
4	Oishi Tsuneo	Chief Advisor / Agricultural Machinery	1 year																																			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Short-term Expert

No	Names	Field of Expertise	Duration of Assignment	JFY 2014												JFY 2015												JFY 2016												JFY 2017												JFY 2018				
				4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8
1	Kitagawa Shinji	Die mold making	1 month																		■																																						
2	Hirakawa Takaaki	Monitoring & Evaluation	1 month																			■																																					
3	Hirakawa Takaaki	Monitoring & Evaluation	1 month																							■																															
4	Kitagawa Shinji	Die mold making	1 month																							■																															
5	Kitagawa Shinji	Die mold making / Production Management	2.5 month																										■	■	■	■																									
6	Kitagawa Shinji	Die mold making / Production Management	2 month																														■	■	■																					
7	Kitagawa Shinji	Die mold making / Production Management	2.5 month																																	■	■	■																		
8	Maki Tsumagari	Capacity Assessment of State owned enterprises	2 months																																	■	■																		
9	Yasuyuki Hidaka	Research method on Development of Agriculuture Machinary	1 month																																	■																			
10	Kitagawa Shinji	Die mold making / Production Management	3 month																																			■	■	■	■															
11	Kitagawa Shinji	Die mold making / Production Management	3 month																																						■	■	■														
12	Yasuyuki Hidaka	Research method on Development of Agriculuture Machinary	1 month																																							■														
13	Keiko Minagawa	Machine Test & Evaluation	1 month																																								■													
14	Kitagawa Shinji	Die mold making / Production Management	3 month																																												■	■	■						
15	Kitagawa Shinji	Die mold making / Production Management	3 month																																															■	■	■		
16	Hiroyuki Takahashi	Machine Test & Evaluation	3 weeks																																															■				

■ : Dispatched　　■ : Planned

5. Acceptance of Counterpart Training in Japan

SFaMP2

updated on 10 August 2018

No	Name of Counterpart Personnel	Field of Expertise	Name of training Course	Duration of Training		JFY 2014												JFY 2015												JFY 2016												JFY 2017												JFY 2018				
				From	To	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8
1	Kharka Bdr. Subba	Farm Machinery	Monozukuri (*1: Full name)	4-Mar-15	7-Nov-15												■	■	■	■	■	■	■	■	■																																			
2	Jom Norbu	Farm Machinery	Monozukuri (*2: Full name)	6-Mar-16	12-Nov-16																							■	■	■	■	■	■	■	■	■																							
3	Tshering Dorji	Farm Machinery	Monozukuri (*2: Full name)	6-Mar-16	12-Nov-16																							■	■	■	■	■	■	■	■	■																							
4	Chencho Tshering	Farm Machinery	Monozukuri	5-Mar-17	30-Sep-17																																			■	■	■	■	■	■	■											
5	Phuntso Deam	Farm Machinery	Monozukuri	5-Mar-17	30-Sep-17																																			■	■	■	■	■	■	■											
6	Jitshen Wangchul	Biomass	Sustainable Rural Development by Biomass	21-Sep-16	3-Dec-16																													■	■	■	■																					
7	Sangay Lhendup	Production	KAIZEN (*3: Full name)	5-Oct-16	3-Nov-16																															■	■																					
8	Sandip Raj Gurung	ICT	ICT for Agriculture use	20-Feb-17	26-May-17																																					■	■	■	■													
9	Chophel Drukpa	Kaizen	Kaizen	24-Sep-17	30-Oct-17																																									■	■											
10	Jigme	Farm Machinery	Agriculture Machinary Testing & Evaluation Methods	4-Feb-18	9-Mar-18																																																			
11	Ugyen Dorji	Farm Machinery	Agriculture Machinary Testing & Evaluation Methods	4-Feb-18	9-Mar-18																																																		
12	Thinley Dorji	ICT	ICT for Agricultural Information Use	18-Feb-18	25-May-18																																																		

*1: Public-Private joint cooperation training on development and extension of agricultural machinery for small scale farmers with Japanese Monozukuri style

*2: Development of farm machinery for small scale farmers

*3: Enhancing SMEs support capacity through learning Quality and Productivity improvement (KAIZEN) (B)

■ : Accepted ■ : Planned

6. Provision of Technical Equipment

SFaMP2

JICA Technical Equipment

Updated 10/8/2018

No.	Name of Equipment	Qty	Amount (JPY)	Delivery Date	Person-in charge	Installation Site	Operation status
SFAMP2-TE-001	Pick Up Truck	1 nos	1,705,011	8-Jan-15	Administration	ADM, AMC	A
SFAMP2-TE-002	Digital multimeter	1 pc	28, 340	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-003	Digital barometer	1pc	56, 100	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-004	Digital dryness and moisture ball meter	1 pc	29, 350	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-005	Socket 1/2- 1/4	10 pcs	2, 400	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-006	Socket 3/8- 1/4	10 pcs	1, 900	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-007	Seal tape 13MM*15mm	20 pcs	3, 600	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-008	T.TYRE connector 6mm	15 pcs	5, 400	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-009	T.tyre connector 8mm	15 pcs	6, 300	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-010	T.tyre connector 10mm	15 pcs	8, 250	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-011	Boll value screw 1/4	5 pcs	9, 350	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-012	Boll value screw T 3/8	5 pcs	9, 800	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-013	Hose nipple screw PT 1/4	15 pcs	1, 350	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-014	Hose nipple screw T 3/8	15 pcs	1, 650	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-015	K tyre thermocouple	1 pc	9, 000	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-016	K tyre thermocouple	1 pc	22, 930	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-017	Cylinder tyre 1L	3 pcs	9, 030	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-018	Plumb bob	5 pcs	5, 000	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-019	Balance	1 pcs	85, 100	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-020	Lawn mower	1 pc	38, 610	20-Mar-15	Kharka	AMRS	A
SFAMP2-TE-021	Lawn mower	1 pc	56, 320	20-Mar-15	Kharka	AMRS	A
SFAMP2-TE-022	Small road cell	2pcs	314, 600	20-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-023	Microflow quantity sensor	2 pc	131, 400	24-Mar-15	Sangay Lhendup	AMCS	A
SFAMP2-TE-024	Flexible hose	1 pc	11,700	24-Feb-16	Kharka	Surface grinder	A
SFAMP2-TE-025	GRIND-X NS- 01B	6 pcs	78, 000	24-Feb-16	Kharka	Surface grinder	A
SFAMP2-TE-026	Pressure sensor paint (aerosol)	1 bottle	9, 116	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-027	Pressure sensor paint (aerosol) (HS CODE:3204.19.900.3) (UN1950/CLASS2.1/PGII)	1 bottle	11, 911	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-028	Divider	1 unit	152,113	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-029	Vibration meter	1 unit	223, 600	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-030	Acceleration meter	1 unit	258, 000	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-031	Related vibration meter	1 unit	240, 800	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-032	Plug for thermocouple	10 pcs	7, 420	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-033	Jack for thermocouple	10 pcs	7,850	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-034	Hook for thermocouple panel	4 PCS	5, 548	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-035	Blade for pole hedge trimmer	1 set	17, 738	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-036	Blade for pole hedge trimmer	1 set	17, 738	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-037	Measuring cylinder	1 pc	1, 258	28-Feb-16	Sangay Lhendup	AMCS	A

6. Provision of Technical Equipment

SFaMP2

JICA Technical Equipment

Updated 10/8/2018

No.	Name of Equipment	Qty	Amount (JPY)	Delivery Date	Person-in charge	Installation Site	Operation status
SFAMP2-TE-038	Measuring cylinder	1 pc	2, 097	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-039	Measuring cylinder	1 pc	3, 145	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-040	Measuring cylinder	1 pc	3, 774	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-041	Gravity meter	1 pc	2, 496	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-042	Gravity meter	1 PC	2, 496	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-043	Ganiometer	1 pc	1, 710	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-044	Carton/soft carton	1 set	9, 235	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-045	Spatula/plastic spatula	5 PCS	490	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-046	Crank handle	1 PC	60, 105	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-047	Spring	1 PC	1, 170	28-Feb-16	Sangay Lhendup	AMCS	A
SFAMP2-TE-048	Bush	1 pc	6,450	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-049	Gear shaft	1 pc	23,650	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-050	Gear	1 pc	26,875	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-051	Double gear	1 pc	37,625	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-052	Pinion gear	1 pc	20,425	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-053	Bush	1 pc	8,600	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-054	Gear	1 pc	22,575	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-055	Worm	1 pc	9,675	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-056	Worm wheel	1 pc	463,225	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-057	Gear	1 pc	18,275	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-058	Leed shaft	1 pc	9,675	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-059	Pin for leed shaft	1 pc	4,193	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-060	Gear	1 pc	33,325	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-061	Gear	1 pc	33,325	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-062	Gear	1 pc	21,500	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-063	Bush	1 pc	8,600	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-064	Pipe	1 pc	26,875	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-065	Spring	1 pc	1,183	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-066	Spring	1 pc	1,075	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-067	Bush	1 pc	8,600	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-068	T-style key	2 pcs	2,366	29-Mar-16	Kharka	workshop AMRS	A
SFAMP2-TE-069	FX controller kit	1 set	790,000	21-Aug-16	Kharka	Surface grinder	A
SFAMP2-TE-070	Scale for cross feed	1 pc	282,000	21-Aug-16	Kharka	Surface grinder	A
SFAMP2-TE-071	Hydraulic pump, hydraulic motor	1 set	201,000	21-Aug-16	Kharka	Surface grinder	A
SFAMP2-TE-072	Crank handle for vertical feed	1 pc	42,000	21-Aug-16	Kharka	Surface grinder	A
SFAMP2-TE-073	Table top wheel dresser	1 pc	33,000	21-Aug-16	Kharka	Surface grinder	A
SFAMP2-TE-074	Diamond tool for overhead dresser	1 pc	11,000	21-Aug-16	Kharka	Surface grinder	A
SFAMP2-TE-075	H1 Wagon	1 no	2,768,119	17-Nov-16	Administration	AMTC, AMC	A

6. Provision of Technical Equipment

SFaMP2

JICA Technical Equipment

Updated 10/8/2018

No.	Name of Equipment	Qty	Amount (JPY)	Delivery Date	Person-in charge	Installation Site	Operation status
SFAMP2-TE-076	Handy scale	1	2,100,000	25-Apr-17	Sangay Lhendup	AMCS	A
	Weigher pad	4					
	Indicator	1					
	Connection cable	4					
	AC power cable 3m (240V)	1					
	Recording paper	1					
	Inked ribbon	1					
SFAMP2-TE-077	Instruction manual (japanese and english)	4					
SFAMP2-TE-078	Battery unit	1	73,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-079	Transformer (240V-100V, 150VA)	1	15,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-080	Inspection record	1	10,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-081	Inspection record (copy)	1	10,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-082`	Clamp on power logger	1	145,000	25-Apr-17	Sangay Lhendup	AMCS	A
	Clamp on sensor	3					
	SD card 2GB	1					
	Carrying bags	1					
	Voltage cable	1					
	USB cable	1					
	PC software CD	1					
	AA battery	6					
SFAMP2-TE-083	Instruction manual (japanese and english)	4		25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-084	Power cable	1	10,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-085	Inspection report		20,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-086	Inspection report(copy)		13,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-087	Portable weighing balance	1	25,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-088	Instruction manual (japanese)	2					
SFAMP2-TE-089	D size batteries	6					
SFAMP2-TE-090	Inspection report	1	15,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-091	Inspection report(copy)	1	5,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-092	Soil sampler	1	128,000	25-Apr-17	Sangay Lhendup	AMCS	A
	Brush	1					
	Knife	1					
	Cloth case	1					
SFAMP2-TE-093	Band saw (vertical type)	1	980,000	25-Apr-17	Kharka	AMRS workshop	A
	L type wrench	2					
	Single ended spanner	1					
	Saw blade	1					
	Japanese instruction manual	1					

6. Provision of Technical Equipment

SFaMP2

JICA Technical Equipment

Updated 10/8/2018

No.	Name of Equipment	Qty	Amount (JPY)	Delivery Date	Person-in charge	Installation Site	Operation status
	Inspection report	1					
	Inspection report(to JICA)	1					
SFAMP2-TE-094	Saw blades	3	90,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-095	Transformer(built in)	1	120,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-096	Japanese instruction manual	1	10,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-097	Japanese instruction manual (ti JICA)	1	10,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-098	Band saw	1	4,900,000	25-Apr-17	Kharka	AMRS workshop	A
	Set of tools	1					
	Standard attached blade						
	Japanese Instrction manual	1					
	Inspection report	1					
SFAMP2-TE-099	Inspection report (to JICA)	1					
SFAMP2-TE-100	Changed specification for width of cut 34mm	1	100,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-101	Baldes	4	40,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-102	Blades	4	40,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-103	Blades	4	40,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-104	Roller table	1	130,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-105	Transformer (415-200V,10KVA)	1	200,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-106	Japanese instruction manual		10,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-107	Japanese instruction manual (to JICA)		10,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-108	Portable lathe machine	1	600,000	25-Apr-17	Kharka	AMRS workshop	A
	5 inch three-jaw chuck with Pawl	1					
	Standard tools	1					
	Chip cover	1					
	Oil pan	1					
	Dead center	1					
	Box wrench	1					
	Change gear	1					
SFAMP2-TE-109	English/Japanese instruction manual	4					
	English/Japanese instruction manual (to JICA)	2					
	Inspection report	1					
	Inspection report(to JICA)	1					
SFAMP2-TE-110	Changed specification for power supply	1	60,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-111	13 mm drill chucks	2	14,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-112	MT3 drill chuck arbors	2	4000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-113	Drill bit grinder	1	700,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-114	Barazon wheel	1		25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-115	Changed specification for power suppy	1	50,000	25-Apr-17	Kharka	AMRS workshop	A

6. Provision of Technical Equipment

SFaMP2

JICA Technical Equipment

Updated 10/8/2018

No.	Name of Equipment	Qty	Amount (JPY)	Delivery Date	Person-in charge	Installation Site	Operation status
SFAMP2-TE-116	Barazon wheel	1	40,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-117	Borazon wheel	2	60,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-118	Japanese Instruction manual	2	20,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-119	Japanese instruction manual (to JICA)	1	10,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-120	Inspection report	1	5,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-121	Inspection report (to JICA)	1	10,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-122	Electric furnance	1	700,000	25-Apr-17	Kharka	AMRS workshop	A
	Hearth plate	1					
	Thermocouple	1					
	Lid Rest	1					
	Repair cement	1					
	Liner piece	8					
SFAMP2-TE-123	English/Japanese instruction manual	4					
SFAMP2-TE-124	English/Jpanese instruction manual (to JICA)	2					
	Inspection report	1					
	Inspectiion report (to JICA)	1					
	Changed specification for power supply	1	70,000	25-Apr-17	Kharka	AMRS workshop	A
	Transformer (415V-22V,20VA)	1					
SFAMP2-TE-125	Eye tracer	1	6,600,000	25-Apr-17	Thomba	FMCL production	A
	Eye tracer cutter (main body)	1					
	Plasma cutter	1					
	Straight torch	1					
	Transformer (415V-100V,2KVA)	1					
	Standard tools	1					
	Air unit	1					
	Hose band	1					
	Indicator light	1					
	Fuse(10A)	1					
	Fuse(0.2A)	1					
	Base material cable 1.5m	1					
	Ground cable 2m	1					
	Cup	1					
	Chip (120A)	4					
	Electrode(120A)	4					
	Wrench	2					
SFAMP2-TE-126	English/Japanese instruction manual	4					
SFAMP2-TE-127	English/Japanese instruction manual (to JICA)	2					
	Inspection report	1					

6. Provision of Technical Equipment

SFaMP2

JICA Technical Equipment

Updated 10/8/2018

No.	Name of Equipment	Qty	Amount (JPY)	Delivery Date	Person-in charge	Installation Site	Operation status
	Inspection report (to JICA)	1					
SFAMP2-TE-128	Frame rail	1	450,000	25-Apr-17	Thomba	FMCL production	A
SFAMP2-TE-129	Straight torches	2	560,000	25-Apr-17	Thomba	FMCL production	A
SFAMP2-TE-130	Shearing machine	1	13,200,000	25-Apr-17	Thomba	FMCL production	A
	Blade for SUS	1					
	Side gauge 1m	1					
	Front support 1m with scale	1					
	Front stopper	2					
	Standard tools	1					
	Stud-type base plate	4					
	Grease gun	1					
	Blade changing jig	2					
SFAMP2-TE-131	English/Japanese instruction manual	4					
SFAMP2-TE-132	English/Japanese instruction manual (to JICA)	2					
	Inspection report	1					
	Inspection report (to JICA)	1					
SFAMP2-TE-133	Blade for SUS	1	350,000	25-Apr-17	Thomba	FMCL production	A
SFAMP2-TE-134	Transformer (415V-200V,15 KVA)	1	250,000	25-Apr-17	Thomba	FMCL production	A
SFAMP2-TE-135	Bench drilling machine	1	450,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-136	English/Japanese instruction manual	4					
SFAMP2-TE-137	English/Japanese instruction manual (to JICA)	2					
SFAMP2-TE-138	13mm drill chucks	2	16,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-139	Drill chuck arbors	2	6,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-140	Drill sleeve	2	10,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-141	Spot welding machine	1	5,500,000	25-Apr-17	Thomba	FMCL production	A
	Investor control device	1					
	Cooling water circulation apparatus	1					
	Electrode trip upper	1					
	Electrode trip lower	1					
	standard tools	1					
	Fuse	1					
	Foot switch unit	1					
	Program box	1					
	Leveling bolt	1					
SFAMP2-TE-142	English/Japanese instruction manual	4					
SFAMP2-TE-143	English/Japanese instruction manual (to JICA)	2					
	Inspection report	1					
	Inspection report (to JICA)	1					

6. Provision of Technical Equipment

SFaMP2

JICA Technical Equipment

Updated 10/8/2018

No.	Name of Equipment	Qty	Amount (JPY)	Delivery Date	Person-in charge	Installation Site	Operation status
SFAMP2-TE-144	Changed specification for expert	1	300,000	25-Apr-17	Thomba	FMCL production	A
SFAMP2-TE-145	Standard electrode sets	10	240,000	25-Apr-17	Thomba	FMCL production	A
SFAMP2-TE-146	Thresher for inspection	1	780,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-147	Japanese instruction manual	2					
SFAMP2-TE-148	Japanese instruction manual (to JICA)	1					
SFAMP2-TE-149	Belt	1	4,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-150	Changed specification for inventor	1	40,000	25-Apr-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-151	Drill bit	10	18,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-152	Drill bit	10	15,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-153	Drill bit	10	15,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-154	Tool bit	5	35,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-155	Tool bit	5	40,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-156	Tool bit	5	49,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-157	Tool bit	5	60,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-158	Tool bit	5	70,000	25-Apr-17	Kharka	AMRS workshop	A
SFAMP2-TE-159	Trusco precision bise	1 pc	45,800	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-160	Trusco drill sleeve	2 pc	14,080	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-161	Trusco drill sleeve	1 pc	6,200	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-162	Trusco drill sleeve	1 pc	5,220	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-163	Teusco chuck arbo	3 pcs	14,100	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-164	Yukiwa drill chuck	3 pcs	19,740	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-165	NSK rolling center	2 pcs	50,600	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-166	Mitsubishi materials chip	5 pcs	24,000	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-167	MIE machine	2 pcs	16,400	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-168	Mitsubishi materials drill set	2pcs	62,000	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-169	Mitsubishi materials straight drill	5 pcs	1800	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-170	Mitsubishi materials straight drill	5 pcs	3,350	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-171	Mitsubishi material straight drill	5 pcs	4,650	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-172	Mitsubishi material straight drill	5 pcs	8,000	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-173	Mitsubishi material straight drill	3 pcs	2,670	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-174	Mitsubishi material straight drill	3 pcs	4,200	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-175	Mitsubishi material straight drill	3 pcs	7,800	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-176	Tubosan file	5 pcs	12,500	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-177	Fujidenki switch box	4 pcs	5,200	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-178	Misumi punch	10 pcs	28,000	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-179	Misumi button die	10 pcs	19,000	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-180	Misumi economy urethane LAE	3 pcs	6,000	18-Jun-17	Kharka	AMRS	A
SFAMP2-TE-181	Hitathittool handle (hitachi tool)	2 pcs	1,280	18-Jun-17	Kharka	AMRS	A

6. Provision of Technical Equipment

SFaMP2

JICA Technical Equipment

Updated 10/8/2018

No.	Name of Equipment	Qty	Amount (JPY)	Delivery Date	Person-in charge	Installation Site	Operation status
SFAMP2-TE-182	Air wire anemometer	1	66,930	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-183	Thermography	1	222,230	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-184	Precision balance	1	151,120	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-185	USB interference	1	8,890	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-186	Glass bressze break	1	22,230	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-187	Rechargable battery unit	1	44,450	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-188	Weighing data logger	1	16,000	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-189	Weighing environment logger	2	71,120	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-190	Photoelectric rotation detector	1	36,900	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-191	Reflective mark	2	5,600	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-192	Digital tecnometer	1	46,800	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-193	Power cable	1	2,600	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-194	Transformer: PAL-1501	1	14,900	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-195	Magnet base	4	14,400	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-196	Clamp	1	1300	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-197	H- shaped stand	1	4,300	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-198	Push pull gauge	1	110,600	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-199	Soil sampler can	2	31,800	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-200	Weighing can	20	24,000	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-201	Gasoline can	2	8,400	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-202	Opacimeter	1	906,900	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-203	Analog output cable	1	29,400	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-204	Calibration filter	1	310,400	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-205	Multi conditioner	1	1,209,700	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-206	Load cell	1	257,500	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-207	Ball joint	2	35,200	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-208	Name tag	2	2,000	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-209	Small binding machine	1	2,000	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-210	Spare belt	5	5,000	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-211	Spare clip	2	1,200	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-212	Chain block	1	17,500	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-213	Pen for pen recorder	2	3,000	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-214	Pen for pen recorder	2	3,000	27-Jul-17	Sangay Lhendup	AMCS	A
SFAMP2-TE-215	Paper holder	1	47,600	27-Jul-17	Sangay Lhendup	AMCS	A
Total			**51,539,935**				

7. Provision of Expert Accompanied Equipment

JICA Accompany Equipment **Updated 10/8/2018**

No.	Name of equipment	Qty	Amount (JPY)	Delivery Date	Person-in-charge	Installation Site
SFAMP2-AE-001	Portable Electric Furnece	1 no	445,000	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-002	Paralel Brock	1 no	46,000	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-003	Digital Vernier Caliper	2 nos	30,400	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-004	Steel Scale	10 nos	1,800	7-Dec-15	Kharkha Bdr Subba. Chophel Drukpa.	AMC
SFAMP2-AE-005	Digital Hight Gauge	1 no	54,000	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-006	Guide Post Sets	4 no	11,200	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-007	V-Block	2 nos	12,400	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-008	Scroll-Chack	1 no	68,000	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-009	Hand-Tap	1 no	2,700	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-010	Hand-Tap	1 no	4,650	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-011	Hand-Tap	1 no	7,000	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-012	Hand-Tap	5 nos	3,050	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-013	Hand-Tap	1 no	2,700	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-014	Hand-Tap	1 no	4,600	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-015	Hand-Tap	1 no	4,600	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-016	Hand-Tap	5 nos	3,050	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-017	Face Milling Cutter	1 no	36,700	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-018	Cutting Chip for Milling Cutter	20 nos	13,200	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-019	Tool Holder for Lathe Machine	1 no	6,250	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-020	Cutting Cip for Lathe Machine	20 nos	11,600	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-021	Precision Vice	1 no	46,300	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-022	Center-Bit	1 no	42,800	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-023	Chacking Holder	1 no	23,200	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-024	Magnet Stand	1 no	10,000	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-025	Switch Box	4 nos	6,000	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-026	Right Angle Square	1 no	13,000	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-027	Picktestter	1 no	9,700	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-028	Drill-Sets	1 no	20,100	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-029	Straight Shanck Drill	2 nos	660	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-030	Straight Shanck Drill	2 nos	1,240	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-031	Straight Shanck Drill	2 nos	1,720	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-032	Straight Shanck Drill	2 nos	3,000	7-Dec-15	Kharkha Bdr Subba	AMC

7. Provision of Expert Accompanied Equipment

JICA Accompany Equipment **Updated 10/8/2018**

No.	Name of equipment	Qty	Amount (JPY)	Delivery Date	Person-in-charge	Installation Site
SFAMP2-AE-033	T-Slot	4 nos	1,920	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-034	Rough Milling Cutter	2 nos	19,400	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-035	Rough Milling Cutter	2 nos	24,000	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-036	Rough Milling Cutter	2 nos	23,000	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-037	Precision Plate	2 nos	10,200	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-038	Precision Plate	1 no	5,600	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-039	Precision Plate	1 no	6,800	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-040	Precision Plate	2 nos	5,200	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-041	Precision Plate	1 no	1,700	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-042	Precision Plate	2 nos	8,200	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-043	Precision Plate	1 no	2,700	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-044	Precision Plate	1 no	2,500	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-045	Precision Plate	1 no	4,000	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-046	Precision Plate	1 no	9,600	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-047	Precision Plate	1 no	15,000	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-048	Coil Spring	4 nos	1,240	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-049	Coil Spring	8 nos	2,480	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-050	Coil Spring	4 nos	1,320	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-051	Coil Spring	4 nos	1,520	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-052	Coil Spring	8 nos	3,200	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-053	Coil Spring	4 nos	1,680	7-Dec-15	Kharkha Bdr Subba	AMC
SFAMP2-AE-054	Precision Surface Plate	1 no	106,286	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-055	Steel Scale	10 nos	2,710	20-Apr-16	Handed over to the participant in the training	AMC
SFAMP2-AE-056	Micrometer	1 no	15,000	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-057	Block Gage	1 no	219,800	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-058	Radius Gage	1 no	4,800	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-059	Radius Gage	1 no	5,486	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-060	Tapper Set	1 no	128,649	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-061	Spiral-Tap	5 nos	9,125	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-062	Spiral-Tap	5 nos	11,875	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-063	Spiral-Tap	5 nos	14,375	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-064	Spiral-Tap	5 nos	18,750	20-Apr-16	Kharkha Bdr Subba	AMC

7. Provision of Expert Accompanied Equipment

JICA Accompany Equipment **Updated 10/8/2018**

No.	Name of equipment	Qty	Amount (JPY)	Delivery Date	Person-in-charge	Installation Site
SFAMP2-AE-065	Hand-Tap	2 nos	33,500	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-066	Solid-Die	3 nos	14,814	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-067	Solid-Die	2 nos	66,750	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-068	Machine Reamer	2 nos	15,210	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-069	Precision Vice	1 no	38,940	20-Apr-16	Chophel Drukpa	FMCL
SFAMP2-AE-070	Cutting Cip for Lathe Machine	1 no	13,894	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-071	Drill Sleeve	2 nos	15,342	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-072	Drill Sleeve	2 nos	12,858	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-073	Stad Bolt	10 nos	3,130	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-074	Stad Bolt	10 nos	3,630	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-075	Nut with Flange	10 nos	3,250	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-076	T-Slot	10 nos	5,630	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-077	Rough Milling Cutter	3 nos	20,475	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-078	Rough Milling Cutter	3 nos	31,950	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-079	Rough Milling Cutter	3 nos	37,500	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-080	2 Edges Milling Cutter	3 nos	5,730	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-081	2 Edges Milling Cutter	3 nos	6,657	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-082	2 Edges Milling Cutter	3 nos	8,484	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-083	2 Edges Milling Cutter	3 nos	12,654	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-084	4 Edges Milling Cutter	3 nos	8,925	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-085	4 Edges Milling Cutter	3 nos	10,350	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-086	4 Edges Milling Cutter	3 nos	13,314	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-087	4 Edges Milling Cutter	3 nos	19,839	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-088	Oil Stone	2 nos	5,518	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-089	File Set	5 nos	16,605	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-090	C-Clamping	2 nos	7,600	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-091	Dowel-Pin	50 nos	2,500	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-092	Guide Post Sets	4 nos	9,760	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-093	Guide Post Sets	4 nos	6,920	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-094	Urethane Rubber	5 nos	9,100	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-095	Urethane Rubber	5 nos	16,250	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-096	Urethane Rubber	5 nos	24,950	20-Apr-16	Kharkha Bdr Subba	AMC

7. Provision of Expert Accompanied Equipment

JICA Accompany Equipment **Updated 10/8/2018**

No.	Name of equipment	Qty	Amount (JPY)	Delivery Date	Person-in-charge	Installation Site
SFAMP2-AE-097	Cap Screw	100 nos	500	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-098	Cap Screw	100 nos	700	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-099	Cap Screw	100 nos	800	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-100	Cap Screw	100 nos	1,000	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-101	Cap Screw	100 nos	1,200	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-102	Cap Screw	100 nos	1,600	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-103	Cap Screw	100 nos	1,900	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-104	Cap Screw	100 nos	2,400	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-105	Cap Screw	60 nos	4,320	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-106	Cutting Cip for Lathe Machine	50 nos	17,000	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-107	Precision Plate	2 nos	10,280	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-108	Precision Plate	1 no	19,050	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-109	Precision Plate	1 no	11,250	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-110	Precision Plate	2 nos	18,420	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-111	Precision Plate	2 nos	5,100	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-112	Precision Plate	2 nos	6,200	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-113	Precision Plate	3 nos	14,370	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-114	Precision Plate	2 nos	8,220	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-115	Precision Plate	2 nos	24,780	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-116	Precision Plate	1 no	13,970	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-117	Precision Plate	3 nos	31,260	20-Apr-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-118	Digital Gauge with Display for Milling Machine 2MF	1set	560,000	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-119	Stad Bolt	10 nos	3,630	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-120	Stad Bolt	10 nos	3,880	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-121	Stad Bolt	10 nos	3,880	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-122	Nut with Flange	10 nos	3,750	2-Aug-16	Kharkha Bdr Subba. Chophel Drukpa.	6 at AMC 4 at FMCL
SFAMP2-AE-123	T-Slot	10 nos	5,630	2-Aug-16	Kharkha Bdr Subba. Chophel Drukpa.	6 at AMC 4 at FMCL
SFAMP2-AE-124	Rough Milling Cutter	2 nos	10,900	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-125	Rough Milling Cutter	2 nos	21,300	2-Aug-16	Kharkha Bdr Subba. Chophel Drukpa.	1 at AMC 1 at FMCL

7. Provision of Expert Accompanied Equipment

JICA Accompany Equipment **Updated 10/8/2018**

No.	Name of equipment	Qty	Amount (JPY)	Delivery Date	Person-in-charge	Installation Site
SFAMP2-AE-126	Rough Milling Cutter	2 nos	25,000	2-Aug-16	Kharkha Bdr Subba. Chophel Drukpa.	1 at AMC 1 at FMCL
SFAMP2-AE-127	Rough Milling Cutter	1 no	17,625	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-128	2 Edges Milling Cutter	2 nos	3,376	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-129	2 Edges Milling Cutter	2 nos	3,826	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-130	2 Edges Milling Cutter	2 nos	12,100	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-131	2 Edges Milling Cutter	2 nos	17,400	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-132	4 Edges Milling Cutter	2 nos	5,350	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-133	4 Edges Milling Cutter	2 nos	5,950	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-134	4 Edges Milling Cutter	2 nos	19,200	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-135	4 Edges Milling Cutter	2 nos	19,200	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-136	Drill Sleeve	2 nos	15,342	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-137	Drill Sleeve	2 nos	12,858	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-138	Machine Reamer	1 no	9,645	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-139	Machine Reamer	1 no	12,919	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-140	Machine Reamer	1 no	18,476	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-141	Scraper	1 no	6,075	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-142	Long Center Drill Bit	2 nos	7,772	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-143	Oil Stone	2 nos	5,518	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-144	Chuck Arber	1 no	5,863	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-145	Drill Chuck	2 nos	14,700	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-146	Fice Milling Arbor	1 no	14,200	2-Aug-16	Chophel Drukpa	FMCL
SFAMP2-AE-147	Set Screw	50 nos	850	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-148	Spring	12 nos	3,000	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-149	Spring	12 nos	3,720	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-150	Spring	8 nos	3,120	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-151	Spring	8 nos	3,560	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-152	Spring	8 nos	2,720	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-153	Spring	8 nos	3,600	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-154	Spring	8 nos	4,000	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-155	Air Nozzle with Air Hose Set	2 nos	8,298	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-156	Spool Retainer	12 nos	4,320	2-Aug-16	Kharkha Bdr Subba	AMC

7. Provision of Expert Accompanied Equipment

JICA Accompany Equipment **Updated 10/8/2018**

No.	Name of equipment	Qty	Amount (JPY)	Delivery Date	Person-in-charge	Installation Site
SFAMP2-AE-157	Spool Retainer	12 nos	4,320	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-158	Spool Retainer	12 nos	4,320	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-159	Spool Retainer	12 nos	4,320	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-160	Air Plug	3 nos	1,950	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-161	Air Coupler	3 nos	7,080	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-162	Button Die	4 nos	8,680	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-163	Button Die	6 nos	13,020	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-164	Button Die	4 nos	8,680	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-165	Punch Pin	6 nos	17,400	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-166	Punch Pin	6 nos	17,400	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-167	Punch Pin	4 nos	1,880	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-168	Polishing Wheel	2 nos	6,580	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-169	Polishing Wheel	2 nos	8,742	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-170	Precision Plate	2 nos	8,180	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-171	Precision Plate	2 nos	3,600	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-172	Precision Plate	2 nos	2,500	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-173	Precision Plate	1 no	12,820	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-174	Precision Plate	1 no	12,340	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-175	Precision Plate	2 nos	32,660	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-176	Precision Plate	1 no	5,970	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-177	Precision Plate	2 nos	3,760	2-Aug-16	Kharkha Bdr Subba	AMC
SFAMP2-AE-178	Precision Vice	1 no	57,609	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-179	Drill Sleeve	2 nos	17,332	28-Apr-17	Kharkha Bdr Subba. Chophel Drukpa.	1 at AMC 1 at FMCL
SFAMP2-AE-180	Drill Sleeve	1 no	7,671	28-Apr-17	Chophel Drukpa	FMCL
SFAMP2-AE-181	Drill Sleeve	1 no	6,429	28-Apr-17	Chophel Drukpa	FMCL
SFAMP2-AE-182	Chuck Arbor	3 nos	17,589	28-Apr-17	Kharkha Bdr Subba. Chophel Drukpa.	2 at AMC 1 at FMCL
SFAMP2-AE-183	Drill Chuck	3 nos	22,050	28-Apr-17	Kharkha Bdr Subba. Chophel Drukpa.	2 at AMC 1 at FMCL
SFAMP2-AE-184	Rolling Center	2 nos	69,000	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-185	Carbide Cutting Chip	5 nos	82,140	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-186	Straight Reamer	2 nos	16,560	28-Apr-17	Kharkha Bdr Subba	AMC

7. Provision of Expert Accompanied Equipment

JICA Accompany Equipment **Updated 10/8/2018**

No.	Name of equipment	Qty	Amount (JPY)	Delivery Date	Person-in-charge	Installation Site
SFAMP2-AE-187	Drill Bit Sets	2 nos	72,150	28-Apr-17	Kharkha Bdr Subba. Chophel Drukpa.	1 at AMC 1 at FMCL
SFAMP2-AE-188	Straight Drill Bit	5 nos	1,975	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-189	Straight Drill Bit	5 nos	3,715	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-190	Straight Drill Bit	5 nos	5,095	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-191	Straight Drill Bit	5 nos	8,990	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-192	Straight Drill Bit	3	2,925	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-193	Straight Drill Bit	3	4,665	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-194	Straight Drill Bit	3	8,610	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-195	File Sets	5 nos	16,605	28-Apr-17	Kharkha Bdr Subba. Chophel Drukpa.	3 at AMC 2 at FMCL
SFAMP2-AE-196	Switch Box	4	5,572	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-197	Standard Punch	10	24,800	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-198	Standard Button Die	10	17,800	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-199	Urethane Rubber	3	5,460	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-200	Handle Tool for Cutting Chip	2 nos	1,960	28-Apr-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-201	Spiral tap	2 pcs	3,000	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-202	Spiral tap	2 pcs	4,400	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-203	Dice	1 pce	4,000	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-204	Dice	1 pce	32,500	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-205	Roughing end mill	2pce	11,200	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-206	Roughing end mill	2pce	17,400	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-207	Roughing end mill	2pce	20,400	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-208	End Mill	2pce	3000	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-209	End Mill	2 Pce	3,200	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-210	End Mill	2 pce	3,700	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-211	End Mill	2 pce	4,800	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-212	End Mill	2 pce	7,000	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-213	End Mill	2 pce	10,000	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-214	Scale	10 pce	2,500	19-Dec-17	Handed over to the participant in the training	AMC
SFAMP2-AE-215	Straight drill	2pce	1,600	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-216	Knock Pin	50 pce	3000	19-Dec-17	Kharkha Bdr Subba	AMC

7. Provision of Expert Accompanied Equipment

JICA Accompany Equipment **Updated 10/8/2018**

No.	Name of equipment	Qty	Amount (JPY)	Delivery Date	Person-in-charge	Installation Site
SFAMP2-AE-217	Air Gun	3pce	10,800	19-Dec-17	Kharkha Bdr Subba. Chophel Drukpa.	1 at AMC 1 at FMCL
SFAMP2-AE-218	Coupler for air	5pce	6000	19-Dec-17	Kharkha Bdr Subba	AMC
SFAMP2-AE-219	Air Hose	2 pce	24,500	19-Dec-17	Kharkha Bdr Subba. Chophel Drukpa.	1 at AMC 1 at FMCL

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
SFAMP2-EE-001	Seal	1 no	500	15-Sep-14	Project Secretariate	C	A
SFAMP2-EE-002	Nokia 108	1 no	2,500	29-Sep-14	Project Secretariate	E	A
SFAMP2-EE-003	Seal	1 no	540	30-Sep-14	Project Secretariate	S	-
SFAMP2-EE-004	Tp-Link 300 Mbps wireless socket	1 no	3000	6-Oct-14	Project Secretariate	E	A
SFAMP2-EE-005	Power stripes	2 nos	960	17-Oct-14	Project Secretariate	E	A
SFAMP2-EE-006	Esquise safe box (electronic)	1 no	4900	17-Oct-14	Project Secretariate	E	A
SFAMP2-EE-007	Seetmi plug	3 pcs	150	23-Oct-14	Project Secretariate	E	A
SFAMP2-EE-008	Whiteboard 4*3	2 nos	4000	28-Oct-14	SFaMP2 office	E	A
	Board marker	2 nos	480			C	-
	Magnet box	1 no	150			E	A
	Permanenr marker	4 nos	100			C	-
SFAMP2-EE-009	Toner	1 no	2000	3-Nov-14	Project Secretariate	C	-
SFAMP2-EE-010	Alkosign white boards 4*3	2 nos	9000	4-Nov-14	Project Secretariate	C	-
SFAMP2-EE-011	Updated topo sheet	7 nos	595	14-Nov-14	Project Secretariate	S	-
SFAMP2-EE-012	Old topo sheet	2 nos	120	14-Nov-14	Project Secretariate	S	-
SFAMP2-EE-013	Wireless PCI adapter	1 no	1650	25-Nov-14	Project Secretariate	E	A
SFAMP2-EE-014	Copier MP 25011	1 no	1,22,000	25-Nov-14	Project Secretariate	E	A
SFAMP2-EE-015	Heavy duty punching machine	1 no	1150	25-Nov-14	Project Secretariate	E	A
	H.D Stapler machine	1 no	1200			E	A
	Binder clip	1 no	40			S	-
	Binder clip (small)	1 no	15			S	-
	Gems clip	1 no	30			S	-
	Triple stay tray	1 no	450			S	-
SFAMP2-EE-016	Board file	6 nos	1020	29-Dec-14	Project Secretariate	S	-
SFAMP2-EE-017	Liquid hand wash	1 no	380	8-Jan-15	IQCC office	C	-
	Plastic Carpet	1 no	67			C	-
SFAMP2-EE-018	Toner Catridge MP 2501	3 pcs	8,700		Project Secretariate	C	-
SFAMP2-EE-019	Clip file	10 nos	700	15-Jan-15	Project Secretariate	S	-
SFAMP2-EE-020	Dell optiplex	1 no	39,950	23-Jan-15	Project Secretariate	E	A
	Dell LCD 18.5"	1 no				E	A
	Infocus projector	1 no	31,000		AMDC office	E	A

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
SFAMP2-EE-020	Projector ceiling	1 no	4,900	23-Jan-15	AMDC office	**E**	-
	VGA cable	1 no	3,900		Project Secretariate	**E**	**A**
	APCUPS 600VA	1 no	3,450			**E**	**A**
SFAMP2-EE-021	M. tape	5 nos	400	23-Jan-15	IQCC office	**C**	-
	M. tape	2 nos	40			**C**	-
SFAMP2-EE-022	Certificates	1 pc	175	23-Jan-15	Issued to ADM officer	**S**	-
SFAMP2-EE-023	Lable sheet	1 pc	690	2-Feb-15	Project Secretariate	**C**	-
SFAMP2-EE-024	Certificate paper A4	3 pcs	525	2-Feb-15	Issued to ADM officer	**C**	-
SFAMP2-EE-025	Camera	5 nos	48,750	5-Feb-15	M&E office, IOCC	**E**	-
					RAMC, Paro	**E**	**A**
					RAMC, Bajo	**E**	**A**
					RAMC, Samtenling	**E**	**A**
					RAMC, Khangma	**E**	**A**
SFAMP2-EE-026	Photo-copy paper	100 ream	17,400	11-Feb-15	Project Secretariate	**C**	-
SFAMP2-EE-027	Toner HP Q5950A	2 nos	1,51,400	3-Mar-15	Issued to Admin officer	**C**	-
SFAMP2-EE-028	V' pulley 4"*100mm	1 no	770	5-Mar-15	IQCC office	**E**	**A**
	Bowel 10"	12 nos	960			**E**	**A**
	Hose pipe 6mm	1 no	1900			**E**	**A**
	Hose pipe 8mm	1 no	2200			**E**	**A**
SFAMP2-EE-029	Plastic bowl	8 pcs	640	5-Mar-17	IQCC office	**C**	-
	Brass tee	5 pcs	425			**C**	-
SFAMP2-EE-030	Bed Liner	1 pc	10,352	5-Mar-15	Project vehicle	**C**	-
	Side visitor(Rain Guard)	1 pc	2,077			**C**	-
SFAMP2-EE-031	Grassfoot mate	22.2 sqtt	2553	7-Mar-15	Project Secretariate	**C**	-
	Tarpotin	1 no	390			**C**	-
SFAMP2-EE-032	Hilux seat cover, velvet cloth	1 set	5200	10-Mar-15	Project Vehicle at AMC	**C**	-
SFAMP2-EE-033	Bulb Infocus IN3102	2 nos	53,200	11-Mar-15	RAMC, Bhur	**E**	-
SFAMP2-EE-034	White board	2 nos	8600	23-Mar-15	For hiring services	**S**	-
	File	100 nos	8500			**S**	-
SFAMP2-EE-035	Graph paper	10 nos	300	20-Apr-15	Project Secretariate	**S**	-
SFAMP2-EE-036	Certificate paper	5 pcs	600	21-Apr-15	Project Secretariate	**C**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
SFAMP2-EE-037	Napkin clothes	40 nos	800	6-May-15	Project Secretariate	**C**	-
SFAMP2-EE-038	Staple pin	1 no	45	8-May-15	Project Secretariate	**S**	-
	Gluestick	5 nos	125			**S**	-
	Plastic folder file	24 nos	240			**S**	-
	A3 photocopy paper	1 no	360			**C**	-
SFAMP2-EE-039	Seal	1 no	400	9-May-15	Project Secretariate	**S**	-
SFAMP2-EE-040	Cloth piece	20 nos	400	14-May-15	Project Secretariate	**C**	-
SFAMP2-EE-041	Fuse	4 nos	20	14-May-15	Project Secretariate	**C**	-
SFAMP2-EE-042	Tool box	80 nos	40,000	18-May-15	Training participants in Mongar	**E**	**A**
					Training participants in Trashi Yangtse	**E**	**A**
					Training participants in Trashigang	**E**	**A**
					Training participants in Pema Gatsel	**E**	**A**
					Training participants in Samtenling	**E**	**A**
SFAMP2-EE-043	Combination pliers	80 nos	17,120	18-May-15	Issued to operators (Mongar) at AMTC	**E**	-
	Open spanner (10/11mm)	80 nos	2000			**E**	-
	Open spanner (12/13mm)	80 nos	2720			**E**	-
	Open spanner (14/15mm)	80 nos	3600		Issued to RAMC Khangma	**E**	-
	Open spanner (16/17 or 17/18mm)	80 nos	4720			**E**	-
	Adjustable wrench (250mm)	80 nos	26,320		Issued to RAMC Bhur	**E**	-
	Screw driver (+) (-) (180 mm reversible)	80 nos	5520			**E**	-
	Oil refers (poly-bottle)	80 nos	10,400			**E**	-
SFAMP2-EE-044	Board markers	2 pcs	600	6-Jun-15	Project Secretariate	**S**	-
SFAMP2-EE-045	Chartpaper	22 nos	220	6-Jun-15	Project Secretariate	**S**	-
	Book binding tape	2 nos	250			**S**	-
SFAMP2-EE-046	Cloth tape 2"	1 no	125	8-Jun-15	Project Secretariate	**S**	-
	Board marker (snowman)	1 no	300			**S**	-
SFAMP2-EE-047	Chart paper	30 pcs	300	8-Jun-15	Project Secretariate	**S**	-
SFAMP2-EE-048	Cloth celotape	2 nos	180	12-Jun-15	Project Secretariate	**S**	-
SFAMP2-EE-049	Board marker	1 no	110	7-Jul-15	Project Secretariate	**S**	-
	Permanent marker	1 no	120			**S**	-
	Paper folder	2 nos	260			**S**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
	Paper tray	1 no	650			**S**	-
SFAMP2-EE-050	Quick Heal anitivirus pro	1 no	850	8-Jul-15	Project Secretariate	**C**	-
SFAMP2-EE-051	AS Copy power paper	2 nos	720	13-Jul-15	Project Secretariate	**C**	-
SFAMP2-EE-052	4*3 Whiteboard (Alkosign)	7 nos	29,260	13-Jul-15	Issued to RAMC, Bajo	**S**	-
					Issued to RAMC, Khangma	**S**	-
					Issued to RAMC, Samtenling	**S**	-
					Issued to AMDC, Paro	**S**	-
					IQCC, Paro	**S**	-
					Hiring unit	**S**	-
SFAMP2-EE-053	TP-Link wireless modium router 150 MbPS	1 no	2,700	19-Aug-15	Project Secretariate	**E**	**A**
SFAMP2-EE-054	Cloth pieces	30 nos	600	21-Aug-15	Issued to the trainees	**C**	-
SFAMP2-EE-055	Sony Stereo IC Recorder	2 nos	16,500	1-Sep-15	Project Secretariate	**E**	**A**
					Adm, AMC, Paro	**E**	-
SFAMP2-EE-056	Extension stripe	1 no	425	14-Sep-15	Project Secretariate	**S**	-
SFAMP2-EE-057	3G Data card	1 no	2,500	17-Sep-15	Project Secretariate	**E**	**A**
SFAMP2-EE-058	Paper clips	3 nos	30	17-Sep-15	Project Secretariate	**S**	-
	Binder clips	3 nos	150			**S**	-
SFAMP2-EE-059	Cloth pieces	10 nos	300	21-Sep-15	Issued to trainees	**C**	-
SFAMP2-EE-060	Matle can	5 nos	650	24-Sep-15	Issued to short term expert Mr. Kitagawa	**C**	-
	Brush 3"	3 nos	135			**S**	-
	Writing brush	3 nos	360			**S**	-
	Napkin clothes	50 nos	1000			**C**	-
SFAMP2-EE-0561	Flip chart	2 nos	400	30-Sep-15	Issued to short term expert Mr. Kitagawa	**S**	-
	Board marker	1 box	300			**S**	-
	Board marker(blue)	1 box	240			**S**	-
	Cloth tape	2 nos	125			**S**	-
	Board marker(blue)	1 box	240			**S**	-
SFAMP2-EE-062	Board marker pen	1 box	250	30-Sep-15	Issued to short term expert Mr. Kitagawa	**S**	-
SFAMP2-EE-063	Cellotape	2 nos	120	30-Sep-15	Issued to short term expert Mr. Kitagawa	**S**	-
SFAMP2-EE-064	Brother 3320 Catridge	1 no	2,800	7-Oct-15	Expert team, M&E	**C**	-
	Plastic sheet	1 nos	450			**C**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
SFAMP2-EE-065	Plastic bucket	3 nos	1,170	8-Oct-15	Issued to IQCC	C	-
	Cloth tape	2 nos	200			S	-
	Lime	1 no	195			C	-
	Jarkin 10L	1 no	110			S	-
	Jarkin 20L	1 no	220			S	-
	Plastic container	1 no	550			S	-
	Plastic bag	1 no	40			S	-
SFAMP2-EE-066	Combination plier	100 nos	21,400	9-Oct-15	Issued to RAMC, Khangma	E	A
	Open spanner 10/11mm	100 nos	2,500			E	A
	Open spanner 12/13mm	100 nos	3,400			E	A
	Open spanner 14/15	100 nos	4,500			E	A
	Open spanner 16/17mm or 17/18	100 nos	5,900			E	A
	Adjustable wrench	100 nos	32,900			E	A
	Screw driver 180mm	100 nos	6,900			E	A
	Oil refers (poly bottle)	95 nos	12,350			C	-
	Napkin clothes 50cm*50cm	100 nos	2,000			C	-
SFAMP2-EE-067	Plastic tool box empty	100 nos	50,000	9-Oct-15	Issued to RAMC, Khangma	E	-
					Issued to RAMC, Bajo	E	-
					Issued to ramc, Paro	E	A
					Issued to AMTC, AMC, Paro by Dr. Takashi	E	-
					Issued to RAMC, Khangma by project coordinator.	E	-
						E	-
SFAMP2-EE-068	Plastic lanpkine 15*15	1 no	1,000	18-Oct-15	Issued to IQQC	C	-
SFAMP2-EE-069	Battery	2 nos	120	18-Oct-15	Project Secretariate	C	-
SFAMP2-EE-070	Combination plier	25 nos	5,350	2-Nov-15	Issued to RAMC: Training participants. (Gewog operators and Extension officer)	E	A
	Open spanner 10/11mm	25 nos	625			E	A
	Open spanner 12/13mm	25 nos	850			E	A
	Open spanner 14/15	25 nos	1,125			E	A
	Open spanner 16/17mm or 17/18	25 nos	1,475			E	A
	Adjustable wrench	25 nos	8,225			E	A

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
	Screw driver 180mm	25 nos	1,725			**E**	**A**
	Oil refers (poly bottle)	25 nos	3,250			**C**	-
	Napkin clothes 50cm*50cm	25 nos	500			**C**	-
SFAMP2-EE-071	Filter (fuel)	1 no	650	13-Nov-15	Used in project car	**C**	-
	Engine oil change	1 no	100			**C**	-
	Fuel filler change	1 no	100			**C**	-
SFAMP2-EE-072	Empty tool box	25 nos	12,500	20-Nov-15	AMRS	**E**	-
SFAMP2-EE-073	Lead pencil	5 nos	175	30-Nov-15	Project Secretariate	**S**	-
	Leads box (pencil)	5 nos	50	30-Nov-15		**S**	-
SFAMP2-EE-074	Projector: Infocus IN 220	2 nos	59,980	21-Dec-15	Admin Officer, AMC, Paro.	**E**	-
					The Chief Instruction, AMTC, AMC, Paro	**E**	-
SFAMP2-EE-075	Printing and desi8gning of wall calendar	1000 nos	95,000	31-Dec-15	Issued to all AMC brance and sections	**S**	-
	Printing and Designing of Table Calendar	1000 nos	85,000			**S**	-
SFAMP2-EE-076	Glue stick	10 nos	300	4-Jan-16	Project Secretariate	**S**	-
	Binder clip	3 nos	60			**S**	-
	Paper clip	1 no	35			**S**	-
SFAMP2-EE-077	Binder clip	2 nos	96	4-Jan-16	Project Secretariate	**S**	-
SFAMP2-EE-078	Ricoh MFP 2501SP	1 no	1,03,000	26-Jan-16	IQCC manager	**E**	**A**
	ARDF 2020	1no				**E**	-
SFAMP2-EE-079	Graph sheet	50 nos	1,000	2016/3/2	Project Secretariate	**S**	-
SFAMP2-EE-080	Brother 3320 catridge	1 no	2,800	25-Feb-16	Issued to M&E	**C**	-
SFAMP2-EE-081	Dell Desktop (I5) dell Optiplex-3020 I5, 4GB,500GB	10 sets	374,900	26-Feb-16	3 sets issued to AMCD manager(FMCL)	**E**	**A**
					1 set issued to IQQC manager	**E**	**A**
					2 sets isued to AMSC manager	**E**	**A**
					1 set each at RAMC store	**E**	**A**
SFAMP2-EE-082	Socket wrench set	50 nos	3,500	29-Feb-16	Issued to RAMC, Samtenling	**E**	**A**
	Ring wrench 6-7 to 20*22	50 nos	760		Issued to RAMC, Bajo	**E**	**A**
	Open end wrench set	50 nos	650		Issued to RAMC, Paro	**E**	**A**
	Adjustable wrench 8"	50 nos	415		Issued to AMDC. AQMC, Paro	**E**	**A**
	Circlip plier 7" internal	50 nos	485		Issued to IQCC, AMC, Paro	**E**	**A**
	Circlip plier 7" external	50 nows	485		Issued to RAMC, Khangma	**E**	**A**

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
	Ball Rein Hammer- 450 gm	50 nos	450		Issued to AMTC, Paro	**E**	**A**
	Combination plier 8"	50 nos	450			**E**	**A**
SFAMP2-EE-083	Bag	1 no	680	1-Mar-16	Issued to admin officer (ADM)	**S**	-
SFAMP2-EE-084	Napkin clothes	60 nos	1,200	1-Mar-16	Project Secretariate	**C**	-
	Lamp	1 no	450			**S**	-
SFAMP2-EE-085	flip chart	2 nos	500	1-Mar-16	Project Secretariate	**S**	-
	Cellotape	2 nos	100			**S**	-
	Paper colour clips	3 nos	60			**S**	-
	Marker pen	2 nos	50			**S**	-
SFAMP2-EE-086	Telephone wire	15 mts	250	3-Mar-16		**S**	-
SFAMP2-EE-087	APC BACK-UPS 600VA	10 nos	28,890	4-Mar-16	3 nos issued to AMDC manager with desktop	**E**	-
					1 no issued to IQCC manager with desktop	**E**	-
					4 issued to AMSC and RAMC manager with desktop computer sets.	**E**	-
SFAMP2-EE-088	Microsoft windows 10 Lincense	10 nos	89,900	4-Mar-16		**E**	-
SFAMP2-EE-089	Mobil Grade 32 M9K	210 nos	55,650	4-Mar-16	Issued to AMDC	**E**	-
SFAMP2-EE-090	Printing of AMC pamplet	1000 nos	77,700	4-Mar-16	Issued to IQCC manager, Paro	**S**	-
SFAMP2-EE-091	Barrel pump	1 set	1300	7-Mar-16	Issued to AMDC	**E**	-
SFAMP2-EE-092	Napkin clothes	70 nos	1400	8-Mar-16	Project Secretariate	**C**	-
SFAMP2-EE-093	Dusting clothes	30 nos	600	8-Mar-16	Project Secretariate	**C**	-
SFAMP2-EE-094	Stanley plastic box	50 nos	67,500	13-Apr-16	8 nos issued to RAMC, Samtenling	**C**	-
	16" plastic				7 nos issued to RAMC, Bajo	**C**	-
	Part No. 92-905				9 nos issued to RAMC, Paro	**C**	-
					8 nos issued to AMDC,AMC,Paro	**C**	-
					5 nos issued to IQCC,AMC,Paro	**C**	-
					Issued to RAMC, Khangma	**C**	-
					Issued to AMTC (GIN 482)	**C**	-
SFAMP2-EE-095	Sticky pads	2 nos	100	4-May-16	Project Secretariate	**S**	-
SFAMP2-EE-096	Oil filter	1 no	650	6-Jun-16	Project vehicle	**C**	-
	Fuel filler	1 no	650			**C**	-
SFAMP2-EE-097	Napkin clothes	120 nos	2,400	14-Jun-16	Issued to AMDC manager	**C**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
SFAMP2-EE-098	Rear glass guard and side nailing making with all the materials required			17-Jun-16	Project vehicle	**C**	-
SFAMP2-EE-099	Dell PowerEdge R530 Server	1 no	2,98,000	30-Jun-16	Issued to FMCL	**E**	**A**
	Net Rack 42U	1 no	97,312			**E**	**A**
	Keyboard USB Dell	1 no	8,100			**E**	**A**
	Dell LED Monitor 18.5" E1916HV	1 no				**E**	**A**
	Mouse USB Dell	1 no				**E**	**A**
SFAMP2-EE-100	Widows Server 2008	1 no	66,000	15-Jul-16	Issued to FMCL	**E**	**A**
	Technical Charges	1 no	20,000				-
SFAMP2-EE-101	APC Smart UPS 2200VA	1 nos	47,980	27-Jul-16	Issued to FMCL	**E**	**A**
SFAMP2-EE-102	HERO Bikes	12 nos	884,112	19-Aug-16	Issued to FMCL	**E**	**A**
SFAMP2-EE-103	TDCP-018R	1 no	600	24-Aug-16	Project vehicle	**C**	-
SFAMP2-EE-104	Ricoh Toner MP-2501	3 nos	8,700	24-Aug-16	Issued to FMCL	**C**	-
SFAMP2-EE-105	Oil filler	1 no	650	9-Sep-16	SFaMP2 office	**C**	-
SFAMP2-EE-106	Tyre 265/65R17	5 nos	40,500	9-Sep-16	Fixed on Hilux pick up	**C**	-
SFAMP2-EE-107	Stanley tools storage work station	1 no	44,711	5-Oct-16	Issued to expert Kitagawa	**S**	-
SFAMP2-EE-108	Tirpal	1 no	1,150	6-Oct-16	Used for Hilux	**C**	-
SFAMP2-EE-109	Back pack brush cutter	1 no	18,000	3-Oct-16	Issued to AMDC for testing	**E**	**A**
SFAMP2-EE-110	Drill bill 12.7 m	1 no	1020	8-Oct-16	Issued to AMDC for testing	**E**	**A**
	Dusting clothes	36 nos	900		Issued to AMDC for testing	**C**	-
SFAMP2-EE-111	TALLY ERP 9	1 no	62,000	12-Oct-16	Issued to FMCL	**C**	-
	Remote configuration charges	1 pec	10,000			**C**	-
	1 year support subscribtion for multi-user	1 pec	15,900			**C**	-
	Installation and setup charges for multi-user	1 pec	5,000			**C**	-
	Tally ERP 9 Single-user package	1 pec	88,000			**C**	-
	1 year support subscribtion for single-user	1 pec	27,200			**C**	-
	Installation and setup charges for single-user	1 pec	20,000			**C**	-
SFAMP2-EE-112	Machine development pamplets	200 nos	9,000	18-Oct-16	Issued to AMDC and for field day programme of cardamom	**S**	-
SFAMP2-EE-113	Pipe wrench	1 no	400	18-Oct-16	Issued to AMDC	**C**	-
	Leather hand gloves	15 nos	2175			**S**	-
	Leather apron	7 nos	2240			**S**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

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SFAMP2-EE-114	saftey helmet	7 nos	1750	4-Nov-16	Issued to Production Unit of FMCL	**S**	-
	nose/mouth mask	7 nos	560			**S**	-
	Ear pug	7 nos	175			**S**	-
	saftey goggles	7 nos	700			**S**	-
	Knee cap	7 nos	595			**S**	-
	Arm guard	7 nos	595			**S**	-
SFAMP2-EE-115	Key	1 no	105	13-Nov-16	Project Secretariate	**S**	-
	Key	1 no	80			**S**	-
SFAMP2-EE-116	Oil filler	1 no	650	28-Nov-16	Project vehicle	**C**	-
	Fuel filler	1 no	650			**C**	-
SFAMP2-EE-117	No. plate	2 nos	900	28-Nov-16	Used for H1 Wagon	**S**	-
	Sticker (written AMC/AMTC)	2 nos	1100			**S**	-
SFAMP2-EE-118	Printing of leaflets	300 nos	13,500	30-Nov-16	Used for Field day programme of cardamom	**S**	-
SFAMP2-EE-119	Spirit level (2 feet)	1 no	395	10-Jan-17	Project Secretariate	**S**	-
	Spirit level (1 feet)	1 no	395			**S**	-
SFAMP2-EE-120	Power adapter	1 no	500	18-Jan-17	Project Secretariate	**E**	-
SFAMP2-EE-121	Power Extension cable	2 nos	780	19-Jan-17	Project Secretariate	**S**	-
					Mr. Oishi offcie in FMCL	**S**	-
SFAMP2-EE-122	Marker pen	1 packet	200	19-Jan-17	Project Secretariate	**S**	-
SFAMP2-EE-123	Almira (5ft)	2 nos	24,000	24-Jan-17	Issued to AMDC	**E**	**A**
SFAMP2-EE-124	Design and printing of table calendar	1000 nos	87,500	26-Jan-17	Issued to FMCL	**S**	-
	Design and printing of table calendar	2000 nos	60,000			**S**	-
SFAMP2-EE-125	Anti-virus software (Quick Heal)	1 no	800	1-Feb-17	Issued to AMDC	**C**	-
	Wifi network card	1 no	1,500			**E**	**A**
	Router ADSL (300 mbps)	1 no	3,000			**E**	**A**
SFAMP2-EE-126	A3 photocopy paper	10k	3,900	10-Feb-17	Project Secretariate	**C**	-
	Socket wrench set STMT 72795-8	20 nos	70,000			**S**	-
	Ring wrench set 70-394E	20 nos	15,200			**E**	**A**
	Open end wrench set 70 379E	20 nos	13,000			**E**	**A**
	Adjustable wrench 87432123	20 nos	8,300			**E**	**A**

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
SFAMP2-EE-127	Circlip plier int.7"8434123	20 nos	9,700	14-Feb-17	Issued to FMCL	**E**	**A**
	Circlip plier ext.7"8434123	20 nos	9,700			**E**	**A**
	Ball pein Hammer 54114	20 nos	9,000			**E**	**A**
	Combination plier 8" 70482	20 nos	9,000			**E**	**A**
	Tool Box 16" 92-905	20 nos	35,760			**E**	**A**
SFAMP2-EE-128	Filler gauge 70115-5	4 nos	1,840	14-Feb-17	Issued to FMCL	**E**	**A**
	Plastic hammer S7056-23	8 nos	10,256			**E**	**A**
	Puller 3 jaw 150mm 70748.S	1 nos	4,775			**E**	**A**
	Screw Extractor 87432123	8 nos	3,424			**E**	**A**
SFAMP2-EE-129	Stanley tool storage work station 9354723 1D	1 no	44,711	14-Feb-16	Issued to AMDC	**E**	**A**
SFAMP2-EE-130	Safety boots(single density sds)	26 pairs	27,300	20-Feb-17	Issued to FMCL	**C**	-
	size-4 (8 pairs)					**C**	-
	size-5 (2 pairs)					**C**	-
	size-6 (8 pairs)					**C**	-
	size 7- (7 pairs)					**C**	-
	size 9-(1 pair)					**C**	-
SFAMP2-EE-131	Photocopy Machine MP2014AD Ricoh	2 nos	1,19,780	20-Feb-17	Issued to FMCL	**E**	**A**
	Brother HL-L5000D Printer	5 nos	1,20,000			**E**	**A**
	Infocus Projector IN220i	2 nos	57,840		Issued to AMC:	**E**	**A**
	Celing Mount Kit	2 nos	19,780		1 for RAMC, Samtenling	**E**	**A**
	VGA Cable 20 Mtr.	2 nos			1 for RAMC, Khangma	**E**	**A**
	VGA to HDMI Adapter	2 nos				**E**	-
SFAMP2-EE-132	Desktop Computer	5 pec	2,15,000	24-Feb-17	Issued to FMCL	**E**	**A**
	UPS	5 pec	15,500			**E**	**A**
	Laptop Computer	1 pec	49,000			**E**	**A**
SFAMP2-EE-133	Napkin clothes	44 nos	880	1-Mar-17		**C**	-
SFAMP2-EE-134	Whiteboard 4*3	3 nos	6,600	3-Mar-17	Issued to FMCL	**S**	-
SFAMP2-EE-135	Board marker	6 nos	1,440	3-Mar-17	Project Secretariate	**S**	-
SFAMP2-EE-136	Stitching and filling of a set of seat cover for H1 bagon (12 seats)	1 no	20,900	3-Mar-17	Issued to AMC VEHICLE H1 (BG-1-A2745)	**C**	-
SFAMP2-EE-137	Reams A4	20 nos	3,500	9-Mar-17	Project Secretariate	**C**	-
	Glue sticks	5 nos	140			**S**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
SFAMP2-EE-138	Napkin clothes	120 nos	2,400	15-Mar-17	Project Secretariate	**C**	-
	Brush	10 nos	900			**C**	-
SFAMP2-EE-139	Cement	51 nos	19, 125	1-May-17	FMCL	**C**	-
SFAMP2-EE-140	M/S rod (16m)	13	7,507	1-May-17		**C**	-
SFAMP2-EE-141	Hydraulic Jack	2 nos	50,050	9-May-17		**C**	-
SFAMP2-EE-142	Bril bit	1 no	290	12-May-17	FMCL	**C**	-
SFAMP2-EE-143	Cement	10 nos	3,750	12-May-17	FMCL	**C**	-
SFAMP2-EE-144	TMT rod	110 K g	6,380	12-May-17	FMCL	**C**	-
SFAMP2-EE-145	Cutting charge	110 Kg	550	15-May-17	FMCL		-
	Cement	14 nos	5,250			**C**	-
SFAMP2-EE-146	Hydraulic Jack	1 no	25,025	25-May-17	FMCL	**E**	**A**
SFAMP2-EE-147	Puller 3 jaw 150mm 70748.S	4 nos	19,100	1-Jun-17	FMCL	**E**	**A**
	Ring end slogging- 96920	1 no	2,875			**E**	**A**
	Elecric engraving pen	1 no	2,500			**E**	**A**
	Piston ring compension	12 nos	8,280			**E**	**A**
	Piston ring plier	12 nos	7,740			**E**	**A**
	Air compressor 1.0 kw	1 no	18,620			**E**	**A**
SFAMP2-EE-148	Mobil Grade 32 M9K	210 LTR	54,180	2017/6/6	FMCL	**E**	**A**
SFAMP2-EE-149	Leveling	1 no	215	12-Jun-17	Project Secretariate	**C**	-
SFAMP2-EE-150	Omega Mag Rack	2 nos	360	15-Jun-17	Project Secretariate	**S**	-
	Omega office tray deluxe	1 no	980		Project Secretariate	**S**	-
	Omega pen stand	1 no	160		Project Secretariate	**S**	-
	Plastic folder A4	123 nos	1,230		Project Secretariate	**S**	-
	File divider 1D12	3 nos	195		Project Secretariate	**S**	-
	Luxor notepad 20405	2 nos	190		Project Secretariate	**S**	-
	Stapler machine 24/6	1 no	100		Project Secretariate	**S**	-
	Stapler machine Gold 10	1 no	60		Project Secretariate	**S**	-
	Stapler pin 24/6	1 no	15		Project Secretariate	**S**	-
	Stapler pin Gold 10	3 nos	30		Project Secretariate	**S**	-
	Binder clips 32mm	1 no	75		Project Secretariate	**S**	-
	Binder clips 25mm	1 no	55		Project Secretariate	**S**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

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	Binder clips 19mm	1 no	40		Project Secretariate	**S**	-
	Paper clips 35mm	1 no	35		Project Secretariate	**S**	-
	Paper clips 26mm	3 nos	60		Project Secretariate	**S**	-
	Glue stick 15g	5 nos	200		Project Secretariate	**S**	-
SFAMP2-EE-151	Electric wire 2.5*4 core	3 nos	26,412	15-Jun-17	Mr. Kitagawa	**S**	-
	Electric cable 16*4 core	50 nos	34,100		Mr. Kitagawa	**S**	-
	Electric cable 35*4 core	20 nos	34,700		Mr. Kitagawa	**S**	-
	MCB Havells 63A, 4 pole	1 no	2,380		Mr. Kitagawa	**E**	**A**
	MCB Havells 100A, 4 pole	2 nos	16,450		Mr. Kitagawa	**E**	**A**
	Earth pole copper rod	10 nos	6,600		Mr. Kitagawa	**E**	**A**
SFAMP2-EE-152	Air hose plug 3/8"	5 nos	1,970	15-Jun-17	Mr. Kitagawa	**E**	**A**
	Air hose socket 3/8"	5 nos	1,970		Mr. Kitagawa	**E**	**A**
	Aie hose joint	5 nos	1,970		Mr. Kitagawa	**E**	**A**
	Air hose 1/4"	10 mts	1,320		Mr. Kitagawa	**E**	**A**
	Air hose 3/8"	30 mts	4,110		Mr. Kitagawa	**E**	**A**
SFAMP2-EE-153	GKS Transport Trolley L3	4 nos	63,960	19-Jun-17	Mr. Kitagawa	**E**	**A**
SFAMP2-EE-154	Hydraulic oil veedol avalon VG32 (BARREL)	1 bucket	42,730	21-Jun-17	Mr. Kitagawa	**E**	**A**
	Hydraulic oil veedol avalon VG46	2 buckets	9,200		Mr. Kitagawa	**E**	**A**
	Soluble cutting oil veedol	2 buckets	10,240		Mr. Kitagawa	**E**	**A**
SFAMP2-EE-155	Arch file	10 nos	1,300	27-Jun-17	Project Secretariate	**S**	-
	Arch file	10 nos	1,300		Project Secretariate	**S**	-
	Note pad	5 nos	150		Project Secretariate	**S**	-
	Note pad	2 nos	70		Project Secretariate	**S**	-
	Note pad	1 no	40		Project Secretariate	**S**	-
	Clipper	2 nos	40		Project Secretariate	**S**	-
	Scissor	1 no	220		Project Secretariate	**S**	-
	Clip	3 nos	270		Project Secretariate	**S**	-
SFAMP2-EE-156	Anchor Bolt, nut, pin and washer	25 sets	2,425	12-Jun-17	Mr. Kitagawa	**S**	-
SFAMP2-EE-157	Makmetamol 32 210cm	1 drum	59,190	26-Jun-17	Mr. Kitagawa	**C**	-
SFAMP2-EE-158	Thimble	12 nos	72	4-Jul-17	Mr. Kitagawa	**C**	-
SFAMP2-EE-159	File	25 nos	3,250	5-Jul-17	Mr. Kitagawa	**S**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
SFAMP2-EE-160	Oil filler Vigo	1 no	700	6-Jul-17	Mr. Kitagawa	**C**	-
SFAMP2-EE-161	Mobil change		150		Project Vehicle	**C**	-
	Mobil filter change		150		Project Vehicle	**C**	-
SFAMP2-EE-162	Color printed paper A4	1 reem	310	7-Jul-17	Project Secretariate	**S**	-
	Plastic folder A4	300 nos	3000		Project Secretariate	**S**	-
	MX-1462 4-way socket	1 no	675		Project Secretariate	**C**	-
	MX-3535 4-way socket	1 no	600		Project Secretariate	**C**	-
	Transparent sheets A4	2 nos	900		Project Secretariate	**S**	-
	Stapler remover SR-500	1 no	120		Project Secretariate	**S**	-
	Ball pen (signature)	4 nos	400		Project Secretariate	**S**	-
	Mistubushi pen	5 nos	75		Project Secretariate	**S**	-
SFAMP2-EE-163	Omega paper tray (3 storied)	1 no	550	7-Jul-17	Project Secretariate	**S**	-
	Marker pen for whiteboard	50 nos	1,250		Project Secretariate	**S**	-
	White board duster (Alkosign)	1 no	290		Project Secretariate	**S**	-
	Business card holder	1 no	450		Project Secretariate	**S**	-
	Dust bin	2 nos	190		Project Secretariate	**S**	-
SFAMP2-EE-164	CGI steel (8'*0.3mm*800mm)	360 nos	1,15,920	10-Jul-17		**C**	-
	Ridging (6"*18")	60 nos	14,040			**C**	-
	Wire mesh (3mm*3mm*0.4*900mm)	200 nos	38,000			**C**	-
	MS pipe (25mm*3mm*6mm)	60 nos	34,020			**C**	-
SFAMP2-EE-165	Cardamom drying bhukari	20 sets	360,000	11-Jul-17		**C**	-
SFAMP2-EE-166	Drum kit (Ricoh 2501SP)	1 set	21,500	13-Jul-17		**C**	-
SFAMP2-EE-167	Distilled water	12 nos	300	14-Jul-17		**C**	-
SFAMP2-EE-168	C.D	5 nos	125	28-Jul-17		**S**	-
	Pin remover	1 no	35			**S**	-
SFAMP2-EE-169	Cement	20 bags	7,500	28-Jul-17		**C**	-
SFAMP2-EE-170	Hard disk drive 500GB	1 no	4,500	1-Aug-17		**S**	-
SFAMP2-EE-171	Tashiba External hard disk drive (500 GB)	1 no	4,500	3-Aug-17		**S**	-
	Sony DVD	1 no	75			**S**	-
SFAMP2-EE-172	Lock	1 no	950	3-Aug-17		**S**	-
SFAMP2-EE-173	Cement	50 bags	18,500	3-Aug-17		**C**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

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SFAMP2-EE-174	Omega office tray deluxe	1 no	980	6-Aug-17	Project Secretariate	**S**	-
	Cellotape	9 nos	315		Project Secretariate	**S**	-
	Omega tap Dispenser	1 no	250		Project Secretariate	**S**	-
	Omega Mag Rack	1 no	380		Project Secretariate	**S**	-
	Dusting clothes	180 nos	3600		Project Secretariate	**S**	-
	Harpic	1 no	72		FMCL	**C**	-
	Phenile	1 no	45		Project Secretariate	**C**	-
	Colin	1 no	79		Project Secretariate	**C**	-
	Omega pen stand	2 nos	320		Project Secretariate	**S**	-
	Trio LA5001 Arch file	10 nos	2100		Project Secretariate	**S**	-
	Highlighter pen	1 no	100		Project Secretariate	**S**	-
	Cello Gripper pen	8 nos	80		Project Secretariate	**S**	-
	Glue stick 15g	10 nos	400		Project Secretariate	**S**	-
	HP Thumb drive 16GB	1 no	575		Project Secretariate	**S**	-
	Sticky pad	1 no	57		Project Secretariate	**S**	-
	Sticky pad	1 no	48		Project Secretariate	**S**	-
	4 color sticky pads	5 nos	225		Project Secretariate	**S**	-
	Neon color sticky pad	1 no	37		Project Secretariate	**S**	-
	Sticky pad	2 nos	70		Project Secretariate	**S**	-
	Sticky pad plastic 5 colored	20 nos	1,200		Project Secretariate	**S**	-
SFAMP2-EE-175	CGI steel (8'*0.3mm*800mm)	40 nos	12,880	10-Aug-17	Project Secretariate	**E**	**A**
	Nail (3", 4", 5")	60 kg	3,900		Project Secretariate	**C**	-
	CGI nails	20 kg	2,200		Project Secretariate	**C**	-
SFAMP2-EE-176	Clip board	2 nos	180	14-Aug-17	Project Secretariate	**C**	-
	Pencil battery	4 nos	40		Project Secretariate	**C**	-
SFAMP2-EE-177	File holder	60 nos	600	16-Aug-17	Project Secretariate	**C**	-
	Lan network cable for Project office		1,100	16-Aug-17	Project Secretariate	**E**	-
	D-Link Switch 16-Port DES-1016	1 no	1,420	30-Nov-17	Project Secretariate	**C**	-
	I/O Box cat6 Single Port	8 nos	3,600	30-Nov-17	Project Secretariate	**C**	-
	Patch cord 3m cat6 Digi-Link	6 nos	2,280	30-Nov-17	Project Secretariate	**C**	-
	UTP Cable Cat5E Mtr	150 mtrs	3,750	30-Nov-17	Project Secretariate	**C**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
SFAMP2-EE-178	Net Rack 12U	1 no	49,890	30-Nov-17	Project Secretariate	**C**	-
	Net Rack 6U	1 no	6,950	30-Nov-17	Project Secretariate	**C**	-
	Patch cord 3m cat5 Digi-Link	10 nos	2,100	30-Nov-17	Project Secretariate	**C**	-
	Patch panel cat6 24 port Digi-Link	1 no	7,200	30-Nov-17	Project Secretariate	**C**	-
	RJ-45 Connector	5 nos	125	30-Nov-17	Project Secretariate	**C**	-
	Patch Cord Digilink 5m	2 nos	960	15-Nov-17	Project Secretariate	**S**	-
SFAMP2-EE-179	Steel Almirah	1 no	12,500	16-Aug-17	AMC	**E**	**A**
SFAMP2-EE-180	Pocket file plastic	200 nos	800	19-Aug-17	Project Secretariate	**S**	-
SFAMP2-EE-181	Notice board (NBFC 6090)	2 nos	8,928	19-Aug-17		**S**	-
SFAMP2-EE-182	Cement	25 nos	9,250	21-Aug-17	Project Secretariate	**C**	-
SFAMP2-EE-183	CRCA Spray	24 nos	9,000	21-Aug-17	Project Secretariate	**C**	-
SFAMP2-EE-184	CRCA Spray	1 no	325	1-Sep-17	Project Secretariate	**C**	-
SFAMP2-EE-185	Havells Thermal Magnetic Adjustable MCCB, 4 pole 400A, 25KA,415V.	1 no	27,728	4-Sep-17	Project Secretariate	**C**	-
	Havells Thermal Magnetic Adjustable MCCB, 4 pole 200A, 25KA,415V.	2 nos	24,484		Project Secretariate	**C**	-
	Bas Bar Box 400A, 415V (mex)	1 no	11,117		Project Secretariate	**E**	**A**
	Bas Bar Box 200A, 415V (mex)	2 nos	13,744		Project Secretariate	**E**	**A**
SFAMP2-EE-186	Mopping sstick	1 no	350	6-Sep-17	FMCL	**S**	-
	Toilet bucket	1 no	120		FMCL	**S**	-
SFAMP2-EE-187	Jug	1 no	50	6-Sep-17	FMCL	**S**	-
	Bucket	1 no	300		FMCL	**S**	-
SFAMP2-EE-188	Stapler machine 24/6	1 no	100	6-Sep-17	Project Secretariate	**S**	-
	Stapler machine mini-10	1 no	40	6-Sep-17	Project Secretariate	**S**	-
	Stapler pin 24/6	2 nos	30	6-Sep-17	Project Secretariate	**S**	-
	Stapler pin 10	10 nos	100	6-Sep-17	Project Secretariate	**S**	-
	Clear sheet protector A4 rainbow	10 nos	2,500	6-Sep-17	Project Secretariate	**S**	-
SFAMP2-EE-189	Trio LA5001 Arch file	9 nos	1,890	6-Sep-17	Project Secretariate	**S**	-
SFAMP2-EE-190	Sony DVD-R	10 nos	450	12-Sep-17	Project Secretariate	**C**	-
	Sony CD-R	50 nos	1500		Project Secretariate	**C**	-
SFAMP2-EE-191	Brush	5 nos	150	29-Sep-17	Project Secretariate	**S**	-
SFAMP2-EE-192	Spiral	30 nos	520	8-Oct-17	Project Secretariate	**S**	-
SFAMP2-EE-193	Ring File	10 nos	650	8-Oct-17	Project Secretariate	**S**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
SFAMP2-EE-193	Colour Paper	I ream	350	8-Oct-17	Project Secretariate	**S**	-
SFAMP2-EE-194	Astra plus magnetic white board with grid	8 nos	56,512	11-Oct-17	AMCS-2 AMRS-2 FMCL-1 RAMC-1	**E**	**A**
	Acrylic covered notice board (90*180)	6 nos	58,680	11-Oct-17	AMCS-2 AMRS-1 FMCL-1 RAMC-1 RFMCL-1	**E**	**A**
	Acrylic covered notice board (NBFC6090)	4 nos	14,512	11-Oct-17	AMCS-2 AMRS-1 FMCL-1	**E**	**A**
	Astra exhibition display system (AEDS-2 SETNO.2)	6 nos	156,000	11-Oct-17	AMCS-2 AMRS-1 FMCL-1 Project Office-1 RAMC-1	**E**	**A**
SFAMP2-EE-195	Cement	25 bags	9,250	13-Oct-17	FMCL	**C**	-
SFAMP2-EE-196	M.S square tube 100*600mm	2 nos	7,780	16-Oct-17	FMCL	**C**	-
	M.S sheet 8*4*4m	3 nos	19,350	16-Oct-17	FMCL	**C**	-
	M.S angle 50m*50m*600m	2 nos	2,960	16-Oct-17	FMCL	**C**	-
	Weilding rod	2 nos	660	16-Oct-17	FMCL	**C**	-
	High Cutter Wheel 14"	12 nos	2,928	16-Oct-17	FMCL	**C**	-
	Grinding Wheel 75mm	5 nos	220	16-Oct-17	FMCL	**C**	-
	Red Oxide primer	4 general	520	16-Oct-17	FMCL	**C**	-
SFAMP2-EE-197	ELGi Air Compressor	1 no	142,492	23-Oct-17	FMCL	**E**	**A**
SFAMP2-EE-198	Engine oil change		150	23-Oct-17	Project Vehicle	**C**	-
	Filter change		150	23-Oct-17	Project Vehicle	**C**	-
SFAMP2-EE-199	Oil filter vigo		700	23-Oct-17	Project Vehicle	**C**	-
SFAMP2-EE-200	Terminal a 3/16	1 set	3,350	25-Oct-17	Mr. Kitagawa	**C**	-
SFAMP2-EE-201	Terminal B 3/15	1 set	3,350	25-Oct-17	Mr. Kitagawa	**C**	-
	Nut bolt with plain washer	135 nos	2,700	27-Oct-17	Mr. Kitagawa	**C**	-
	Extra plain washer	135 nos	1,080	27-Oct-17	Mr. Kitagawa	**C**	-
	Extra spring washer	135 nos	1,620	27-Oct-17	Mr. Kitagawa	**C**	-
SFAMP2-EE-202	Transparent sheet A4	1 packet	600	3-Nov-17	Project Secretariate	**S**	-
	Mx-2720 4 way socket 15Amp	2 nos	2,900	3-Nov-17	Project Secretariate	**C**	-
	Scissor mumix	1 no	125	3-Nov-17	Project Secretariate	**C**	-
	Ruler 30cm	1 no	20	3-Nov-17	Project Secretariate	**S**	-
	Sticky pad	10 packets	400	3-Nov-17	Project Secretariate	**S**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
SFAMP2-EE-203	HP laserJet Pro M402dn Printer	1 no	22,000	15-Nov-17	Project Secretariate	**E**	-
SFAMP2-EE-204	APC UPS 1100VA	4 nos	27,960	15-Nov-17	Project Secretariate	**C**	-
SFAMP2-EE-205	Lamination Pouch A3	1 packet	750	7-Dec-17	Project Secretariate	**S**	-
	Lamination Pouch A4	1 packet	1,500	7-Dec-17	Project Secretariate	**S**	-
	Photocopy paper A4	10 reams	2,000	7-Dec-17	Project Secretariate	**S**	-
	Gun stapler TS-623	1 no	720	7-Dec-17	Project Secretariate	**S**	-
SFAMP2-EE-206	Kangaro stapler pin 23/8-H	1 no	30	7-Dec-17	Project Secretariate	**S**	-
	Kangaro stapler pin 24/6	1 packet	15	7-Dec-17	Project Secretariate	**S**	-
	Thumb pin	1 packet	20	7-Dec-17	Project Secretariate	**C**	-
	Thumb pin	5 packets	75	7-Dec-17	Project Secretariate	**C**	-
	Marking tape	1 ream	30	7-Dec-17	Project Secretariate	**S**	-
	Post it pad	3 packets	111	7-Dec-17	Project Secretariate	**S**	-
	Magnetic button	4 packets	800	7-Dec-17	Project Secretariate	**S**	-
	Bucket	4 nos	2,600	22-Dec-17	AMCS, AMC	**S**	-
SFAMP2-EE-207	Tarpoulin	2 no	1,360	22-Dec-17	AMCS, AMC	**S**	-
	sacks	25 nos	750	22-Dec-17	AMCS, AMC	**C**	-
	Bucket	4 nos	380	22-Dec-17	AMCS, AMC	**S**	-
	Bucket	4 nos	260	22-Dec-17	AMCS, AMC	**S**	-
	Bucket	5 nos	125	22-Dec-17	AMCS, AMC	**S**	-
	MCB TPN 16Amps	8 nos	11,120	3-Jan-18	Mr. Kitagawa	**C**	-
SFAMP2-EE-208	Thimble A1 (16sqmm)	32 nos	320		Mr. Kitagawa	**C**	-
	Thimble A1(35sqmm)	12 nos	180		Mr. Kitagawa	**C**	-
	Multi Plug 16Amps Cone	3 nos	390		Project Secretariate	**C**	-
	Electric terminal	32 nos	800	4-Jan-18	Project Secretariate	**C**	-
SFAMP2-EE-209	Electric terminal	30 nos	1350	4-Jan-18	Project Secretariate	**C**	-
	Buttom File	1 no	35	4-Jan-18	Project Secretariate	**C**	-
	Development of DB program for 0P4		246,000	4-Jan-18	FMCL	**E**	-
SFAMP2-EE-210	Pressure valve for Air Compressor (Airmax Pneumatic)	2 nos	20,496	26-Dec-17	FMCL	**E**	-
SFAMP2-EE-211	Fibre Cement Flat Sheet	28 nos	33,600	19-Jan-18	AMRS	**C**	-
SFAMP2-EE-212	MCB Box Geco 6 Way	1 no	790	18-Jan-18	Project Secretariate	**C**	-
SFAMP2-EE-213	Electric tape		60	19-Jan-18	Project Secretariate	**C**	-

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
SFAMP2-EE-214	Electric tape	1 no	265	22-Jan-18	Project Secretariate	**C**	-
SFAMP2-EE-215	Printing of training manual for production design	20 nos	5,800	2-Feb-18	AMRS	**S**	-
SFAMP2-EE-216							-
	Four color paper A4	1 ream	250	8-Jan-18	Project Secretariate	**S**	-
SFAMP2-EE-217	Mag Rack	2 nos	380		Project Secretariate	**S**	-
	Luxor permanent marker	3 nos	75		Project Secretariate	**S**	-
	Havells RCCB (40A)	2 nos	7,000	11-Jan-18	Mr. Kitagawa	**S**	-
SFAMP2-EE-218	RCCB box 4 way	1 no	500		Mr. Kitagawa	**S**	-
	Iron Sheet (PGI) 2ft/1 ft	51 sets	33,150	26-Jan-18	AMTS (AMC)	**S**	-
SFAMP2-EE-219	Mounting Cord	1 no	480	23-Jan-18	Project Secretariate	**S**	-
SFAMP2-EE-220	Arch file	15 nos	3,150		Project Secretariate	**S**	-
	Sticky pads (1*4)	5 nos	200		Project Secretariate	**S**	-
	Paper Cutter (Big)	1 no	40		Project Secretariate	**S**	-
	JK Copier Paper A4 75 GSM	10 ream	2,000		Project Secretariate	**C**	-
	HP Toner Cartridge CF226A	1 no	10,600		Project Secretariate	**C**	-
	Copper Round Cable 16mm*4 core	25 mtr	18,225	26-Jan-18	FMCL	**C**	-
SFAMP2-EE-221	Four legged stand (AWBSL4L)	4 nos	20,060	6-Feb-18	AMCS, AMC	**S**	-
SFAMP2-EE-222	Flip chart holder	4 nos	3,820			**S**	-
	Folding writing Board	4 nos	10,880			**S**	-
	Telescopic Stand	6 nos	13,860			**S**	-
	Sheet Glass	1 no	4,160	7-Feb-18	AMCS, AMC	**S**	-
SFAMP2-EE-223	Poster Starflex	9 nos	12,960	7-Feb-18	AMC	**S**	-
SFAMP2-EE-224	Tent for field activity	1 no	15,700	7-Mar-18	AMRS	**C**	-
SFAMP2-EE-225	Ricoh toner MP2501SP	1 no	3,000	7-Mar-18	Project Secretariate	**C**	-
SFAMP2-EE-226	Shelving body ASUB 184 1875*900 400 2 side roll post and 1 set back plate	2 nos	15,870	9-Mar-18	AMRS	**E**	**A**
SFAMP2-EE-227	Door set ASUD 1875 1875 MM Height	2 nos	16,986	9-Mar-18	AMRS	**E**	**A**
	Shelves ASUS 400 900*400MM	22 nos	21,692	9-Mar-18	AMRS	**E**	**A**
	Panda Bins No 405 415*300*135MM	60 nos	21,900	9-Mar-18	AMRS	**E**	**A**
	Shelving body ASUB 184 1875*900 400 2 side roll post and 1 set back plate	2 nos	15,870	9-Mar-18	AMRS	**E**	**A**
	Door set ASUD 1875 1875 MM Height	2 nos	16,986	9-Mar-18	AMRS	**E**	**A**
	Shelves ASUS 400 900*400MM	22 nos	21,692	9-Mar-18	AMRS	**E**	**A**

8. Provision of Expert Equipment

SFaMP2
Updated on 10/8/2018

SL.NO	Name of equipment	Qty	Amount (Nu)	Purchased date	Installation site	Equipment/ Consumables/ Stationeries	Operation status
	Panda Bins No 405 415*300*135MM	80 nos	21,120	9-Mar-18	AMRS	**E**	**A**
SFAMP2-EE-228	Shelving body ASUB 184 1875*900 400 2 side roll post and 1 set back plate	2 nos	15,870	9-Mar-18	AMRS	**E**	**A**
	Door set ASUD 1875 1875 MM Height	2 nos	16,986	9-Mar-18	AMRS	**E**	**A**
	Shelves ASUS 400 900*400MM	24 nos	23,664	9-Mar-18	AMRS	**E**	**A**
	Panda Bins No 405 415*300*135MM	132 nos	25,872	9-Mar-18	AMRS	**E**	**A**
	NAE Book Maestro A5 with logo and project name	100 nos	17,600	9-Mar-18	AMRS	**S**	-
SFAMP2-EE-229	DB505 A4, 60 Pocket file	96 nos	18,048	9-Mar-18	AMRS	**S**	-
	Cello pointec pen, blue	100 nos	1,800	9-Mar-18	AMRS	**S**	-
	Information holder	48 nos	1,440	12-Mar-18	Project Secretariate	**S**	-
SFAMP2-EE-230	Double side tape	6 nos		10-May-18	Mr. Kitagawa	**S**	-
SFAMP2-EE-231	JK Copier Paper A4 75 GSM	30 Reams	6,000	14-May-18	Project Secretariate	**S**	-
SFAMP2-EE-232	HP Toner Cartridge CF226A	1 no	10,600	14-May-18	Project Secretariate	**S**	-
SFAMP2-EE-233	HP Toner Cartridge CF226A	1 no	10,600	20-Jul-18	Project Secretariate	**S**	-
SFAMP2-EE-234	Binders	10 nos	110	20-Jul-18	Project Secretariate	**S**	-

Evaluation Grid

SFaMP2
PMU5
Version 10 July 2018

Project Management

No	Expected outputs	Objectively Veriflable Indicators	Mean of Verification	Outcomes (Progress)	Result
	Farmers have better access to appropriate farmmachinery in the sites	1. At least 4 types of farm machineries (from a total of 7 models) are distributed with certificate of AMC.	1. AMC report	① Test Report on Power Tiller (Kubota-RT125/Test Report No: 2015001) ②Test Report on Power Tiller (Yanmar/Test Report No: 2016002) ③ Test Report on Walk behind Power Reaper (Chinese INGS-90/Test Report No: 2017003) ④ Test Report on Walk behind Power Reaper (Yanmar-YAP120)/Test Report No: 2017006) ⑤ Test Report on Mini-Oil ExpellerTest Report No: 2017007.1) ⑥Test Report on Power Tiller (SIAM Kubota- PEM125DI/Test Report No: 2018008) 7, Test Report on Mini Tiller (MItsubishi-MM658AS/ Test Report No: 2018009)	Achieved
		2. "Farm mechanized Area Ratio" of "Landpreparation" increases by 10 points from 4.1%in the sites	2. AMC survey and report	FMCL Report	Almost achieved. 7.6% points increased from 4.1% (Total: 11.7%, 82.9% achievement)
		3. Machines modified / developed by AMC are introduced in the sites	3. AMC report	**Farm machinery model:** ①Report on Cardamom Dryer (report of 2018) ②Report on Hedge Cutter (report of 2018) ④Report on Potato Digger (report of 2018)	Prototypes developed by the project are introduced in the sites.

Evaluation Grid

SFaMP2

Output 1 **PMU5**

Version 10 July 2018

No	Expected outputs	Objectively Veriflable Indicators	Mean of Verification	Outcomes (Developed by Project)	Result
1	Objective basis for farm machinery selectionare introduced	1-1At least 6 types of farm machines' testcodes and standards are drafted andsubmitted	1-1 AMC report	① Standard and test codes on Power Tiller(BTS 34&35) ② Standard and test code on Walk behind power reaper (BTS 36&37) ③ Standard and test code on Rice milling machine (BTS 37&38) ④ Standard and test code on Cereal flaking machine(submitted to BSB) ⑤ Standard and test code on Oil expeller (submitted to BSB) ⑥ Standard and test code on Mini tiller(submiited to BSB)	Achieved

Evaluation Grid

Output 2

SFaMP2
PMU5
Version 10 July 2018

No	Expected outputs	Objectively Veriflable Indicators	Mean of Verification	Outcomes (Developed by Project)	Result
2	2-1 At least 12 test items are tested withdeveloped test codes and standardsAwareness of farm machinery safety andquality is enhanced	2-1 At least 12 test items are tested with developed test codes and standards	2-1 AMC report	① Test Report and Result on Standard formatting of test items: 1. Test Report on Power Tiller (Kubota-RT125/Test ReportNo:2015001) 2. Test Report on Power Tiller(Yanmar/Test Report No:2016002) 3. Test Report on Walk behind Power Reaper (Chinese INGS-90/Test Report No: 2017003) 4. Test Report on Walk behind Power Reaper (Yanmar-YAP120)/Test Report No: 2017006) 5. Test Report on Mini-Oil ExpellerTest Report No: 2017007.1) 6. Test Report on Power Tiller (SIAM Kubota- PEM125DI/Test Report No: 2018008) 7. Test Report on Mini Tiller (MItsubishi-MM658AS/Test Report No: 2018009) ② Test result sheet (report and format)	Achieved
		standards2-2 Awareness of farm machinery of safetyand quality of trainees (private sectors,farmers and extension officers, etc.) is raised	2-2 AMC survey	Survey Report	ongoing (Plan to conduct within 30th June, 2018)
		2-3 More than 50% of AMC staff realise that their awareness of "Inspection & QualityControl" is improved	2-3 AMC survey	Report on HRD needs assesment of AMC.	Achieved

Evaluation Grid

Output 3

SFaMP2
PMU5
Version 10 July 2018

No	Expected outputs	Objectively Veriflable Indicators	Mean of Verification	Outcomes (Developed by Project)	Result
3	Machine performances are improved in thesites	3-1 At least 3 farm machinery modificationsare proposed and applied	3-1 AMC report	Farm machinery Model: ① Report on Cardamom dryer (40 installed at various locations) ② Report on hedge cutter (20 numbers are purchased through other project) ③ Report on Corn sheller (20 samples are promoted to farmers) ④ Report on Potato digger (5 samples are distributed for use and evaluation)	Achieved
		3-2 Field capacity of specific operation(s)through modification / development ofmachines is improved by 30%.	3-2 AMC report	① Report on Field day and field evaluation report. ② Technical Report and PPT (2018) on Cardamom Dryer ③ Technical Report and PPT (2018) on Potato Digger (Power Tiller attached) ④ Technical Report and PPT (2018) on Hedge Cutter ⑤ Technical Report and PPT (2018) on Corn Sheller	Achieved
		3-3 More than 50% of AMC staff realize thattheir performance of "Research &Development" is improved	3-3 AMC survey	Report on HRD needs assesment	Achieved

Evaluation Grid

Output 3

SFaMP2
PMU5
Version 10 July 2018

No	Expected outputs	Objectively Veriflable Indicators	Mean of Verification	Outcomes (Developed by Project)	Result
4	4 Improved service provision model of farmmachinery is proposed	4-1 Farm mechanization prioritizing is conducted	4-1 AMC report	① Report on Review project (2015) ② Farm mechanization survey report ③ Joint coordinating meeting minutes	Achieved
		4-2 Service providing schedule is planned andpracticed in pilot areas (project sites)	4-2 AMC report	① Flow structure of Farm Machinery Hiring Services (2016) ② Detail work plan of FMCL	Achieved
		4-3 Hiring service model(s) is(are) drafted	4-3 AMC report	① Guidelines of Central hiring service (2017) ② Guidelines of Gewog hiring service model (2017)	Achieved

List of Output

SFaMP2

PMU5

Version 10 July 2018

Outputs	Name	Contents	Remarks
Output 1	Standard and test code of Power tiller	① Standards (BTS 34) ② Test codes (BTS 35)	**National Standard** Approved by Bhutan standard Bureau (BSB).
	Standard and test code of Walk behind power reaper	① Standards document (BTS 36) ② Test codes documents (BTS 37)	Submitted to BSB
	Standard and test code of Rice mill	① Standards documents (BTS 36) ② Test codes documets (BTS 37)	Submitted to BSB
	Standard and test code of Cereal flaking	① Standards documents ② Test codes documents	Submitted to BSB
	Standard and test code of Oil Expeller	① Standards documents ② Test codes documents	Submitted to BSB
	Standard and test code of Mini tiller	① Standards documents ② Test codes documents	Submitted to BSB
	Power tiller: Basic requirement (Part 1) – BTS 34:2017	1.Verification of structure 2.Safety test 3.Capacity test (operation test) 4.Engine test (operation test) 5.Handling test 6.Noise test 7.Vibration test 8.Service brake test 9.Parking brake test 10.Water proof test	
	Power tiller: Test code (Part 2) – BTS 35:2017		
	Walk behind power reaper: Basic requirement (Part 1) – BTS 36:2018	1.Verification of structure 2.Safety test 3.Accuracy test (operation test) 4.Capacity test (operation test) 5.Vibration test 6.Noise test 7.Handling test	
	Walk behind power reaper: Test code (Part 2) – BTS 37:2018		
	Rice mill: Basic requirement (Part 1)	1.Verification of structure 2.Safety test 3. Recovery test (operation test) 4.Capacity test (operation test) 5.Noise test 6.Handling test	
	Rice mill: Test code (Part 2)		
	Oil Expeller: Basic requirement (Part 1)	1.Verification of structure 2.Safety test 3.Recovery test (operation test) 4.Capacity test (operation test) 5.Handling test 6.Noise test 7.Duration test	
	Oil Expeller: Test code (Part 2)		
	Cereal Flaking Machine: Basic requirement (Part 1)	1.Verification of structure 2.Safety test 3.Recovery test (operation test) 4.Capacity test (operation test) 5.Noise test 6.Handling test	
	Cereal Flaking Machine: Test code (Part 2)		
	Mini tiller Basic requirement (Part 1)	1.Verification of structure 2.Safety test 3.Capacity test 4.Engine test 5.Noise test 6.Vibration test 7.Handling test 8.Water proof test	
	Mini tiller Test code (Part 2)		
	Test result sheet of kubota power tiller	Specification and Verification.	
	Test result sheet of Yanmar power tiller	Specification and Verification.	
	Test result sheet of SWDD reaper	Specification and Verification.	

List of Output

SFaMP2

PMU5

Version 10 July 2018

Outputs	Name	Contents	Remarks
Ouput 2	Test result sheet of KOSS	Specification and Verification.	
	Test result sheet of SAIM Kubota power tiller	Specification and Verification.	
	Test result sheet of Mitsubishi mini power tiller	Specification and Verification.	
	Test report on SIAM KUBOTA-PEM125DI (2018008)	Specification and Verification.	
	Test report on mini tiller MITSIBISHI-MM658AS (2018009)	Specification and Verification.	
	Test report on Mini oil expeller (2017007.1)	Specification and Verification.	
	Test report on Walk behind power reaper YANMAR-YAP120 (2017006)	Specification and Verification.	
	Test report on Walk behind power reaper Chinese INGS-90 (2017003)	Specification and Verification.	
	Test report on power tiller YANMAR (2016002)	Specification and Verification.	
	Test report on power tiller Kubota-RT125 (2015001)	Specification and Verification.	
	Test report on reaper YANMAR	Specification and Verification.	
	Implementation stratregy	Document and power point (2018)	
	Survey report on awareness of safety	Survey report (2015-2018)	
	Awareness program on standards and test codes	Power point (2015) Power point (2017)	
	Report on Cardamom dryer	Draft of Technical report and PPT (2018)	
	Report on Potato digger (power tiller attached)	Draft of Technical report and PPT (2018)	
	Report on Hedge cutter	Draft of Technical report and PPT (2018)	
	Report on Corn sheller	Draft of Technical report and PPT (2018)	
	Potato Digger mannual (2018)		
	Instruction mannual for imporved cardamom dryer		
	Hedge cutter mannual		
	Cardamom dryer technical instruction		

List of Output

SFaMP2

PMU5

Version 10 July 2018

Outputs	Name	Contents	Remarks
Output 3	Training manual on Die making	Training mannual for production Design Training mannual for press die mold in the year 2017	
	Survey report on cardamom drying rate Survey report on need assessment	Need Assesment done on Feb (2015) Need Assesment done on June (2018)	
	Technical dessiminaton folder, AMC information note book and pen		
	Dessimination kit	1. Mobile dessimination board. 2. White boards. 3. Postures for each models.	
	Actitvity Information Display	1. Information board (Display Pannels on Activities of outputs, management and progress of Project)	
	Actitvity Information Display	2. Posters (displaying psoters for each models and actvitiies, display banners for exhibitions and other activities.)	
	Actitvity Information Display	3. Pictures (Printing and laminations of colored pictures in A4,A3 for display in each outputs)	
	Workshop management (5S)	workshop partition, Storage (cabinets), Workshop painitng layout, Epoxy floor painting, Compressor pipe layout, workshop machine layout and installation, Installation of workshop new machines	
Output 4	Central Hiring Services Model	2015	
	Geog Power Tiller Hiring Services Model	2015	
	Calendar of Repair and Maintenance Activities	Region-wise calendar of repair and maintenance activities	
	Detailed work plan of central hiring services	central hiring activities are carried out & completed on right time	
	Detailed work plan of geog power tiller hiring services	Geog power tiller hiring activities are carried out & completed on right time	
	Flow structure of Farm Machinery Hiring Services	enhance the proper route line of hiring services activities	
	Procedure of job card for central hiring	The standardization of hiring services reporting system	
	Procedure of job card for geog hiring	The standardization of hiring services reporting system	
	Standard operating procedure for repairing & maintenance	The daily repairing & maintenance activities in all the regional workshops.	
	Standard operating procedure for physical verification	The physical verification process for farm machineries.	
	Terms of reference for Workshop In-charge (WI) and Technical Support Specialist (TSP)	Inculcate clear roles between the WI and TSP to enhance customer services	

List of Output

SFaMP2

PMU5

Version 10 July 2018

Outputs	Name	Contents	Remarks
	Central Hiring Services guidelines 2017	misuse of machines, misuse of hiring revenue, misinterpretation of responsibilities etc. at ground level	
	Geog Power Tiller Hiring Services guideline 2017	misinterpretation of responsibilities between FMCL officials, Geog extension officer and local government leaders	
	Geog power tiller bill closing manual 2017	Accountability Geog power tiller and also to know the progress of the use of power tillers	
	Detail reporting format for central hiring services	Format for reporting	
	Detail reporting format for geog power tiller hiring services	Format for reporting	
	Online database development	Sales service through online	
Project management	Project Information display on Project Management	Flip board with stands, White board and postures.	
	Project Information display on Outputs 1-4	white board, stands and postures	
	Project informat display at model site	Whiteboard, postures, flip board and information board	RAMC and RFMCL at Samtenling.