Department of Agriculture Cooperative Promotion,
Ministry of Agriculture Forestry and Fisheries

Summary Report

Cambodia

Pilot Survey for Disseminating Small and Medium Enterprises Technologies for Mini Rice Center in Cooperation with Agricultural Cooperatives and Supporting Partners

September, 2015

Japan International Cooperation Agency

Taiwa Seiki Corporation

1. BACKGROUND

Currently, Cambodia produces more than 9 million tons of paddy per year, which is twice as much as the volume of local consumption. The surplus paddy of about 4 million tons is informally exported to Thailand and Vietnam and is milled in respective countries. Some of them are exported to other countries as Thai-produced and Vietnam-made rice. In Cambodia, the majority of agriculture population is small scale rice farmers, and they are not able to negotiate the selling price of their paddy, therefore having no choice but to sell at the low price right after the harvest to pay their debt during rice cultivation.

Taiwa Seiki, a rice milling machine manufacturer, has established their manufacturing base in Cambodia and conducted a "Project Formulation Survey on possible ODA projects for Cambodia" commissioned by the Ministry of Foreign Affairs of the Japanese Government in 2012-2013". In the survey, it was found that Cambodian government promoted the policy to strengthen the capacity of Agricultural Cooperatives (ACs). Based on the findings of the survey, it was considered that the rice milling business could be one of the possible and welcomed activities by ACs which may contribute to the betterment of farmers' income in the end.

2. OUTLINE OF THE PILOT SURVEY FOR DISSEMINATING SME'S TECHNOLOGIES

(1) Purpose

In order to tackle the issue of less bargaining power by individual farmers over paddy collector, one possible solution is to properly dry paddy and produce price competitive milled rice through cooperative milling in a scale large enough for bargaining better price and conditions.

This pilot Survey aims to establish the model cases of rice milling business of ACs. In the initial stage, ACs with supports from supporting partners, implement rice milling businesses. In the final stage, they are expected to establish reference models of Mini-Rice Center (MRC: small scale rice milling plant with drying machines operated by agricultural cooperatives) for future dissemination.

(2) Activities

Principles of implementation

The survey has the following basic principles.

- MRC operators who are capable of doing profitable rice milling businesses must be selected.
- MRC operators must be registered as an agricultural cooperative under the MAFF. They are required to implement the rice milling business together with supporting partners who have experiences in assisting farmers and producing and marketing of milled rice.
- The Survey team (Taiwa Seiki as the project leader, and Kaneko Agricultural Machinery and Japan Development Institute as external human resources) provides technical training on the MRC equipment as well as training on management, market research, quality control etc. in cooperation with supporting partners.

(1) Selection of MRC operators (ACs and Supporting Partners) (August-November, 2013):

(i) Identification of potential ACs

Identify potential ACs from the following ACs.

- ACs selected at the preliminary survey,
- ACs recommended by MAFF,
- ACs recommended by potential supporting partners.

(ii) Seminar for explaining the Survey

- Send invitations for the Survey explanatory seminar to potential candidates (AC and supporting partners) so that the interested ACs can submit Expression of Interest (EOI).
- Conduct a seminar to explain the Survey objective and selection process, and request to submit business plans. The submission due will be set one month after the seminar.

The following qualifications are applied to the interested ACs.

Table 1: Qualifications of ACs

Pre-Qualification of AC	**Pre-Qualification of AC or as a group (AC and Supporting Partner)**
• Capital: 100 million Riel • Management: having management structure and rules (high management capacity and proper management accounting) • Experience in rice related business • Strong will for rice milling business	• Having experience in milled rice business with the capacity (annual sale) of 1,000 ton/year. *It was modified as added point criteria after the seminar. • Able to prepare the land and warehouse (about 30m x 30m) to accommodate rice milling plant and dryers • Able to prepare working capital for purchasing paddy and plant operation (enough for annual sale of 1,000 ton of milled rice and for over 100 days operation). • Able to have full-time staff for 'MRC and operators who have experiences in rice milling.

(Source: Survey team)

(iii) Evaluation of ACs' proposals and implementation abilities

- Select two groups of ACs and supporting partners as operators of the Survey based on selection criteria and submitted business plans together with site visits by the Survey team.
- Sign the contract agreement among MAFF, Taiwa Seiki and selected ACs/supporting partners.

(iv) Confirmation of implementation structure

- Make sure that ACs have partnership with supporting partners.
- Discuss with ACs and supporting partners about necessary supports and trainings for successful business operations

(v) Preparation of MRC buildings

ACs prepare buildings for MRCs with advices from the Survey team.

(2) Plant procurement, Installation, Test run (March, 2014):

(i) Equipment procurement

Rice milling machines and dryers are imported from Japan by the Survey team. Other plant facilities are imported from Thailand and Indonesia by the Survey team.

(ii) Installation and test run

Rice milling machines (whiteners and polishers) are assembled and installed by Taiwa Seiki. The design and installation of other plant facilities is subcontracted to a Thai contractor. The installation of dryers is done by Taiwa Seiki together with the supplier of the dryers (Kaneko Agricultural Machinery).

(iii) Training of operational skills

Prepare the operation manuals and provide technical training for proper operation, adjustment and repair technique for the minor troubles. In case of malfunction during the Survey, Taiwa Seiki (Cambodia) repairs the machines and revises Operation Manual.

(3) Rice milling business and Monitoring of MRC operation (March, 2014-March 2015):

(i) Consideration of business plan

The installation is scheduled in March, 2014 when the dry season rice starts to be harvested. In case of limited paddy purchase in the dry season, the business shall perform milling and drying services to prepare for the full-fledged rice milling activity of wet season rice harvested in November, 2014. Technical assistance for management, ensuring market and product quality control will be provided together with the supporting partners.

(ii) Implementation of rice milling business

The MRC operators are scheduled to start their business operation from April 2014. Their business operation include the following activities

- Buying paddy
- Drying and Milling paddy
- Selling milled rice
- Marketing milled rice

(iii) Analysis and evaluation of the business

- Collect data on rice milling performances including moisture content of purchased paddy, recovery rate and broken rate as well as volume and value of purchased paddy, sales volume and value of milled rice and operation costs, etc.
- Analyze the business performance of dry and wet season and evaluate annual business model. The monitoring of the performance of MRC and participation status of AC will be confirmed together with the counterparts.

(4) Dissemination measure (March 2015-April 2015):

(i) Conduct Seminar for dissemination

The MRC projects will be demonstrated to related ministries, other ACs, rice millers and supporting partners in a seminar in order to promote AC rice milling activities and their business model.

(ii) Consideration on future dissemination (the payment method of initial investment)

In order to start rice milling business with limited funds, loan arrangement shall be explored by stakeholders including private financial institutions.

(3) Information of Product/ Technology to be Provided

The MRC projects introduce two sets of “Mini Rice Center” composed of rice milling plant and mechanical dryers.

Rice Milling Plant

Rice milling machines (whiteners and polishers) were developed by Taiwa Seiki for long grain rice and Rice Milling Plant to be used in the pilot Survey was already experimented in Cambodia and its quality of milled rice was confirmed in 2012. The overall rice milling plant is as shown below.

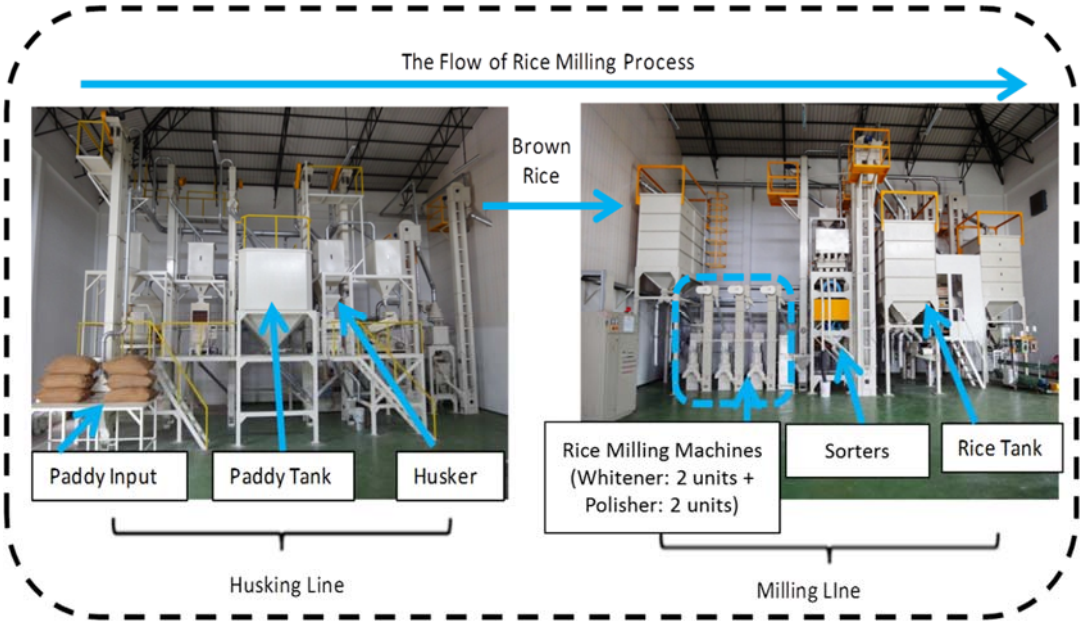

Figure 1: Rice Milling Plant
(Source: Taiwa Seiki)

The specification of Rice Milling Plant is as follows.

- Capacity (Brown rice base): 1ton/hour
- Power requirement: 380V (3 Phase Electricity)
- Facilities: Basic equipment includes a Destoner, a Husker, a Separator, Rice milling machines (two whiteners and two polishers) and a Color sorter. This composition is necessary to produce quality milled rice required to target the higher domestic market.

The main features of the Taiwa Seiki's products are the followings: (i) high recovery rates; (ii) low broken rice rates; (iii) finishing appearances (polished); (iv) energy efficiency; (v) automatic; (vi) after service; (vii) compact size (less space); and (viii) easy to repair and for maintenance. Above all, (i) high recovery rates and (ii) low broken rates are of utmost importance to rice millers. A comparative performance study of Taiwa Seiki's and Vietnamese made rice milling machines, which was conducted in 2012, is as follows. The data show 5% higher recovery rate and 19% lower broken rate.

Table 2: Comparative Performance between Taiwa Seiki and Vietnam Rice Milling Machines

		Unit	Taiwa Plant	Vietnamese Plant
Weight	Input (paddy)	kg	5,536.00	10,497.00
	White rice	kg	3,527.96	6,140.00
Recovery rate of rice products*		%	**63.7**	**58.5**
Whiteness		%	41	41
Broken rice rate (against white rice)	Head rice(A)	%	**67.0**	**48.0**
	Big broken rice(B)	%	14.0	22.5
	Medium broken rice (C)	%	11.3	6.8
	Small broken rice(D)	%	6.9	19.4
	Very small broken rice(E)	%	0.3	2.5
	Total broken rice	%	32.5	51.2

(Source: Taiwa Seiki)

* The paddy from the same stock was used for the comparison in February 2012. It was Jasmine variety (organic) which was harvested in late 2011. The quality of the paddy was very fine. It was presumably dried manually by sun.

In this report, “rice recovery rate” is defined on the weight basis in two ways. “Recovery rate of rice products” and “recovery rate of all the rice” defined by the following equations. The former represents the rice of relatively high commercial value while the latter represents all the rice including very small broken rice and colored rice. Both recovery rates generally change depending on the moisture level, variety, production location, quality, oldness etc.

- Recovery rate of rice products = (head rice (A)+ big broken rice (B)+ medium broken rice (C)+ small broken rice (D))/paddy input
- Recovery rate of all the rice = (head rice (A)+ big broken rice (B) + medium broken rice (C)+ small broken rice (D)+ very small broken rice (E) + colored rice)/paddy input

Head Rice (A)：rice grains of the original length (100%)
Big Broken Rice (B)：rice grains of 75-99% of the original length
Medium Broken Rice (C)：rice grains of 33-75% of the original length
Small Broken Rice (D)：rice grains of 12.5-33% of the original length
Very Small Broken Rice (E)：rice grains of less than 12.5% of the original length
Colored Rice：rice grains removed by a color sorter (mainly for animal feeds)

Since Taiwa Seiki (Cambodia) is the only rice milling machine maker locally manufacturing in Cambodia, it was confirmed that swift responses to the requests of parts delivery and repair services are also attractive points to the users.

Dryer
The dryers are Circular type made by Kaneko Agriculture Machinery.
The specification of the dryers is as follows.

- Capacity: 20 tons/day
- Power requirement: 380V (3 Phase Electricity)
- Facilities: Two sets of 10 ton dryer (height 9m)

The main features of dryer are the followings: (i) durability having 8 layers in drying zone, (ii) homogeneous drying with multiple wind flows, and (iii) speedy drying with strong wind. Taiwa Seiki (Cambodia) is planning to manufacture the dryers in Cambodia, therefore reliable maintenance services are also one of their comparative advantages as well as the case of rice milling machines.

(4) Counterpart Organization

Department of Agricultural Cooperative Promotion (DACP),
Ministry of Agriculture Forestry and Fisheries (MAFF)

(5) Target Area and Beneficiaries

Sankor Meanchey Agricultural Cooperative (Sankor AC): Kampong Thom Province
Samaki Senpreah Ream Agricultural Cooperative (Samaki AC): Takeo Province

(6) Duration

July, 2013 – September, 2015

(7) Progress Schedule

Activity Component		2013						2014			2014									2015			2015					
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Preparation																												
1	Selection of Operators																											
2	Coordination of Supporting Partners																											
3	Plant Manufacturing																											
4	Shipping / Transportation																											
5	Installation / Test-run																											
6	Technical Assistance for Milling Technology																											
Demonstration Activities																												
7	Monitoring on Rice Milling																											
8	Consideration on Business Model																											
9	Business Assessment																											
Dissemination Activities																												
10	Seminar																											
11	Consideration on Dissemination																											
Domestic Work																												
12	Report Preparation																											

Plan Result

(8) Manning Schedule

	Responsibility	Name	Company		2013						2014						2014						2015								
					Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	Project Manager	Ryoichi Takai	Taiwa	Plan				8					8				8				8				5						
				Result				8								11					11								5		
2	TA for Rice Mill Installation and Test-run	Toshiharu Tanaka	Taiwa	Plan									15								15										
				Result												15					20	5									
3	TA for Mini Rice Center Operation	Local Staff	Taiwa (Cambodia)	Plan									28		1	1	1	1	1	1	2		1	1	1						
				Result												21	1	1			14			1	1						
4	TA for Dryer Installation and Test-run	Shigeaki Yamada	Kaneko	Plan									14																		
				Result												14															
5	Chief Advisor／ Business Model/ Dissemination	Michiko Hatakeyama	JDI	Plan		3		7	14														7		7						
				Result		3		7	7						7												4				
6	AC Business Model	Tsumio Hatsukade	JDI	Plan		3 14			14								3				4	7	6		3						
				Result		3 14			14			7									4	7	6		6		3				
7	Dissemination	Tomoko Hattori	JDI	Plan		3		14					7									7									
				Result		3		7		7		2			7							7		6							

(9) Implementation Structure

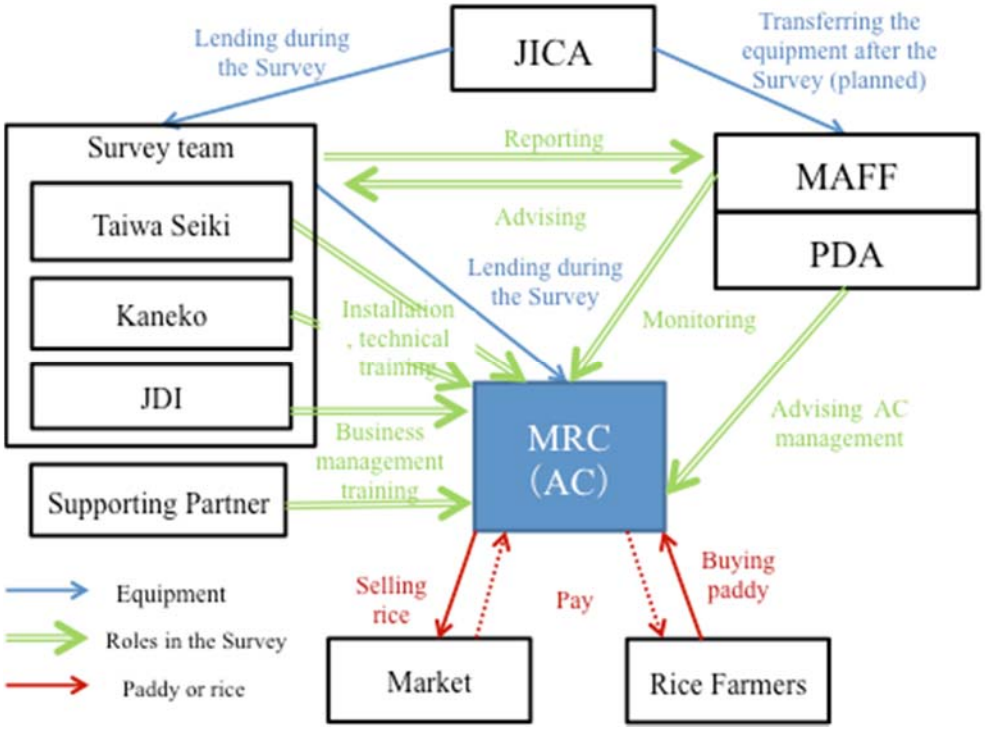

Figure 2: Implementation structure of the Survey

(Source: Survey team)

Taiwa Seiki Corporation:

- Installation of the equipment
- Training of milling operation and maintenance
- Monitoring of the rice milling businesses

Kaneko Agricultural Machinery Co., Ltd. (External human resource):

- Installation of the equipment
- Training of drying operation and maintenance

Japan Development Institute Ltd. (External human resource):

- Considering the rice marketing plan
- Considering of the MRC dissemination
- Evaluation of the profitability of MRC
- Coordination within the MRC group
- Training of milling business

Agricultural Cooperatives:

- Implementation of rice milling business

Supporting Partner:

- Assistance to the rice milling businesses of the agricultural cooperatives

MAFF:

- Monitoring of the rice milling businesses of agricultural cooperatives
- Advising the Survey team

PDA:

- Advising the agricultural cooperatives

Other government organizations:

- Participation of dissemination seminar
- Sharing of information within the ministry

3. ACHIEVEMENT OF THE SURVEY

(1) Outputs and Outcomes of the Survey

The Survey team selected two agricultural cooperatives (ACs) as MRC operators and installed the equipment of MRCs by July, 2014. The MRC operator was originally assumed as a combination of an agricultural cooperative and their supporting partner.

However, at the time of submitting their proposals, both the two ACs did not have supporting partners with experiences of rice milling business. Therefore, the Survey team introduced a local rice business expert (an NGO). However, the partnership could not be established due to the shortage of fund to pay the fee for the expert and the extra budget was not prepared by the Survey team. Finally, the Survey team discussed with the MAFF and decided to request Green Trade Company (GTC) under the Ministry of Commerce to become the supporting partner for the ACs and to advise on the basic rice business management for free. Japan Development Institute (JDI) additionally provided advices and trainings on rice business management to the ACs.

After receiving trainings from the Survey team and the supporting partner, the two ACs started their rice milling businesses from July 2014. Their businesses were monitored from July 2014 to March 2015. As of March, 2015, the two ACs learned the basic skills of the MRC equipment operation. However, due to luck of local support partner that have knowledge and experience of rice mill business and limited time for the trainings on marketing together with financial problems, their rice milling business could not get on the track yet.

The more details are as follows:

(1) Selection of MRC Operators

The Survey team organized a seminar for explaining the MRC project in October, 2013. As a result, four ACs submitted their proposals to the Survey team. The Survey team finally selected Samaki AC from Takeo Province and Sankor AC from Kampong Thom Province based on the availability of land/building, capital, organizational capacity, business experiences and business plans. The two ACs and Taiwa Seiki signed the Survey contract with the witnesses of MAFF and JICA in December 2013.

In the original assumption, ACs were expected to partner with supporting partners with rice business experience, who can advise on the management of rice mill business. However, after the commencement of the selection, it was revealed that there were no such supporting partners among those who were named by the selected ACs. One NGO with rice business experience offered their willingness to support the ACs as supporting partner and quoted their consulting fee, which was too expensive for the selected ACs to pay. Therefore, the Survey team discussed with the MAFF how to find a suitable supporting partner, and finally requested GTC to become the supporting partner of the two ACs. GTC accepted the request and provided basic advices and training on rice milling business to the ACs as their supporting partner. In cooperation with GTC, JDI, a Survey team member, additionally provided advices and training on rice business management to the ACs in order to support their business management.

As a result, the supporting structure and the schedule of the MRC Survey substantially changed from the original assumptions as shown below.

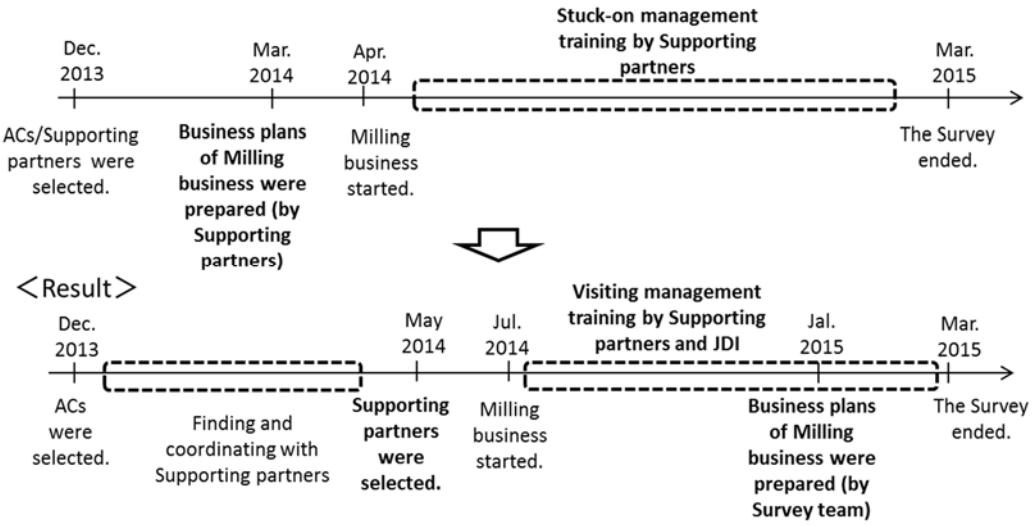

Figure 3: The assumption and actual result of the Supporting partner
(Source: Survey team)

As a result, there were following impacts on the MRC project.

- There was a delay in the selection of the supporting partner by about half a year.
- The business plans were originally assumed to be prepared by supporting partners. However, the supporting partner could not prepare the business plans, and therefore, the Survey team prepared them instead in January 2015. As a result, there was a long delay in the preparation because of the prolonged selection of the supporting partner.

(2) Plant procurement, Installation, and Test run

At the time of application, both the ACs did not have buildings for accommodating the MRC equipment. Therefore, the ACs decided to construct buildings for the MRC with their own funds.

The construction of the buildings needed time and expense more than expected. Accordingly the installation of the equipment was also postponed by 2-3months. Therefore, the demonstration period for the milling business operation was shortened from 12 months to 9 months.

The equipment was carried in and installed in the buildings in May and June 2014. The test run of the equipment except drying machines was conducted and intensive training courses were organized for the operation staff of the ACs in early July 2014. The result of recovery rate of rice products was the below, but the test run was conducted without using the color sorting machine. Therefor this result* cannot be directly compared with another results of recovery rate of rice products.

Table3: Test run result (without using the color sorting machine)

	Sankor AC Aug 2014, Rumdoul variety	Samaki AC July 2014, Krohorm variety
Paddy input (after pre-cleaning)	defined as 100.0%	defined as 100.0%
Brown rice (after husking)	74.4%	74.9%
White rice (Tank A: head rice and big broken)	42.9%	40.9%
White rice (Tank B: big broken and medium broken)	5.8%	1.6%
White rice (Tank C: medium broken and small broken)	14.0%	21.8%
White rice (Tank D: very small broken)	1.8%	1.2%
Recovery rate of rice products (Tank A＋B＋C)	62.7%*	64.3%*

The opening ceremony of the MRCs was organized on 22nd July 2014 at Samaki AC with the attendance of MAFF, the provincial department of agriculture (PDA), JICA Cambodia and representatives of the ACs. The training of drying machines was provided in November 2014 with newly harvested rainy season paddy.

(3) Rice milling business and Monitoring of MRC operation

The ACs started the rice milling businesses in July 2014. The rice milling business of the MRCs includes "commercial milling business (ACs buy paddy with their own fund and sell milled rice)", "milling service business (ACs provide milling service for customers' paddy and receive a fee)"etc. In the initial stage, when dry season paddy were available, the ACs purchased and sold dry season rice, which were less profitable and low value. And their management of cost and profit were not strict. Therefore, they could not make a profit. Since November 2014, they shifted from low value rice variety to high value rice variety (Jasmine rice), which were more profitable. They learned how to buy paddy based the paddy moisture. Wet paddy were dried by the drying machine or manually and then stored as dry paddy. The majority of the purchased paddy had good quality.

In addition to the initial intensive training course on the milling plant operation, continuous trainings were required for the ACs to fully learn the milling skills. It took a longer time for the ACs to obtain basic operational skills and further experience will be necessary to use the milling plant to reach the level to gain a profit from rice mill business. As of March 2015, the rice milled by the ACs satisfied the Thai export standard of "5% broken rice" based on quality tests certified by OMIC (an inspection company).

The recovery rate of rice products (head rice, big broken rice and medium broken rice) were measured by Taiwa Seiki and are summarized in Table 4. The recovery rate of rice products of Samaki AC exceeded 61% for Jasmine variety paddy of relatively good quality, which was a level expected by MAFF. On the other hand, that of Sankor AC did not exceed 61% during the Survey period. Taiwa Seiki continues to technically support the ACs even after this JICA Survey was completed.

Table4: The result of recovery rate of rice products by Taiwa Seiki

	Sankor AC			**Samaki AC**	
	2nd test (2)	**2nd test (1)**	**1st test**	**2nd test**	**1st test**
Date of Test	8/5/2015	23/4/2015	15/11/2014	28/4/2015	22/11/2014
Source of paddy	Old Jasmine rice procured by Taiwa from V company	New Jasmine rice procured by AC	New Jasmine rice procured by AC	New Jasmine rice procured by Taiwa from V company	New Jasmine rice procured by AC
Drying method	Mechanical drying	Sun drying	Sun drying	Mechanical drying	Mechanical drying
Paddy quantity tested	1,952.3kg	1,020.5kg	1,338.0kg	2,290.8kg	1636.0kg
Effective paddy input (after pre-cleaner)	100%	100%	100%	100%	100%
Brown rice	-%	-%	-%	-%	-%
White rice (Tank A: head rice and big broken)	44.4%	36.7%	40.6%	**45.1%**	**49.8%**
White rice (Tank B: big broken and medium broken)	4.6%	7.0%	5.6%	4.5%	2.2%
White rice (Tank C: medium broken and small broken)	9.3%	15.0%	13.7%	13.5%	5.7%
White rice (Tank D: very small broken)	3.6%	6.1%	2.4%	1.0%	0.8%
White rice removed by the color sorting machine (colored rice)	1.0%	0.4%	2.0%	1.1%	4.2%
Recovery rate of rice products (Tank A＋B＋C)	58.3%	58.7%	59.9%	63.1%	57.7%

From July 2014, GTC and JDI provided trainings and advices on rice business management. GTC, JDI and ACs checked quality requirements of different market segment and sold rice in provincial market as well as Phnom Penh market. The target segment for rice marketing was set as middle class to high class restaurants etc. in the business plan prepared in January 2015. In January and February 2015, Sankor AC found new customers in the targeted restaurant segment and their sales were increasing. However the monthly sales dropped in March after the Survey team stopped the marketing assistance. The initial sales contracts were not long enough. Moreover Sanko AC lost some business chance without being able to procurement the paddy to sell. Samaki AC faced a financial problem and could not continue the "commercial milling business" due to the shortage of the working capital after January 2015. The AC continued the milling service business only since then.

The targets and results of the Survey are shown in the graph below. The ACs could not achieve the targets set by the Survey team.

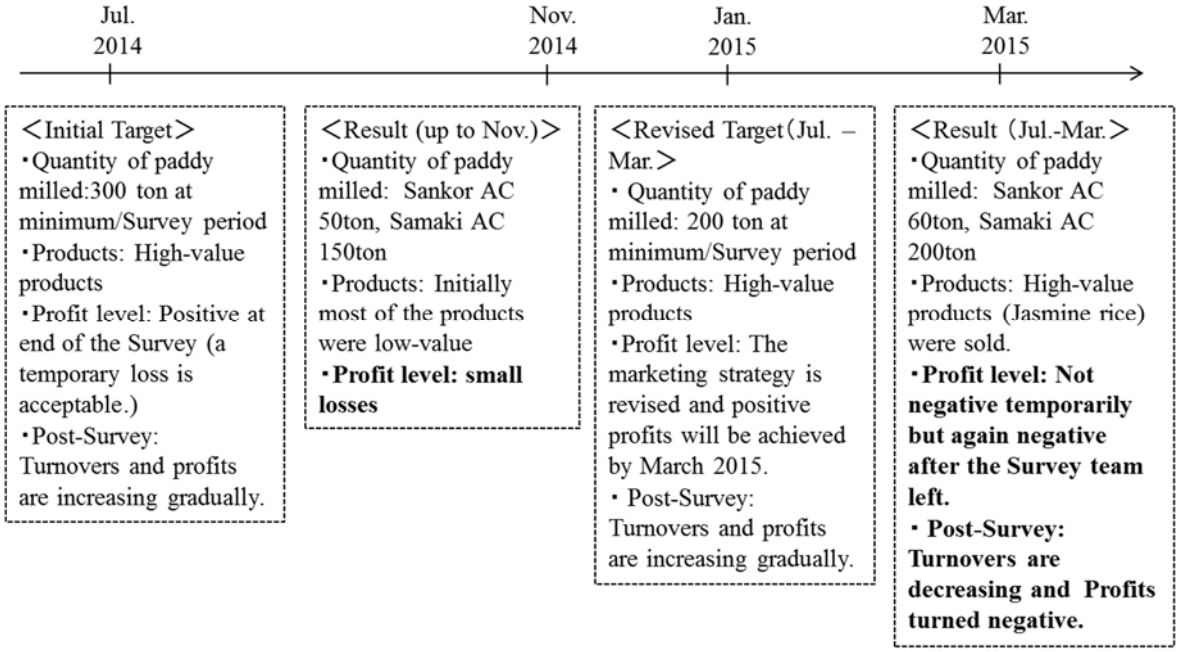

Figure 4: The targets and results of the Survey
(Source: Survey team)

While GTC provided basic supports and training to the ACs, the Survey team prepared ACs' business plans and provided guidance and trainings on the management and marketing. However, the results of the MRC businesses were not sufficient enough. The possible causes of the low achievements are traced back to the root cause and they are summarized in the graph below (Causes No.1-3). Considering the insufficient capability of the Survey team, the Survey team should have prepared an additional budget for employing trainers with rice business expertise. The cause No.4 in the figure means that Samaki AC borrowed money expecting to repay it based on the account receivables of other business of the AC. But finally it took too long time to collect the account receivables, resulting in the shortage of the working capital for the rice milling business. The Survey team should have noticed earlier the status of the account receivables and discussed the financial problem with the AC.

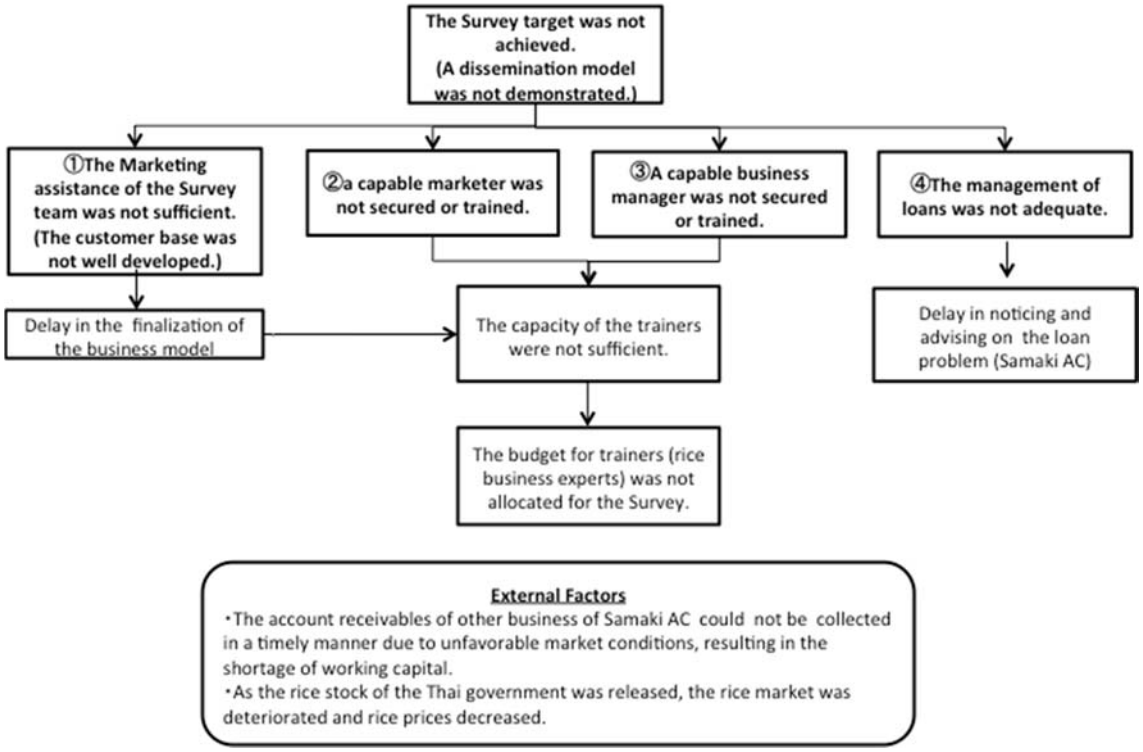

Figure 5: The possible causes of not achieving the Survey target
(Source: Survey team)

(2) Self-reliant and Continual Activities to be Conducted by Counterpart Organization

Working capital, marketing, knowledge and experience etc. are essential to sustainable rice mill business and to make a profit. In consideration of the result of the Survey, it is not easy for the ACs to acquire them by themselves. The Survey team could advocate that is might be effective to develop the ACs by outside persons with relevant knowledge and experience.
Taiwa Seiki shall make the best efforts to support the ACs even after the Survey.

4. FUTURE PROSPECTS

(1) Impact and Effect on the Concerned Development Issues through Business Development of the Product/ Technology in the Surveyed Country

The Survey team judges that the two ACs are not ready to start the rice mill business for the near future unfortunately. In the longer run, when the ACs expand their business and secure the profit, the business models for ACs could be designed. For the moment, the Taiwa Seiki will focus its business on manufacturing and selling rice milling machines of 3 ton/hour for the private rice milling industry in Cambodia.

Taiwa Seiki Cambodia had their first forwarding of their products, whiteners and polishers, assembled and made in Cambodia on October 18th, 2013. Their promising products are 3 ton/hour machines, and they are trying to increase the local purchases of parts and materials including from neighboring countries. Regarding the staff recruitment, they are selecting the graduates of Japanese universities, considering the importance of good communication. Sales promotion up to date is focused in the area of Battambang Province where modernized rice production is well developed.

(2) Lessons Learned and Recommendation through the Survey

(i) Countermeasures to risks in the implementation of soft assistance

There were two sites in this Survey, hence the Survey budget became very tight. Considering a possible case where the original assumptions were not fulfilled, the Survey team should have secured budgetary and temporal measures in advance. For such occasion, the Survey team should have surveyed in only one site, which would have secured enough room of budget for employing a rice business expert by the Survey team. This might have greatly reduced the risk.

(ii) Importance of preceding studies

In the preceding study, the Survey confirmed interests of potential ACs and their supporting partners in the MRC project. After the MRC project started, the Survey team found that the intentions of ACs and their supporting partners were from what the team confirmed in the preceding study. This suggests that the confirmation of the interests and intentions was not sufficient.

(iii) Importance of marketing activity

The implementation period of ACs' rice business operation was shortened to 9 months due to the delay of the preparation of the MRC building. After the Survey, the Survey team realized that the 9 months were not enough for the trainings of ACs. Especially the training and assistance of rice marketing was conducted only from January to March (mainly February). The Survey team should have extended the training period.

ATTACHMENT 1: OUTLINE OF THE SURVEY

THE PILOT SURVEY FOR DISSEMINATING SME'S TECHNOLOGIES

Pilot Survey for Disseminating SME Technologies for Mini Rice Center in Cooperation with Agricultural Cooperatives (Cambodia)

Outline of the Survey

- Proposed by : Taiwa Seiki Corporation , Toyama, Japan
- Counterpart Organization: Department of Agriculture Cooperative Promotion, Ministry of Agriculture Forestry and Fisheries
- Target area and Beneficiaries: Sankor Meanchey Agriculture Cooperative: Kampong Thom Province
  Samaki Senpreah Ream Agriculture Cooperative: Takeo Province
- Duration : July 2013 – September 2015

Concerned Development Issues in Cambodia	match	**Proposed Products / Technologies**
• The surplus of more than half of the total paddy production is exported without being milled. The Government aims to promote the domestic milling and high value products. • Rice farmers, who are at the bottom of the rice sector, have weak bargaining power and sell their paddy at low prices. • Agricultural cooperatives, who are expected to function as joint purchase and selling, are still not well developed. Their business capability is low.		• Small-scaled rice milling machines for long grain rice, which are suitable for small business entities • Minimization of milling loss (high milling rate), technology for milling high value rice

Implemented Activities in the Survey

- Demonstration: For the two agricultural cooperatives, (1) the equipment was installed and technical trainings on drying and milling were provided. (2) With supports from the Support partners, trainings of rice milling business were provided.
- Dissemination: A dissemination seminar was planned. However, it was not conducted as the dissemination model was not established.

Outputs and Outcomes of the Survey

- The agricultural cooperatives partly acquired the ability of operating the rice milling business after trainings.
- However, the ability is not sufficient for successful business operation yet. Further improvement is needed.

Impact on the Concerned Development Issues in Cambodia

- As of the end of the Project, the impact on the concerned development issues had not yet been realized.

ATTACHMENT 2: THE RESULT OF RECOVERY TEST BY JICA

Samaki AC: Recovery Test -1 on 27 Aug., 2015

1. Weight	Paddy	(a) Feeding weight	(b) Cleaned impurities by pre-cleaner	(c=a-b) Cleaned paddy	(Brown rice)	
		1518.0 kg	25.0 kg	1493.0 kg	(1079.4 kg)	
	Each weight of milled rice	(d) TANK A (after sorted rice by color sorter)	(e) TANK B	(f) TANK C	(g) Bag D (fine broken rice)	(h) Discolored rice by color sorter
		559.3 kg	60.0 kg	243.4 kg	35.1 kg	67.5 kg
	(i) Milled rice	Total weight of (d) + (e) + (f)		862.7 kg		
2. Recovery	**(j) Milled rice**	**(j) = (i)/(c)*100**		**57.8%**		
3. Moisture	Each moisture content	Paddy	Brown rice	Milled rice		
		12.5%	12.6%	12.4%		
4. Whiteness	Each whiteness	Brown rice	Milled rice	Increase of whiteness		
		20.7%	37.7%	17.0%		

Samaki AC: Recovery Test -2 on 28 Aug., 2015

1. Weight	Paddy	(a) Feeding weight	(b) Cleaned impurities by pre-cleaner	(c=a-b) Cleaned paddy	(Brown rice)	
		1584.6 kg	23.5 kg	1561.3 kg	(1125.0 kg)	
	Each weight of milled rice	(d) TANK A (after sorted rice by color sorter)	(e) TANK B	(f) TANK C	(g) Bag D (fine broken rice)	(h) Discolored rice by color sorter
		562.6 kg	583.0 kg	269.2 kg	44.3 kg	56.2 kg
	(i) Milled rice	Total weight of (d) + (e) + (f)		890.1 kg		
2. Recovery	**(j) Milled rice**	**(j) = (i)/(c)*100**		**57.0%**		
3. Moisture	Each moisture content	Paddy	Brown rice	Milled rice		
		12.3%	13.1%	12.8%		
4. Whiteness	Each whiteness	Brown rice	Milled rice	Increase of whiteness		
		21.2%	37.3%	16.1%		

Sankor AC: Recovery Test -1 on 1 Sep., 2015

1. Weight	Paddy	(a) Feeding weight	(b) Cleaned impurities by pre-cleaner	(c=a-b) Cleaned paddy	(Brown rice)	
		1570.9 kg	26.7 kg	1544.2 kg	(1118.0 kg)	
	Each weight of milled rice	(d) TANK A (after sorted rice by color sorter)	(e) TANK B	(f) TANK C	(g) Bag D (fine broken rice)	(h) Discolored rice by color sorter
		644.0 kg	50.1 kg	224.5 kg	71.4 kg	17.5 kg
	(i) Milled rice	Total weight of (d) + (e) + (f)		918.6 kg		
2. Recovery	**(j) Milled rice**	**(j) = (i)/(c)*100**		**59.5%**		
3. Moisture	Each moisture content	Paddy	Brown rice	Milled rice		
		12.6%	13.3%	13.1%		
4. Whiteness	Each whiteness	Brown rice	Milled rice	Increase of whiteness		
		20.7%				

Sankor AC: Recovery Test -2 on 2 Sep., 2015

1. Weight	Paddy	(a) Feeding weight	(b) Cleaned impurities by pre-cleaner	(c=a-b) Cleaned paddy	(Brown rice)	
		1486.8 kg	25.7 kg	1461.1 kg	(1057.8 kg)	
	Each weight of milled rice	(d) TANK A (after sorted rice by color sorter)	(e) TANK B	(f) TANK C	(g) Bag D (fine broken rice)	(h) Discolored rice by color sorter
		579.6 kg	65.3 kg	205.2 kg	91.1 kg	8.4 kg
	(i) Milled rice	Total weight of (d) + (e) + (f)		850.2 kg		
2. Recovery	**(j) Milled rice**	**(j) = (i)/(c)*100**		**58.2%**		
3. Moisture	Each moisture content	Paddy	Brown rice	Milled rice		
		12.5%	13.1%	13.3%		
4. Whiteness	Each whiteness	Brown rice	Milled rice	Increase of whiteness		
		20.7%				

Sankor AC: Recovery Test -3 on 2 Sep., 2015 (Reference test by using their paddy: Variety-Phka Rumdoul)

1. Weight	Paddy	(a) Feeding weight	(b) Cleaned impurities by pre-cleaner	(c=a-b) Cleaned paddy	(Brown rice)	
		521.8 kg	2.6 kg	519.2 kg	(375.9 kg)	
	Each weight of milled rice	(d) TANK A (after sorted rice by color sorter)	(e) TANK B	(f) TANK C	(g) Bag D (fine broken rice)	(h) Discolored rice by color sorter
		204.9 kg	26.1 kg	75.0 kg	29.1 kg	2.5 kg
	(i) Milled rice	Total weight of (d) + (e) + (f)		306.0 kg		
2. Recovery	**(j) Milled rice**	**(j) = (i)/(c)*100**		**58.9%**		
3. Moisture	Each moisture content	Paddy	Brown rice	Milled rice		
		12.8%	13.6%	13.3%		
4. Whiteness	Each whiteness	Brown rice	Milled rice	Increase of whiteness		
		20.7%				