

## Summary of Terminal Evaluation Results

<b>1. Outline of the Project</b>	
<b>Country:</b> The Republic of Union of Myanmar	<b>Project Title: The Project on Development of Participatory Multiplication and Distribution System for Quality Rice Seed</b>
<b>Sector: Agriculture and Rural Development</b>	<b>Cooperation Scheme:</b> Technical Cooperation Project
<b>Division in charge:</b> Arid and Semi-Arid Farming Area, Division 2, Rural Development Department	<b>Total Cost</b> (at the time of Evaluation): Approximately: 499 million yen
<b>Period of Cooperation(R/D):</b> August 9, 2011- August 8, 2016 (5 years)	<b>Partner Country's Implementation Organization:</b> Department of Works
	<b>Supporting Organization in Japan:</b>
<b>1-1. Background of the Project</b>	
<p>Agriculture is one of the most important sectors in Myanmar contributing to 40% of GDP. Among the various agricultural products in Myanmar, rice is cultivated more than half of the total farmland and supplies the major part of the calories consumed by Myanmar population as the staple food.</p> <p>For improving and stabilizing the rice production, various measures are necessary; development of agricultural infrastructure, supply of quality seeds, appropriate application of fertilizers, etc. Among them, supply of quality seeds is considered prioritized as it is executed at reasonable cost, easy to adopt for small-scale farmers, and generates positive effects rapidly.</p> <p>From the late 1970s, the Government of Myanmar (GoM) has implemented projects for quality seed supply with assistance of international donors; Seed Development Project Phase I and II, financed by World Bank and UNDP (1977-1993), Quality Seed Production Project by FAO (1984-1987), and Maize and Oil Seed Production Project by USAID (1982-1987), etc.</p> <p>However, utilization of quality seeds has not been expanded as expected due to shortage of skillful staffs in MOAI, loss of seed growers' motivation because of same seed and paddy prices, improper selection of target rice varieties without full consideration of local population's tastes to indigenous varieties or their adaptability to prevailing rain-fed cultivation method, low technical level of local seed growers, and vulnerability of the seed storage and distribution system that cannot supply the farmers with necessary amount of quality seeds at the required timing.</p> <p>In order to address these issues, JICA has been implementing "Project on Development of Participatory Multiplication and Distribution System for Quality Rice Seed (the Project)" since August 2011 targeting Ayeyawady region, together with Department of Agricultural Research (DAR) and Department of Agriculture (DOA) of the Ministry of Agriculture and Irrigation (MOAI) as counterpart agencies for the designated cooperation period of five years.</p> <p>In February 2016, six months prior to the completion of the cooperation period of the Project, Terminal Evaluation was conducted jointly by the Japanese and Myanmar sides to ascertain the progress of the Project, and provided recommendations on the actions to be taken during the remaining cooperation period to secure the sustainability of the Project, as well as drawing lessons useful for technical cooperation schemes in general.</p>	
<b>1-2. Project Overview (PDM (version 1.0))</b>	
<b>(1) Overall Goal:</b> Quality seed of rice is widely used by farmers in Myanmar.	
<b>(2) Project Purpose:</b> Participatory multiplication and distribution system for quality seed of rice is established in Ayeyawady delta area.	
<b>(3) Outputs:</b>	
1. Capacity for production of Breeder's Seed (BS) in DAR is improved.	
2. Capacity for production of Foundation Seed (FS) and Registered Seed (RS) is improved and quality control system is strengthened in DOA Seed Division	
3. Capacity of instruction in DOA Extension Division is improved for Certified Seed (CS) production by seed growers.	
<b>(4) Inputs (at the time of review (2013.11))</b>	
<b>Japanese Side</b>	
<ul style="list-style-type: none"> <li>• Dispatch of Experts: 4 Long-term Experts (146 M/M) and 9 Short-term Experts (23.3 MM)</li> <li>• Procurement of Equipment : Approximately 66.4 million yen (vehicles, rice graders, laboratory equipment, etc.).</li> <li>• Local Cost Assistance: 43.5 million yen for improvement of facilities (threshing floors, extension camps, etc.).</li> </ul>	
<b>Myanmar Side</b>	
<ul style="list-style-type: none"> <li>• Allocation of CPs: 20 CPs as of the end of February 2016</li> <li>• Office space for the Japanese experts in Yangon, Seed farms (Yezin, Hmawbi, Myaungmya and Hinthada), Seed laboratory in Gyogone</li> <li>• Salary of CPs, utilities, domestic telephone charge, etc.</li> </ul>	
<b>2. Terminal Evaluation Team</b>	
<b>Japanese Side</b>	<b>Cameroonian Side</b>
(1) <b>Ms. Tomoko TAIRA</b> (Leader), Director, Team1,	(1) <b>U Naing Kyi Win</b> (Leader) Deputy Director

Agricultural and Rural Development Group1, Rural Development Department, JICA (2) <b>Dr. Akira KAMIDOHZONO</b> (Farming System) Visiting Senior Advisor, JICA (3) <b>Mr. Hiroaki IMAI</b> (Planning and Management), Assistant Director, Team1, Agricultural and Rural Development Group1, Rural Development Department, JICA (4) <b>Dr. Hideaki HIGASHINO</b> (Evaluation Analysis), Senior Consultant, Recs International. Inc.	General, Department of Agriculture (DOA), MOAI (2) <b>U Myo Zaw</b> (Member) Deputy Regional Officer, DOA Ayeyawady Region, MOAI (3) <b>Daw Nilar Aung</b> (Member) Assistant Director, Planning Division, MOAI (4) <b>Dr. Aye Min</b> (Member) Staff Officer, Seed Division, DOA, MOAI (5) <b>Dr. Ye Tun Tun</b> (Member) Senior Research Assistant, Department of Agricultural Research, MOAI
<b>Period of Review:</b> February 1, to February 19, 2016	<b>Type of Evaluation:</b> Terminal Evaluation

### 3. Results of Evaluation

#### 3-1. Project Performances

##### (1) Summary of Project Purpose Achievements

**Project Purpose:** Participatory multiplication and distribution system for quality seed of rice is established in Ayeyawady delta area.

**Indicator 1:** More than 150 farmers continue to multiply CS every year in the Project site.

- Indicator 1 has been achieved.

For monsoon rice cropping from 2012 through 2015, all the 150 farmers continued to multiply CS in the Project site. (Indicator 1 does not apply to summer cropping)

**Indicator 2:** Passing rate of CS inspection become more than 50 % in the Project site.

- Indicator 2 has been almost achieved.

- The pass rate of CS inspection since 2012 is as follows:

Season	Pass Rate
2012 Monsoon Cropping	43%
2012/13 Summer Cropping	22%
2013 Monsoon Cropping	53%
2013/14 Summer Cropping	60%
2014 Monsoon Cropping	73%
2014/15 Summer Cropping	60%
2015 Monsoon Cropping	To be compiled.

Examining the inspection results in detail, it was found out that quality of CS in general (rate of red rice), has been improving although more improvement is necessary for rouging to reduce red grain.

**Indicator 3:** More than 70% of CS, which is excluded for own-use of the seed growers, produced in the Project site will be sold by 150 seed growers.

- It is still uncertain that Indicator 3 has been achieved or not at the time of Terminal Evaluation.
- Apart from the portion for own-use, 150 seed growers sold more than 70% of CS in the monsoon season in 2014.

Season	Average Rate Sold
2012 Monsoon Cropping	57%
2013 Monsoon Cropping	29%
2014 Monsoon Cropping	79%
2015 Monsoon Cropping	To be compiled.

- The ratio of CS sold over CS produced by farmers in 2012 and 2013 monsoon cropping seasons were lower than 50%.
- As described above (Indicator 2), it was found out that pass rate of CS is lower in the cropping seasons in 2013 than in other seasons, and consequently, farmers were not able to sell produced rice as CS as expected.

Taking into consideration the above fact, it is considered necessary to judge whether Indicator 3 has been achieved or not by obtaining and verifying the result for 2015 and 2016 monsoon cropping.

##### (2) Summary of Output Achievements

**Output1: Capacity of staffs in Provincial Works Offices in the target provinces is strengthened.**

Indicator	Achievements
<i>Indicator1-1:</i> Guideline of quality control technology for BS multiplication is prepared.	<ul style="list-style-type: none"> <li>Indicator 1-1 is almost achieved.</li> <li>Manuals titled "BS, FS and RS Multiplication Method" is under preparation will be</li> </ul>

	finalized in March 2016.
<i>Indicator 1-2:</i> More than 9 varieties of BS which meet demand of the farmers are satisfied with the seed standards.	<ul style="list-style-type: none"> <li>Indicator 1-2 is almost achieved.</li> <li>Traits of nine varieties were examined in terms of culm and panicle lengths, and Coefficient of Variation (CV) was examined through test cropping conducted seven to eight times in Yezin.</li> <li>As a result, it was verified that CVs of the eight out of nine varieties are smaller than five, which is the “rule of thumb” to judge genetic purity (variety fixation).</li> <li>Test cropping has been ongoing in DAR Yezin on the remaining one variety; Ayermin.</li> </ul>
<i>Indicator 1-3:</i> DAR researchers master BS multiplication and quality control methods.	<ul style="list-style-type: none"> <li>Indicator 1-3 is almost achieved.</li> <li>DAR researchers have mastered the basics of technology for multiplication of nine varieties of BS.</li> <li>They apply the techniques (pure line selection method) to eight varieties that are produced under DAR other than the said nine varieties.</li> <li>Quality control (daily field inspection) methods such as rouging by over-viewing the rice field were also transferred to DAR staffs. However the number of staffs taking charge of experimental field in DAR Yezin is only three at the moment, which is considered questionable to maintain the sustainability of the Project.</li> </ul>

**Output2: Roads of pilot sites in the target provinces are maintained properly by the DoW in-house workforce and equipment.**

<b>Indicator</b>	<b>Achievements</b>
<i>Indicator 2-1.</i> More than 9 varieties of FS and RS which meet demand of the farmers are satisfied with the seed standard.	<ul style="list-style-type: none"> <li>Indicator 2-1 has been achieved to some extent.</li> <li>Data on Sinthukha, Theedatyin, Ayeyarmin, and Pawsanyin was collected for monsoon seasons in 2014 and 2015 for analysis.</li> <li>As genetic purity of nine BS varieties has been improved, it is considered that genetic purity is maintained in the multiplication process of FS and RS.</li> </ul>
<i>Indicator 2-2.</i> Capacity of staff from DOA Seed Div. as trainer for field inspection training is increased.	<ul style="list-style-type: none"> <li>Indicator 2-2 has been achieved.</li> <li>Capacity of staffs from DOA Seed Division has improved through participating in the Project activities: they take charge of field inspection trainings as instructors on the nationwide basis and contribute to fostering junior staffs.</li> </ul>
<i>Indicator 2-3.</i> Number of RS and CS of rice sample for laboratory inspection in Seed Division in Yangon increase 2 times or more than that of 2011.	<ul style="list-style-type: none"> <li>Indicator 2-3 has been achieved.</li> <li>Number of RS and CS of rice sample was 233 in total as of 2011.</li> <li>It increased to 654 in 2015, more than double the number of 2011.</li> </ul>
<i>Indicator 2-4.</i> Field inspection and lab test are implemented for 150 seed farms in the Project site.	<ul style="list-style-type: none"> <li>Indicator 2-4 has been already achieved.</li> <li>Since 2012, field inspection and laboratory tests have been implemented for 150 seed farmers in the Project site.</li> </ul>

**Output3: Capacity of instruction in DOA Extension Division is improved for CS production by seed growers.**

<b>Indicator</b>	<b>Achievements</b>
<i>Indicator 3-1.</i>	<ul style="list-style-type: none"> <li>Indicator 3-1 has been achieved.</li> <li>According to the results of the questionnaire survey<sup>&lt;*</sup> to seed growers conducted in November 2015, seed growers highly evaluated the extension services: Average evaluation grade for instruction: 4.6 and for extension service: 4.0.</li> </ul> <p>&lt;*: five grade evaluation with five as the highest grade(3; no change, 4; improved, 5; significantly improved)/103 respondents</p>
<i>Indicator 3-2.</i>	<ul style="list-style-type: none"> <li>Indicator 3-2 has been achieved.</li> </ul>

- In the 1<sup>st</sup> baseline survey conducted in December 2011, 12 to 22 % of farmers answered that they knew the characteristics of CS.
- Meanwhile, in the 2<sup>nd</sup> baseline survey conducted from February to March 2015, the rating by farmers who know about the characteristics of CS improved to 26 to 49%.
- As for marketing information, as it was difficult to compare the results of the 1<sup>st</sup> and the 2<sup>nd</sup> baseline surveys, an additional questionnaire survey was conducted targeting seed growers in November 2015. <\*

Questions	Average Grade
The number of people you (CS grower) sold CS	4.1
CS volume (amount) you (CS grower) sold	4.3
CS Price	3.9
Marketing, number and/or variety of information about seed marketing	3.8
Easiness of selling or finding seed market	3.9

- The results show that farmers' knowledge on CS market information has improved through the implementation of the Project activities (Activity 3-4 and 3-5) <\*: five grade evaluation (3; no change, 4; improved, 5; significantly improved)/103 respondents
- The Project Team conducted comparison study on CS and non-CS paddies<\*\* in the three T/S (100 farmers in each) in 2015, and the information will be used to increase stakeholders (not only farmers but also rice millers, and middlemen, etc.)

Location	Yield of CS Paddy	Yield of non-CS Paddy
Hinthada (Sinthka)	74.4 (basket/acre)	71.6 (basket/acre)
Myaungmya (Sinthaka)	95.9 (basket/acre)	84.2 (basket/acre)
Labutta (Pawsanyin )	54.7 (basket/acre)	48.8 (basket/acre)

- In addition, the results of quality test of CS paddy in three T/S and other similar varieties in Nay Pyi Taw Area were analyzed and superiority of CS paddy were presented.  
<\*\*:CS means paddy produced by CS user farmers, and "non-CS" means paddy produced by non-CS farmers.

### 3-2 Summary of Evaluation based on Five Evaluation Criteria

Evaluation results based on 5 evaluation criteria are as follows:

#### (1) Relevance: High

The Project is highly relevant with Myanmar's development policy, the needs of local communities, Japan's aid policy and strategy, as well as technical advantages of Japan. The project approach to involve whole stakeholders throughout the seed flow was relevant. Also, the project site and project beneficiaries (CS farmers) were selected relevantly as the Ayeyawady area is one of the most important rice production area and most CS is produced by CS farmers.

#### (2) Effectiveness: Relatively High

Technical transfer to the Myanmar CPs has been successfully executed as a whole to the DOA and DAR staffs at central and local levels. In addition, CS farmers (150 farmers) as well as CS user farmers participated actively in the Project activities during the past four and half years. However, due to unstable achievements of indicators related to pass rate of CS inspection, and the rate of CS sales by CS grower over total CS productions, it is difficult to conclude Project Purpose has been fully achieved. These achievements need further verification with 2015 and 2016 monsoon cropping data.

#### (3) Efficiency: Relatively High.

Most of the provided equipment by the Japanese side has been fully utilized to implement the Project activities and contributed to the achievements of Output. Thus, inputs by both the Japanese and Myanmar sides are evaluated as appropriate. However, at the transition period from the previous to the current administration in 2011, the pace of visa application/issuance procedure by the Government temporarily slowed down, and affected the assignment schedule of the Japanese Experts.

#### (3) Impact:

The Joint Terminal Evaluation Team considered that sufficient technologies to achieve the Overall Goal have been transferred to the Myanmar CPs. Therefore, when Myanmar Government decides to maintain the current level of budget and staffs in the organizations related to the Project activities, the Overall Goal (663 CS farmers) is expected to be achieved to a certain extent in three years after the completion of the Project with 150 active CS farmers. Meanwhile, quality control of CS production will become progressively crucial in the future as CS producing farmers will increase against the budget and human resources available. In addition, various positive impacts, including the plan of mini-seed laboratory establishment in local areas taking

JICA Project as a model, were observed.

**(5) Sustainability: Moderate**

There remains slight concern about budget and human resources arrangement by the Myanmar side to continue the Project activities after the cooperation period, satisfying the quality of seeds in accordance with the requirement of the JICA Project. In addition, taking into account the unstable achievements of indicators related to pass rate of CS inspection, and the ratio of CS sales by CS grower over total CS productions as was stated above, it is preferred to keep technical transfer to CS growers and monitoring the performance of CS growers at least one more cropping season. Thus, the evaluation team evaluates that the project effect will be sustained within the project target area if CS growers surely attained the technique, and the project effect will expand to other areas if the Myanmar side successfully allocates budget on the activities.

The evaluation team thinks the BS production techniques to maintain genetic purity is very important thus a new indicator for overall goal related to this point should be added for ex-post evaluation.

**3-3. Factors promoting the production of effects**

**3-3-1. Factors pertaining to planning**

No particular factors pertaining to planning were recognized.

**3-3-2. Factors pertaining to implementation process**

- Increasing needs for CS by farmers in the Project site due to liberalization of rice export in 2012
- Poverty Reduction Fund, allocated in 2013/2014 and 2014/2015 fiscal years, was used for purchasing CS produced in three T/Ss, to maintain the incentives of CS growers in the T/Ss.
- Good collaboration among the Project Team and the local governments (regional, district and T/S) in the target areas
- Due to abolition of compulsory rice cropping by the Government in 2003, farmers had more scope and incentive to choose rice varieties to cultivate. Some of the farmers chose to cultivate high quality varieties and resistant variety for irrigation water shortage and its salinity.
- JICA Project could focus on improvement of technical aspect of quality seed multiplication as foundation of seed production process was established under the Seed Development Project Phase I and II that were implemented by World Bank and UNDP from 1977 until 1993.

**3-4 Factors inhibiting the production of effects**

**3-4-1. Factors pertaining to planning** In the original Project design, several key stakeholders were omitted from the Project counterpart such as township office in a township covered by DOA seed farm.

**3-4-2. Factors pertaining to the implementation process**

- Market mechanism that does not reflect the quality of the rice on the price at the moment
- At the transition period from the previous to the current administration in 2011, the pace of visa application/issuance procedures by the Government temporarily slowed down, and affected the assignment schedule of the Japanese Experts.
- Production of FS and RS in seed farms (Hmawbi, Hinthada, and Myaungmya) scaled down in 2013, and data collection to verify the genetic purity of target varieties became difficult.

**3-5 Conclusion**

Based on the analyses of the achievements of the Project and the results of evaluation according to five evaluation criteria, the Evaluation Team concluded it is necessary to extend the Project seven months until March 2017, in order that the Project Purpose will be fully achieved and sustainability of the Project will be ensured.

**3-6 Recommendations**

**(1) Discuss a Solution for the Distribution Gap among Stakeholders and Reach a Consensus for Specific Actions**

The evaluation team recommends the Project Team to continue discussion how to fill the distribution gap both from technical (ex. growing summer variety's seed in monsoon season) and financial (ex. as shown in 5-1-3) aspects and make a consensus for specific actions. The solution should become an institutional action involving Ayeyawady regional DOA through being enclosed in the Action Plan.

**(2) Continue the Activities and Find a way to Involve Rice Millers to Purchase Paddy Grown from CS**

The Project is now conducting activities to encourage rice millers to purchase paddy grown from CS at reasonable price which reflect paddy quality by showing the benefit of paddy grown from CS for rice milling through milling demonstration and advocating the quantitative data. This activity has been expanded on a full scale just in 2015/2016 season so that rice miller will be interested in purchasing CS for distribution among affiliated paddy growers.

The evaluation team recommends the Project Team to continue the activities (PDM activities 3-4 and 3-5) at the time of harvesting summer rice (around June-July 2016) and monsoon rice (around December 2016- January 2017).

**(3) Seek a Way to Introduce and Sustainably Manage a Revolving Fund to Purchase CS at the Time of Harvesting such as the Fund made in 3 Townships**

Three Townships in the Project Site have allocated “poverty reduction fund” for the activity to purchase CS at the time of harvesting and sell them at the time of sowing. Although the sustainability of the fund has not been proofed yet, such fund is potentially a solution of the problem of distribution gap.

So the Evaluation Team recommends the Ayeyawady regional DOA and Myanmar C/P in 3 townships to monitor the effectiveness and sustainability/transparency of the established fund and be prepared for the future opportunity to allocate any emerging budget in the future, or seek the possibility of every financial scheme such as NGO’s microfinance, Ministry of Cooperative’s microfinance, etc. Organizing farmers group as an entity to manage such fund may need to be considered.

**(4) Elaborate the Action Plan for Expansion of CS Production to 26 Townships in Ayeyawady**

Although Ayeyawady regional DOA is trying their best to attain budget for extension, budgetary allocation for the regional 5-year-plan is not promised. Based on the actual budget, the expansion plan should be adjusted in realistic matter. Otherwise, the effort to increase CS production in Ayeyawady region may end in unproductive devote of energy.

So the evaluation team recommends the Project Team and Ayeyawady regional DOA to elaborate the action plan through learning by doing in FY2016/2017 based on the actual budget allocated and real capacity/number of extension workers. The evaluation team deems the “5 years regional plan” is a strategy which needs to have supplementary action plan to be formulated by the end of the Project with specific tactics how to achieve the Overall Goal of the Project.

**(5) Give Technical Advice to Control Quality of CS while Expanding the Activities to 26 TS**

Seed grower’s production technique is the foundation of CS production, however, the extension staff and seed growers in other townships may need some more experience than just leaning through reading technical materials. So the evaluation team recommends the Project Team to give technical advice to other district’s SMS (subject matter specialist), township’s extension staffs and seed growers through various occasions.

Especially, the evaluation team recommends strengthen horizontal technical transfer (district SMS to district SMS, TS officer to TS officer and farmer to farmer) by the activities such as making field trip to other district/township, organizing farmer’s inter township field visit, etc.

**(6) Continue the Activities to Involve Rice Millers to Acknowledge CS Quality**

CS market was not existent before the Project, however, the market is now emerging owing to the Project Team’s effort as well as social and economic change. As mentioned in the recommendation 5-1-2, the Project has started the activities to involve rice millers to acknowledge CS quality such as organizing field day at rice mill and demonstrate milling with the paddy grown from CS. The evaluation team recommends the Ayeyawady regional DOA to expand these activities in non-project target townships in 2016/2017 with technical advices by the Project Team in order to make the emergence of CS market more complete.

Beyond the Project activities, Myanmar stakeholders may need to consider such new ideas as giving advice to improve package of milled rice to “improve the value of the rice” made of CS. Also, the PR activities will show not only conceptual idea but also real data of the difference between CS and others.

**(7) Monitor and Sustain Genetic Purity through BS, FS and RS Stage**

Sustaining genetic purity of BS, FS, and RS is an important task as it affects whole nation’s productivity. In order to sustain the genetic purity, the evaluation team recommends **the Project Team** to monitor the genetic purity of not only BS but also FS and RS within the Project period.

Also, Ayeyawady regional DOA and DOA NPT HQs and DAR HQs Yezin should make best effort to allocate budget for BS, FS and RS production in accordance with the technical necessity (ex. labor budget for sufficient times of rouging for seed production) and monitor the genetic quality of BS, FS and RS. The evaluation team recommends to add an indicator to the overall goal of the Project in conjunction with this issue.

In order to maintain the genetic purity of BS, line method introduced by the Project should be continued by DAR Rice Division. Also, BS of one variety should be produced only in one place in order to keep the genetic purity. If there were multiple places to produce BS, these places should produce mutually exclusive varieties.

**(8) Conduct End-line Survey**

The evaluation team recommends the Project Team to conduct end-line survey to organize the information on how much intervention leads to how much benefit, and how to do it.

**(9) Disseminate the Project Activities**

As the DOA NPT HQs and DAR HQs Yezin has nationwide training mechanism through CARTC, the Evaluation Team recommends DOA NPT HQs and DAR HQs Yezin to disseminate the Project activities by incorporating the technical package and end line survey data into CARTC training program.

Recommendations	The Project Team	Ayeyawady regional DOA	DOA NPT HQs and DAR HQs Yezin
5-1-1 (1)	✓	✓	
5-1-1 (2)	✓		
5-1-1 (3)	✓	✓	
5-1-2 (1)	✓	✓	
5-1-2 (2)	✓		
5-1-2 (3)		✓	
5-1-3 (1)	✓	✓	✓
5-1-3 (2)	✓		
5-1-3 (3)			✓

**3-7. Lessons Learned**

**(1) Farmer's benefit**

As the Evaluation Team reconfirmed through the field observation and interview, both the seed grower and CS buyer (ordinary farmer) enjoyed the benefit of the Project. The lesson learned here is the importance to ensure the incentive of farmers when introducing new technologies and make the benefit easy to understand through collecting quantitative data.

By examining the interview and data collected during the terminal evaluation, it is supposed that the about 1,000 farmers would enjoy the benefit of the yield increase effect of CS. 8,216 baskets of CS produced in the Project has theoretically equivalent amount required for grain production by 1,000 small scale farmers.

Also, the seed grower can benefit from growing certified seed as the CS is appreciated by seed buyer and get clearly different price from ordinary grain. According to the rough estimation, CS grower can gain about 48,000 Kyat / acre (net income after deducting additional cost) by growing CS instead of ordinary grain.

**(2) Stakeholder Identification and Involvement**

In the original Project design, several key stakeholders were omitted from the Project counterpart such as township office in a township covered by DOA seed farm on assumption that DOA seed farm extends CS production technique by themselves. In actual, seed farm did not have extension function so it was necessary to involve township office for extending CS production technique to farmers.

During the Project, the Myanmar and Japanese sides adjusted and included such stakeholders into the Project. However, it took additional coordination effort. For smooth implementation of the future project, it is necessary to carefully examine who should be involved in the project at the time of project planning.

**(3) Awareness of Seed Quality Control**

The Project originally tried to set a quantitative target of CS dissemination, however, the definition of "CS" was not commonly shared at each level of seed flow and there was a concern that unqualified seed would be produced by stakeholders to achieve the target amount. So the Project focused their resource on materializing seed flow from BS to CS in selected townships only and tried to raise awareness of stakeholders in each level of seed flow.

This operational adjustment succeeded and the Project could materialize the streamline of quality seed from BS to CS which fulfills the standard of both field inspection and laboratory test. As the CS production requires proper awareness of all stakeholders in every level of seed flow, it is very important to raise awareness of definition of CS at each level of stakeholders.

The Lesson here is that when we design a project to change the mindset and disseminate the concept in various stakeholders, we need to allocate enough time and resources for the dissemination of the concept.