

The Republic of Uganda

FY2016 Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for Construction of Rice Research and Training Centre”

External Evaluator: Isao Dojun, Chuo Kaihatsu Corporation

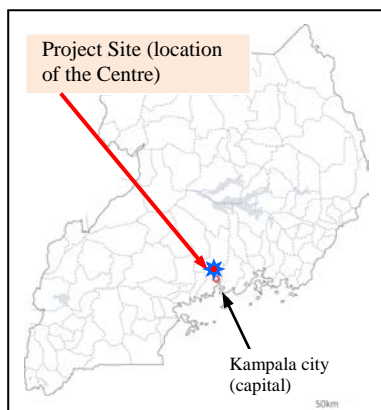
0. Summary

The Project was conducted at the National Crop Resources Research Institute (hereinafter referred to as NaCRRI) with the aim of devising a means to improve the quality of planning, research, training, dissemination, and evaluation necessary for the promotion of rice via the provision of a rice research and training centre and related equipment.

Both at the time of planning and the ex-post evaluation, the Project is and has been in accordance both with the development needs and development policies of Uganda, given the important political objectives on increasing rice production in its national development plans and agricultural planning and policy, as well as its high rice production needs. The Project has high relevance in consideration of its consistent with Japan’s ODA policy, given the importance placed upon rice promotion in agricultural development as one of the important areas by the Japanese government for its Ugandan aid policy. Therefore, the actual count of rice cultivation trainees at the Rice Research and Training Centre fell significantly below the target; a primary factor for this was that most farmer-oriented training has been carried out locally (areas where near farmers live) , and so the number of calls to train farmers at NaCRRI decreased. On the other hand, through use of the facility and equipment provided by the Project, rice cultivation researchers were able to showcase their growth and research successes. By way of practical training, agricultural officers and others strengthened their skills in promoting rice cultivation technology. Thus, while the quality of research and training improved, the number of trainees did not meet the target. In terms of contributing to rice promotion in Uganda – the Overall Goal of the Project – the cultivation area and crop yield of rice at the farmer level increased thanks to the distribution of high-quality rice variety seeds to trained farmers and the farmers’ trainings. The Project has made a certain contribution to rice production increase. Therefore, the effectiveness and impact of the project is fair. While project cost stayed within the plan, project period exceeded the plan. Therefore, efficiency of the project is fair. There were no issues with operation and maintenance with regards to institutional, technical, financial, or current status; the sustainability of the project effects is high.

In light of the above, this project is evaluated to be satisfactory.

1. Project Description



Project Location



Rice Training and Cultivation Centre building, NaCRRI

1.1 Background

Seventy four percent (74%) of the Ugandan workforce was engaged in the agricultural sector (2005/6) in Uganda, but their productivity accounted for only 15.6% of GDP (2007/8) with an extremely low growth rate of 0.7% per year. 8.4 million citizens (31.1% of the national population) were estimated to live below the poverty line¹ (2005/2006). In response, the Ugandan government formulated the Plan for Modernization of Agriculture or PMA (2000) based on the Poverty Eradication Action Plan, or PEAP (2004/5-2007/8), which established the key industry of agriculture as an important sector for the reduction of poverty by way of encouraging growth in agriculture and rural development. Further, rice in Uganda is valued as an important cash crop and the consumption and production of rice has rapidly grown: in 2007 total domestic production stood at 162,000 tons, or about doubled the volume in 10 years since 1997. The major factor of this increase in production volume is the increase of the planted area for rice, while yield per unit area has stalled at about 1.5 tons/ha. Furthermore, rice production growth has been unable to keep up with the growth in demand. The deficit has been made up with a reliance on imports. On the other hand, the NaCRRI facility – a base for experimentation, research, and promotion of rice in Uganda – had begun to show wear in its 60 years since construction, and as it was being used also for research and lab work for maize, cassava, and other crops, it was ill-equipped for rice-related research and training. Also, much of the existing research and training equipment was deteriorating or broken down, and farm machinery such as tractors were not receiving sufficient repair or inspection. Furthermore, there was nothing in the way of lodging for visiting or long-term researchers nor experimental fields for cultivar selection experiments or seed multiplication.

¹ The 2005/2006 poverty line varied based on the region, ranging from a PPP (purchasing power parity) of USD \$0.94 to \$1.07 per person per day. (Source: The Uganda Poverty Assessment Report 2016, World Bank Group)

This is the context in which JICA – having identified rice promotion as the core element of Japanese collaboration – dispatched individual specialists (in NERICA rice adoption techniques) to NaCRRI from June of 2004 to work on establishing technical foundations, training, and dissemination. However, as there was a deficiency in human resource development, the framework for extension, and facilities for rice-related research and extension in Uganda, the Ugandan government requested for the commencement of this project and the technical cooperation project known as the “NERICA² Rice Promotion Project,” with the aim of improving production and productivity of NERICA rice by way of strengthening NaCRRI’s NERICA rice research capabilities, training researchers, developing human resources for local dissemination, and establishing a framework for extension.

1.2 Project Outline

The objective of this project is to improve quality of planning, research, training, dissemination, and evaluation necessary for promoting rice production by providing rice research and training centre facilities and related equipment at NaCRRI, thereby contributing to the rice promotion in Uganda.

<Grant Aid Project>

E/N Grant Limit or G/A Grant Amount / Actual Grant Amount	651 million yen / 578 million yen
Exchange of Notes Date (/Grant Agreement Date)	March 2009 / March 2009
Executing Agency	National Agricultural Research Organization: NARO
Project Completion	November 2010
Main Contractor(s)	The Zenitaka Corporation
Main Consultant(s)	NTC International Co. Ltd.
Basic Design	July 2008 – February 2009
Related Projects	<p><JICA Technical Cooperation Project></p> <ul style="list-style-type: none"> - Sustainable Irrigated Agriculture Development Project in Eastern Uganda (2008-2011) - NERICA Rice Promotion Project in Uganda (2008-2011) - Promotion of Rice Development Project (2011-2018) (includes extension period)

² NERICA (New Rice for Africa) rice is general term of rice cultivars developed in 1994 by interbreeding high yield Asian rice varieties with disease- and weed-resistant African rice varieties. There are wet- and dry-growing varieties, enabling NERICA rice to be grown on both uplands and paddy fields.

	<Another Donor’s Support> - World Bank: 1) Agriculture Cluster Development Project (2015-2022), 2) Agricultural Technology and Agribusiness Advisory Services Project (ATAAS) (2010-2017) - Netherlands: Integrated Seed Sector Development (2012-2016)
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2. Outline of the Evaluation Study

2.1 External Evaluator

Isao Dojun, Chuo Kaihatsu Corporation

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: September 2016 – January 2018

Duration of the Field Study: January 15, 2017 – March 3, 2017, and May 1, 2017 – May 14, 2017

3. Results of the Evaluation (Overall Rating: B³)

3.1 Relevance (Rating: ③⁴)

3.1.1 Consistency with the Development Plan of Uganda

At the time of project planning, PEAP (1997-2007), a national development plan, had identified the key industry of agriculture as an important sector for poverty reduction. In addition, PMA (formulated in 2000) identified rice cultivation as an effective means of improving the incomes of poor farmers, raising their standard of living, and realizing food security at the farmer level. In addition, the UNRDS⁵ of 2009 (2008-2018) had set a goal of about tripling rice production between the period of 2009/2010 to 2017/2018.

At the time of the ex-post evaluation, rice was included among 12 prioritized commodities for investment in the agricultural portion of the Second National Development Plan (2015/2016-2019/2020). Focus topics included, among others, 1) Strengthening agricultural research, 2) Implementation of a “single spine” agricultural extension system⁶, and 3) Technological adoption at the farmer level. In addition, there was a recognition of the necessity for improving the agricultural extension system and strengthening agricultural research. The Agricultural Sector Strategic Plan (2015/2016-2019/2020) continuously places

³ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁴ ③: High, ②: Fair, ①: Low

⁵ Uganda National Rice Development Strategy

⁶ Until the reformation of the National Agricultural Advisory Services (NAADS), extension services by NAADS employees and extension services by agricultural employees of the Ministry of Agriculture operated independently. As only the Ministry-led service remained after the reformation of NAADS, it became known as the Single Spine Agricultural Extension System.

rice as one of 12 priority commodities⁷, with plans for rice research, promotion, pest management, post-harvest processing, marketing etc. In addition, the fourth item⁸ in the investment strategy section of the Agricultural Sector Strategic Plan discusses improvement of agricultural productivity and increase of agricultural production, and improvement of services of the Ministry of Agriculture Animal Industry & Fisheries and related institutions by way of strengthening their organizational capacity. Further, the National Agricultural Extension Policy of 2016 established a goal of developing organizational capacity for effectively providing agricultural extension services, and developing sustainable mechanisms in order for packaging and disseminating appropriate technologies. The Rice Research and Training Centre established at NaCRRI acts as the primary institution for rice cultivation promotion (rice cultivation research activities and rice cultivation technical training). In this way, the Project has a high level of consistency with national development policy and agricultural policy both from the time of the project planning and at the time of ex-post evaluation.

3.1.2 Consistency with the Development Needs of Uganda

JICA began development of rice cultivation researchers in Uganda with the dispatch of individual JICA expert starting in 2004. Until that point there were almost no researchers doing work on rice researches in Uganda and there were almost no agricultural officers who have knowledge about rice cultivation techniques. At the time of planning of the Project, demand for rice in Uganda was on the rise, and there was a need for strengthening both rice cultivation research capability and extension capability. The vice president of the country at that time was aware of the higher productivity of NERICA rice, and aggressively promoted rice cultivation as a part of the poverty reduction campaign.

As of the ex-post evaluation, the Second National Development Plan (2015/2016 - 2019/2020) has set a target of 680,000 tons in rice production by 2020 (as of 2014 the production was 237,000 tons). Meeting this target requires ongoing development of appropriate rice cultivation techniques, multiplication of high-quality seeds, extension of techniques to farmers, improvement of post-harvest processing, etc. There is thus a need to further strengthen the research and extension capabilities of NaCRRI, which acts as the central institution for the research and extension of rice cultivation. In this manner, at the time of planning as well as for the ex-post evaluation, the Project has high consistency with Uganda's development needs.

⁷ Bananas, legumes, maize, rice, cassava, tea, coffee, fruit, vegetables, dairy, fish, livestock

⁸ 1) Improvement of agricultural productivity and increase of agricultural production, 2) Improvement of access to important agricultural inputs, 3) Improvement of the agricultural market and added value, 4) Improvement of services offered by the Ministry of Agriculture, Animal Industry and Fisheries and other institutions by way of improvement of their organizational capacities.

3.1.3 Consistency with Japan's ODA Policy

At the time of planning, agricultural development was identified as a priority area in Japanese aid policy according to the country-wide data book for Uganda (2007). Rice promotion, animal husbandry promotion, and strengthening and promotion of local industry were all raised as possible cooperative areas in the agricultural development; rice promotion was identified an important area as the nucleus of Japanese cooperation.

This project has been highly relevant to the country's development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The major facilities established by the Project include blocks for research and administrative affairs, training block, a canteen/kitchen, a dormitory for researchers, a screenhouse⁹, a warehouse for agricultural machinery, a drying yard¹⁰, a workshop¹¹, and irrigation facilities for experimental fields. Major equipment furnished includes research equipment, equipment for the experimental fields, post-harvest processing equipment for demonstration, and workshop equipment.

While there is some variation in the floor space of some of the facilities and irrigation/drainage canals used for the experimental fields, changes from the original plan were small. We consider the continued use of the provisional drainage canal, which was used during construction period for improving drainage condition, to be reasonable. As for the equipment, a compressor, a gantry crane,¹² and workbenches have been added, but these are not significant changes in a quantitative or financial sense. The specific facilities and equipment are as outlined in Table 1.

Table 1 Comparison of Planned and Actual Output (Facility)

Facility Type	Plan (see Note 1)	Actual
Contributions by Japanese side		
Administrative block	Laboratory, administrative affairs office, equipment storage room, workroom, pass ways etc. (total floor area 700m ²)	As planned
Training block	Lecture rooms (2 rooms for up to 90 persons, total floor area 424m ²)	As planned
Canteen and kitchen block	Canteen, kitchen, and storage (total floor area 216m ²)	As planned
Dormitory for researchers	6 rooms accommodating 12 individuals, 1 common space. (total floor area 252m ²)	Alteration: area increase (336m ²)

⁹ A construction made with netting that prevents penetration by insects and other pests into facilities being used for botanical and cultivation experiments.

¹⁰ A facility with a concrete floor for the sun-drying of harvested rice

¹¹ A workroom for the repair and maintenance of equipment

¹² A portal crane with an element capable of moving above the rail, used to lift machinery and others

Screenhouse with glass roofing	For cultivation experiments of rice varieties and installation of lysimeters ¹³ (total floor area 600m ²)	As planned
Warehouse for agricultural machinery	For storing agricultural machinery and research workspace for threshers etc. (total floor area 270m ²)	As planned
Drying Yard	For drying unhulled rice (total floor area 450m ²)	As planned
Workshop, demo rice mill	Place for equipment and repair work, automotive repair. (total area 348m ²), installation of rice huller/miller, and training activity space (total floor area 200m ²), 548 m ² altogether	Alteration: total floor area decrease (498m ²)
Public Toilet	For researchers and trainees	As planned
Generator Room	Furnished with generator for power outages	As planned
Septic tank and infiltration wells	Facility for processing waste and sewage water	As planned
Irrigation Facility	Experimental fields (2ha)	As planned
	Main irrigation canal (650m)	Nearly as planned (648m)
	Secondary irrigation canal (700m)	Alteration: length decrease (580m)
	Drainage canal (320m)	Alteration: length increase (939m) (breakdown: main drainage canal (619m) secondary drainage canal (320m))
	Farm road (1,200m)	Nearly as planned (1,189m)
Contributions by Ugandan side		
	NaCRRI land needed for construction of new facilities	As planned
	Securing land for facilities and equipment for the Project, and demolition/clearing of existing buildings and subsequent soil preparation when necessary	As planned
	Assurance to diverge existing power lines/water supply necessary for constructing new facilities	As planned
	Legal procedures relating to environmental impact assessment	As planned
	Procurement of furniture, fixtures, appliances, and consumables not included in the scope of the Project	As planned
	Preventative measures against accidents and theft during construction	As planned

Source: Basic Design Study Report, materials provided by JICA, and interviews with individuals involved in the Project.

Note 1: items in parentheses refer to facility scale.

Table 2 Comparison of Planned and Actual Output (Equipment)

Use Location/ Purpose	Plan (see note 1)	Actual
Research/administrative block	Generator (1) and solar battery system (1)	As planned
Research equipment	Meteorological observation equipment (2) and lysimeters (8)	As planned
Equipment for experimental fields	Tractor (2), disc plow (2), bottom plow (2), seeder 1 (1), seeder 2 (1), pesticide sprayer (1), cultivator (1), and trailer (Traction type) (2)	As planned
Post-harvest	Rice huller/miller (1)	As planned

¹³ A vat placed in the soil made of metal and concrete used to measure the amount of water movement in the soil and evapotranspiration.

processing equipment for demonstration		
Workshop equipment	Arc welding machine (1), gas welding machine (1), upright drill press (1), high-speed cutter (1), bench grinder (1), pipe threading machine (1), electric tools (1 set), high pressure cleaning machine (1), hydraulic jack (3), other assorted tools (1 set)	Mostly as planned. One compressor, one gantry crane, and 2 workbenches were added.

Source: Basic Design Study Report and materials provided by JICA

Note 1: items in parentheses refer to quantity

3.2.2 Project Inputs

3.2.2.1 Project Cost

The Project was budgeted at 651 million yen on the Japanese side and 7 million yen on the Ugandan side for a total budget of 658 million yen at the time of planning. However, as we have been unable to obtain actual figures from the Ugandan side, we are only able to make final comparisons with the Japanese actual costs only. Costs on the Japanese side came to 578 million yen, or lower than planned at 89% of the initial estimate. The reason for this disparity was due to a reduction in the exchange rate (strengthening yen) and price reductions as a result of the bidding process.

3.2.2.2 Project Period

The Project was expected to last for about 19 months in total from March 2009 to June 2010 at the time of planning, but in reality, it ran for 21 months from March 23, 2009 to November 30, 2010 (completion ceremony), exceeded the plan (111% of planned duration). The main reasons for the extended duration were the longer than expected time from the signing of E/N to the signing of the consultant contract (2 months compared to the estimated 0.5 months), and the extension of the construction period by one month (13 months actual vs. 12 months planned).

As is shown above, although the project cost was within the plan, the project period exceeded the plan. Therefore, efficiency of the project is fair.

3.3 Effectiveness¹⁴ (Rating: ②)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

“Trainees numbers at the Rice Research and Training Centre” in 3.3.1.1 shows the quantitative result indicator decided at the time of project planning. 3.3.1.2 and 3.3.1.3 show the increase in rice cultivation researchers and research reports as a result of the establishment of the Rice Research and Training Centre and provision of equipment, which show provided as a supplementary index.

¹⁴ Sub-rating for Effectiveness is to be put with consideration of Impact.

3.3.1.1 Rice Cultivation Trainee Numbers at the Rice Research and Training Centre

Table 3 shows the actual numbers of trainees from 2009 to 2016. Further, trainee numbers from farmer-oriented training that was carried out apart from the Rice Research and Training Centre (mainly in rural communities) have been included as a supplementary index.

Table 3: Rice Research and Training Centre Trainee Figures

Units: person

Entry	Baseline	Target	Actual					
	2008 Planned Year	2012 2 Years After Comple- tion	2009-2011 (the Project Completed in 2010)	2012 2 Years After Comple- tion	2013 3 Years After Comple- tion	2014 4 Years After Comple- tion	2015 5 Years After Comple- tion	2016 6 Years After Comple- tion
Indicator 1: Total trainees at the Rice Research and Training Centre	Yearly total of 1,300	Yearly total of 2,600	4,810 in 3 years (yearly average of 1,603) (see Note 1)	321	229	290	228	244
*Breakdown								
(1) Government engineers	50	980	21	11	10	10	9	7
1) Rice researchers (ZARDI) (see Note 2)				202	102	112	39	48
2) Extension officers, etc.	1,190	1,460	1) 4,506 (9/2008-3/2011) 2) 283 (12/2008-2/2011)	20	20	48	32	25
(2) Farmers/NGO				3	22	38	72	72
(3) Foreign researchers etc.	60	160		85	75	82	76	92
(4) JOCV members (see Note 3)	---							
Target of Index 1 (2,600 persons/ year)	---	---	62%	12%	9%	11%	9%	9%
(supplementary indicator 1) Farmers who received rice cultivation training at locations other than the Rice Research and Training Centre (training took place at farming communities etc.)	---	---	1) 9,749 (9/2008-3/2011) 2) 780 (3/2009-4/2011)	3,570	9,505	10,556	10,964	8,870
(supplementary indicator 2) Farmers who received training away from the Centre and indicator 1 (Centre trainees): Total	---	---	15,339 over three years (yearly average of 5,113)	3,891	9,734	10,846	11,192	9,114
Yearly target attainment (2,600 persons/year)	---	---	197%	150%	374%	417%	430%	350%

Source: NERICA Rice Promotion Project Terminal Evaluation Report, Sustainable Irrigated Agriculture Development Project in Eastern Uganda Terminal Evaluation Report, data provided by the Promotion of Rice Development Project

Note 1: Training results from 2009-2011 (3 years) are drawn from 1) the technical cooperation project “NERICA Rice Promotion Project”, and 2) the technical cooperation project “Sustainable Irrigated Agriculture Development Project in Eastern Uganda”. The figures for 1) are from September 2008 to March 2011 (2 years and 6 months), and for 2) are from March 2009 to April 2011 (2 years and 1 month). In other words, these results are not from the period of January 2009 to December 2011. As the monthly breakdowns are unknown, average values are displayed.

Note 2: Zonal Agricultural Research and Development Institute (hereinafter referred to as “ZARDI”).

Note 3: Generally, for technical cooperation projects, participation from the Japan Overseas Cooperation Volunteers (hereinafter referred to as “JOCV members”) is not included in the effect target, but it has been included as an indicator as a means of judging effectiveness and impact as this project is a special case.

Looking at the project target year of 2012, there were a total of 321 trainees at the Centre, or about 12% of the target (in total 2,600 trainees per year) – well below target. In the 4 years ranging from 2013 to 2016, the figure was around 10% (from about 220/year to about 320/year), again failing to reach the target. Indicator 1 was established based on the training plans of two technical cooperation projects: the NERICA Rice Promotion Project and the Sustainable Irrigated Agriculture Development Project in Eastern Uganda (based on the plans prepared in 2008 at the time of this project’s planning). From 2009 to 2011 (including a portion of the training results from 2008), the average number of trainees per year was 1,603, or about 62% of the target. The level of achievement during this period was so much higher compared to 2012 onward due to the large number of farmer trainees at the Rice Research and Training Centre (however, in spite of the fact that the indicator was defined based on the training plan of the two aforementioned technical cooperation projects, targets were not reached). From 2012 onward, as most of the farmer-oriented training took place in rural areas where farmers live, there was a decrease in the number of farmer trainees at the Centre. The target was for 1,460 trainees per year made up of farmers and persons involved with NGOs at the Centre, but from 2012 onwards the number of trainees was from about 20 to 50 persons per year.

The 2,600 target figures for rice cultivation trainees was calculated in accordance with the training plans of two technical cooperation projects;¹⁵ over half of trainees were expected to be farmers. However, it is thought that this target became difficult to reach, because the policy of the technical cooperation project “Promotion of Rice Development Project” contained a decision that most farmer-oriented training would be held locally from 2012 onwards.¹⁶

While the number of trainees at the Centre did not meet target, the degree of achievement with the trainees in rural communities included shows that from 2012 to 2016, the figures range from about 1.5 to about 4.3 times the target (2,600 persons per year).

As shown above, by shifting location for farmers’ training from the Rice Research and Training Centre to rural communities’ due to the policy change in farmer-oriented training location enacted by the technical cooperation project “Promotion for Rice Development Project”, the target figures for the Project (as an operational indicator) became difficult to achieve. As a result, while a steady number (about 200 to 300 persons per year) of trainees

¹⁵ There is one technical cooperation project ongoing since 2012.

¹⁶ The Promotion of Rice Development Project, which began in 2011, plans to conduct training with 40,000 farmers over the course of 5 years. Based on interviews with NaCRRI, training with farmers has shifted from taking place at the Centre to taking place locally.

continued to study at the Centre according to the available reliable data,¹⁷ due to the large disparity with the initial target, the level of achievement is judged to be low.

3.3.1.2 NaCRRI Rice Cultivation Researcher Numbers

As shown in Table 4, the total number of rice cultivation researchers at NaCRRI (researchers, technicians,¹⁸ and related staff) gradually increased from 8 individuals in 2011 to 18 at the time of the ex-post evaluation in 2016: two times or more increase.

Table 4 NaCRRI Rice Cultivation Researcher Figures

Units: person

Year	Before / During /After Project Completion							
	1 Year Before Completion	Year of the Project Completion	1 Year After Completion	2 Years After Completion	3 Years After Completion	4 Years After Completion	5 Years After Completion	6 Years After Completion
	2009	2010	2011	2012	2013	2014	2015	2016
Total Number of Rice Cultivation Research Personnel	8	8	8	14	14	14	18	18
<Breakdown> Researchers	2	2	2	3	3	3	5	5
Technicians	2	2	2	4	4	4	6	6
Other staff	4	4	4	7	7	7	7	7

Source: Answer to questionnaire by NaCRRI

3.3.1.3 Number of Rice Research Reports

Over the project duration there were roughly 4-5 rice-related research reports and papers etc. produced yearly, but since project completion, the number is roughly 5-6 per year (see Table 5).

Table 5 NaCRRI Rice-Related Research Report and Paper Figures

Year	Before / During /After Project Completion							
	1 Year Before Completion	Year of the Project Completion	1 Year After Completion	2 Years After Completion	3 Years After Completion	4 Years After Completion	5 Years After Completion	6 Years After Completion
	2009	2010	2011	2012	2013	2014	2015	2016
Number of research reports	2	2	2	2	2	2	2	2
Number of papers	2	2	3	3	4	4	4	3
Total	4	4	5	5	6	6	6	5

Source: Answer to questionnaire by NaCRRI

Further, based on the results of the questionnaire provided to NaCRRI, among the reports and papers etc. prepared after project completion, 13 papers have appeared in peer-reviewed international journals and 9 presentations have been made at peer-reviewed

¹⁷ Aside from this, the lecture rooms are also being used for rice related or non-rice crop-related training sessions and seminars as well as conferences, but there is no reliable data.

¹⁸ Research staff who conducts research activities at the direction of researchers.

academic conferences (international as well as domestic). In consideration of such achievements about publications of the peer-reviewed international journals, the quality of the research papers appears to have been preserved. The level of achievement in research results is therefore deemed to be high.

3.3.1.4 Use of Provided Facilities

While no data was recorded of utilization or operating rates of the facilities the Project provided, Table 6 presents usage situations of the major facilities based on hearings from a Farm Manager at NaCRRI.

Table 6 Facility Usage Situations

	Facility	Usage Conditions, etc.
1	Administrative Block	- Originally it was planned for around 20 staff to use this space. However, at the time of the ex-post evaluation, around 40 individuals - twice the number - were using it. The rate of use is therefore high, but there is now a need for more space. A major reason for this is that the administrative affairs block is now being used both by researchers and staff working on rice and those working on maize.
2	Training Block	- There are two lecture rooms, and one can accommodate 100 persons at the most. They can be used for a variety of training activities, meetings and seminars. Based on interviews with JICA experts, in months with a lot of training planned, they are in almost constant operation. The lecture rooms are used frequently not just for the JICA technical cooperation project's training activities, but also other crop-related training activities and meetings.
3	Canteen and Kitchen Block	- The Canteen generally has around 70 seats arranged inside, and can hold a maximum of about 100 persons. There are no other dining facilities at NaCRRI; it is used by both lecture attendees as well as NaCRRI staff with about 50 persons using it per day at usual time. When seminars or training activities are being held, lunch is offered to training participants. The use rate of the canteen is high.
4	Dormitory for Researchers	- On top of rice lecture attendees and researchers, the dormitory is also used by researchers and others from other crop research programs. Domestic college students (who come here for long-term stays as interns) and researchers from ZARDI etc. (for long-term OJT ¹⁹ before Training in Japan) also use it; the rate of use is constant. However, because the maximum accommodation is low at 12 individuals, people participating in the regular training course (at the scale of around 30 trainees) are unable to use it. Based

¹⁹ OJT: On-the-Job Training

		on an interview with the director of NaCRRI, a dormitory able to accommodate 30-40 persons would have been more appropriate on training expense reduction.
5	Screenhouse with Glass Roofing	- Based on interviews with researchers at NaCRRI, the screenhouse is very helpful for rice cultivation research activities and is used year-round.
6	Warehouse for Agricultural Machinery	- No particular problems. It is being effectively used as a place to store agricultural machinery.
7	Drying Yard	- The drying yard is being effectively used to dry rice seeds.
8	Workshop	- The workshop building and equipment are in good working condition and are frequently used to perform maintenance on the machinery. The rice mill is equipped with a seed sorter. At the time of rice seed harvest, it is used to sort and bag the rice seeds distributed to farmers attending the trainings.
9	Demo Rice Mill	
10	Common Toilet	- Outdoor toilet for trainees and others. In useable good condition.
11	Generator Room	- Generator is in good condition, and is used during power outages.
12	Septic Tank and Infiltration Wells	- Good condition.
13	Irrigation Facilities (on the experimental fields)	- Based on interviews with NaCRRI researchers, in Uganda, rice cultivation is possible year-round with enough water for irrigation. In order to show lecture attendees different stages of the rice-growing stages, rice is planted at different intervals throughout the year. The irrigation facilities are also used year-round for rice cultivation research.

Source: Most of information was obtained from the Farm Manager of NaCRRI and a part of information was obtained from other persons concerned. Information of the results of site observation conducted by the external evaluator is also included.

As Table 6 shows, the administrative affairs block with its offices for researchers and laboratories, the training block, the canteen, the screenhouse with glass roofing, the workshop, and the irrigation facilities are all noted as facilities with a lot of users concerned and a high degree of use. Generally speaking, the facility usage rate is thus considered high.

3.3.1.5 Usage Rate of Provided Equipment

Based on interviews with Farm Manager at NaCRRI, no numerical data is kept at NaCRRI on utilization or operating rates of the equipment provided by the Project. However, going by the field inspection conducted at the time of the ex-post evaluation and the above interviews, almost all of the provided equipment is in operatable condition and used for research activities, field works, and maintenance of machinery. The utilization rate is therefore judged to be high.

3.3.2 Qualitative Effects (Other Effects)

The qualitative effects²⁰ expected at the time of project planning were “Smooth Implementation of Training Courses,” “Improvement of Training Effectiveness Via Practical Training with Equipment,” “Proper Equipment Maintenance and Reductions in Maintenance Costs,” “Reception of Researchers and Reduction of Researcher-Related Economic Burdens Via the Construction of Dormitory Building,” “Implementation of Continuous Year-Round Rice Cultivation Experiments and Improvement of Effectiveness of Researches and Trainings.” These qualitative effects were evaluated as follows, based on interviews with NaCRRI staff and trainees²¹ at the Rice Research and Training Centre. At the time of the ex-post evaluation, the effects had largely been realized.

3.3.2.1 Continued Implementation of Training

- At NaCRRI, it became possible to plant different rice varieties at different seeding times so that lecture attendees could learn about the rice growing stages and the differences in growth of different rice types. There has also been practical training in rice planting and others. Agricultural officers and farmers who knew very little about rice cultivation were able to acquire rice-related knowledge and techniques because of the practical training activities.
- It became possible to cultivate and conduct research on rice year-round due to the creation of rice cultivation experimental fields with irrigation facilities. With the existence of the irrigation facility, rice seeds multiplication stabilized, and rice seeds could be produced for distribution to trainees.
- Post-harvest processing equipment like the rice milling machine is useful during practical training sessions of rice cultivation trainings.
- The Centre functions as a base for domestic rice cultivation research. As a variety of topics relating to rice cultivation can be learned at the Centre in one place, it operates as a “one-stop centre” for rice research and training.

3.3.2.2 Improvement of the Research Environment, Facility Usefulness and Functionality

- Until the construction of the Centre, NaCRRI did not have large lecture room or a canteen. When training events were held, outside training facilities were rented, and lunches were catered. With provision of the lecture rooms and the canteen, NaCRRI and training sponsors

²⁰ Direct effects of the Project which are described in the Basic Design Study Report

²¹ 11 NaCRRI staff, 11 JICA employed staff, 10 ZARDI staff, 44 agricultural officers, 19 farmers, and 7 members of JOCV, for a total of 102 persons. NaCRRI staff and JICA employed staff members who were involved in rice research and training and available for interviews at NaCRRI at the time of the ex-post evaluation were selected. As for the ZARDI staff, visits were made to the regional agricultural offices of the Eastern, Northern, Western, and Central regions during the ex-post evaluations of the Sustainable Irrigated Agriculture Development Project in Eastern Uganda and the NERICA Rice Promotion Project, with interviews conducted at the 4 ZARDI locations along that route. Interviews were carried out to agricultural officers at agricultural offices in districts selected as targets of the beneficiary survey for the ex-post evaluation surveys of the above-mentioned projects. JOCV members were selected from among those who were able to give interviews and who attended trainings at the Rice Research and Training Centre. Farmers, as the counterpart to the JOCV members, were selected from among those who took lectures on rice cultivation at the Centre.

(donor institutions) no longer had to burden the cost of outside training facilities nor deal with the work of procuring lunch, which led to cost reductions and improvement in convenience.

- With provision of research equipment and experimental fields, the types of rice cultivation research expanded, rice seed multiplication capabilities were enhanced, and it became possible to conduct year-round rice cultivation experiments and demonstration of rice growing stages.
- As a result of the equipment provided, research and training can continue uninterrupted during power outages (by using the generator), weather data can be utilized (by using the weather observation equipment), and research on post-harvest processing can be conducted (by using the post-harvest equipment).
- Before commencement of the Project it was necessary to travel outside the country in order to enhance rice cultivation research capability, but with the establishment of the Rice Research and Training Centre, it is now possible to strengthen one's research skills on rice domestically.

3.4 Impacts

3.4.1 Intended Impacts

The main impact (overall goal) of the Project was to “contribute to the promotion of rice in Uganda,” and at the time of project planning the following items were expected as impact.

- (1) A dormitory facility will enable researchers to visit from afar, or reduce their financial burden.
- (2) The quality of planning, research, dissemination, monitoring, evaluations etc. will be improved.
- (3) Through the increase of rice production, farmer incomes will increase, leading to a higher standard of living.
- (4) By facilitating use of the Centre by rice-related international institutions, donors, NGO meetings, and seminars, rice promotion can be advanced throughout Uganda.
- (5) Use of the Rice Research and Training Centre for learning agriculture by the agricultural schools throughout Uganda.

The realization of the impact of these items is as follows.

3.4.1.1 On the Reception of Researchers and their Financial Burden

The Rice Research and Training Centre dormitory accepts researchers doing work related to rice cultivation, college interns, OJT trainees who is going to be trained in Japan etc. As the dormitory is on the Centre grounds, it is very convenient. Based on an interview with the NaCRRI Farm Manager, institutions conducting training activities save money on lodging and commuting fees via this setup compared to using outside facilities other than NaCRRI.

3.4.1.2 On Quality Improvement in Planning, Research, Dissemination, Monitoring, and Evaluation

Based on interviews with NaCRRRI rice cultivation researchers, the number of reports etc. documenting rice cultivation research results is increasing due to provision of facilities and equipment under the Project. It is judged that this is an indication of increased research quality. The rice experimental fields, demonstration fields, and agricultural machinery have enabled hands-on training, which has improved the quality of training.

3.4.1.3 Regarding the Increase of Farmer Income and Improvement of Living Standards

Agricultural officers and ZARDI staff who attended rice cultivation lectures at the Rice Research and Training Centre have conducted farmer-oriented training activities. As the farmers who received the training began to properly utilize rice cultivation techniques, rice productivity increased. According to the results of an ex-post evaluation survey on the Sustainable Irrigated Agriculture Development Project in Eastern Uganda (2008-2011) which compared the rice productions of farmers who had and who had not received training in irrigated rice cultivation techniques,²² at a farmer who received training, rice production in one cropping season was 0.98 tons before receiving training and 1.83 tons after training, it is roughly double the production. While an increase of land devoted to rice cultivation was partially responsible for the production increase, the unit yield increase is major factor, in particular, an average of 2.6 tons/ha in yield for farmers who had received training versus an average of 1.9 tons/ha for those who had not. Improvement in the unit yield is contributing rice production increase. Based on the results of beneficiary surveys of farmers who received training with the NERICA Rice Promotion Project and the Sustainable Irrigated Agriculture Development Project in Eastern Uganda, the average percentage of income from rice sales within total income of farmer's household was about 73% for farmers doing irrigated rice cultivation and about 51% for farmers growing upland rice. Thus, rice production increase and starting rice cultivation newly are linked to enhancement of farmer income and livelihood.

3.4.1.4 Regarding the Contributions of International Institutions Involved with Rice Cultivation

Among the rice cultivation training programs held at the Rice Research and Training Centre, there were training program aimed at refugees (refugees from neighboring countries such as South Sudan) in collaboration with the United Nations High Commissioner for Refugees (UNHCR). Based on interviews with Japanese experts, these trainings were attended by both refugees and farmers of the host community (the training was held four times in 2015 as

²² 11 districts out of 22 in the Eastern Region were selected to interview farmers doing irrigated rice cultivation in areas where pilot project sites were set up. 175 farmers were interviewed in total. Among these, 135 (or 77%) had received training of the Project and whereas 40 (23%) had not. 125 interviewees were male (71%) and 50 were female (29%). The districts surveyed were 11 districts, i.e. Budaka, Butaleja, Iganga, Kumi, Manafwa, Mayuge, Mbale, Namutumba, Pallisa, Sironko, and Tororo.

part of the Promotion of Rice Development Project's training activities, with a total of 72 participants made up of agricultural officers, refugees, and host community farmers). This sort of format contributes to rice promotion at a nationwide scale in Uganda.

3.4.1.5 Use of the Rice Research and Training Centre for Learning Agriculture at Domestic Schools

According to interviews with NaCRRRI rice cultivation researchers, college students can get engaged with research at the Centre temporarily as interns and write papers. In this way, the Centre has contributed to student rice cultivation research.

3.4.2 Other Positive and Negative Impacts

The following items have been identified as impacts on research, dissemination, and rice production increase. They are based on results of a beneficiary survey for the Project, specifically, targeting users of the Rice Research and Training Centre.²³

- Rice research specialization has increased in terms of the growth of rice cultivation research personnel who have used the Centre facilities and equipment.
- As a result of rice cultivation technical training and the distribution of high quality rice variety seeds (NERICA 4, WITA 9, etc.), at the farmer level, rice yield and rice cultivation area have increased. As a result, the farmers' interest in rice cultivation has increased yet further.
- Accompanying increases in rice production, the number of rice millers has also increased, which is tied to job creation. Specifically, following results of interviews with 17 millers in 17 different districts, roughly half of them (9 millers) commenced operation since 2012 (after the completion of this project). In recent years (the last 5 years), 16 rice millers noted that the number of rice millers in neighboring areas had increased (90% or more). Table 7 shows data related to the increase of rice millers.

²³ The targets of the beneficiary survey included main researchers and technicians involved with rice cultivation research at NaCRRRI as well as the NaCRRRI director, researchers and technicians involved in rice cultivation research at ZARDIs (at 4 locations along the route used for regional agricultural office visits), JICA employed researchers and technicians, agricultural officers (interview survey done at the district agricultural offices in 24 districts), farmers who took training lectures at NaCRRRI jointly with JOCV members (19 individuals), JOCV members engaged in rice cultivation extension (7 individuals), for a total of 102 individuals. They were interviewed about the effectiveness of the Rice Research and Training Centre's research facilities and equipment.

Table 7 Results of Interview Survey on Changes in the Number of Rice Millers

	District	Miller Location	Opening Year	Number of Neighboring Millers	Recent Change in Miller Number
1	Mayuge	Town Council	2012	3	Increase
2	Iganga	Town Council	2012	3	Increase
3	Butaleja	Town Council	2010	8	Increase from 2 to 8 in past 5 years
4	Budaka	Kamonkoli S/C (note)	2014	6	Increase from 2 to 6 in past 3 years
5	Tororo	Western Division S/C	2007	5	Increase from 2 to 5 in past 5 years
6	Mbale	Mbale town	2012	15	Increase from 11 to 15 in past 5 years
7	Manafwa	N/A	N/A	0	None (based on information from the district agricultural office)
8	Sironko	Town Council	2014	1	Increase (only one in this district)
9	Kumi	Town Council	2008	7	Increase from 5 to 7 in 2016
10	Kole	Ayer S/C	2014	1	Increase
11	Dokolo	Town Council	2016	1	Increase
12	Amuru	Pabbo S/C	2015	5 or 6	Increase
13	Kakumiro	Bugangaizi West S/C	2010	4	Increase from 2 to 4 in past 3 years
14	Hoima	Hoima town	2004	25	Increase from 10 to 25 since 2004
15	Masindi	Pakanyi S/C	2014	3	Increase (first was established in 1990)
16	Nakasongola	N/A	N/A	0	None (based on information from the district agricultural office)
17	Luwero	Zirobwe S/C	2005	4	Increase (additional increase of 1 in 2017)
18	Wakiso	(data not collected)	(same as left column)	2	Decrease (based on information from the district agricultural office)
19	Mukono	Nakisunga S/C	2008	6	Increase
20	Nakaseke	Semuto Town Council	2007	3	Unknown (2 in operation)

Source: Results from interviews conducted at rice millers at the time of the ex-post evaluation. For some, interview results with district agricultural offices are included.

Note: S/C: Sub-county

- Some of the JOCV members²⁴ attended rice cultivation training sessions at the Centre and engaged in rice cultivation extension. Farmers who learned rice cultivation techniques from JOCV members held their

²⁴ JOCV members involved in rice cultivation and community development.

technical transfer activities in high esteem (based on interviews with agricultural officers at district agricultural offices as well as farmers who received guidance from JOCV members).

This project has achieved its objectives to some extent. Therefore, effectiveness and impact of the project are fair.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

3.5.1.1 On the Research/Training System and the Facility Operation/Maintenance System at NaCRRI

There is a total of 18 regular officers working at the Rice Research and Training Centre, composed of 5 researchers, 6 technicians, and 7 support staff members. The number has doubled since the construction of the Centre in 2010, when there was a total of 8 persons working there. According to interviews with NaCRRI researchers, there is a need to recruit and train more young researchers, and there is currently discussion in establishing a new training unit at NaCRRI. As for the facility and equipment operation and maintenance system, there are a number of research programs at NaCRRI; among them is the cereals program which focuses on researching rice and maize. Each of the research programs has a Program Coordinator who reports directly to the director of NaCRRI. While operation of research and training activities at the Rice Research and Training Centre is handled by the cereals program, Centre facilities and equipment is handled by the facility maintenance supervisor, under the title of Farm Manager (belongs the Administration unit). The Farm Manager oversees all of NaCRRI's experimental fields, facilities, and equipment. Each research program has a staff member who acts as a Farm Manager assistant.

Equipment/facility troubleshooting and periodic inspections at the Centre are handled mainly by the plumber, electrician, and mechanic staff stationed at the workshop (4 persons in total).

In this way, the Centre's sustainability on rice research and training implementing system is guaranteed, and there is an appropriate chain of command to manage and maintain the facilities and equipment. Figure 1 depicts the entire NaCRRI organizational structure.

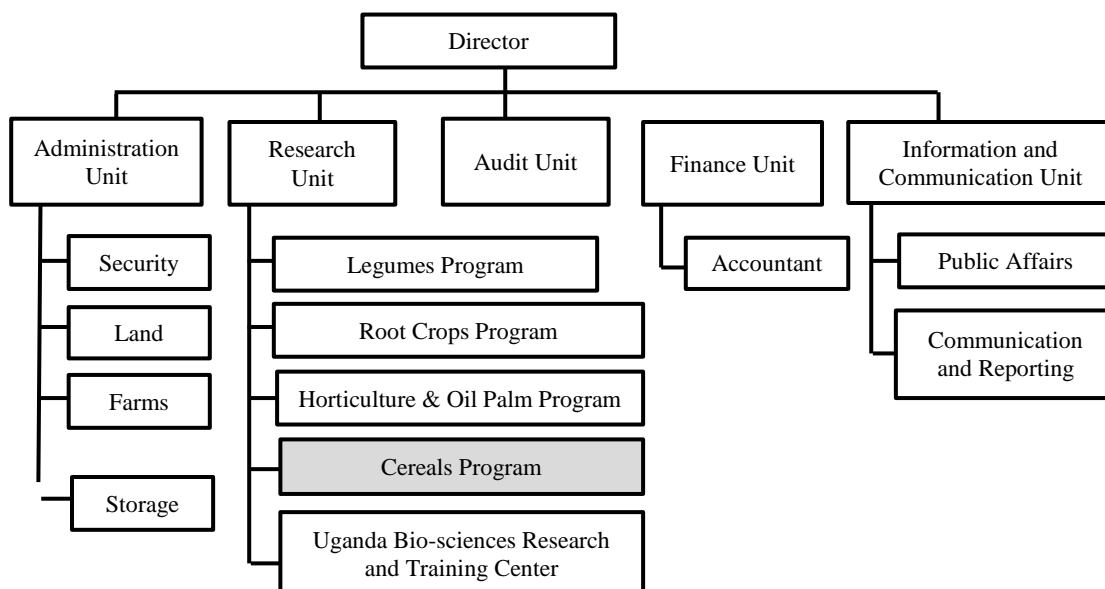


Figure 1 NaCRRI Organizational Chart

3.5.2 Technical Aspects of Operation and Maintenance

There is a monthly and periodical equipment inspection. For the most part, repair and procurement of spare parts for breakdowns is adequately handled. There was no equipment that was inoperable due to an inability to source spare parts. Operation and maintenance manuals are available and utilized. Judging by the fact that most of the equipment is in good operating condition, the technicians in charge of maintenance appear to have the requisite technical skills to carry out their functions.

3.5.3 Financial Aspects of Operation and Maintenance

Table 8 shows revenues and expenditures of the last 3 years at NaCRRI. The NaCRRI income table shows that governmental budgetary assistance has remained roughly constant over the past three years (about 1,200 million Uganda Shillings UGX/year). NaCRRI has also received financial support from a variety of donors, research institutions, foundations, NGOs and the like, making up 90% or more of NaCRRI's total revenue. Over the past three years, NaCRRI's total revenue has increased from 13,160 million UGX to 16,446 million UGX. In other words, outside funding has increased. Until now the World Bank has consistently funded NaCRRI, and at the time of the ex-post evaluation, the Agriculture Cluster Development Project was in operation (2015-2022). As the Project will continue until 2022, it appears that for the time being there will continue to be a steady source of funds. As for the Rice Research and Training Centre's funds, while there has been fluctuation depending on the year, roughly 985 million UGX has been secured for the fiscal year 2016/2017. The maintenance budget for the Centre is increasing, and about 1,437 million UGX has been secured for the fiscal year 2016/2017.

According to interviews with the Farm Manager and researchers at NaCRRI, while the budget for facility and equipment upkeep isn't always abundant, where there is a deficiency, funds from the budgets of other projects and the JICA's on-going technical cooperation project are used to deal with problems. As there have so far not been any major problems with maintenance and it appears that there will continue to be financial support from other donor institutions (NaCRRI received financial support from donor organizations and research institutions etc. even before the implementation of this project, and such financial support is continued to be the major source of revenue), finances to ensure proper operation and maintenance of the Rice Research and Training Centre are considered to be secured mostly.

Table 8 NaCRRI Revenue and Expenditures

(1) NaCRRI Revenue (2 years before Implementation of the Project and Past 3 years)

Unit: Uganda Shilling (UGX)

Revenue		2006/07	2007/08	2014/15	2015/16	2016/17
1	Budget allocation from Ugandan government	1,165,000,000	627,000,000	1,235,049,600	1,262,438,357	1,222,845,303
2	Other donor institutions	3,257,385,792	1,797,039,866	6,284,075,703	8,642,318,116	10,942,445,361
3	Research institutions, universities, etc.	1,396,717,324	1,688,523,286	5,593,860,812	5,354,138,450	4,111,114,379
4	Other	150,000,000	120,000,000	47,368,200	32,500,600	169,982,000
	Total	5,969,103,116	4,232,563,152	13,160,354,315	15,291,395,523	16,446,387,043
	<i>Reference: totals converted to JPY</i>	<i>190,354,698</i>	<i>134,976,439</i>	<i>419,694,666</i>	<i>487,655,346</i>	<i>524,488,988</i>

Source: Data source of past 3 years is NaCRRI finance officer and data source of 2 years before implementation of the Project is the Basic Design Study Report

Note: The Japanese Yen (JPY) conversion utilizes JICA's average rate for the fiscal year 2016 (1UGX = 0.03189JPY)

(2) NaCRRI Expenditures (past 3 years)

Units: Ugandan Shilling (UGX)

Expenditure		2014/15	2015/16	2016/17
1	Staff Salaries	2,478,718,429	2,446,416,819	3,588,115,459
2	Research and Training	6,040,539,835	6,245,106,149	7,582,824,337
3	Operation and Maintenance	4,526,069,401	5,033,959,057	4,223,460,177
4	Equipment Procurement	69,725,000	1,291,559,469	925,000,000
5	Outsourced Research	45,301,650	274,354,029	126,987,070
	Total	13,160,354,315	15,291,395,523	16,446,387,043
	<i>Reference: totals converted to JPY</i>	<i>419,683,699</i>	<i>487,642,603</i>	<i>524,475,283</i>

Source: NaCRRI finance officer

Note: The JPY conversion utilizes JICA's average rate for the fiscal year 2016 (1UGX = 0.03189JPY)

(3) NaCRRI Cereals Program Budget and the Rice Research and Training Centre Maintenance Budget

Unit: Ugandan Shilling (UGX)

Budget		2014/15	2015/16	2016/17
1	Rice Research and Training Budget	916,500,000	746,000,253	985,000,000
2	Maize Research and Training Budget	174,984,138	1,025,626,075	1,675,721,100
(1+2)	Cereals Program Total Budget	1,091,484,138	1,771,626,328	2,660,721,100
3	Rice Research and Training Centre Operation/Maintenance Budget	1,025,789,265	1,260,720,000	1,437,225,000
	<i>Reference: totals converted to JPY</i>	<i>32,712,420</i>	<i>40,204,361</i>	<i>45,833,105</i>

Source: NaCRRRI finance officer

Note: The JPY conversion utilizes JICA's average rate for the fiscal year 2016 (1UGX = 0.03189JPY)

3.5.4 Current Status of Operation and Maintenance

As shown in the facility usage situations in item 3.3.1.3, there is a high rate of use of provided facilities (administrative affairs block, training block, canteen, screenhouse with glass roofing, workshop, irrigation facilities etc.) and equipment (research equipment, experimental field equipment, post-harvest equipment for demonstrations, workshop equipment, etc.). Most of facilities and equipment provided are well working and an equipment ledger for farming machinery and lab equipment has been established; this and similar practices indicate appropriate maintenance. While rate of use of the training block is considered high, facility usage record is not properly taken, therefore, usage rate is not able to confirm numerically. As for improvement of this issue, installation of use record registration book at each lecture room and input data recorded in the registration books in computer periodically are expected.

As of the ex-post evaluation, the JICA technical cooperation "Rice Promotion Project" is underway. As there has been little deterioration of the facilities and equipment roughly 6 years since the completion of the Project, there have been no major issues with the maintenance of facilities or equipment. However, going forward, in order to appropriately approach upgrades and replacements with facility deterioration and equipment service life in mind, it is preferable, for example, to discuss and create a mid-term plan for the renewal of the equipment (including budgetary considerations).

No major problems have been observed in the institutional, technical, financial aspects and current status of the operation and maintenance system. Therefore, sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The Project was conducted at NaCRRRI with the aim of devising a means to improve the quality of planning, research, training, dissemination, and evaluation necessary for the promotion of rice via the provision of a rice research and training centre and related equipment.

Both at the time of planning and the ex-post evaluation, the Project is and has been in accordance both with the development needs and development policies of Uganda, given the important political objectives on increasing rice production in its national development plans and agricultural planning and policy, as well as its high rice production needs. The Project has high relevance in consideration of its consistent with Japan's ODA policy, given the importance placed upon rice promotion in agricultural development as one of the important areas by the Japanese government for its Ugandan aid policy. Therefore, the actual count of rice cultivation trainees at the Rice Research and Training Centre fell significantly below the target; a primary factor for this was that most farmer-oriented training has been carried out locally (areas where near farmers live) , and so the number of calls to train farmers at NaCRRI decreased. On the other hand, through use of the facility and equipment provided by the Project, rice cultivation researchers were able to showcase their growth and research successes. By way of practical training, agricultural officers and others strengthened their skills in promoting rice cultivation technology. Thus, while the quality of research and training improved, the number of trainees did not meet the target. In terms of contributing to rice promotion in Uganda – the Overall Goal of the Project – the cultivation area and crop yield of rice at the farmer level increased thanks to the distribution of high-quality rice variety seeds to trained farmers and the farmers' trainings. The Project has made a certain contribution to rice production increase. Therefore, the effectiveness and impact of the project is fair. While project cost stayed within the plan, project period exceeded the plan. Therefore, efficiency of the project is fair. There were no issues with operation and maintenance with regards to institutional, technical, financial, or current status; the sustainability of the project effects is high.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) Expansion of the Dormitory Facility

The dormitory built by the Project was originally intended for long-term stays by visiting research personnel (maximum accommodation of 12 persons). However, the scale of training events is usually 30-40 persons, and as the training organizer offers lodging at establishments in the capital city, Kampala, as well as transportation to and from NaCRRI when training events are held, these expenses must be included in the training budget. In order to reduce these training costs, it is expected that the National Agricultural Research Organization (NARO) and NaCRRI examine feasibility on building an additional building so that 30-40 persons may be accommodated (however, it will be necessary to sufficiently investigate the financial viability of such an undertaking).

(2) Income Generation at NaCRRRI

There is currently heavy reliance on donor support in order to procure the required funds and equipment for rice research and training activities and rice seed multiplication. In order to bolster financial durability, increasing budgetary allocation from the government is ideal, but in the event that that is difficult, NaCRRRI will have to find a way to generate income. It would be advisable to look into ways in which funds may be generated through use of the Rice Research and Training Centre's facilities and equipment and its research and training activities. For example, the Promotion for Rice Development Project, which is under implementation at the time of the ex-post evaluation, is constructing a system for the generation and use of income via the multiplication and sale of rice seeds. We propose that NARO and NaCRRRI look into generating income by selling high quality rice seeds produced at NaCRRRI to NGOs, seed companies, and seed production farmers.

(3) Creating a Mid-Term Plan for Equipment Renewal

There have been no major issues with the upkeep of equipment provided by the Project. However, moving forward, breakdowns as a result of deterioration of equipment will increase, and there will be a need for replacement of the equipment. As funds are necessary to carry out such a renewal when the time comes, it would be advisable for NARO and NaCRRRI to put together an equipment update plan that includes a financing plan.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

Look into Income Generation Activities to Supplement Expenses for Activities of Implementing Organization and Its Maintenance Expenses

If it is thought that government budget allocations may not necessarily be sufficient for research and training activities and the maintenance of equipment and facilities on site, it would be advisable to look into the viability of income generation by way of utilizing the lecture rooms, dormitory, seed multiplication fields, farm machinery etc. which are provided by the Grant Aid Project. It is desirable to consider such requirements during any forthcoming planning stage.