

Country Name		The Food Crop Diversification Support Project Focusing on Rice Production										
Republic of Zambia												
I. Project Outline												
Background	<p>In Zambia, the agricultural sector has been crucial in the national economy as it had accounted for 20% of Gross Domestic Product (GDP) and more than 60% of the population has been engaged in the sector. Nonetheless, the vast majority have been small-scale farmers who have relied on rain-fed cultivation, resulting in low productivity and high poverty levels. Besides, the excessive emphasis on maize production in the government policy brought about more vulnerability of the farmers. There were thus compelling issues to reduce the vulnerability and to exploit the potential by diversification of the cropping pattern of small-scale farmers as per local growing conditions for sustainable production of various crops countrywide. Although Zambia had plenty of lands suitable for rice production and increasing interest from small-scale farmers in rice production, there was limited knowledge and proper techniques among farmers and the extension service providers.</p>											
Objectives of the Project	<p>Through strengthening basic research capacity for rice cultivation techniques and enhancing extension services on the target crops, the project aimed at improving the research and extension system for the promotion of food crop diversification with a focus on rice production, thereby contributing to the enhancement of the diversified food crop production in Northern, Muchinga, Western, Eastern, Lusaka, and Copperbelt provinces in Zambia.</p> <ol style="list-style-type: none"> Overall Goal: Diversified food crop production especially rice production is enhanced in the target areas. Project Purpose: Research and extension systems for the promotion of food crop diversification are improved, focusing on rice production. 											
Activities of the Project	<ol style="list-style-type: none"> Project Site: Northern, Muchinga, Western, Eastern, Lusaka, Copperbelt provinces Main Activities: Inputs (to carry out the above activities) <ol style="list-style-type: none"> strengthen research capacity for rice cultivation techniques, 2) identify the potential areas for research and extension on rice production, 3) enhance research and extension services on other target crops, 4) identify potential linkages and strengthen institutional collaboration between research and extension to promote food crop diversification. 											
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Project Period	June 2012 – June 2015	Project Cost	(ex-ante) 210 million yen, (actual) 207 million yen									
Implementing Agency	Zambia Agricultural Research Institute (ZARI), Ministry of Agriculture (MoA) (the former Ministry of Agriculture and Livestock (MAL) was split into two Ministries: The Ministry of Agriculture (MoA) and the Ministry of Fisheries and Livestock (MFL) in 2015)											
Cooperation Agency in Japan	Ministry of Agriculture, forestry, and fisheries											
II. Result of the Evaluation												
1 Relevance												
<Consistency with the Development Policy of Zambia at the Time of Ex-Ante Evaluation and Project Completion>												
<p>The project was consistent with the development policies of Zambia since the Government of Zambia aimed to enhance the system for food security by reducing the dependency on maize production and promoting the income of smallholder farmers. It also notably addressed the promotion of crop diversification in “the Vision 2030”, the “6th National Development Plan (SNDP)” (2011-2015), and the “National Agriculture Policy (NAP)”. Among other crops, rice was included in the “Farmer Input Support Programme (FISP)” to benefit from government subsidies of seed and fertilizer.</p>												
<Consistency with the Development Needs of Zambia at the Time of Ex-Ante Evaluation and Project Completion >												
<p>The project was consistent with the development needs of Zambia. Despite government policy above, the use of improved production technologies of smallholder farmers has remained very low leading to low productivity. Additionally, there were impending issues concerning establishing and extending the package of cultivation techniques, and these, among others, included limited access to quality seed and suitable varieties, as well as limited control of pest insects and diseases. Rice cultivation in Zambia still faced a number of other challenges that needed to be addressed. There was no change in the need for promoting food crop diversification, particularly rice production, by the time of project completion.</p>												
<Consistency with Japan’s ODA Policy at the Time of Ex-Ante Evaluation>												
<p>The project was consistent with Japan’s ODA policy for Zambia¹. It intended to support the three priority areas, inter alia, “industrial promotion” that included agriculture. Based on the fact that low agricultural productivity and yield exist, as the majority of farmers grow maize and rely on rain-fed cultivation, it was pertinent to support the expansion of irrigation and crop diversification through its technical</p>												

¹ MOFA ODA Databook 2012

cooperation.

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Status of Achievement of the Project Purpose at the time of Project Completion>

The Project Purpose was achieved by the project completion. According to the project completion report, 6 research programs on rice were implemented in the 2014/15 cropping season in Lusaka, Northern and Western Provinces by 5 Zambian researchers (Indicator 1). “Rice production potential paper in Zambia 2015” was compiled and officially presented to be shared at the Rice Stakeholder Conference in 2015 to discuss the challenges and potentials of the rice industry (Indicator 2). The first and second editions of brochures on upland rice cultivation were produced during the project. The first edition was distributed to extension officers and farmers who participated in the training on rice cultivation (Indicator 3).

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

The project effects have continued since the project completion. All three target research stations have continued their research programs after 2015. Furthermore, although it has room for further utilization at the district level, the above-mentioned 2015 report on rice production has kept being referred mainly by researchers for ensuring effective rice production after the project. In 2019, the report was updated by the succeeding “Rice Dissemination Project (RDP)” (2015-2016). Regarding the brochure for dissemination, it has been strategically distributed to extension workers and leads farmers expected to be a focal point to conventional farmers in the vicinity.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The Overall Goal had been partially achieved at the time of ex-post evaluation. According to the survey results of the ex-post evaluation, due to various challenging issues in the market and production, only about 30% of farmers of the Target Group have continued to grow rice (indicator 1). Although the total average yield of rice in the target provinces was 1.13t/ha in 2017/18, which is below the target of 2.0 t/ha, it was confirmed that the yield level of rice in some target sites in the district level exceeded the target. It was deemed that those farmers adopted of improved technique the project demonstrated (indicator 2).

<Other Impacts at the time of Ex-post Evaluation>

At the time of the ex-post evaluation, it was confirmed in some sites that rice cultivation and the other means of earning a living were mutually exclusive. Specifically, as road construction was taken place in the vicinity of rice fields in Nyimba, many farmers took day-labor jobs. As a result, the retention rate of rice-growing declined. In Ndola, as farmers opted for some vegetables with a shorter cultivation period over rice, rice farming did not continue inevitably. No other negative impact was confirmed.

<Evaluation Result>

In light of the above, the effectiveness/impact of the project is fair.

Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results
(Project Purpose) Research and extension systems for the promotion of food crop diversification are improved, focusing on rice production.	Indicator 1 At least 5 research on rice are implemented.	Status of the Achievement: achieved (continued) (Project Completion) Four programs on rice research had been conducted in the 2013/14 cropping season in Northern Province by both the Zambian and Japanese researchers (3 Zambian researchers and a Japanese expert). The reports on research No.1 “Preliminary Research on Occurrence of Cold Weather Damage and Evasion and Advantage of Early Cultivation,” and research No.2 “Development Study on Rice Cultivation System Implemented from Flooded Paddy Field to Non-Flooded Paddy Field in Dambo” were made. Up to 6 research programs on rice were being implemented in the 2014/15 cropping season in Lusaka, Northern and Western Provinces by 5 Zambian researchers and 2 Japanese experts. (Ex-post Evaluation): <ul style="list-style-type: none"> • The research station in Misamfu had conducted four research such as “Response of rice lowland varieties to different Nitrogen” between 2015 and 2018. • The research station in Mt. Makulu has conducted the 13-research including “Research on tolerance to cold weather” and “Comparison of the yield of various rice varieties on the station” between 2015 and 2018. • The research station in Mongu had conducted the following 2 research topics during 2 seasons from 2015: “International Upland Rainfed Observatory Nursery (IURON)”, and “International Lowland Rainfed Observatory Nursery (ILRON).”
	Indicator 2 The report on the identified potentials of rice production is shared with the research and other relevant institutions.	Status of the Achievement: achieved (continued) (Project Completion) A report titled “Rice production potential paper in Zambia 2015” was compiled. It was also presented at the Rice Stakeholder Conference (27th May 2015). During the process of editing and compiling the report, rice researchers could discuss scientific findings regarding the rice production and value chain. (Ex-post Evaluation) The 2015 report kept being referred to mainly by researchers. However, it has also been pointed out that extension officers, especially at the district level have not been evenly informed about it. Thus, there is still room for further utilization for the sake of the extension of rice production. The 2015 report was updated under RDP in 2019 and was referred to in “Market-Oriented Rice Development Project (MOREDeP)” (2019-2025) with the aim of research and documentation for dissemination.

Indicator 3
Extension materials on rice cultivation are made available for extension services.

Status of the Achievement: achieved (continued)
(Project Completion)
A brochure on upland rice cultivation was produced to comprehensively cover the farming practices. This brochure had been distributed to extension officers and farmers who had participated in the training on rice cultivation. About 5000 copies of the first edition had been distributed. The contents of the brochure were revised in October 2014 as the second edition.
(Ex-post Evaluation)
The brochure was mainly distributed to lead farmers at the district level. Under the constraints on public resources, brochure dissemination has been strategically carried out within interpersonal relations and in locality conditions.

(Overall Goal)
Diversified food crop production especially rice production is enhanced in the target areas.

Indicator 1
The number of rice-growing farmers is increased by 20% in the target areas by 2018 compared to the number in 2012.

(Ex-post Evaluation) Not achieved.
According to the survey responses from each district agriculture office at the project sites, on average only 30 % of farmers of the project sites have continued to grow rice. Among others, low percentages were reported in Masaiti at 2 %, followed by Ndola at 10%. Nyimba district office had the highest percentage of rice growing reported at 75% for farmers continuing to grow rice. The main issues that rice farmers are facing were summarized as follows.

- Low total productivity of land caused by certain climate/ecological conditions (arising from, among other things, limitations in the availability of quality seed of preferred varieties and processing equipment)
- Market competitiveness with other crops and alternative income opportunities

Table 1: The number of rice-growing households in the Target Provinces

Target provinces	Baseline 2011/12	2012/13	2013/14	2014/15	2015/16	2017/18
Northern	11,942	14,070	16,363	9,973	12,835	12,551
Muchinga	13,488	13,804	12,573	12,217	17,597	17,485
Western	25,615	24,376	30,369	32,577	18,801	18,404
Eastern	6,231	4,908	2,650	4,255	5,088	4,152
Lusaka	141	72	199	43	10	0
Copperbelt	83	55	22	210	105	46
Total	57,500	57,285	62,176	59,275	54,436	52,638
Increase rate (%)		99.6	108.1	103.1	94.7	91.5

Source: Crop Forecast Surveys, 2016 and 2018

Indicator 2
The average yield of rice in the target area exceeds 2.0 t/ha by 2018.

(Ex-post Evaluation) Partially achieved
Some farmers adopted better cultivation techniques, and this led to an increase in yield in the project sites. The research also introduced better seeds such as Supa MG and Minsamfu 2 and 3. Additionally, aiming at further extension, the major research stations, notably Mt Makulu, have been purifying the seed as well as multiplying quality seed. However, where the yield was less than the target, it was resulted from adverse weather patterns, particularly drought in some areas, given the status of irrigation development.

Table 2: The average yield of rice in project sites (Unit:t/ha)

Project Sites (District)	Baseline 2012	2016	2017	2018
Ndola	N/A	2.56	N/A	N/A
Masaiti	N/A	N/A	N/A	N/A
Nyimba	N/A	2.3	1.9	2.9
Chinsali	N/A	4.4	2.4	2.6

Source: Questionnaire Survey among the District Agriculture Offices in Ndola, Masaiti, and Nyimba districts and Farmer Questionnaire Survey in Chinsali
Note 1: The baseline data were not readily available.
Note 2: Ndola and Masaiti are in the Copperbelt Province, Nyimba in Eastern Province, and Chinsali in Muchinga Province

Table 3: The average yield of rice in the Target Provinces (Unit: t/ha)

Target provinces	Baseline 2011/12	2012/13	2013/14	2014/15	2015/16	2017/18
Northern	1.67	1.00	1.20	0.97	0.83	1.56
Muchinga	1.72	1.49	1.60	1.84	1.88	1.79
Western	1.18	1.01	1.10	0.17	0.93	1.28
Eastern	1.13	1.89	1.09	1.98	1.48	1.70
Lusaka	0.77	1.09	1.15	0.63	0.18	0
Copperbelt	1.76	1.09	1.57	0.51	2.45	0.48

Source: Crop Forecast Survey, 2016 and 2018

3 Efficiency

Both the project cost and project period were within the plan (ratio against the plan: 99% and 100%, respectively). The outputs were produced as planned. Thus, the efficiency of the project is high.

4 Sustainability

<Policy Aspect>

The promotion of crop diversification has retained its importance in the national policy of the Government of Zambia. The Second “National Rice Development Strategy, NRDS,” (2016-2020) has aimed at doubling rice production in the country in 5 years. Its endeavor has to encompass the value chain development for rice, ranging from research, production, extension, to marketing. Policy pronouncements by MOA have also confirmed that crop diversification was an important policy direction and rice was one of the prioritized crops.

<Institutional Aspect>

The role and responsibility of MoA have not changed concerning the promotion of crop diversification. MoA has been responsible for the promotion of crop diversification. In terms of the implementation of specific activities such as research and extension for rice production in the context of crop diversification, the organizational structure, and responsibilities of ZARI (target research stations: Mt. Makulu, Misamfu, Mongu), as well as two supporting organizations: the Department of Agriculture (DoA) (HQ as well as the provincial offices) and the Seed Control and Certification Institute (SCCI) have remained unchanged. As per manpower status to ensure crop diversification, it was reported that in terms of farming system, it had not been sufficient especially in Mongu research station of the ZARI which has only 1 staff, whereas Mt. Makulu has 5 staff and Misamfu has 8 staff. And there is no staff in Mongu to engage in plant protection. Regarding the status of rice research, it was reported that Misamfu and Mongu perceived there had been a need to increase the number of technical staff (who currently stand at 3 staff each) in order to properly address the relevant issues. As far as DoA and its provincial offices are concerned, they perceived current staffing to be sufficient, enough to supervise the aspects of extension and crop production. The SCCI, however, perceived that its staffing was not sufficient to properly address seed control and certification such as variety testing, because some positions remain vacant. After project completion, it was recognized in the successor projects (RDP and MOREDeP) that Mansa research station in Luapula province would be suitable for rice cultivation research under natural conditions. As such, the station received several researchers from Misamfu research station and has been assisted to facilitate it through the projects.

<Technical Aspect>

According to the survey results, as the ex-counterpart staff members have remained active in each organization, it is considered technically sustained for the promotion of rice production. However, ZARI perceived that it requires more research skills and capacity in relevant fields and SCCI also reported that they need to enhance capacities for the inspection process, variety identification, and laboratory seed testing. ZARI has in its plans a training program; however, the current budget constraints have not allowed it to amply conduct training but self-study. SCCI has had a coping strategy of working with the private sector to conduct training courses each year. Concerning the number of equipped extension officers and trained farmers for rice production in target provinces², it was reported as follows; 113 in 2015/16 (93 extension officers and 20 master trainers), 201 in 2017/18 (128 block extension officers, 61 district staff, 22 master trainers), 282 in 2018/19 (53 block extension officers and Camp Extension Officers (CEO), 22 district officers, 22 master trainers, 158 extension farmers, and 27 international volunteers); and the number of trained farmers: 1,550 (2015/16), 1,159 (2017/18) and 1,185 (2018/19).

<Financial Aspect>

In Zambia, it has been vulnerable in terms of the government funding mechanism for the last three years. MoA has not guaranteed to disburse the amount of budget as anticipated the lesser amount of revenue for the next fiscal year, 2020. Even though the annual budget has been allocated, the disbursement rate has been less than 30 % at its highest. Or worse, no disbursement was made in some districts. It thus can be concluded that the central government has not adequately disbursed the operation costs in a timely manner.

<Evaluation Result>

Some problems have been observed in terms of the financial aspect. Therefore, the sustainability of the effects through the project is fair.

5 Summary of the Evaluation

The project has achieved the Project Purpose as they have engaged in a process of proving the potential in rice production through the extension and training of farmers. The Overall Goal was partially achieved; either the number of rice-growing farmers or the average yield in target provinces has not met the target. The average yield in some districts, however, showed an increase, meeting and even surpassing the target. As for sustainability, they have performed each duty as respective institutions and technically retained skill set to promote rice production in the context of crop diversification, although the national budget has been precarious to properly address the issue.

Considering all of the above points, this project is evaluated to be satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

In order to enhance the impact of the project, with the concerted efforts of ZARI and SCCI, MoA should engage in the promotion of the rice market, preferable varieties, and fostering of researchers. In order to achieve the fullest potential of rice production, it is necessary to encourage the utilization of the knowledge gained from research through active information-sharing between researchers and extension staff.

The survey revealed that officers in some districts were not aware of “Rice Production Potential Paper in Zambia 2015”. And sufficient level of budget for rice cultivation activities has not been allocated in such districts. Thus, to enhance the sustainability of the project, it is imperative to initiate active information sharing and take appropriate budget measures.

Lessons Learned for JICA:

The project used existing structures and the official mandate of the Ministerial organization. As in the notable case of ZARI, this was a positive basis for the project’s sustainability. On the other hand, in order to further enhance the impact of the project, it should have fully addressed sales activities in the project design. By the same token, in order to improve productivity in rice cultivation, it is essential to place a system for farmers to obtain appropriate means of production, such as a system to supply quality seeds. Considering the fact that the

² Data of the numbers of equipped extension officers and trained farmers in the year of 2016/17 were not readily available.

percentage of farmers who continue to cultivate rice depending on the target site, it is important to formulate a dissemination plan based on total marketability of rice such as the price competitiveness of rice in the target sites, the existence of markets to serve the income of rice farmers and competing crops.



Interview with a Rice Farmer (left) in Nyimba District