Internal Ex-Post Evaluation for Technical Cooperation Project (Technical Assistance under Finance and Investment Account)
conducted by Kenya Office: December, 2022

Country Name	**Rice-based and Market-oriented Agriculture Promotion Project**
Republic of Kenya	

I. Project Outline

Background	Among the three major staple crops in Kenya, maize, wheat, and rice, the consumption of rice, which is easy to prepare, was increasing rapidly, especially in urban areas, as the population grew. As a result, the country's self-sufficiency rate had been decreasing year by year and was below 20% at the time of ex-ante evaluation, with the shortage being imported from abroad. In order to promote the increase in rice production, incentives for farmers were needed. Producing high value-added rice that meets the needs of the market was deemed to increase the farm income, which would lead to the sustainable farming. In the Mwea Irrigation Scheme (MIS), which produced more than 50% of the country's rice, it was very important to properly assess the situation of farmers and provide them with support that meets their needs in order to increase rice production in Kenya in the future.		
Objectives of the Project	Through (i) identifying potential rice-based market-oriented farming systems, (ii) enhancing capacity of irrigation water management for improving rice-based and market-oriented farming systems, (iii) enhancing production and post-harvesting technologies for improving rice-based and market-oriented farming systems, (iv) practicing the rice-based and market-oriented farming systems by farmers in MIS, and (v) disseminating the market-oriented approach by development organizations, the project aims at increasing the agricultural profit of farmers in MIS, thereby contributing to disseminating the market-oriented approach in other irrigation schemes.		
	1. Overall Goal: The market-oriented approach established in Mwea Irrigation Scheme is disseminated and adopted in other irrigation schemes. 2. Project Purpose: The agricultural profit of farmers in Mwea Irrigation Scheme is increased through the market-oriented approach.		
Activities of the project	1. Project site: MIS (in Kirinyaga County) 2. Main activities: (i) identifying potential rice-based market-oriented farming systems, (ii) enhancing capacity of irrigation water management for improving rice-based and market-oriented farming systems, (iii) enhancing production and post-harvesting technologies for improving rice-based and market-oriented farming systems, (iv) practicing the rice-based and market-oriented farming systems by farmers in MIS, and (v) disseminating the market-oriented approach by development organizations. 3. Inputs (to carry out above activities) Japanese Side 1) Experts: 18 persons 2) Trainees received in Japan: 30 persons 3) Trainees received in the third countries (Uganda, Ghana, Egypt and Tanzania): 32 persons 4) Equipment: Measurement equipment, agricultural machinery, vehicles, office equipment, etc. Kenyan Side 1) Staff allocated: 11 persons 2) Land and facilities: Office space and operation room in Mwea, the trial farm in Mwea Irrigation Agricultural Development (MIAD) Centre for the Project 3) Local operational expenses: purchase of vehicles, new office construction expenses, tools for agricultural machineries, etc. Prototype reaper, electricity, water, fuel for transportation, office furniture and a part of stationeries		
Project Period	(ex-ante) December 2011 - November 2016 (actual) January 2012-January 2017	Project Cost	(ex-ante) 685million yen, (actual) 475 million yen
Implementing Agency	Ministry of Agriculture, Livestock and Fisheries (MoALF) (Currently, Ministry of Agriculture, and Livestock Development: MoALD) Ministry of Water and Irrigation (MoWI) (currently, Ministry of Water, Sanitation and Irrigation: MoWSI), National Irrigation Board (NIB) (Currently, National Irrigation Authority: NIA) (Cooperating agencies)		
Cooperation Agency in Japan	Ministry of Agriculture, Forestry and Fisheries		

II. Result of the Evaluation

1 Relevance/Coherence
[Relevance] <Consistency with the Development Policy of Kenya at the Time of Ex-Ante Evaluation > The project was consistent with the development policy of Kenya at the time of ex-ante evaluation. Agriculture has been identified as a key sector in the "Kenya Vision 2030", the national development plan. In the "Agricultural Sector Development Strategy" (ASDS), productivity enhancement, agribusiness promotion, and improved market access are the key objectives. The "National Rice Development Strategy" (NRDS), formulated in 2008, plans to promote rice cultivation to enhance food security and improve farmers' livelihoods. <Consistency with the Development Needs of Kenya at the Time of Ex-Ante Evaluation >

The project was consistent with the development needs for increasing rice production of Kenya at the time of ex-ante evaluation. Kenya's self-sufficiency rate had been decreasing year by year and there was a need to increase farm income.

<Appropriateness of Project Design/Approach>

No problem attributed to the project design/approach was confirmed.

As for the equality, there were vulnerable households in the scheme in terms of scarcity of irrigation water that subjected farmers in the lower sections to less water form rice production. The project involved the locals and also supported the most vulnerable ones with input and advice. And in the end, all farmers both in the upper and lower sections have been able to equitably benefit from the available irrigation water and can produce rice every season.

<Evaluation Result>

In light of the above, the relevance of the project is ③. (④ : very high, ③ : high, ② : moderately low, ① : low. *To be the same afterwards.).

[Coherence]

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

The project was consistent with the Japan's ODA policy to Kenya at the time of ex-post evaluation. Based on the "Country Assistance Program" formulated in 2000, five areas were identified as the priority areas for assistance. The "agriculture and rural development" was one of the priority areas with emphasis on market-responsive agricultural development through rice crop promotion[1]

<Collaboration/Coordination with other JICA's interventions>

The collaboration/coordination between the project and other projects of JICA was planned at the time of ex-ante evaluation and was implemented, and the positive effects expected were confirmed at the time of ex-post evaluation.

The project utilized outcomes of JICA's previous interventions, such as, "Mwea Irrigation Development Project" (phase 1) (1989-1991), a grant aid project for the development of irrigation facilities, rehabilitation of existing ones and establishment of Mwea Irrigation Agricultural Development (MIAD) Center; "Mwea Irrigation Agricultural Development Project"(1991-1996), a technical cooperation project for human resource development of NIB (now NIA) for operation and maintenance of the irrigation facilities. The continuation of utilization and synergy were confirmed at the time of ex-post evaluation, as the irrigation facilities improved and better operation/maintenance (O&M) have been useful for better water management in the scheme to promote the enhancement through Water Saving Rice Culture (WSRC). Further, MIAD provided the trail farm and personnel of MIAD has continued working for a succeeding technical cooperation project "Capacity Development Project for Enhancement of Rice Production in Irrigation Schemes" (CaDPERP) (2019-2024). The other JICA project that has been synergized was with the "Project on Enhancing Gender Responsive Extension Services in Kenya" (PEGRES) (2014-2017) that developed Gender Mainstreaming Package (GMP) as an extension tool in agriculture and implemented in the target areas under the project, and the GMP was confirmed to be continuously used by CaDPERP at the time of ex-post evaluation. Also, through a grant aid project of "Food Security Project for Underprivileged Farmers" (2KR) in 2012, the project was provided with agricultural machinery to enhance adoption of rice technologies, and they were still utilized by the succeeding project at the time of ex-post evaluation.

The project was implemented as part of ODA loan project of infrastructure development, "Mwea Irrigation Development Project" (Phase 2) (2010-2023) for expansion of paddy area and dam development. Although the infrastructures are yet to be completed fully, it is expected to facilitate adoption of the project approaches further by the succeeding projects.

<Cooperation with other institutions/ Coordination with international framework>

The cooperation/coordination with the World Bank's Natural Resource Management Project (NRMP) was planned at the time of ex-ante evaluation and implemented as planned, and the positive effect(s) was/were confirmed at the time of ex-post evaluation. The project promoted double cropping among farmers around the canals lined by NRMP. In this regard, the project constructed 400m long by-pass canal to provide water to farms that were cut-off from water access for double cropping. This enhanced the water supply and improved efficiency through lining of the canal.

There are other collaborations as follows: (1) The project staff members for the succeeding project from MoALD have supporting Kilimo Trust with development of training materials for Uganda on Good Agronomic Practices (GAPs) as guided by manuals under the project. (2) The project lined up with other stakeholders such Kilimo Trust, International Rice Research Institute (IRRI) and Kenya Agricultural and Livestock Research Organization (KALRO) in promoting and supporting the availability of certified seeds in Western Kenya with high-yielding and market-accepted varieties, (3) an increase in rice production enhanced by the project contributed to the Coalition for African Rice Development (CARD) initiative.

<Evaluation Result>

In light of the above, the coherence of the project is ③.

[Evaluation Result of Relevance/Coherence]

In the light above, the relevance/coherence of the project is ③.

2 Effectiveness/Impact

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

At the time of project completion, the Project Purpose was achieved as beyond the plan. The result of baseline survey conducted at the start of the project in 2011 showed the annual average profit of conventional farmers 58,150 Kenyan Shillings (Ksh) per farmer. As the result of project activities, such as adoption of new rice cropping technology, mainly Water Saving Rice Culture (WSRC), plus Improved Ratoon Production (IRaP), sequential crops production, improved irrigation water management, appropriate agriculture mechanization and so forth, the annual average profit of core farmers increased to Ksh 137,462 with 136% in ratio of rice cropping in 2015 and ratoon in 2016 in total. However, the target figure for the indicator was significantly lowered from 240% to 40% in 2014, as the project thought 240% was unrealistic[2].

<Continuation Status of Project Effects at the Time of Ex-Post Evaluation>

[1] Source: MOFA, ODA Data book 2011

[2] The original indicator turned out to be unrealistic in terms of cropping system, unit productivity ratio per acre, value of production ratio per kg and production cost per acre. Since the rice cultivation yield did not increase as expected

By the time of the ex-ante evaluation, the project effects have continued. Despite the climate-related challenges during the season at the time of ex-post evaluation, effects have continued to be felt across the entire MIS (expanding from 30% to 50% of scheme) and impact has been still notable in yields and profits. Due to the serious drought experienced in the last season, water scarcity affected the "rice + ratoon" farmers the most. "Double cropping" farmers got their yields boosted quite a lot in the second cropping phase when water usually has low competition.

<Status of Achievement of the Overall Goal at the Time of Ex-Post Evaluation>

At the time of ex-post evaluation, the Overall Goal has been partially achieved. Efforts towards dissemination of the project approach for new rice cropping techniques mentioned above across MIS reached the 50% mark up from 30% in 2015. While other schemes across the country have not been able to adopt the approach, efforts can be noted in escalating various components of the approach in various schemes. CaDPERP as the succeeding project, was designed to upscale the project technologies in MIS and customize for adoption of the same approaches in Ahero irrigation scheme and West Kano irrigation scheme (both in Kisumu County).

Various organizations have promoted the adoption of the technologies mainly at MIS. Irrigation Water Users Association (IWUA) has had sensitization meetings with farmers through their unit leaders. Mwea Rice Growers Multipurpose Cooperative Society Ltd (MRGM), the farmer's cooperative with membership of over 7,000 households, has pushed the agenda of the project technologies to its members through training/contact meetings. Kirinyaga County – the county extension officers (Sub-County Agriculture Officer (SCAO) and Ward Agriculture Extension Officer (WAEO)) collaborate with CaDPERP to provide extension services to farmers on these technologies. Agriculture Sector Development Programme (ASDSP) has applied guidelines developed under the project to train farmers on Good Agronomic Practices (GAP). Previous core farmers who underwent training on project technologies also have shared skills and passed message of the project to other neighboring farmers

<Other Impacts at the Time of Ex-Post Evaluation>

No negative impacts on the natural environment have been observed.

Some positive impacts have been observed in terms of gender aspect. As mentioned above ("Coherence"), GMP under PEGRES was introduced in the target areas under the project, and fully embraced by its succeeding project (CaDPERP). Through this gender extension tool, households were trained as a unit on participatory agricultural activities, which enabled women to increase their involvement in productive farming activities. This has resulted in enhanced harmonious decision-making process in rice production activities.

No negative impacts have been observed in terms of social aspects.

The project has produced some positive impacts on the national policy. The "National Rice Development Strategy 2" (NRDS 2) (2019-2030) proposes upscaling of improved rice production technologies as part of increasing rice production and productivity. Some of the technologies highlighted were developed under the project.

<Evaluation Result>

In light of the above, the effectiveness/impact of the project is ③.

Achievement of Project Purpose and Overall Goal

<table>
<tr><th>Aim</th><th>Indicators</th><th>Results</th><th>Source</th></tr>
<tr>
<td>(Project Purpose)
The agricultural profit of farmers in Mwea Irrigation Scheme is increased through the market-oriented approach.</td>
<td>Indicator 1
The average profit of farmers in Mwea Irrigation Scheme from irrigated field is increased by at least 40%.</td>
<td>Status of the Achievement (Status of the Continuation): achieved beyond the plan (continued)
(Project Completion)
<table>
<tr><th colspan="4">Yield (unit in kg/acre)</th></tr>
<tr><th>2011 Conventional Rice + Ratoon (n=357)</th><th>2015 Conventional Rice + Ratoon (n=15)</th><th>2015 Rice + Ratoon Core farmers (n=27)</th><th>2015 Double Cropping Core farmers (n=19)</th></tr>
<tr><td>2,083</td><td>3,321</td><td>3,782</td><td>4,960</td></tr>
<tr><td>100%</td><td>159%</td><td>182%</td><td>238%</td></tr>
<tr><th colspan="4">Profit (unit in Ksh/acre)</th></tr>
<tr><td>58,150</td><td>99,449</td><td>137,462</td><td>182,542</td></tr>
<tr><td>100%</td><td>171%</td><td>236%</td><td>314%</td></tr>
</table>
(Ex-post evaluation)
<table>
<tr><th></th><th colspan="2">2015</th><th colspan="2">2022</th></tr>
<tr><th></th><th>Yield (kg/acre)</th><th>Profit (Ksh/acre)</th><th>Yield (kg/acre)</th><th>Profit (Ksh/acre)</th></tr>
<tr><td>Rice + Ratoon Core farmers*</td><td>3,782</td><td>137,462</td><td>3,087</td><td>140,696</td></tr>
<tr><td>Double Cropping Core farmers**</td><td>4,980</td><td>182,542</td><td>6,240</td><td>345,600</td></tr>
</table>
*n=27
**n=19</td>
<td>JICA documents, Interview (Project Manager for CaDPERP; SCAO for Mwea West), Questionnaires, FGD (Core Farmers)</td>
</tr>
<tr>
<td>(Overall Goal)
The market-oriented approach established in Mwea Irrigation Scheme is disseminated and</td>
<td>Indicator 1
At least 2 irrigation schemes adopt the market-oriented approach established in Mwea Irrigation Scheme within 3 years after</td>
<td>(Ex-Post Evaluation) partially achieved
Expansion to other schemes (including MIS)
<table>
<tr><th>Name of scheme</th><th>Since</th><th>Type of approach/technology adopted</th><th>Area for which the technologies were adopted</th><th>Number of farmers adopted</th><th>Organization which promoted the adoption</th></tr>
<tr><td>Mwea</td><td>2012</td><td>WSRC</td><td>All sections</td><td>>50%</td><td>The</td></tr>
</table></td>
<td>Questionnaires, Interviews (Project Manager, CaDPERP; MIS Manager), FGD with Core Farmers</td>
</tr>
</table>

adopted in other irrigation schemes.	completion of the Project.	(Kirinyaga County)		IRaP	All sections	>50%	project/CaDPERP, IWUA, NIA, MIAD, MRGM, ASDSP, Kirinyaga County
				Mechanized harvesting	All sections	90%	
				Push weeding	All sections	30%	
		Ahero (Kisumu County)	2017	WSRC	Just introduced	-	The project
				Mechanized harvesting	All scheme areas	-	Farmer groups, Individual MIS farmers
		West Kano (Kisumu County)	2017	WSRC	Just introduced	-	-
				Mechanized harvesting	All scheme areas	30%	Agrized (private farm), Individual farmers
		Bunyala (Busia County)	2019	Mechanized harvesting	Entire scheme	30%	MoALD (Engineering Services Department)
		Bura (Tana River County)	2021	Mechanized harvesting	Entire scheme	30%	NIA, Individual farmers

Expansion within MIS

	Project completion 2016	Ex-post valuation 2022
Section	Mwea, Tebere, and Ndekia sections	Mwea, Tebere, Ndekia, Thiba, Wamumu, and Karaba
Number of households	2,213 households (Out of 7,452 households in Mwea Irrigation Scheme)	3,739 households (out of 11,244 households in Mwea Irrigation Scheme)

During the project period, promotion of RiceMAPP approaches was not started in other regions, but a trial with two farmers, one in Abero and the other in West Kano was made without intention of dissemination. These two farmers have continued to implement leveling, line transplanting, timely fertilizer application, intermittent irrigation, and a bit of mechanization. While farmers in the two schemes have generally embraced these technologies, only about 7 farmers practice at least one technology in West Kano and Ahero with majority embracing only line planting. However, the succeeding project (CaDPERP) has finalized customization trials of these approaches for Ahero and West Kano.

3 Efficiency

Both the project cost and the project period were within the plan (the ratio against the plan: 69% and 100 %, respectively). Outputs were produced as planned.

In the light above, the efficiency of the project is ④.

4 Sustainability

<Policy Aspect>

Several support policies and programs have been set up all working towards sustaining the gains of the project. As mentioned above ("Impact"), NRDS (2019 – 2030) proposes upscaling of improved rice production technologies, including the technologies developed under the project, as part of increasing rice production and productivity. Initiatives under the "National Agricultural Mechanization Policy, 2021", the "Strategic Food Reserve Trust Fund" (SFRTF), have promoted agricultural mechanization, and food security respectively. The "Irrigation Act 2019" transformed NIB to NIA and expanded the mandate to include irrigation research thereby devolving services to 5 regions including Mt. Kenya East (MIS) and Nyanza (Ahero and West Kano) through participatory management of schemes. This empowers farmers in management of agricultural water and inclusion of farmers' representative (IWUA) at the Management Board of NIA.

<Institutional/Organizational Aspect>

The structural changes and the number of staff in the sustenance system of the approach have been somehow sufficient and well created and functional towards enhancement of the gains

The structure has been functioning well from national to irrigation scheme level. Rice Promotion Programme (RiPP) Unit has been set up in the MoALD with specific focus on promotion of rice production across the country. At the same time, implementation structure of CaDPERP includes the Ministry of Water, Sanitation & Irrigation, Kenya Agricultural and Livestock Research Organization (KALRO) and Counties, which needed clearer coordination channels - and this is where Joint Agriculture Secretariat (JAS) was established as a communication link between national and county levels. MIAD also hosts CaDPERP with the Officer-in-Charge being the Unit Leader for MIS.

At MIS, MIAD of NIA has been responsible for dissemination within the MIS, Sub-County Agriculture Officer (SCAO) and Ward Agriculture Extension Officer (WAEO) have been responsible for dissemination in the Kirinyaga County, and RiPP Unit has been

responsible for national dissemination.

As for the number of staff, 62 staff member of MIAD have been actively engaged. According to the Officer-in-Charge, this number has been sufficient; however, there is optional need for an Irrigation Engineer. The Kirinyaga county government has had 36 key staff members under the department of agriculture and about 7 of them have been assigned in the Mwea West sub-county where MIS is located. This number has not been sufficient and the county government has employed new staff to bridge the gap however, only one staff (water management) has been engaged in CaDPERP for upscaling and dissemination to Ahero/West Kano. At the national level, RiPP Unit has had only 3 key members of the staff despite the wider national mandate. According to the Head of RiPP, there is need for about 5 more staff members to handle (i) Monitoring & Evaluation, (ii) Agribusiness (iii) Crop production & technology dissemination, and (iv) irrigation.

<Technical Aspect>

Most of the staff members in each of the organizations have undergone good training and capacity-building processes and the numbers of trained staff are sufficient with the exception of Kirinyaga County that just recruited fresh staff. These new staff members need training to introduce them to extension of project approaches, and CaDPERP plans to conduct some training to them meanwhile. At national level, CaDPERP has supported RiPP Unit.

The guidelines and manuals developed under the project, such as IRaP, WSRC, water management and appropriate mechanization have been utilized.

<Financial Aspect>

While almost all the organizations have no dedicated budget allocation from the government, there is still evidence of ability to finance and sustain activities related to promotion of the approach.

At MIS level, NIA has continued to allocate some funds for implementation of MIAD activities although it generates internal revenue for most of its activities. For example, in the fiscal year 2021-2022, MIAD had a budget of up to KES. 7 million almost fully financed from internal revenue.

As for the dissemination in the Kirinyaga County, no data on this could be obtained from the county government of Kirinyaga.

At the national level for dissemination to other schemes, there is no dedicated budget allocation to the unit for promotion of its mandate towards these approaches but RiPP activities are supported by work plans. This kind of facilitation has continued to be provided by the MoALD through an umbrella basket for crop diversification in which RiPP budget requirement of usually approximately KES. 50 million.

<Environmental and Social Aspect>

No monitoring system has been developed for environmental and social purposes, as risks was regarded minimum.

<Evaluation Result>

In light of the above, some problems have been observed in terms of the institutional/organizational and financial aspects of the implementing agency. Therefore, the sustainability of the project effects is ②.

5 Summary of the Evaluation

The project almost achieved the increase in the profit of farmers (Project Purpose) and partially achieved the adoption of the project approaches (Overall Goal). Coherence is high. As for the Sustainability, some problems have been observed in terms of the financial aspect, though no problems have been observed in terms of policy, institutional and technical aspects.

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

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

1.Availability of financial and personnel resources

- National government needs to allocate and avail funds on regular basis to the government agencies that are responsible for promotion of rice production across the country (NIA, RiPP).
- Kirinyaga County and Kisumu County governments to ensure dispatch of relevant extension officers to CaDPERP to improve sustainability of gains under the project. NIA on the other hand, needs to take a higher role in the projects under CaDPERP and dispatch dedicated personnel with specific role.
- It is important for NIA through the Principal Secretary, Ministry of Water, Sanitation and Irrigation and Rice Promotion Programme (RiPP) through the Principal Secretary for Crop Development of MoALD, to ensure an Environmental Management Plan (EMP) is developed for each scheme

Lessons Learned for JICA:

- When the guidelines were developed for each of the technologies, some aspects have been inappropriate for farmers and may not be adopted quite easily, due to limited involvement of end-users (farmers). In the future, it then becomes necessary to do so in a participatory manner and put in place a system for regular review of the manuals through different editions. At the same time, the existing manuals and guidelines should be reviewed before the CaDPERP completes.
- The initial stages of the trials focused more on academic approach. This caused adoption rate by farmers became unexpectedly lower due to lack of farmer-centeredness of the technologies developed. Experts in close cooperation with counterparts should become deliberate with the inclusion of expected users of technologies to be developed for efficient rollout and effective adoption. A clear system for sustaining the project activities through continued budgeting by the beneficiary should have been incorporated in the planning phase.

Line planting shown in a paddy field as practiced by one of the successful core farmers

A core farmers using a push-weeder in his paddy field