

India

FY2017 Ex-Post Evaluation of Japanese ODA Loan Project

“Rajasthan Minor Irrigation Improvement Project”

External Evaluator: Nobuyuki Kobayashi, OPMAC Corporation

0. Summary

This project aimed at an increase in agricultural productivity in the project target area through the rehabilitation of existing minor irrigation dams and canal systems, and the promotion of water management and agricultural technology in Rajasthan, thereby contributing to improvements in the livelihoods and living conditions of the beneficiary farmers. This project was to make water accessible to wide range of farmers in Rajasthan where precipitation in the dry season is extremely low. As this purpose is consistent with India’s developmental policy and development needs as well as Japan’s ODA policy, the relevance of this project is high. The cost of the project fell within the plan, but the implementation period exceeded the plan due to the delay in project implementation caused by the delay of the consultancy contract. Therefore, the efficiency of the project is therefore fair. The beneficiary area of the project achieved the target, and two crops out of four crops achieved the expected values in the unit yield of major crops. However, targets for the production volume of the major crops was not set and no data was collected. Thus, it was difficult to sufficiently verify the incidence of project effects. By a comparison of before and after the project, it was confirmed that the income of beneficiary farmers had increased, they had a more balanced diet, and that there was increased expenditure on articles other than daily necessities. Based on the above, the effectiveness and the impact of the project are both evaluated as fair. For the project as a whole, the detailed situations such as whether water tariff is collected in accordance with the state regulation and whether Water Users Associations (WUA) face a constraint in budgets for their activities could not be confirmed. Of the 353 subprojects selected for this project, 189 were under the supervision of the panchayats, but the trend of their O&M budget was not clear. Out of the subprojects visited, most WUA were not collecting the water tariff and this was being a constraint in budgets for their activities. Although the O&M of this project does not have major issues in its institutional, technical aspects, and its status, there are some problems with finance. The sustainability of the effects realized as a result of this project is fair.

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

1. Project Description



Project location



The dam rehabilitated by the project

1.1 Background

Rajasthan is the state of India with the largest land area and is one of the leading granaries in the country. The unique meteorological characteristics of the state are that the average annual rainfall is small and that precipitation is concentrated in the rainy season. To use the limited water resources effectively, irrigation systems were developed in the state in 18th century. The rain water collected in dams and small reservoirs in the rainy season is thus used for agriculture in the dry season. By 1990s, however, deterioration of the irrigation systems themselves, and sediment and water leakage as a result of poor maintenance were making the irrigation systems less efficient. Many irrigation systems were no longer able to provide farmland with enough water. The state had promoted the use of groundwater to supplement surface water, but excess water pumping in response to increases in population and the growing number of domestic animals, as well as expansion of farmland, had caused concerns about the lowering of the groundwater level. To respond to these issues, the Irrigation Department¹ conducted a survey in the late 1990s in preparation for the rehabilitation of minor irrigation systems.

Against this background, the Japan International Cooperation Agency (JICA) conducted a Special Assistance for Project Formulation in 2004 to resolve the issues in the irrigation sector in Rajasthan, which led to the implementation of this project. This project aimed at the rehabilitation of minor irrigation dams and canal systems as well as capacity building for the operation and maintenance (O&M) of the irrigation systems.

1.2 Project Outline

The objective of this project was to increase agricultural production in the project area by the rehabilitation of existing small-scale irrigation facilities and through the dissemination of water management and agricultural techniques in Rajasthan, thereby contributing to the improvement

¹ The name at the time of the appraisal.

of livelihoods and the living conditions of beneficiary farmers.

Loan Approved Amount/ Disbursed Amount	11,555 million yen / 5,351 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 2005 / March 2005
Terms and Conditions	Interest Rate 1.3% Repayment Period 30 years (Grace Period 10 years) Conditions for Procurement General untied
Borrower / Executing Agency(ies)	The President of India/Water Resources Department, State Government of Rajasthan ²
Project Completion	June 2015
Main Contractor(s) (Over 1 billion yen)	—
Main Consultant(s) (Over 100 million yen)	GITEC CONSULT GMBH (Germany)/KIRLOSKAR CONSULTANTS LTD (India)/HAQ CONSULTANTS PVT.LTD (India)/ENV-DAS (INDIA)PVT.LTD (India)
Related Studies (Feasibility Studies, etc.)	“Special Assistance for Project Formulation for Rajasthan Minor Irrigation Improvement Project” (2004)
Related Projects	<ul style="list-style-type: none"> • Rajasthan Water Sector Livelihood Improvement Project (Phase I) (March 2017) • World Bank. “Rajasthan Water Sector Restructuring Project (RWSRP)” (2002-2013)

2. Outline of the Evaluation Study

2.1 External Evaluator

Nobuyuki Kobayashi, OPMAC Corporation

2.2 Duration of Evaluation Study

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

Duration of the Study: November 2017 – January 2019

Duration of the Field Study: January 28 – February 14, 2018, July 10 – July 23, 2018

2.3 Constraints during the Evaluation Study

While the executing agency of this project was the Water Resources Department (WRD), as at the time of this ex-post evaluation, some of subprojects were under the control of the Panchayats. On the sustainability of those subprojects under the jurisdiction of the panchayats³, it was difficult

² At the time of the ex-post evaluation. At the time of appraisal, it was called the Irrigation Department.

³ Panchayat is the local self-governing body in rural areas. There are three layers in the Panchayat system: District Panchayat, Block Panchayat, and Gram panchayat (Secretary and Planning department of the Minister, Ministry of Internal Affairs and Communications (2009) “Administration in India”)

to collect and consolidate the information during the study period since many panchayats have the information on subprojects. The evaluation of sustainability depended, therefore, on the indirect and limited information obtained through the executing agency.

On the effectiveness and the impact, it was difficult to collect and consolidate all information on many subprojects during the study period. For this reason, the effects of the whole project was judged by using the limited number of indicators. In addition, monitoring was not implemented in accordance with the plan, and baseline, target, and actual data for the operation and effect indicators were insufficient. Furthermore, the end line survey used for unit yields by major crops just shows the project effect in a single year and, thus is affected by temporary factors (weather, etc.). From the above reasons, the judgement on the effectiveness / impact is made based on limited information.

3. Results of the Evaluation (Overall Rating: C⁴)

3.1 Relevance (Rating: ③⁵)

3.1.1 Consistency with the Development Plan of India

The 10th five-year National Development Plan (April 2002 – March 2007) was in place at the time of the appraisal. Its focus included an increase of public investment in irrigation facilities and water management, the development and promotion of agricultural techniques, and the diversification of agricultural products. The plan identified insufficient water as a factor hindering overall cropping intensity and placed importance on the expansion of public investment in irrigation facilities and water management as a countermeasure. *The National Water Policy 2002* that covers water resource management overall (formulated in 2002) mentioned on the irrigation sector: a) the maximization of beneficiaries by using all available sources of water, b) the equitable distribution of water and the obviation of the water allocation disparity between farms of different sizes, as well as between regions, c) the introduction of water saving techniques, and d) introduction of participatory water management including WUA. *The State Water Policy* (formulated in 1999) of the state government of Rajasthan resonated with sector policy at the national level, and aimed at the maximization of beneficiaries by usable water resource, fair water distribution in the irrigation sector, and the obviation of water allocation disparity among farms of different sizes and different regions using quantity management and rotational irrigation. The long-term water policy of Rajasthan, *Vision 2045* (formulated in 2000) laid out the maximum use of the water resource reserve, the optimization of water usage, the contribution by users, and the formation and promotion of WUA.

At the time of the ex-post evaluation, *the Three-year Action Agenda 2017/18 – 2019/20* formulated in 2017 by the National Institution for Transforming India Commission (NITI

⁴ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁵ ③: High, ②: Fair, ①: Low

Aayog) stated that 45.7% of the labor population were involved in the agricultural sector and that one of the problems of the sector was the low productivity of the land and water resources in comparison with other countries. The document also pointed to poor access to water in the dry season as the cause of the country's low overall cropping intensity. *The National Water Policy 2012* (formulated in 2012), the national-level plan for the water resource sector at the time of the ex-post evaluation, refers to the fair distribution of water and project participation by a wide range of people including the WUA, aiming at the utilization of minor irrigation systems and water-saving technology. *The State Water Policy 2010* formulated in 2010 by the state of Rajasthan continued to place importance on the fair distribution of irrigation water. It referred to improvement of irrigation efficiency in the upper stream to reduce the disparity in distribution among farms of different sizes as well as between regions. *Vision 2045*, the long-term water policy of Rajasthan, can still be used as reference.

From the time of the appraisal through to the ex-post evaluation, the National Development Policy recognized access to water as a factor hindering the improvement of the overall cropping intensity, and considered infrastructure development in the irrigation sector as crucial for the resolution of this problem. The water sector policy throughout the project period aimed at the obviating of disparity between farms of different sizes as well as between regions. It also counted on the introduction of water-saving technology and the participation of WUA in irrigation projects. This project aimed at the rehabilitation of the irrigation infrastructure, agriculture extension, including water-saving technology, and the formation and capacity building of WUA, thereby enabling access to water by a wide range of farmers. This project, therefore, is considered to be consistent with the national development plan and with water sector policy in India.

3.1.2 Consistency with the Development Needs of India

At the time of the appraisal, Rajasthan ranked 5th in wheat production in India and 2nd in barley production of the country, which made the state the leading agricultural production area⁶. Agriculture played an important role in the state economy as the agricultural population occupied two thirds of its labor population. Agriculture also occupied 34% (based on the price in 1999/2000) of the state's GDP (2003/2004)⁷. In 2004, precipitation in Eastern and Western Rajasthan had been 629.7 mm/ year, and 386.7 mm / year, which was much less than the average in India (1323.5 mm / year; at 36 observation points)⁸. Western Rajasthan had especially little precipitation. The following three points were recognized as developmental problems in the irrigation sector: a) the slow construction of new irrigation systems due to strict financial

⁶ Based on documents provided by JICA.

⁷ Directorate of Economics & Statistics, Rajasthan (2010) "State Domestic Product of Rajasthan 2010"

⁸ Ministry of Statistics and Program Implementation (2017) "Statistical Year Book India 2017"

constraints, b) dysfunction of the existing irrigation facilities due to leakage and sediment in the watercourses, and c) inefficient irrigation water usage caused by insufficient water resource management.

As of the ex-post evaluation, Rajasthan ranked 6th in wheat production in India and 2nd in barley production of the country (data from 2015/2016)⁹. The agricultural population was 15.6 million (2011) which consisted 66% of the labor population. Of the state GDP (2016/2017), agriculture occupied 26% (based on the price in 2011/2012)¹⁰. Precipitation in Eastern and Western Rajasthan (2015) had been 650.4 mm / year and 458.5 mm / year, which was again less than the average in India (1265.3 mm / year; at 36 observation points)¹¹. Furthermore, rainfall in Rajasthan fluctuates greatly by season and 90% of the precipitation is concentrated in the three months between June 15th and September 15th¹². There are approximately 3,900 irrigation systems (of which about 3,800 are small-scale irrigation) in Rajasthan state. Many of the small-scale irrigation have been built for more than 50 years, and the demand for maintenance is enormous. As actual maintenance activities cannot not satisfy the demand, maintenance works have been postponed. Even after the completion of this project, due to delayed maintenance work, the need for the rehabilitation of the irrigation dams and canal systems continues to be high. JICA is therefore supporting the rehabilitation of irrigation dams and canal systems through the “Rajasthan Water Sector Livelihood Improvement Project (Phase I)” (Loan Agreement signed; March 2017).

There was no major change in terms of the developmental needs before and after the project. Rajasthan is India’s leading granary and the agricultural sector occupies a large proportion of both the labor population and GDP. While needs are high in the irrigation system due to the climatic conditions, development of the irrigation system is insufficient. As such, this project is evaluated to be consistent with the developmental needs of Rajasthan.

3.1.3 Consistency with Japan’s ODA Policy

At the time of the appraisal, Japan’s ODA policy for India emphasized poverty alleviation through economic growth, and the focus area for assistance included the poverty agenda¹³. As an approach to poverty alleviation, the direction was set to “promote the alleviation of poverty in rural areas by promoting rural development including that of irrigation systems, and transferring agricultural technology.” JICA’s *Medium-Term Strategy for Overseas Economic Cooperation Operations Policy* raised “rural development that is beneficial to the poor” as the

⁹ Ministry of Statistics and Program Implementation (2017) “Statistical Year Book India 2017”

¹⁰ Directorate of Economics & Statistics, Department of Planning, Rajasthan (2017) “State Domestic Product 2016/2017”

¹¹ Ministry of Statistics and Program Implementation (2017) “Statistical Year Book India 2017”

¹² Commissionerate of Agriculture, Rajasthan (2017) “Rajasthan Agricultural Statistics at Glance 2015-16”

¹³ Ministry of Foreign Affairs. “Official Development Assistance (ODA) Data Book, 2004”

focus area for India. In JICA’s *Country Assistance Strategy* for India (July 2002), “rural development from which poor people benefit” was a priority area.

The objective of this project was to increase agricultural productivity and agricultural income through the rehabilitation of irrigation systems and through technical support. This project objective was consistent with the approach to poverty alleviation stipulated in the ODA policy. JICA’s *Medium-Term Strategy for Overseas Economic Cooperation Operations* mentioned rural development, focusing on the benefits to the poor. As this project aimed at the improvement of the livelihoods of farmers in Rajasthan through the improvement of agriculture productivity, it is consistent with *the Medium-Term Strategy for Overseas Economic Cooperation Operations* and *the Country Assistance Strategy*. Based on the above, this project is deemed to be consistent with Japan’s ODA policy.

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 plan versus actual of the outputs of this project are shown in the following table.

Table 1: The Outputs of this Project (Plan and Actual)

Plan	Actual
<ul style="list-style-type: none"> Rehabilitation of Minor Irrigation Facilities Number of Subprojects: 375 Civil Works: Rehabilitation of Dams, Water Intakes, Irrigation Canals, etc. 	<ul style="list-style-type: none"> Rehabilitation of Minor Irrigation Facilities Number of Subprojects: 322 Civil Works: Rehabilitation of Dams, Water Intakes, Irrigation Canals, etc.
<ul style="list-style-type: none"> Technical Assistance Scope of Assistance: Agriculture Extension, Malaria Prevention, Pro-poor Component, Formation and Capacity Building of WUA, Capacity Building of Government Officials, Strengthening of Project Management 	<ul style="list-style-type: none"> Technical Assistance Scope of Assistance: Agriculture Extension, Malaria Prevention, Pro-poor Component, Formation and Capacity Building of WUA, Capacity Building of Government Officials, Strengthening of Project Management
<ul style="list-style-type: none"> Consulting Services Scope of Services: Engineering and Management, Evaluation and Monitoring Man-Months: International 110M/M, National 438M/M 	<ul style="list-style-type: none"> Consulting Services Scope of Services: Engineering and Management, Evaluation and Monitoring Man-Months: International 81.5M/M, National 659M/M

Source: Ex-ante evaluation, materials provided by JICA, materials provided by the executing agency.

For this project, 393 subprojects were proposed originally. The technical and environmental screening of candidate subprojects resulted in 353 subprojects proposed for rehabilitation and capacity building and 40 subprojects only for capacity building. In 322 subprojects, both rehabilitation and capacity building were completed by the end of the project. Civil work covered from the water source to the watercourse of the minor irrigation facilities. Based on the number

of the target subprojects, the rehabilitation of minor irrigation dams and canal systems reached 86% of the target. Out of the selected subprojects, 31 subprojects could not fully achieve their initial scope due to the reasons such as difficult construction works or incompleteness during the project period¹⁴.

The contents of the support was more or less in accordance with the plan. WRD was a main implementation body for the formation and capacity building of WUA, the Agriculture Department of Rajasthan was for agriculture extension, and the state health department was for malaria prevention. Meanwhile, the selected NGOs supported the implementation of agriculture extension, pro-poor component, and formation and capacity building of WUA. Agriculture extension focused on the technical aspects (introduction of new species, fertilization, pest control, water-saving technology). Workshops for field staff of the Agriculture Department in charge of agriculture extension as well as exhibitions of farming techniques at the subproject sites by government departments such as the Agriculture Department were carried out accordingly. The pro-poor component was carried out with 6 subprojects¹⁵, but this was put on hold during project implementation. According to interviews with people involved in the project, this discontinuation was due to the fact that the NGO responsible for the component could not allocate appropriate personnel in the project target area and could not implement the income generation activities as planned. It was difficult to select a new NGOs and make the income generation activities back on track during the rest of the project period (1 year and 2 months). Regarding the formation and capacity building of WUA, the WRD training institute (Irrigation Management and Training Institute: IMTI) provided training for the staff of the executing agency and officials of WUA on the formation and management of WUA. This project supported a large number of subprojects, and an agreement between the executing agency and a WUA was required for the implementation of each. For this reason, it was necessary to carry out training on the establishment and management of WUA on an unprecedented scale. Since the project supported 336 subprojects which covered the completed 322 subprojects, it is considered that a sufficient number of subprojects was assisted.

The contents of the consulting services were according to the plan. The contracts for “engineering and management” and “evaluation and monitoring” were signed respectively, and carried out. The increase in man-months on the part of domestic consultants was due to a) the extension of consulting services as a result of project delays, and b) supplementing some tasks assigned to international consultants¹⁶.

¹⁴ Out of 31 subprojects, 23 subprojects were partially completed (major part of rehabilitation and capacity building) and 8 subprojects were dropped out.

¹⁵ 6 subprojects were in Karmadia, Shishod, Bhenta ka Naka, Bharai, Modia Mahadev, and Khodi.

¹⁶ Due to the prolonged construction period, the cost of consulting service was increased by 160 m

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual project cost was 7,874 million yen against the planned cost of 14,695 million yen. Even against the adjusted planned cost (13,328 million yen) reflecting the reduction of the cost of civil work, price escalation, and physical contingency (reduction of 1,367 million yen) caused by modification of the outputs (the reduction of the number of subprojects from 375 to 322), the actual cost was less than the plan. The actual project cost was 54% of the plan (before adjustment) and 59% (after adjustment), which was well within the plan. The low actual cost against the plan is considered to be due to the weak Indian rupee, the competitive bidding process, and the reduction of interest during construction due to the reduction of the loan amount.

3.2.2.2 Project Period

The actual project period was 124 months (from March 2005 to June 2015) against the planned project period of 97 months (from March 2005 to March 2013) at the time of the appraisal (see the table below).

The actual project period was 128% of the planned period, which was longer than planned. The main reason for this prolonged project period was the delay of the consulting contracts. As of the appraisal, the onset of consultancy for engineering and project management was assumed to be January 2006. Due to a delay in the recruiting process however, the commencement of consultancy was delayed to April 2008. The delay of the selection process was due to the following: a) the time taken by the executing agency to follow the JICA guidelines, as this project was the first Japanese ODA loan, and b) in accordance with state regulations, the approval of the Rajasthan Financial Department was required when the consulting agreement exceeded a certain percentage (3%) of the project cost. The approval process required a longer period than expected.

Table 2: The Schedule of this Project (Plan and Actual)

	Plan	Actual
L/A Signing	Mach 2005	March 2005
Selection of Consultants	April 2005 - December 2005	June 2006 – March 2008
Consulting Services	January 2006 – March 2013	April 2008 - June 2015
Tendering of Rehabilitation Works	November 2006 – August 2007	April 2009 – January 2011
Rehabilitation Works	September 2007 – December 2011	February 2011 – June 2015
Project Completion	March 2013	June 2015

Source: Documents provided by JICA

3.2.3 Results of Calculations for Internal Rates of Return (Reference only)

(1) Economic Internal Rate of Return (EIRR)

For this ex-post evaluation, the EIRR was recalculated for the 2 completed subprojects for which the EIRR had been computed at the appraisal (see the table below for the conditions of computation). The actual EIRR of the Jilmili subprojects was 10.9% against the planned 13.7%. The EIRR was decreased from that of the appraisal and the decrease of EIRR was due to the reduction of the planned irrigation area. The project cost actually decreased by 20% but the unit cost of operation and maintenance cost increased and the maintenance and maintenance (O & M) cost increased by 70% in real terms. The actual EIRR of the Panwar subproject, on the other hand, was 32.3% against the planned 23.0%. The reason for the latter was the major reduction of the project cost. The financial internal rate of return (FIRR), on the other hand, could not be computed as the executing agency did not gain any financial benefit from the project and there was no mention in the ex-ante evaluation sheet.

Table 3: Conditions for the Computing of EIRR at the Ex-post Evaluation

	Conditions for Calculation
Cost	Project Cost (excluding tax), O&M cost.
Benefit	Expansion of the irrigated area and the economic effect of agricultural products as a result of improved farming practices.
Project period	20 years after the loan agreement
Assumptions	<ul style="list-style-type: none"> Regarding the cost, the conversion factor from the financial price to the economic price was recalculated to be 0.96 based on the trade data (actual) during the project period. Based on the GDP deflator, the nominal price was converted into the real price at the time of the ex-post evaluation (2017). In terms of the benefits, the total benefit calculated at the time of the appraisal was recalculated by multiplying the ratio of irrigated area (actual / planned) and the price change (reflecting the price of agricultural product). The benefit was computed by using the price of agricultural products (wheat, barley, gram, mustard, and cumin) at the time of the ex-post evaluation (2017). The prices of agricultural products at the time of the ex-post evaluation increased by approximately 10-50% from the assumptions of the appraisal.

Although the project cost was within the plan, the project period exceeded the plan. Therefore, efficiency of the project is fair.

3.3 Effectiveness and Impacts¹⁷ (Rating: ②)

3.3.1 Effectiveness

In this ex-post evaluation, the outcome of this project was defined as “increase in agricultural production in the project target area.” At the time of the appraisal, the outcome of this project was assumed to be the improvement in both agricultural productivity of the entire state, and agricultural income. However, considering that the project target area was less than 1% of the cropped area in the state, it was deemed more appropriate to limit the expected range of project

¹⁷ Sub-rating for Effectiveness is to be put with consideration of Impacts.

outcome to that of the project target area, and to set improvement in agricultural income as a project impact.

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

Among the operation and effect indicators set at the appraisal, 3 indicators were directly related to the outcome of this project, “increase of agricultural productivity in the project target area”. These are beneficiary area, productivity of major crops, and unit yield of each major crop. There was not enough data to allow evaluation of the yield of major crops for the project. Neither was the target value determined. As the operation and effect indicators, therefore, the beneficiary area and the unit yield of each major crop were mainly examined.

The beneficiary area was defined in the appraisal as the irrigable command area (ICA) based on the volume of water reserved in dams, and the data was collected from all subprojects. As shown in the following table, the beneficiary area achieved the target value set at the appraisal. Of the 5 subprojects¹⁸ where site surveys were conducted, four were discharging water in the dry seasons and have become an important water source. As one subproject (Dantli Bund) did not have sufficient rainfall, the supply of water was stopped to maintain the water level of wells¹⁹. The benefits of this subproject were therefore not readily accessible to those farmers who did not own wells. Based on the above, it should be noted that there were differences in the level of benefit even within the beneficiary area.

Table 4: Beneficiary Area of this Project

	Baseline	Target	Actual	
	2004	2015	2015/16	2016/17
		2 years after project completion	The year of project completion	A year after project completion
Beneficiary area (ha)*	89,754	101,938	116,000	118,300

Source: Documents provided by JICA. Documents provided by the executing agency.

The baseline was not set for the unit yield of major crops at the time of the appraisal. To create the baseline, in the 2010/2011 season, a sample survey was conducted with beneficiary farmers in 22 subprojects (Number of responding households: 2,297 households). In 2014, as the end line survey, a sample survey was conducted with beneficiary farmers in 20²⁰

¹⁸ Site surveys were conducted at 5 subproject sites: (Para-I, Govta, Ronija, Dantli Bund, and Tokra) in this ex-post evaluation.

¹⁹ According to the local hydrology engineers, it is thought that the dam water penetrates into the ground and the water level of the groundwater rises.

²⁰ Only 20 subprojects where civil work had progressed sufficiently for the emergence of the effect were surveyed. These subprojects were Needer, Ram Sagar Lumbahar, Reria Dam, Shodenpura, Tal Sarowar Arnia, Kana, Kiwandi Bankli, Meli, Seli Ki Nal, Khatka, Mogra, Ronija, Ankar Sol Ka Naka, Bandora, Biyapada Tank, Kala Bhata, Mandol, Modia Mahadev, Raithlias, and Unchakia.

subprojects (Number of responding households; 1,991 households)²¹. As the target values for the unit yield of the major crops were not defined during the project period, the estimation of the unit yield used for the computation of the EIRR during the appraisal (the expected unit yield of 6 target subprojects immediately after project completion) was used as a reference for evaluation of the achievement. Of four crops (wheat, mustard, gram, and barley)²² for which the achievement level could be evaluated using the baseline, the end line, and conditions for the EIRR computation at the appraisal, two crops (wheat and barley) achieved the expected value (see the table below). While the annual rainfall (state average) at the time of the baseline survey was 436.6 mm (2009/10), that for the time of the end-line survey was 583.6 mm (2013/14). The amount of rainfall was relatively high for the time of the end-line survey. The improved water supply during the dry season as a result of this project and agriculture extension (such as the introduction of new varieties and their cultivation methods, mixed use of chemical fertilizer and compost) enabled the introduction of higher yield species of wheat, which, in turn, led to the achievement of a unit yield that exceeded the expected value. Barley also reached the target value of unit yield due to the increased water supply and the farming technology (introduction of high yield variety) promoted by this project. The unit yield of mustard and gram improved after the project, but did not reach the target.

Table 5: Unit Yield of Major Crops in the Project Target Area

	Unit: 100kg/ha			
	Wheat	Mustard	Chickpeas	Barley
A: Baseline Survey* (2010-11)	23.73	11.17	9.41	20.39
B: End line Survey** (2014)	35.07	11.68	12.45	26.67
C: EIRR computing conditions (Unit Yield immediately after project completion)	30.00	14.00	14.00	25.00
B-A: Change of Unit Yield (Actual)	11.34	0.51	3.04	6.28
C-A: Change of Unit Yield (Target)	6.27	2.83	4.59	4.61
Achievement Rate ((B-A)/(C-A))	181%	18%	66%	136%

Source: Documents provided by JICA, Baseline survey, End line survey.

*The number of respondents in the baseline survey was 2,297 households. The respondents owned 2,170 ha in total.

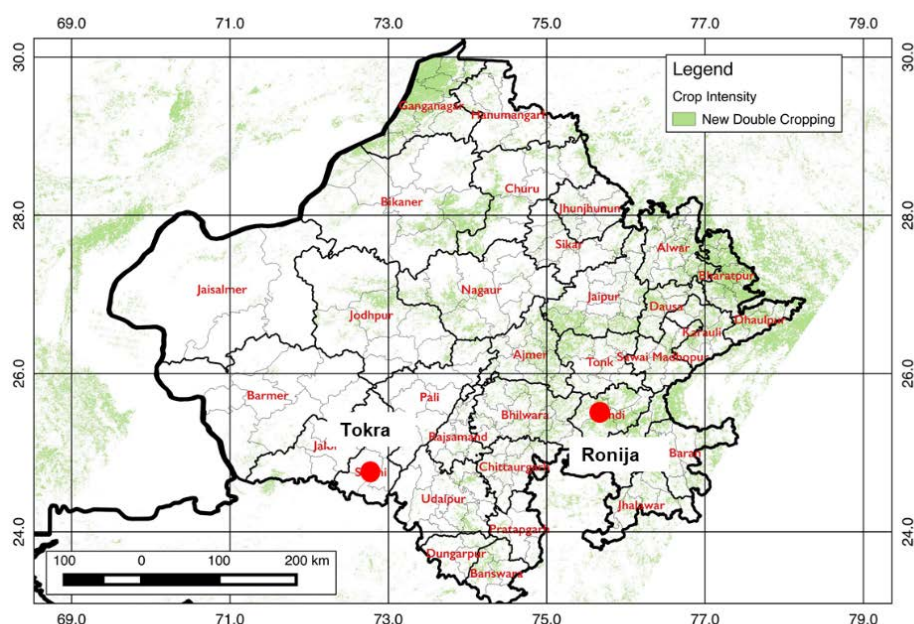
**The number of respondents in the end-line survey was 1,991 households. The respondents owned 2,377 ha in total.

²¹ As the samples were not randomly selected, statistical representativeness is not assured. Nonetheless, samples were selected as one-third from each of the head/middle/tail of canals and attention was paid in the sampling method to the reduction of bias.

²² While wheat and barley are major grains with less price fluctuation due to seasons and varieties, mustard and chickpeas are cash crops with wide price fluctuations caused by seasons and quality.

[Column] Use of the Remote Sensing Data

To objectively analyze the effectiveness and impact of a project where the sites are dispersed, it is necessary to select sites for the site visits and data collection so that the evidence on the incidence of project effects is collected without a bias. When the subprojects are dispersed over a large area, as in this project, it is difficult to capture the whole picture on the incidence of project effects prior to the field survey. For this ex-post evaluation, remote sensing data provided by the Japan Aerospace Exploration Agency (JAXA) was used to select the subproject sites for the visits. This enabled the selection of sites from both districts where the number of harvests per year had increased from once (before the project) to twice (after the project: green parts on the map) and the districts where there was no change.



Interviews were conducted at each subproject with the beneficiary farmers and other people involved in the project (the staff of WRD and the agriculture department) regarding the changes before and after the project. Both situations are shown below.

Ronija subproject (Bundi district): Of the 3 farmers interviewed, one farmer had started cultivation in the dry season and introduced high yield wheat and vegetables after the project. An adjacent area has abundant water and large scale cultivation of vegetables and fruit was underway.

Tokra subproject (Sirohi district): Three farmers interviewed were cultivating during the dry season before the project, and none expanded the areas under cultivation after the project. The water supply in the dry season was increasing, however, high yield wheat which requires more water was being introduced. The Tokra subproject continued to supply water, but there were irrigation dams and canal systems that stopped the water supply in adjacent areas.

3.3.1.2 Qualitative Effects (Other Effects)

(1) Expansion of horticulture and cattle breeding

In the qualitative study²³, beneficiary farmers were interviewed about the qualitative changes in the agricultural sector brought by the irrigation dams and canal systems at six subprojects²⁴. The results showed that the rehabilitation of the irrigation dams and canal systems had contributed to the expansion of horticulture and cattle breeding²⁵. In terms of horticultural crops, in the area with good access to urban areas, there were farmers who cultivated vegetables (onions, cabbages, etc.) during the dry season. In areas without good access to urban areas, it was observed that the introduction of vegetable cultivation was introduced, and that the crops the produced were exchanged, sold in adjacent areas, or consumed at home. Vegetable cultivation requires more water than grain cultivation, and the increase of irrigation water led to this expansion. The interviews also revealed that farmers had begun to raise cattle, or had switched to a breed with a higher milk yield after the project. Farmers either sell the milk to dairy cooperatives, or manufacture dairy products for self-consumption. As a motivation for the expansion of cattle breeding, it was mentioned that the increase of irrigation water had made it easier to obtain fodder and water during the dry season.

(2) Use of water flow meters

This project placed water flow meters at 326 subprojects and provided the village water masters of the WUA with training on how to use them. As of the ex-post evaluation, to objectively measure water volume for the fair distribution of water among beneficiary farmers, water flow meters were being used by the executing agency staff and the farmers when discharging water in the dry season.



The water flow meter installed by this project

Executing agency staff who were working in

the O&M of the irrigation dams and canal systems pointed out that the introduction of the water meters lessened the number of complaints from farmers that water distribution to executing agency was arbitrary.

²³ For founding quantitative effects, interviews were conducted with beneficiary farmers (19 men and 5 women) at 6 subprojects (Para-I, Govta, Ronija, Talwas, Dantli Bund, and Tokra) of the project in the qualitative study.. For avoiding a bias in the upstream / midstream / downstream of the irrigation canal, 4-5 farmers (including 1 female) were selected for each sub-project except Tarwar. In Talwas, a beneficiary farmer (1 person) was interviewed on horticulture crops.

²⁴ In the state of Rajasthan , precipitation increases from the west to the east, so the subprojects to be surveyed were selected from the west (Tokra), the center (Para-I, Govta), and the east (Ronija, Talwas, Dantli Bund) respectively with attention to the prevention of bias.

²⁵ Interviews with staff of the executing agency and the Agricultural Agency show that horticulture (mainly vegetables) was introduced after the development of the irrigation systems in the whole project.

3.3.2 Impacts

For this ex-post evaluation, the impact of this project was set as “the improvement of livelihoods and living conditions among the beneficiary farmers.” Although poverty reduction in the entire state was included in the impact when the project objective was set at the appraisal, the beneficiary land area was less than 1% of the total cropped area of the state (2014/15: 24.24 million ha)²⁶. As the contribution of this project to poverty reduction in the entire state was very limited, the incidence of the project effects was analyzed mainly taking into account changes in the livelihoods of the beneficiary farmers in the project target area.

3.3.2.1 Intended Impacts

(1) Quantitative impacts

The end line survey, which mentioned in “3.3.1.1 Quantitative Effects (Operation and Effect Indicators)”, gathered information on household income in the project target area, which revealed that agricultural income made up 50% of the entire household income. The end line survey referred to the increase of both agricultural income per unit and annual household total income when comparing the situation before and after the project. While the former marked a 77% increase (baseline survey: 17,853 India rupee/ha, end line survey: 31,624 India rupee/ha), the latter marked a 53% increase (baseline survey: 63,328 India rupee, end line survey: 96,819 India rupee). The rate of increase exceeded that of inflation in the same period (24.1% based on the GDP deflator between 2010 and 2014). Meanwhile the factors other than this project (the crop market situation, changes in income other than that from agriculture) also influenced agricultural income per unit area and the household income, and thus impacts cannot be credited solely to this project. The project, still, is assumed to have contributed to the increase in income that occurred during the project implementation period.

The rate of poverty decreased from 34% at the time of the baseline survey to 21% at the time of the end line survey. From the income data mentioned above, it can be presumed that the income increase partly brought by the project formed one of the factors that led to the reduction of the poverty rate.

Table 6: Transition of the Poverty Rate

	Above the poverty line	Below the poverty line*	Unknown	Total
Baseline survey (2010)	61%	34%	5%	100%
End line survey (2014)	77%	21%	2%	100%

Source: End line survey report

Note: “Below the poverty line” is defined as the households that own the ration card issued to those below the poverty line set by the Indian government (Minimum needs basket method).

²⁶ Commission of Agriculture (2017) “Rajasthan Agricultural Statistics at a Glance 2015-16”

(2) Qualitative Impacts

In the qualitative survey, beneficiary farmers were interviewed about changes in diet and household expenditure as qualitative impacts.

The results of the interviews revealed that the farmers' diets had become more balanced after the project. In terms of food consumption, both men and women said that they consumed more dairy (yogurt, butter and cheese), vegetables and fruit after the project. The interviews with the beneficiary farmers confirmed the increase



Vegetable cultivation in the project area

in the consumption of food items other than the staples of the project target area (wheat and barley). As mentioned in the section “effectiveness,” “3.3.1.2 Qualitative Effects (other effects),” the increase in farmers who cultivate vegetables and produce dairy products for home consumption led to changes in the patterns of food consumption. Fruit, on the other hand, was often being purchased. The increase in fruit consumption therefore is assumed to have been the result of increased income.

As items for which expenditure had increased after the project, men who were interviewed mentioned farming equipment, motor cycle, house repairs, social affairs (weddings, religious rituals) and so on. The interviews with women revealed increases in the purchase of clothes and jewelry. It is considered that decisions about expenditure made by women are increasing. It is surmised that the increase of income is enabling a tendency to allow both men and women to purchase relatively costly goods, and to spend more on goods that are beyond the necessities of life. In terms of expenditure on education, it was difficult to spot a clear trend after the project as this expense depends also on the age of the children in each family and was affected by factors other than income.

3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

JBIC Guidelines for the Confirmation of Environmental and Social Considerations (2002) were applied to this project, the category being FI²⁷. Based on the agreement at the time of the appraisal, the engineering and management consultant reviewed the probable impact of the subprojects on the natural environment during project implementation. As a result of the review, those subprojects that could have a large impact on the environment were deemed noneligible for the project. The questionnaire response from the executing agency did not point out any

²⁷ This category is applied when confirmation of environmental and social considerations is not possible at a loan agreement due to the unestablished scope of a project at the appraisal.

negative impact on the natural environment during project implementation. There was no negative impact on the natural environment observed either during the site surveys at the time of the ex-post evaluation.

(2) Resettlement and Land Acquisition

According to the questionnaire response from the executing agency, there was no resettlement or land acquisition. The interview with the executing agency confirmed that the project did not require land acquisition as it was to rehabilitate existing minor irrigation dams and canal systems.

(3) New Initiatives of This Project

The project was the first large-scale irrigation rehabilitation project since the formulation of the WUA operational provision in Rajasthan in October 2002. The project introduced partnerships with NGOs to provide a variety of assistance to WUA in an extended area. Six NGOs²⁸ were selected and each NGO was engaged in the support of WUA in the assigned area (2-7 districts). Through this project, many executing agency staff received training on the operation of WUA at IMTI, were able to familiarize themselves with assistance to WUA, and then to experience cooperation with NGOs. Furthermore, for this project, the executing agency established a corpus fund worth 200,000 India rupees for each subproject to strengthen the financial base of WUA. The fund was managed in bank accounts jointly opened by the executing agency and WUA, and interest is spent on the O&M of the irrigation facilities. The ODA loan project that follows this project, "Rajasthan Water Sector Livelihood Improvement Project (Phase I)," has a plan to continue the above mentioned cooperation with NGOs as well as the establishment of the fund.

WUA have a major role in enhancing and sustaining the project effects of irrigation projects. As stated above, this new approach was introduced in this project to build the capacity of WUA. This initiative is incorporated in the subsequent project.

Among the indicators to show the outcomes of this project, that of beneficiary area of the project reached the target, and as for the unit yield of major crops, two crops out of four achieved the expected values. Thus, its achievement level of outcome is moderate. On the other hand, monitoring of the production volume of major crops was not carried out in accordance with the plan. The targets for the production volume of major crops was not set and no data was collected. Thus, it was difficult to verify the achievement of project targets. Through a before-after comparison of the project, though it does not necessarily show the pure effect of the project, the increase in farmers' income leading to a more balanced diet, and the increase in expenditure on

²⁸ The NGOs were not those which implemented the pro-poor component.

articles other than daily necessities were confirmed. In view of this above, the project has achieved its objectives to some extent, thus effectiveness/impacts of the project is fair.

3.4 Sustainability (Rating: ②)

3.4.1 Institutional / Organizational Aspect of Operation and Maintenance

According to the plan about O&M of each subproject after the completion of the civil work, at the time of the appraisal, it was arranged that WRD would oversee the O&M of the subprojects where the culturable command area (CCA) was over 300ha, while panchayats would oversee those with less than 300ha. As of this ex-post evaluation, the O&M work followed this initial structure. Of the selected 353 subprojects, 189 were under the supervision of the panchayats. Each subproject formed more than one WUA, each of which selects its officers by election every 5 years.

Interviews with people related to the project, at the time of ex-post evaluation, revealed that WRD or panchayats were carrying out the O&M work for the dams and related facilities as well as for the irrigation canals other than watercourses, while WUA were taking responsibility for the O&M of the watercourses. Within WRD, it was found that the division office was taking responsibility for the formation of O&M plans and budget management while the sub-division office was in charge of the actual O&M work of the individual irrigation dams and canal systems (management of the civil work contracts and progress as well as the monitoring of the quality of the civil work). Within panchayats, the duties were divided in the manner that the district panchayat supervises the overall O&M, the block panchayat formulated the plan for O&M, and the gram panchayat implements²⁹ the O&M work.

There was no increase in the number of engineers at WRD over the past few years: 1,403 in April 2015, 1,218 in April 2016 and 1,317 in April 2017. According to questionnaire responses and the interview with the executing agency, the rehabilitation work was supposed to be commissioned to contractors in principle and there was no shortage of engineers. Within the panchayats, engineers were allocated to district panchayats and block panchayats and the district panchayats were seconded by WRD staff.

It is considered that there are no organizational issues that negatively affect sustainability as the management structure of O&M is clearly established for the rehabilitated irrigation dams and canal systems of this project, and as the number of engineers is stable.

3.4.2 Technical Aspect of Operation and Maintenance

During the project, training was conducted for WRD staff and WUA officers on participatory irrigation management, water canal operation and maintenance, establishment and operation of WUA, etc at IMTI. A total of 212 training sessions were organized during the project

²⁹ Gram panchayats are responsible for the O&M work for not only the irrigation, but also for the agricultural roads.

implementation, and the number of participants amounted to 6,203. In addition, IMTI conducted the training of WUA village water masters on the formulation of water distribution plans, the control of water flow, and the management of water tariffs. IMTI was a permanent training institute, and as such, at the time of the ex-post evaluation, it continued training for WRD staff and WUA officers as well on subjects such as participatory irrigation management and canal maintenance and the formation and management of WUA. In addition to IMTI, other public training institutes and universities provide technical training for WRD staff (on the use of PC, irrigation services, GIS, etc.). From the interviews with the division and the subdivision offices of the executing agency, it was understood that executing agency staff received training once a year or so.

Questionnaire responses from the executing agency stated that manuals were being in place for the O&M of irrigation dams and canal systems, and for the operation of WUA. They also stated that these manuals were being used at the WRD sub-division offices though they were not assumed to be used by WUA.

The situation of the technical level at the time of the ex-post evaluation is as follows.

WRD: Rehabilitation work of this project was carried out by local contractors. Though highly advanced technology was not utilized, the O&M could be implemented at the same technical level as that for the existing irrigation dams and canal systems. In view of the above, WRD seems to have the capacity to carry out the O&M of the facilities rehabilitated in this project as it also was involved in the O&M of irrigation facilities for many years.

Panchayats: As mentioned in the previous section, the O&M of the facilities rehabilitated in this project did not require sophisticated technology. Furthermore, executing agency staff were seconded to the panchayat in order to provide support for the technical aspects of the irrigation sector. The O&M of the facilities rehabilitated in this project, therefore, can be judged to be technically possible.

WUA: The majority of the watercourses where WUA were carrying out O&M were minor earth canals, and beneficiary farmers had the technical capacity to attend to the O&M needs. Interviews with beneficiary farmers revealed that they had the support of the WRD sub-division offices for O&M (repair and canal operation).

Training was provided to WRD staff and the WUA officers during project implementation. At the time of the ex-post evaluation, too, there was an environment that enabled the sustainability of the technical level among executing agency staff through training. The project is concerned with the rehabilitation of existing irrigation dams and canal systems, and the executing agency

staff, the panchayat staff and the WUA staff all have a technical level that assures O&M activities. Based on the above, it is presumed that there are no technical issues that have detrimental effect on sustainability.

3.4.3 Financial Aspect of Operation and Maintenance

The annual expenditure of the executing agency during the past three years shows the trend of increase (see the table below). However, there was a decrease in O&M expenditure in the fiscal year 2016/17 because there was an increase in the expenditure for the rehabilitation of the existing facilities within the construction budget. Comparing the annual expenditure at the time of the appraisal (FY2003/04: 7,224 million India rupees) and at the time of the ex-post evaluation (FY2016/17: 18,648 million India rupees), it can be seen that there is a nominal 2.58-fold increase, while in real terms the increase was 1.35-fold (based on the GDP deflator). It should be noted, however, that there was no provision of maintenance budget by the executing agency for subprojects where the CCA was below 300ha and that were under the supervision of the panchayats. As of the ex-post evaluation, the trend of the O&M budget for these subprojects is unclear as the executing agency does not monitor the subprojects under the supervision of the panchayats.

Table 7: Annual Expenditure of the Implementing Agency

	Unit: million India rupees		
	2014/15	2015/16	2016/17
Total expenditure	11,529	12,873	18,648
Civil work	3,595	4,805	12,606
O&M	3,241	3,490	2,512

Source: Provided by the executing agency

In this project, the executing agency provided each subproject with a corpus fund worth 200,000 India rupees. WUA were entitled to withdraw the interest (about 10,000 – 20,000 yen a year) for O&M activities. For other irrigation facilities outside this project where the executing agency supervised O&M, no corpus fund available for WUA was established. Interviews with the beneficiary farmers showed that the interest from the fund was being used to purchase necessary materials (cement, etc.) for maintenance or to pay for labor. It can be presumed that the interest of the fund was covering the minor O&M needs of the watercourses to a certain extent.

According to the state regulations, WUA were responsible for collecting water tariffs, a part of which WUA could expense. At the majority of the subprojects where site surveys were conducted, however, collection was carried out by the Rajasthan Revenue Department³⁰. In

³⁰ Of the 5 subprojects where site surveys were conducted in this ex-post evaluation, the WUA of 4 subprojects were not collecting the water tariff.

interviews, executing agency staff explained that it was normal practice that the revenue department collected the water tariffs. However, there is the information that WUA have started to collect water tariff recently. On the collection of water tariff, the detailed situation is not clear. Water tariff could not be directly used for maintenance of the irrigation facilities as the tariff went to the state revenue and was expensed as a recurrent budget. Insufficient budget restricted the activities of WUA, having made activities other than minor repair difficult. Individuals related to the project pointed out that there was not much incentive for WUA to collect the water tariff as they could not use it for their own activities. According to the site survey, one subproject Govta introduced a system where the WUA collects the water tariff and its activity budget for its own use. With the support of NGOs, some subprojects collected funds other than the water tariff for their activities, and conducted income generating activities (such as sales of fodders) for the budget of WUA activities³¹.

The annual expenditure of the executing agency was on the increase, and the allocation for O&M was stable. It was difficult, however, to have an accurate grasp of the situation in the subprojects that were not supervised by the executing agency. The trend of the O&M budget in this respect was not clear. For watercourses where WUA were taking responsibility for O&M, it was possible for minor O&M needs to be covered with interest from the fund. For the project as a whole, however, the detailed situations such as whether water tariff is collected in accordance with the state regulation and whether Water Users Associations (WUA) face a constraint in budgets for their activities could not be confirmed.

3.4.4 Status of Operation and Maintenance

As far as it could be observed in the site surveys of 4 subprojects, there was no serious damage (structure collapsing, etc.) in the rehabilitated facilities. At the Tokra subproject, however, the head area of the main canal (not part of the project area) was damaged in the rainy season of 2017. It was planned that the damage would be repaired by the dry season of the same year. In the subprojects where the executing agency took care of the O&M, dirt was cleaned out before the dry season. Weeding was also conducted (once a year). In addition to the O&M carried out by the executing agency, other O&M activities for the waterways were achieved through the



Cleaned canal
(section improved by this Project)

³¹ JICA(2017) “The Preparatory Survey on Rajasthan Water Sector Livelihood Improvement Project: Final Report”

national government's rural job creation program³². Regarding the O&M of the watercourses, WUA discussed measures, although the frequency of discussions differed from one subproject to another. In the subprojects that provided irrigation water, the farmers themselves were participating in the cleaning of dirt and the weeding of the watercourses on average once a year (before the dry season). As mentioned in the previous section, Dantli Bund subproject did not supply water and the irrigation water canal was not in use. Therefore, the cleaning of the waterway did not take place often enough, and the canal was clogged with mud and overgrown with weeds.

In the site survey, no subproject was found where the damage to the rehabilitated facilities was hindering the emergence of the project effects. At subprojects where the irrigation waterways are not in use, however, the cleaning was insufficient.

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

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aimed at an increase in agricultural productivity in the project target area through the rehabilitation of existing minor irrigation dams and canal systems, and the promotion of water management and agricultural technology in Rajasthan, thereby contributing to improvements in the livelihoods and living conditions of the beneficiary farmers. This project was to make water accessible to wide range of farmers in Rajasthan where precipitation in the dry season is extremely low. As this purpose is consistent with India's developmental policy and development needs as well as Japan's ODA policy, the relevance of this project is high. The cost of the project fell within the plan, but the implementation period exceeded the plan due to the overall delay in project implementation caused by the delay of the consultancy contract. Therefore, the efficiency of the project is therefore fair. The beneficiary area of the project achieved the target, and two crops out of four crops achieved the expected values in the unit yield of major crops. However, targets for the production volume of the major crops was not set and no data was collected. Thus, it was difficult to sufficiently verify the incidence of project effects. By a comparison of before and after the project, it was confirmed that the income of beneficiary farmers had increased, they had a more balanced diet, and that there was increased expenditure on articles other than daily necessities. Based on the above, the effectiveness and the impact of the project are both evaluated as fair. For the project as a whole, the detailed situations such as whether water tariff is collected in accordance with the state regulation and whether Water Users Associations (WUA) face a

³² Called the MGNREGA program as it is conducted based on the Mahatma Gandhi National Rural Employment Guarantee Act.

constraint in budgets for their activities could not be confirmed. Of the 353 subprojects selected for this project, 189 were under the supervision of the panchayats, but the trend of their O&M budget was not clear. Out of the subprojects visited, most WUA were not collecting the water tariff and this was being a constraint in budgets for their activities. Although the O&M aspect of this project does not have major issues in its institutional structure, technical aspects, and its status, there are some problems with finance. The sustainability of the effects realized as a result of this project is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

At the subproject sites of this project, the tariff paid by the beneficiary farmers could not be used directly for O&M activities of WUA. Therefore, WUA faced a constraint in an operational budget at many subprojects. During the project implementation, however, the WUA in some subprojects collected additional funds on top of the water tariff. WUA started income-generating activities and used income as their operational budget. For revitalizing the activities of WUA in the future, it is desirable that the WRD analyze the situation at each subproject, consider the introduction of similar schemes, and gradually expand the coverage of the schemes.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

Setting the Operation and Effect Indicators

This Project did not make a final selection of subprojects at the appraisal and it was planned to select appropriate subprojects through a detailed survey after project commencement. Thus, the targets were not set for some of the effect indicators at the time of the appraisal and it was planned that appropriate targets would be set for the selected subprojects after commencement of the project. However, no target was set during the project implementation and the executing agency and JICA did not make an agreement on targets. In the case where subprojects are selected after the commencement of a multisite project, it is recommended that operation and effect indicators are reviewed in consideration of project scope, that JICA agrees with the executing agency for data collection in a timely manner, and that monitoring is implemented in accordance with the agreement. Moreover, it is desirable to assess types of crops to measure production volume and unit yield in operation and effect indicators, reflecting characteristics of subprojects area and types of crops. The executing agency can also provide guidance to farmers for the achievement of

project targets based on the latest state of operation and effect indicators such as the latest production volume of crops and the unit yield in the target area through monitoring.

The criteria for NGO selection

There was a pro-poor component in this project, but it was halted during project implementation. The reason for the discontinuation was that the NGO responsible for this component could not allocate appropriate staff in the project target area, which hindered the implementation according to plan of the livelihood improvement activities. In view of the above, where livelihood improvement activities are carried out through cooperation with NGOs, it is critical that there are personnel who are well informed of the target area, and who also have the necessary knowledge about the livelihood improvement activities concerned. It is therefore suggested that the selection criteria of NGO is carefully set, in order to obtain a sufficient number of personnel with the required capacity in the project target area. It is also desirable that NGO issues are grasped at an early stage through monitoring, and that countermeasures are considered.

The establishment of a monitoring system where the executing agency does not supervise the O&M

During the appraisal, it was assumed that, after the completion of civil work in subprojects, the O&M of some of the subprojects would be supervised by the panchayats rather than by the executing agency. However, there was no system envisaged to enhance the monitoring of those subprojects supervised by the panchayats. This situation made it difficult to collect some of the operational indicators set in the appraisal for the purpose of the ex-post evaluation. Information concerning sustainability was also limited. In cases where it is already evident during the appraisal that the executing agency would not supervise the O&M, it is desirable that the related organizations responsible for the O&M be officially incorporated into the monitoring system and that agreements be signed with these organizations regarding the provision of information after project completion.

End

Comparison of the Original and Actual Scope of the Project

Item	Plan	Actual
1. Project Outputs		
Rehabilitation of Minor Irrigation Facilities	<ul style="list-style-type: none"> • 375 subprojects 	<ul style="list-style-type: none"> • 322 subprojects
Technical Assistance	<ul style="list-style-type: none"> • Agriculture Extension • Malaria Prevention • Pro-poor Component • Formation and Capacity Building of WUA • Capacity Building of Government Officials • Strengthening of Project Management 	<ul style="list-style-type: none"> • Agriculture Extension • Malaria Prevention • Pro-poor Component • Formation and Capacity Building of WUA • Capacity Building of Government Officials • Strengthening of Project Management
Consulting Services	<ul style="list-style-type: none"> • International: 110M/M • National: 438M/M 	<ul style="list-style-type: none"> • International: 81.5M/M • National: 659M/M
2. Project Period	March 2005 – March 2013 (97 months)	March 2005 – June 2015 (124 months)
3. Project Cost		
Amount Paid in Foreign Currency	935 million yen	348 million yen
Amount Paid in Local Currency	13,760 million yen (5,733 million INR)	7,526 million yen (3,653 million INR)
Total	14,695 million yen	7,874 million yen
ODA Loan Portion	11,555 million yen	5,351 million yen
Exchange Rate	1INR = 2.4 yen (As of August 2004)	1INR = 2.06 yen (Average between 2005 and 2015)
4. Final Disbursement	July 2015	