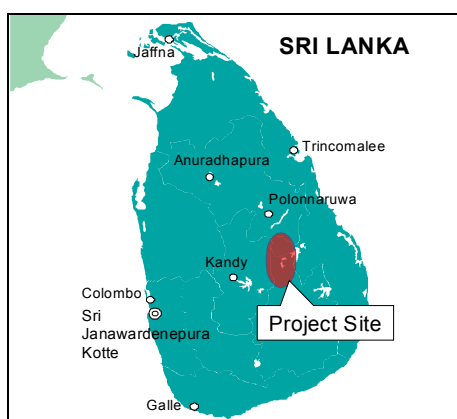


Ex-Post Evaluation of Japanese ODA Loan Project  
“Mahaweli System C Upgrading Project”

Hisae Takahashi  
Ernst & Young Advisory Co., Ltd.

## 1. Project Description



Map of Project Area



Rehabilitated D-F Canal of Irrigation Scheme

### 1.1 Background

The Mahaweli System C area was included in the Mahaweli Ganga Development Project which was implemented to solve the severe food and power shortages in the late 1960s. The Japan International Cooperation Agency (JICA) and the World Bank (WB) implemented the joint financing projects of Mahaweli Development Project I and II and supported the construction of an irrigation system in the Mahaweli System C area. As a result, the settlement of 20,000 families and the production of farm products were achieved in this area.

On the other hand, the agricultural sector of Sri Lanka at that time absorbed a large part of the national budget, and in particular the cost devoted to the irrigation facilities caused fiscal deficits. Based on this, the government of Sri Lanka introduced the idea of participatory agriculture management, and a policy of transferring the operation and maintenance of the end irrigation facilities to Farmers Organizations (FOs). The steps of this transfer were started in the Mahaweli System C area, and the Mahaweli Authority of Sri Lanka (MASL) executed the Program by its own funds in aiming for the establishment of an activation model for the FOs. However, the irrigation facilities that were becoming too old had to be repaired to transfer them to the FOs. Following this situation, Special Assistance for Project Sustainability (SAPS) was implemented in 1995 by JICA. As a result, the necessity of assistance capable of instilling self reliance in the FOs through the diversification of crops, improving productivity for crops like rice, agricultural financing for farmers, and so on was pointed out. In response to the results, the execution of this project in the Mahaweli System C area was

decided upon.

## 1.2 Project Outline

The objective of this project was to increase the productivity and the quality of paddy in the Mahaweli system C area by strengthening the FOs and agricultural management training, as well as the rehabilitation of the irrigation system, thereby contributing to the increase of the farmers' income.

Approved Amount / Disbursed Amount	3,737 million yen / 3,077 million yen
Exchange of Notes Date/Loan Agreement Signing Date	June 1997 / August 1997
Terms and Conditions	Interest Rate : 2.3% Repayment Period :30 years (Grace Period: 10 years) Conditions for Procurement : General Untied
Borrower / Executing Agency	Democratic Socialist Republic of Sri Lanka / Mahaweli Development Authority of Sri Lanka
Final Disbursement Date	November 2006
Main Contractor	—
Main Consultant	Nippon Koei Co., Ltd.

## 2. Outline of Evaluation Study

### 2.1 External Evaluator

Hisae Takahashi (Ernst & Young Advisory Co., Ltd.)

### 2.2 Duration of Evaluation Study

Duration of the Study: December 25, 2009 – November 29, 2010

Duration of the Field Study: February 24 – March 21, 2010 and June 12 – 30, 2010

## 3. Results of the Evaluation (Overall Rating: B)

### 3.1 Relevance (Rating: a)

#### 3.1.1 Relevance with the Development Plan of Sri Lanka

The Public Investment Plan (PIP) 1996-2000 that was the development policy in Sri Lanka as of the time of the appraisal attached importance to the “Acceleration of economic growth” and “Impartial distribution of growth.” One of the emphasized fields was “Investment in infrastructure in rural areas.” Moreover, the policy for agriculture, forestry, and fisheries puts the priority issues as “Improvement of agricultural productivity and income”, and placed importance on “Infrastructure maintenance management such as roads for irrigation and agriculture by farmers.”

The Mahinda Chintana Ten Year Plan (2006-2016) that is the present development policy also aims at the “Improvement of basic infrastructure in rural areas” and “Regional development and poverty reduction through community development,” including irrigation facilities, and it upholds “Securing food and income improvements to small-scale farmers” as a priority area.

In addition, the “Achievement of food self-sufficiency,” “Improvement of the productivity for paddy,” “Provision of agricultural loans,” as well as “Participation of community-based organizations” have been placed as priority items in the Ten Year Development Project for Agricultural Policy. This project is expected to contribute towards rice production and increasing farmers’ income through strengthening the FOs and the improvement of irrigation systems. Thus, the project corresponds to the national and other relevant development plans of Sri Lanka both at the times of the appraisal and ex-post evaluation, and its relevance is thus extremely high.

### 3.1.2 Relevance with the Development Needs of Sri Lanka

The concept of participatory agriculture management was introduced in Sri Lanka at the time of the appraisal, and a policy of transferring the operation and maintenance of the end irrigation facilities to the FOs was announced. However, the handing over of the on-farm irrigation facilities to the FOs with the participatory management concept may not be advanced unless rehabilitation work on the damaged facilities is properly carried out. Furthermore, strengthening the FOs in terms of credit, the procurement of inputs, and so on was necessary in order to secure the self reliance of the FOs.

The major agricultural product in this area is paddy. The main farm product in the same region is still rice, and there is constantly a great need for the restoration of the end irrigation facilities where the productivity is to be improved. In addition, because the FOs are bearing the operation and maintenance of the end irrigation facilities as of now, needs and the importance for strengthening the FOs is high.

### 3.1.3 Relevance with Japan’s ODA Policy

At the time of the appraisal, Japan’s ODA policy towards Sri Lanka placed importance on the “Improvement of infrastructure for agriculture production” and “Increasing income in rural areas” for the development of agriculture, forestry, and fishing. In addition, JICA’s assistance policy to Sri Lanka’s agricultural sector was described clearly as follows, “Aiming to improve the efficiency of existing facilities instead of the construction of new or large scale agricultural facilities.” It is important to aim to improve the living standard and income level of farmers, which account for the majority of the population. Since the project aims to increase the income of farmers through the refurbishment of existing irrigation facilities, its relevance with Japan’s ODA policy for the agricultural sector in Sri Lanka is consistent.

Thus, this project has been highly relevant with the country’s development plan, development needs, as well as Japan’s ODA policy, therefore its relevance is high.

### 3.2 Efficiency (Rating: b)

#### 3.2.1 Project Output

The project consists of the following: strengthening of FOs, construction of an agricultural management training center, rehabilitation of irrigation canal systems, and consulting services for project implementation. The table below shows the actual output in comparison with the original plan.



Table 1: Comparison of Planned and Actual Outputs

Output	Original Plan	Actual Plan
<b>1. Strengthening of FOs</b>		
(1) Restoration of D-F <sup>Note 1</sup> Canals	7,200 D-F Canals	7,200 D-F Canals
(2) Credit Facilities (Agricultural Loans)	1) Expansion of Group Cultivation Loans 2) Relief Scheme for Defaulters 3) Improvement of the Institutional Support System 4) Enterprise & Operation capital loan for the FO Federation 5) Revolving Fund	1) Revolving Fund
(3) Construction and Rehabilitation of Storage Facilities	1) Refurbishing of WFP <sup>Note 2</sup> Warehouses 40 nos. 2) Farm Input Storage Facilities 9 nos. 3) Agricultural Product Storage Facilities 9 nos.	1) Refurbishing of WFP Warehouses 25 nos.
<b>2. Construction of Agricultural Management Training Center</b>		
(1) Training Center	Construction of Training Center	Refurbishment of Training Center
(2) Procurement of Equipment	Procurement of Agricultural Machinery, Office & Teaching Equipment, Access Roads, Facilities Supplying Water & Electricity	Procurement of Agricultural Machinery, Water-supply System, Access Roads, Fences & Roads for Farms, Canals in Farms
<b>3. Rehabilitation of Facilities</b>		
(1) Trans-basin Canal <sup>Note 3</sup>	Rubber Seal Stop Log Concrete Lining Mastic Filter Joint Filter Under Drain Pipe	Gate Rehabilitation Work Stop Log Fabrication Work Rehabilitation of Stop Log House Replacing by Pass Gates Repairing Skin Plates & Girders Rehabilitation of O&M Road Trans-basin Canals and Floodgate
(2) Zone 3-6 <sup>Note 4</sup>	Concrete Lining 20 km Gate Replacement 80 nos. Earth Works & Weed Removal for Canal System	Concrete Lining 20 km Gate Replacement 80 nos. Ulhitiya Spill Tail Improvement Hungamala Ela Drainage Improvement Further Improvement of Irrigation Facilities Improvement of the Water-supply System Rehabilitation of Main and Branch Canals

(3) Procurement of O&M and Office Equipment	O&M Equipment Equipment for Project Management	Revised the actual requirement and changed the type and quantity within the budget.
(4) Consulting Services	501 M/M Monitoring & management of project activities Plan, implementation & monitoring of all activities in connection with FOs Survey, design and construction supervision of project facilities	537 M/M

Note 1: D-F Canal indicates end irrigation waterways called “Distribution Canals” and “Field Canals.” In addition, each FO member of an FO is a farmer in this distribution waterway downstream. Field Canals indicate the waterway where the Distribution Canals exists further in the downstream.

Note 2: WFP is an abbreviation of World Food Program.

Note 3: Trans-basin canals indicate main irrigation canals where the reservoir, etc., and the end irrigation waterway are connected.

Note 4: There is Zone 1-Zone 6 in the Mahaweli C area, and the target areas of this project are the four Zones of Zone 3-Zone 6. In these four zones, there are six blocks, and each FO belongs to each block.

As shown in Figure 1, this project targeted the Mahaweli System C area which is situated along the right bank of the Mahaweli River. The basic designs outlined by the appraisal were reviewed based on the local situations when this project was implemented, and the consequent major modifications were as follows.

#### 1) Credit Facilities (Agricultural Loan Scheme)

As of the time of the appraisal, the government of Sri Lanka had taken a policy decision to “write off cultivation loans<sup>1</sup>”. At that time, write offs were repeatedly conducted by the government, and consequently there were a lot of farmers who had the recognition that “Loans where public support was received do not need to be repaid” or “It is capital similar to a subsidy.” Under such circumstance, MASL judged that it was inappropriate to implement such programs and only the revolving fund scheme was executed.<sup>2</sup> Loan schemes implemented under this project were not covered by the government policy to write off cultivation loans. Considering the fact that the write off of cultivation loans was frequently implemented, and subsidies to farmers were introduced by the government, it was appropriate to scale down the agricultural loan scheme.

#### 2) Construction/Refurbishing of Storage Facilities

As of the time of the appraisal, 40 storage facilities were planned to be refurbished or constructed, however the Resident Project Manager (RPM) of the Mahaweli C area of MASL decided to reduce this to refurbishing 25 storage facilities based on their past experiences. The main reasons for this change were decided due to the lack of the capacity of the FOs which were to

<sup>1</sup> Cultivation loans are loans which are used for purchasing seeds or fertilizer by farmers.

<sup>2</sup> Under this project, only the revolving fund scheme was supported among the five originally planned credit schemes. However, some credit schemes such as the “expansion of group cultivation loans” and “enterprise and operation capital loans for FO Federations” were partially included in the revolving fund system. Moreover, for the implementation of the revolving fund, the Sri Lankan side proposed that the overall operation be managed by MASL and that operations such as loans and upgrades would be carried out by Sri Lankan banks (Uva Development Bank and Rajata Development Bank). This received approval from the JICA side and the scheme was implemented.

take responsibility for operation and maintenance after project completion. According to the beneficiary survey to farmers, the lack of storage facilities was partially confirmed. However, it is a realistic and appropriate change that is based on the current state of the operation and maintenance capacity viewpoint of the FOs.

### 3) Construction of the Agricultural Management Training Center

For the agricultural management training center which was scheduled to be newly constructed, this was changed from construction to refurbishing the existing facilities. While this had been used for another purpose at the time of the appraisal, the facilities were not in use at the time of project implementation,<sup>3</sup> so this was done in order to utilize the existing facilities. As for the provision of equipment to the facilities, the part types, models, and so on were altered in accordance with the on-site conditions. These were realistic modifications based on the actual conditions, and the claim could be made that they were beneficial in improving project efficiency by means of leading to cost reductions.

### 4) Additional Work for the Rehabilitation of Facilities (Ulhitiya, Hungamala)

In Ulhitiya and Hungamala, which were the target areas, agricultural roads would overflow with water and farm work would fall into arrears on account of the rising waters and flooding from the heavy rains in the rainy season. For this reason, there was a need to quickly install and improve canals. Here, the installation of canals was added in two locations deemed to be indispensable for the resumption of farm work in the surrounding area. This was also an appropriate change based on the current conditions.

### 5) Consulting Services

As per the extension of the project period, the assignment period for the consulting services was also extended from 501M/M to 537M/M. Since consultants played an indispensable role in the course of the project implementation, the increase in the M/M of the consulting services with the extension of the project period was considered reasonable and appropriate. Other than this extension, the consulting services were executed as planned without any problems.

### 6) Others

For the repairs of the trans-basin canals, the current situation was surveyed at the time of the start of the project, which produced slight changes to the contents of the refurbishments in order to meet the local needs. Furthermore, in Zones 3-6 the earth works and weed removal work that had initially been scheduled to be carried out were cancelled. Because this work is work that arises on a

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<sup>3</sup> The agricultural management training center was revised from the construction of new buildings to the refurbishment of the existing building. This facility had been fully utilized for seed production. Subsequently, this activity was diminished and died down due to the changes brought about by privatization. Consequently, the facility had been lying idle and the plan was revised in order to put the existing facility into effective use.

daily basis and which the FOs handle voluntarily, and as such it was not included as a component of this project. These are minor changes, and do not impose factors that are detrimental to the achievement of results.

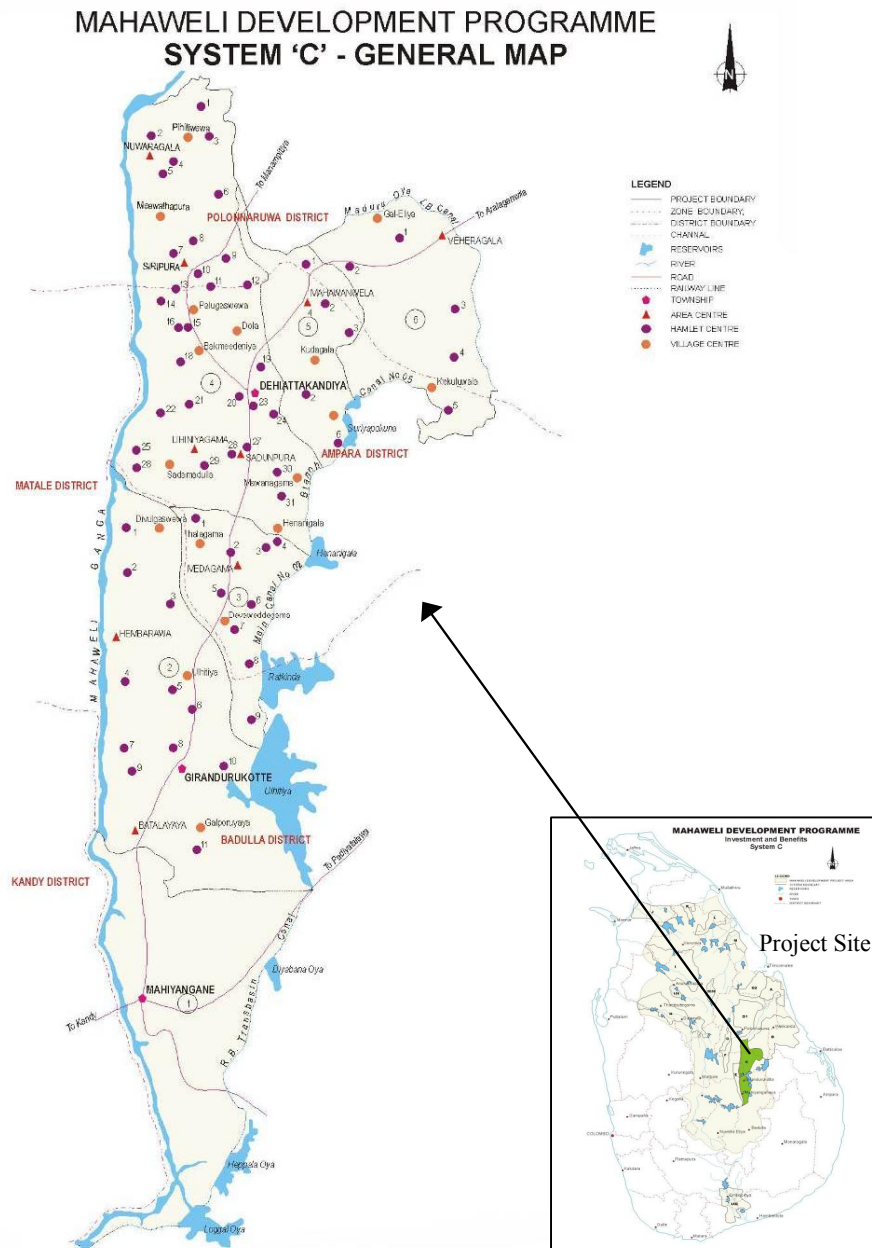


Figure 1: Mahaweli System C Area

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Period

Under the original plan, the project period was to last from August 1997 to November 2004 (88 months), but the actual project period was August 1997 to November 2006 (112 months), which turned out to be 27% longer than planned. The major reasons for the implementation extension

include: (1) about one year and a half's delays in the consultant selection<sup>4</sup> and delays in the initiation of sub-projects (repair and construction work) due to the delays in the consultant selection, and (2) the lack of human resources due to the reform of MASL.<sup>5</sup>

### 3.2.2.2 Project Cost

The planned project cost was 4,396 million yen (of which the Japanese ODA loan accounted for 3,737 million yen), and the total project cost at the time of the ex-post evaluation was 3,544 million yen (of which the Japanese ODA loan accounted for 3,077 million yen), which was 19% lower than planned. The reason why the project cost fell below the original plan even though the project period was extended originates in the change of the construction of the agricultural management training facilities, the number of storage facilities restored, and a great change in the exchange rate<sup>6</sup>.

As mentioned above, although the project period was longer than planned, the project cost was lower than planned, therefore efficiency of the project is fair.

## 3.3 Effectiveness (Rating: a)

### 3.3.1 Quantitative Effects

#### 3.3.1.1 Results from Operation and Effect Indicators

##### (1) Paddy Yields, Cultivated Area, and Production in the Target Area

Table 2 shows the summary of changes in the yield, cultivated area, and production of paddy in the Mahaweli system C area. Although documents from the time of the appraisal did not show any qualitative indicators demonstrating the effectiveness of the project, officials of MASL mentioned in interviews that there were discussions at the start of the project over making it a goal to set 5.0 Mt./ha<sup>7</sup> as the unit yield for paddy by the end of the project. Owing to this point of view, this figure was set as the planned value in this ex-post evaluation.

The unit yield for paddy in 2006, the year that the project completed, came to 5.4 Mt./ha, thereby exceeding the planned value. Following the completion of the project, the unit yield has risen up through the present, and the target area has a high unit yield relative to the nationwide average as well. Moreover, the project period for this project was initially scheduled to end in 2005. Considering that this figure (5.3 Mt./ha) had already exceeded the planned value as of 2005, it can be confirmed that the project was highly effective.

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<sup>4</sup> As explained, the Government envisaged the restructuring of MASL. The delays in the selection of consultants were affected by the administrative confusion caused by this restructuring process to some extent.

<sup>5</sup> Delays in the consultant selection and in the initiation of sub-projects affected the schedule of the construction and refurbishment of irrigation facilities. Ordinarily it is necessary to dam up canals in order to carry out the construction and refurbishment of irrigation facilities, and so these cannot be carried out during the cultivation season. Because the start period for the sub-projects was delayed and the work could not begin during the fallow period as scheduled, the project was faced with the situation of having to wait until the next fallow period.

<sup>6</sup> The exchange rate at the time of the appraisal was 2.09 yen to 1 rupee. Then it changed to 1.13 yen to 1 rupee by the time of the completion of the project.

<sup>7</sup> Mt. is the abbreviation for Metric Ton, which is a unit that expresses weight. 1 Mt. is equivalent to approximately 1,000 kg.



Planned values were not set for the irrigated area nor for the production volume. But from the table below it can be seen that the figures from the time of the appraisal onward have been improving year by year.

Table 2: Change in the Paddy Yield and Cultivated Areas

Indicator	Unit	1996	2005	2006	2007	2008	2009
Yield of Paddy	Original Plan: 5 Mt./ha (At the time of project completion)						
Maha <sup>Note 1</sup>	Mt./ha	4.1	5.4	5.1	5.6	5.5	6.0
Yala <sup>Note 1</sup>		4.2	5.2	5.6	5.6	5.8	5.8
Average of target area		4.1	5.3	5.4	5.6	5.6	5.9
National average		3.5	4.0	4.1	4.3	4.1	4.4
Cultivated Area	No Original Plan						
Maha	1,000 ha	20.9	22.7	22.1	21.1	22.0	22.8
Yala		19.0	18.6	20.2	22.1	21.2	9.2
Total		40.0	41.3	42.3	43.2	43.2	31.9
Production	No Original Plan						
Maha	Mt.	84.7	108.3	100.3	107.2	107.9	122.4
Yala		78.9	86.7	102.5	112.7	110.2	47.7 <sup>Note 2</sup>
Total		163.6	195.0	202.8	219.9	218.1	170.0 <sup>Note 2</sup>

Source: MASL Web site <http://www.mahaweli.gov.lk/Other%20Pages/Statistics.html>

Note 1: The cultivation period of the agriculture of Sri Lanka is divided into two terms, namely the Maha period (northeast monsoon in October - March) and the Yala period (southwest monsoon in April - September). Rain is brought only to the southwest in the Yala period and to the entire island in the Maha period.

Note 2: Production in 2009 stayed at a slight increase due to the influence of the drought of the Yala period compared with production in 1996. However, it can be confirmed that production in 2007 and 2008 was 218.1(1,000 tons) and 219.9 (1,000 tons), respectively.

Note 3: Figures don't match in average/total because of the rounding.

## (2) Strengthening of FOs

It is difficult to measure the strengthening of the FO's institutional capacity in figures. However, changes in the capital amounts accumulated by the FOs were taken up as one example for interpreting the capacity of the FOs in this ex-post evaluation. These capital amounts are accumulated from the membership fees to each FO and from part of the contract fees from when the FOs handle repair work on the irrigation facilities, and they are used for the activity fees of each FO. This increase in capital amounts leads to an increase in the operation and maintenance expenses for the irrigation facilities, as well as the completeness of the FOs' activities. As such, this can be thought of as having increased the financial capabilities of the FOs.

The target area of this project in the Mahaweli System C area is comprised of six blocks, with FOs that belong to each of these blocks. Table 3 below shows the capital amounts accumulated by the FOs in each block, as well as the number of FOs and the number of households for each block as basic information. In terms of measuring the changes in the capital amounts, baseline values (from the start of the project) could only be obtained from two of the blocks. Yet even so, the Siripura block increased its value by approximately 1.3-fold, while the Medagama block

increased its value by more than four-fold.

Table 3: Number of FOs and Households, and Capital Amount of FOs

Block	Number of FOs	Total Number of Households		Capital Amount(1,000 rupees)	
		As of appraisal	Actual	As of appraisal	Actual
Sadunpura	35	2,827	4,516	N/A	4,356
Siripura	20	2,935	3,103	572	719
Nuwaragala	18	2,349	2,826	N/A	2,474
Medagama	20	2,056	2,600	684	2,819
Mahawanawela	30	2,422	2,318	N/A	2,923
Veheragala	21	1,730	1,922	N/A	4,242
Total	144	14,317	17,285	-	17,533

Source: RPM, MASL

### 3.3.1.2 Results of Calculations of Internal Rates of Return (IRR)

The Economic IRR (EIRR) was calculated at the time of the appraisal and at project completion. At the time of the ex-post evaluation, when the actual figures were calculated via the same preconditions, the results exceeded the planned values as shown below.

Table 4: EIRR

	Plan	Project Completion	Actual
EIRR	22.0%	16.2%	27.8%

Note: Cost = Investment cost, Replacement cost, Maintenance cost, Benefit = Production, Price, Gross income, Production cost, Net income

### 3.3.2 Qualitative Effects

#### (1) Beneficiary Survey

A beneficiary survey was conducted at Zones 3-6 in the Mahaweli System C area to confirm the qualitative effects. One hundred and four farmers responded and the following points were confirmed as a result of this survey.<sup>8</sup>

#### 1) Sufficiency of Water for Agriculture

About 90% of the respondents replied that they are now able to obtain a sufficient volume of water for the production of agricultural product due to the implementation of this project. The problem of disputes concerning the volume of water being used by neighboring farmers frequently arose, especially in the dry season when water is in short supply. But since concrete lining was applied to the canals through this project the volume of water lost from the irrigation canals has decreased, and as a result this problem has currently been resolved.

<sup>8</sup> The distribution of respondents is as follows.

Block	Sadunpura	Siripura	Nuwaragala	Medagama	Mahawanawela	Veheragala	Total
Number of responses	18	19	27	4	25	11	104

[QN] Do you think that the volume of water released is enough for purposes of cultivation after the project?	Yes	No
	92(88%)	12(12%)

### 2) Strengthening the FO's Institutional Capacity

Of the respondents, 98% replied that the FOs are taking responsibility for managing the D-F canals. In addition, 67% of the respondents answered that the implementation of the project had contributed to improving the capacity of the FOs. More specifically, they indicated that the FOs performed rehabilitation work on the D-F canals themselves, in addition to which the remuneration from this was accumulated by the FOs as capital. It was also pointed out that the FOs acquired fundamental technical skills related to the operation and maintenance of facilities through this experience, and that even afterwards the FOs were performing maintenance on the canals themselves. Moreover, even later on there were examples given wherein the FOs had carried out their own unique activities<sup>9</sup> and established maintenance funds based on this capital. Additionally, it was also claimed that having the FOs take part in maintenance work on the D-F canals themselves had benefits like developing ownership among the FO members and raising their awareness with regard to maintenance (from interview surveys with the beneficiaries).

[QN] Do you think the FOs take responsibility for maintaining D-F canals?	Yes	No
	102 (98%)	2 (2%)

[QN] Do you think the capacity of the FOs has increased after the implementation of the project?	Yes	No
	70 (67%)	34 (33%)

### 3) Access to Agricultural Loans

With regard to agricultural loans, 65% of the respondents answered that they do not access such loans, and so it would be difficult to claim that results from the project's implementation have been fully realized. The use of the revolving fund is limited to uses related to agriculture. It was used by many of the FOs because they could procure capital for a low interest rate while the project was being implemented. But currently the number of users is on a downward trend due to the fact that the government has started providing subsidies for purchases of fertilizer, and because the interest rates were hiked up following the completion of the project.

[QN] Do you think that you can access agricultural credit easier after the implementation of the project?	Yes	No	Not Accessed
	35 (35%)	0 (0%)	69 (65%)

<sup>9</sup> For instance, the scholarship was set up for FO members' children to go to school, and contributions at funerals were offered and so on.

#### 4) Quality of Paddy

Those engaged in agriculture who responded that the quality of the paddy had improved did not rise above 22%. According to respondents who sat for interviews, their order of priorities from when the project was implemented was not on improving the quality of the paddy, but rather on expanding the production output. As such, they had little in the way of awareness when it came to the quality of the paddy. What is more, the quality of the paddy depends on a variety of factors, such as the amount of foreign matter like stones and waste mixed in with it, the percentage of paddy harvested from the rice plant, its weight, and the variety of paddy. As a result, it was difficult to determine whether or not this project had directly contributed to improving the quality of the paddy.

But after the implementation of the project the farmers were able to obtain the proper volume of water for cultivation, and the production output and revenue rose year by year. Because of this, in recent years the project started dealing with appropriate ways of using things like agricultural fertilizers. Responses were received to the effect that presently this has allowed the farmers to be on their way toward improving the quality. One respondent gave the opinion that, “This project showed us the way when it comes to improving the quality of the paddy.”

[QN] Do you think that the quality of the crops has improved after the project?	Yes	No
	23 (22%)	81 (78%)

Thus, this project has largely achieved its objectives, therefore its effectiveness is high.

### 3.4 Impact

#### 3.4.1 Intended Impacts

As can be seen from the above, the unit yield for paddy in the target area by the project improved remarkably after the project. The extent to which productivity improvements contributed to both raising household income and the growth of the agricultural sector in the area were confirmed in the following manner.

##### (1) Changes in Household Income

Table 5 below shows the trends in the household income of residents in the targeted area. Household incomes in the year 2008 in the targeted area rose substantially compared to before the implementation of the project. But it is believed that the reason why the growth rate in income in 2008 was particularly high is also partially because of the impact from the rise in the cost of paddy in this same year.<sup>10</sup>

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<sup>10</sup> While the producer's price of paddy was 13.3 rupees per kg in 2005, this fell to 12.8 rupees per kg in 2006 and then rose to 18.8 rupees per kg in 2007. In 2008 this rose to 32.6 rupees per kg due to the steep jump in domestic market rates.

Table 5: Average Household Income in the Mahaweli System C Area  
(Unit: 1,000 rupees)

	1997	2006	2007	2008
Household Income (actual)	92.4	118.4	164.0	273.4

Source: MASL Web Site, <http://www.mahaweli.gov.lk/Other%20Pages/Statistics.htm>

In the beneficiary surveys, about 60% of the respondents answered that their revenue had increased due to this project. Meanwhile, when this was confirmed with the respondents it was found that their income had increased by about 1.5-times on average. In terms of the reasons for this, maintenance on the canals leads to a drop in lost agricultural water and the yield for paddy rose were frequently heard. It is conceivable that the implementation of this project contributed to a certain extent to increase the incomes of the residents of this area.



Interview surveys with residents

## (2) Growth in the Agricultural Sector

Since the completion of the project, the agricultural production output<sup>11</sup> for the region has been on a rising trend, and growth in the agricultural sector of the targeted area can be confirmed. Furthermore, in the results from the beneficiary surveys, a little less than about 90% of the respondents answered that the project had contributed to their agricultural activities. They indicated the fact that the enlargement of agricultural production brought about by the results of this project led to growth in the agricultural sector of the area.

Table 6: Agricultural Production in Mahaweli System C  
(Unit: Mt)

	1997	2006	2007	2008
Production	195,745	209,613	227,682	228,324

Source: MASL Web site <http://www.mahaweli.gov.lk/Other%20Pages/Statistics.htm>

### 3.4.2 Other Impacts

According to the regulations of Sri Lanka from the time of the appraisal, this project did not require that an Initial Environmental Evaluation (IEE) or an Environmental Impact Assessment (EIA) be conducted, and it was deemed as not having any particular impact on the environment. Regarding the resettlement of residents and land acquisitions, these would not be problems as a small amount of land to construct new warehouses would be acquired and the resettlement of residents was not planned. When this was actually confirmed with the executing agency through this survey, it was confirmed that there were not any environmental problems or impact in relation

<sup>11</sup> Production output for paddy, as well as grains and vegetables which are referred to as Other Field Crops (OFC).

to land acquisition or resettlement of residents.

As outlined above, the implementation of this project in the target area led to enhancing agricultural water and an increase in paddy production by strengthening the FOs and refurbishing irrigation facilities. Based on these results, this project can be considered to have contributed to a certain degree to the realization of a number of impacts, such as improving the income of the residents and vitalizing agriculture in the targeted area.

### **3.5 Sustainability (Rating: b)**

#### **3.5.1 Structural Aspects of Operation and Maintenance**

Following the completion of the project, operation and maintenance is to be overseen by the FOs for the D-F canals which are end irrigation canals and the storage facilities, and by the RPM for the agricultural management training center and the major irrigation facilities (trans-basin canals), respectively.

The FOs that will manage the D-F canals and storage facilities<sup>12</sup> will hold meetings at the time of the start of the cultivation season and decide on the necessary maintenance (mowing and the necessary measures). In cases where repairs and other such construction work is needed, the FOs will handle as much of the work as they can handle themselves after receiving the approval of the RPM. In addition, the RPM is in charge of maintenance for the agricultural management training center and large-scale major irrigation facilities. Through interviews with the RPM, it was learned that there is an adequate number of staff to take charge of the maintenance at present. However, during the reform of MASL it went through a process of substantial personnel cutbacks, and after the employees who have reached the retirement age retire in several years, it is estimated that there will be a shortfall of personnel to take charge of maintenance. A request to increase the personnel has already been submitted to MASL, but this issue is now considered to be pending, and there are some concerns that remain regarding the future structure.

#### **3.5.2 Technical Aspects of Operation and Maintenance**

It had been assumed that the FOs would use the Operation & Maintenance Manuals prepared by the consultants. Through the interview surveys it was confirmed that while the manuals had been stored, they were not being used effectively. But by giving the members of the FOs the opportunity to take part in the repair work through this project, they have acquired the fundamental technical skills and experience necessary for operation and maintenance of the D-F canals. As such, at present serious problems have not arisen with their techniques pertaining to the maintenance that the FOs should be taking charge of. However, the content that the FOs are capable of handling is limited to very basic repair work. Therefore, it has been decided that the RPM will provide technical support when such support for technical aspects are needed by the FOs. When RPM and

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<sup>12</sup> The structures vary slightly depending on the FO, but in general each FO elects a representative, manager in charge of clerical work, manager in charge of financial affairs, manager in charge of water management, and a leader in charge of F-D canals. They primarily perform the operation and maintenance on the facilities.

FOs were interviewed, it was found that at present no serious problems have occurred since not a whole lot of time has passed after the completion of the project.

### 3.5.3 Financial Aspects of Operation and Maintenance

As in the operation and maintenance structure, the FOs are in charge of the D-F canals and storage facilities, and the RPM is in charge of the major irrigation facilities and agricultural management training center, regarding their financial aspects.

According to the Project Completion Report (PCR), the total annual operation and maintenance costs needed for the target facilities were estimated to be 15.5 million rupees. According to the interview survey with MASL, at present an adequate budget has not been secured. When MASL's budget for 2009 was actually confirmed, it was found that it had requested an amount of 33 million rupees as maintenance costs targeting the overall irrigation facilities in the Mahaweli C area, but in reality it had only received an amount of 21 million rupees.

Since the FOs cover the maintenance costs for the facilities, a Maintenance Fund (MF) was established after the implementation of the project. This MF was established by using 5% of the contract price from when maintenance work on the facilities is carried out by the FOs via free contracts through the project. Later on, it was mandated that a commission of 5% from the costs relating to maintenance work were to be accumulated in this fund. In addition, the FOs collect about 250 rupees on average from members each cultivation season as collection fees. The aforementioned commission of 5% and these collection fees are partitioned out to the FOs' capital funds (which are used as the FOs' activity funds) and the MF.<sup>13</sup> Since the maintenance costs differ for each D-F canal an accurate amount cannot be planned. But according to the interviews with the block offices and FO members, they explained that currently these collection fees are not enough to adequately cover the amount of the costs for operation and maintenance.<sup>14</sup>

### 3.5.4 Current Status of Operation and Maintenance

In the site visit the project evaluation, observations were conducted on the physical condition of the facilities and the actual state of their operation and maintenance concurrently with the beneficiary survey. The statuses of the training facilities, storage facilities, and irrigation facilities improved through this project were largely satisfactory. A slight amount of damage has occurred on the concrete lining of about 30% of the D-F canals targeted by this project. In order to avoid having this damage advance in the future, it will conceivably be necessary to carry out maintenance for the D-F canals. But the canals themselves are constantly functioning, and it was confirmed that there are no serious problems.

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<sup>13</sup> In 1994 the government entered the Irrigation Law and the Agricultural Support Law into force, and the FOs were vested with the authority to collect water supply fees (collection fees) from their members and to take action against members who have not paid.

<sup>14</sup> The collection fees paid to the FOs vary for each FO, but are around 250 rupees (about 186 yen) on average. When members of the FOs were interviewed it was learned that this amount had been kept at the same level for a long time, and it is not considered to be a high amount.

As mentioned above, some problems have been observed in terms of financial aspect, therefore sustainability of the project is fair.

## **4. Conclusion, Lessons Learned and Recommendations**

### **4.1 Conclusion**

The actual project period was longer than planned. While minor concerns for future sustainability are observed in areas such as staffing and budgeting, this project has achieved its targets, for the most part such as increasing the cultivated area, increasing household income, and promoting agriculture in the target area.

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

### **4.2 Recommendations**

#### 4.2.1 Recommendations to the Executing Agency

- 1) At present, slight damage to the concrete lining of some of the end irrigation facilities (D-F canals) has been confirmed. The canals are functioning without any difficulties, and currently this has not posed any serious problems. But there is the possibility that the situation will grow worse in the future. The maintenance work that the FOs are capable of handling is limited to simple construction work, and so if the extent of the damage were to grow more severe then it is assumed that it will be difficult for the FOs to handle this by themselves. Therefore, in order to prevent the situation from growing serious ahead of time it is desired that responses such as having RPM and MASL periodically provide technical guidance will be considered.
- 2) The FO's financial capabilities have improved remarkably compared to before the project was implemented. But it would be hard that even under the current situation the FOs are able to come up with sufficient costs for the proper maintenance of the irrigation canals. The thinking is that hereafter it will be indispensable to further strengthen the organization of the FOs in terms of their financial aspects in order to guarantee the sustainability of the irrigation facilities over a long time period. For example, in each cultivation season collection fees from the members (250 rupees) have been kept at the same level for a long time. When this was confirmed during the interviews it was thought that the 250 rupees paid during the cultivation season is not necessarily all that high of an amount considering the average income of the households. For this reason, examining raising FO collection fees to the acceptable level can be thought of as one idea.

### **4.3 Lessons Learned**

- 1) The agricultural loan program was partially cancelled and the substantial reductions in the number of storage facilities constructed (partially repaired) were decided in this project, which were thought to be appropriate and minor changes. But, a substantial changes to the project



could have an impact on the schedule for the construction work and the project period overall. For this reason, when examining the outputs in similar project, it is considered important to make the content of the plan realistic in line with the needs. This should be done by performing sufficient coordination based on factors like the needs and issues of the beneficiaries in particular, as well as an understanding of the executing agency.

Comparison of the Original and Actual Scope

Item	Plan	Actual
(1) Output [Strengthening of the FOs]	<ul style="list-style-type: none"> <li>- Restoration of D-F canals: 7,200 units</li> <li>- Credit Facilities (Agricultural Loan) <ul style="list-style-type: none"> <li>1) Expansion of Group Cultivation Loans</li> <li>2) Relief Scheme for Defaulters</li> <li>3) Improvement of Institutional Support System</li> <li>4) Enterprise &amp; Operation capital loan for FO Federation</li> <li>5) Revolving Fund</li> </ul> </li> <li>- Construction and Rehabilitation of Storage Facilities: 58 units</li> </ul>	<ul style="list-style-type: none"> <li>- Restoration of D-F canals: 7,200 units</li> <li>- Credit Facilities (Agricultural Loan) <ul style="list-style-type: none"> <li>1) Revolving Fund</li> </ul> </li> <li>- Construction and Rehabilitation of Storage Facilities: 25 units</li> </ul>
[Construction of the Agricultural Management Training Center]	<ul style="list-style-type: none"> <li>- Construction of Training Center: 1 unit</li> <li>- Procurement of Equipment: 1 set</li> </ul>	<ul style="list-style-type: none"> <li>- Refurbishment of Training Center: 1 unit</li> <li>- Procurement of Equipment: 1 set</li> </ul>
[Rectification of Facilities]	<ul style="list-style-type: none"> <li>- Trans-Basin Canals Rubber Seal, Stop Log, Concrete Lining, Mastic Filter, Joint Filter, Under Drain Pipe</li> <li>- Zones 3-6 Concrete Lining 20 km Gate Replacement 80 unit Earth Works &amp; Weed Removal of Canal System</li> <li>- O&amp;M Equipment: 1 set</li> </ul>	<ul style="list-style-type: none"> <li>- Trans-Basin Canals Gate Rehabilitation Work Stop Log Fabrication Work Rehabilitation of Stop Log House Replacement by Pass Gates Repairing Skin Plates &amp; Girders Rehabilitation of O&amp;M Road/ Trans-basin Canals and Floodgate</li> <li>- Zones 3-6 Concrete Lining 20 km Gates Replacement 80 nos. Ulhitiya Spill Tail &amp; Hungamala Ela drainage Improvement Further Improvement of the Irrigation Facilities &amp; Water-supply System Rehabilitation of Main and Branch Canals</li> <li>- O&amp;M Equipment 1 unit</li> </ul>
[Consulting Services]	501 M/M	537 M/M
(2) Project Period	August 1997 - November 2004 (88 months)	August 1997 - November 2006 (112 months)
(3) Project Cost Foreign Currency Local Currency Total ODA Loan Portion Exchange Rate	<p>2,715 million yen</p> <p>1,681 million yen (804 million rupees)</p> <p>4,396 million yen</p> <p>3,737 million yen</p> <p>1 rupee = 2.09 yen (As of January 1997)</p>	<p>707 million yen</p> <p>2,837 million yen (2,128 million rupees)</p> <p>3,544 million yen</p> <p>3,077 million yen</p> <p>1 rupee = 1.11 yen (Average in the Period from 1999 through 2002)</p>