

Country Name	<b>The Project for Formulating Cascade System Development Plan under North Central Province Canal</b>
Democratic Socialist Republic of Sri Lanka	

**I. Project Outline**

Background	<p>The agriculture and stockbreeding sector was playing an important role in the national economy of Sri Lanka. The promotion of the sector was highly important for the correction of disparity and poverty reduction. The government of Sri Lanka was working on the development and rehabilitation of irrigation facilities and the promotion of efficient water use to improve cropping intensity and expand irrigated farmland, and it achieved domestic self-sufficiency in rice production. As Sri Lanka's food demand diversified, irrigation for other food crops was becoming more important. The dry zones in the North Central Province (NCP) and Northern Province (NP), always suffering from water shortage, had about 1,200 cascade systems for cropping and livestock farming, but it was difficult to secure a stable amount of water especially in the dry season.</p> <p>The government of Sri Lanka was implementing a water resource use plan titled the North Central Province Canal Project (NCPCP) (2015-2024) to convey water to the dry zones in NCP and NP. As the planned amount of conveyed water was not sufficient to cover all of the target areas in the dry season, efficient and equitable water allocation was essential. It was highly sought to formulate a plan for rehabilitation and maintenance of irrigation facilities including the cascade systems.</p>								
Objectives of the Project	<p>The project aims at the formulation of a cascade system development plan in the dry zones of the North Central Province and Northern Province of Sri Lanka, thereby contributing to the promotion of agriculture and to the improvement of economic situation of farmers by way of the implementation of the projects proposed by the plan and by the improvement of irrigation and disaster prevention functions of the cascade systems.</p> <p>Expected Goals through the proposed plan<sup>1</sup>: To improve the irrigation and disaster prevention functions of the cascade systems through the implementation of the cascade system development plan, and then to promote agriculture and improve economic situation of farmers.</p>								
Activities of the Project	<ol style="list-style-type: none"> <li>Project site: North Central Province and Northern Province</li> <li>Main activities: To draft of the cascade system development concept and plan, to select model sites, to implement the detailed survey and development planning in the model sites, to conduct field verification programs, and to propose the development plan and action plans (projects) to the government.</li> <li>Inputs (to carry out above activities) <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Japanese Side</td> <td style="width: 50%;">Sri Lankan Side</td> </tr> <tr> <td>1) Mission members: 12 persons</td> <td>1) Staff allocated: around 20 persons</td> </tr> <tr> <td>2) Trainees received: 15 persons</td> <td></td> </tr> </table> </li> </ol>			Japanese Side	Sri Lankan Side	1) Mission members: 12 persons	1) Staff allocated: around 20 persons	2) Trainees received: 15 persons	
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Project Period	(ex-ante) December 2015 - December 2017 (24 months) (actual) June 2016 - April 2018 (23 months)	Project Cost	(ex-ante) 410 million yen, (actual) 460 million yen						
Implementing Agency	Ministry of Mahaweli Development and Environment (MMDE): Mahaweli Authority Ministry of Irrigation: Department of Irrigation Ministry of Agriculture: Department of Agriculture, Department of Agrarian Development Ministry of Social Services, Welfare and Livestock Development: Department of Animal Production and Health Ministry of Food Security: Department of Cooperative Development North Central Provincial Council Northern Provincial Council								
Cooperation Agency in Japan	Nippon Koei Co., Ltd., NTC International Co., Ltd.								

**II. Result of the Evaluation**

## &lt;Constraints on Evaluation&gt;

During project implementation, Ministry of Mahaweli<sup>2</sup> Development and Environment was responsible for overall administration of the project and coordination with other relevant agencies. However, this ministry no longer exists at the time of ex-post evaluation due to the government reshuffles in 2018 and later. The Mahaweli Authority is a government organization under the Ministry of Irrigation and responsible for the irrigation water, agriculture and the farmers who use water from Mahaweli reservoirs and designated lands to Mahaweli. The government transferred the loan projects of the Ministry of Mahaweli Development and Environment to the different ministries and or Mahaweli Authority or the Mahaweli Water Security Investment Program (MWSIP) funded by the Asian Development Bank (ADB).

<sup>1</sup> The degree of achievement of expected goals is not to be assessed in principle at the time of ex-post evaluation, since it is defined as the medium-to-long-term goals which will be attained as a result of crystallizing the proposed plan ("output" of the project).

<sup>2</sup> Mahaweli River is the longest river in Sri Lanka feeding the two thirds of the country. Mahaweli River is blocked at several places and several dams were constructed with the support of EU countries and Upper Kothmale dam was constructed with the support of JICA to produce hydro power. All the tanks and the lands under the water of Mahaweli River are controlled and managed by Mahaweli Authority and administered by Ministry of Mahaweli (earlier) / Ministry of Irrigation (now).

but it was not the case for technical cooperation projects. Cascade consists of several tanks and the tanks are under different administration depending on the size (small tanks: Department of Agrarian Development or Provincial council (Provincial Irrigation Department); medium tanks: Provincial council (Provincial Irrigation Department) and/or Department of Irrigation (central government); major tanks: Department of Irrigation (central government); All tanks (mainly reservoirs and major tanks) gazette under the Mahaweli areas are managed by the Mahaweli Authority. Under these circumstances, there is no central mechanism that knows the details and implementation status of the cascade system development plan proposed by the project, which has been partially integrated to MWSIP. Information has not been compiled at the central level, and sufficient information for this ex-post evaluation was not available. JICA Sri Lanka Office visited NCP to interview the provincial Department of Irrigation and some farmers' organizations (FOs) in the project model sites that manage their tanks, in addition to the interview with the Ministry of Irrigation for general information.

< Special Perspectives Considered in the Ex-Post Evaluation >

Among the three indicators for the expected Utilization of Proposed Plan, 2) number of projects formulated and implemented based on the system and framework proposed by this project, and 3) number of cascade tanks to which the irrigation, disaster prevention or farming methods proposed by this project are applied, are quantitative indicators without target values. The year of ex-post evaluation (2023) was still the fourth year of the implementation period of the 15 proposed projects in the development plan, and it was too early to measure the progress. No quantitative data for these indicators were available. The upper-level programs in irrigation have not been fully implemented due to the government change, financial crisis and COVID-19 as mentioned below.

Indicators of the Expected Goals through the proposed plan "To improve the irrigation and disaster prevention functions of the cascade systems through the implementation of the cascade system development plan, and then to promote agriculture and improve economic situation of farmers" were not mentioned in the ex-ante evaluation sheet. In the ex-post evaluation, the components of the Expected Goals are used as indicators.

1 Relevance/Coherence

[Relevance]

<Consistency with the Development Policy of Sri Lanka at the Time of Ex-Ante Evaluation >

The project was consistent with the development policy of Sri Lanka at the time of ex-ante evaluation.

The government of Sri Lanka was implementing the North Central Province Canal Project (NCPCP) (2015-2024) to convey water to the dry zones in NCP and NP. Its Phase 1 (2015-2024) included the construction of the Upper Elahera Canal to convey water from the water sources in the Central Province to a reservoir on the edge of the dry zones. Phase 2 (2019-2024) included the construction of the North Central Province Canal to convey water from the reservoir into the dry zones. At the time of ex-ante evaluation, the government was planning the "Integrated Regional Development Project" to rehabilitate the cascade systems and to promote agriculture based on the outcomes of NCPCP.

<Consistency with the Development Needs of Sri Lanka at the Time of Ex-Ante Evaluation >

The project was consistent with the development needs of Sri Lanka at the time of ex-ante evaluation.

As mentioned in "Background" above, the dry zones in NCP and NP needed to improve cascade systems to have stable amount of water for cropping and livestock farming. The project was designed to provide solutions to problems identified such as water scarcity in Yala (minor) season<sup>3</sup> and risk of flood during the rainy season, damages to the paddy fields and canal systems after heavy rain, which required human resources, time and investment for rehabilitation. Link canal construction was the new and prominent approach which benefited to the farmers specially for minimizing flood risk as well as damages to the paddy field bunds and field canals.

<Appropriateness of Project Design/Approach>

The project design/approach was appropriate and no problem attributed to the project design/approach was confirmed.

Kiwlekada and Navelikulam cascades were selected as the model sites for the rehabilitation of tanks and the construction of link canal, and respective FOs supported the work. The FO constitution stipulated that FO should not be discriminative based on gender, ethnicity, age, wealth, or any other factors. There was no segregation of the farmers who were cultivating under the pilot tanks, and when water was sufficiently available, equal access was ensured in the distribution. Water availability and equal access to water during the Yala season increased alternative income of the farmers by cultivating vegetable or other field crops.

<Evaluation Result>

In light of the above, the relevance of the project is ③<sup>4</sup>.

[Coherence]

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

The project was consistent with the Japan's ODA policy to Sri Lanka at the time of ex-post evaluation. Japan's country assistance policy to Sri Lanka (June 2012) prioritized support for the emerging regions, including development of agricultural infrastructure.

<Collaboration/Coordination with JICA's other interventions>

Any collaboration/coordination between the project and other JICA's other intervention was not clearly planned at the time of ex-ante evaluation. The project was based on the outcomes of the past JICA projects that improved irrigation facilities and technology, and aimed to strengthen the capacity of FOs to maintain and manage irrigation facilities on their own initiative. In particular, lessons and knowledge from "Increasing the capacity of integrated management in irrigated agriculture in dry zone (ICIM) project (2007-2011), which was also implemented through the Department of Irrigation of NCP, were utilized for the activities of the pilot projects of this project by the staff to some extent. As the past projects are not considered as the examples of collaboration/coordination, no points are added.

<Cooperation with other institutions/ Coordination with international framework>

The cooperation/coordination with other institutions or coordination with other international framework was planned during the project period and implemented as planned, and the positive effects were confirmed at the time of ex-post evaluation.

Cascade master plan and its components by World Bank, Green Climate Fund financed Climate Resilience Improvement Project (CRiP) (2014-2019) and Climate resilient Integrated Water Management Project (CRIWM) technically supported by UNDP (2017-2024) were

<sup>3</sup> There are two cultivation seasons in Sri Lanka: Maha (major) season from September to March and Yala (minor) season from May to August.

<sup>4</sup> ④ : very high, ③ : high, ② : moderately low, ① : low

implemented at the same time with this project and coordinated. Some of the techniques and knowledge have been utilized at the provincial level (North Central Province) such as link canal as measure for the disaster mitigation. The counterpart officers of the project who were trained in Japan and worked with the JICA cascade masterplan have utilized acquired skills and knowledge to implementation of these project as well.

<Evaluation Result>

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

[Evaluation Result of Relevance/Coherence]

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

## 2 Effectiveness/Impact

<Status of Achievement for the Objectives at the Time of Project Completion>

The cascade system development plan was formulated by the project and proposed to the government. It was to be a part of the North Central Provincial Canal Project (NCPCP), which was one of the components of MWSIP Phase 2 to be funded by ADB. The project targeted 128 cascade systems in Anuradhapura and Vavuniya districts located in the dry zones of NCP and NP. The government was expected to finalize the development plan after the project completion and implement the 15 pilot projects proposed by the plan. The proposed plan aimed to make cascade agriculture an “Economic Entity” to achieve a profitable agriculture with proper utilization of North Central Province Canal (NCPC) water, and to improve the productivity of ordinary crops, diversify the market-oriented high value crops and varieties, and promote crop and livestock integration. The plan included infrastructure development plan, institutional development plan, agriculture development plan, postharvest and marketing development plan, and livestock development plan, and 15 proposed projects were to be implemented in ten years. The implementation period of each project was one to seven years and the total estimated cost was LKR 36,819 million.

< Utilization Status of the Proposed Plan at the Time of Ex-post Evaluation>

The proposed plan has been partially utilized by the time of ex-post evaluation.

The cascade system development plan and its content, knowledge and skills were partially integrated as a part of NCPCP, one of the components of MWSIP Phase 2. After project completion, the government changed three times and ministry reshuffles took place over five times up to June 2023, and the government policies, strategic directions, plans and priorities changed over time. MWSIP has not been fully implemented as per the planned schedule due to current financial crisis of the country, and the NCPCP has only been partially completed and the remaining sections have not yet started. The government decided to complete MWSIP utilizing available funds for the benefits of the farming community. The government requested a loan project to JICA to rehabilitate 1,000 tanks in 120 cascades in Anuradhapura (NCP) and Vauniya (NP) districts, which was a part of the proposed projects in the cascade system development plan. It was not materialized due to financial conditions, changes in priorities and COVID-19.

Still, tanks supported under selected cascade systems are managed by FOs in the project model sites, using the skills acquired and facilities rehabilitated during the project period.

<Status of Achievement for Expected Goals through the Proposed Plan at the Time of Ex-post Evaluation>

The expected goals through the proposed plan have been partially achieved at the time of ex-post evaluation. Farmers in the project model sites reported enhancement of the irrigation and disaster prevention functions of the cascade systems and improvement of agricultural activities and increase of household income, while the proposed pilot projects in the development plan have not been implemented.

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

No negative impacts on the natural environment, social environment, gender and other aspects were observed according to the field observation by JICA office, discussion with farmers in the model sites and interview with Provincial Director of Irrigation, NCP. No land acquisition or resettlement occurred. The plan proposed in this project was partially integrated into the NCPCP component of ADB's MWSIP Phase 2, and environmental measures such as soil conservation and waste disposal have been implemented in the MWSIP.

<Evaluation Result>

In light of the above, the effectiveness/impact of the project is ②.

### Status of Achievement of Utilization Status of the Proposed Plan and Expected Goals through the Proposed Plan

Aim	Indicators	Results	Source
(Utilization Status of the Proposed Plan) The projects proposed in the development plan are implemented.	1. The proposals by this project are adopted as the development plan of cascade systems of the Ministry of Mahaweli Environment, Ministry of Irrigation and Ministry of Agriculture and are implemented according to the plan.	Status of Utilization: Partially utilized (Ex-post Evaluation) The cascade system development plan and its content, knowledge and skills were partially was integrated as a part of NCPCP, which was one of the components of MWSIP Phase 2. The project targeted 128 cascade systems in Anuradhapura and Vavuniya districts located in the dry zones of NCP and NP, covering five river basins (Malwathu Oya, Yan Oya, Ma Oya, Parangi Aru, and Kanakarayan Aru).  MWSIP has not been fully implemented as per the planned schedule (only trench 1 & 2 completed, and no forecast for the remaining trench 3) due to current financial crisis of the country. Therefore, NCPCP fully completed only up to Moragahakanda reservoir and from that point onwards project activities are only partially completed or even not yet started including the underground canal part of 18 kilometers. The government decided to complete MWSIP utilizing available funds for the benefits of the farming community. Climate Resilience through Integrated Water (CRIWM) project of UNDP started to work on link canal establishment in NCP for	Project final report Interview with Director-Water resource planning, Ministry of Irrigation

		selected tanks in three cascades.	
	2. Number of projects formulated and implemented based on the systems and frameworks proposed by this project.	Status of Utilization: Not utilized (Ex-post Evaluation) One loan project to rehabilitate 120 cascade tanks was requested to JICA, but was not materialized due to the government reshuffling and change of priorities, financial crisis and COVID-19.	Interview with Director-Water resource planning, Ministry of Irrigation
	3. Number of cascade tanks to which the irrigation, disaster prevention or farming methods proposed by this project were applied.	Status of Utilization: Not verifiable (Ex-post Evaluation) No data available. Cascade systems are managed by FOs in JICA project model sites, using the skills acquired and facilities rehabilitated during the project period.	Interviews of farmers in the model sites and Provincial Director of Irrigation, NCP
(Expected Goals through the Proposed Plan) The irrigation and disaster prevention functions of the cascade systems are enhanced, and agriculture is promoted in the project target areas, and the livelihood of farmers is improved.	1. Enhancement of irrigation and disaster prevention functions of the cascade systems	Status of Achievement: Partially achieved Although no data were available, farmers in the model sites recognized the improvement of water use efficiency and water management. There is no increase of volume or the irrigated land area in the Maha season, but the cultivated land area increased during the Yala season, while water availability and the cultivable land area totally depend on the rainfall.  Farmers mentioned that disaster prevention function was enhanced. Because of the establishment of link canal, farmers can decide to open it in the decided percentage to send the water directly to the next immediate tank. Farmers can control the spill off water by taking advanced action to release the water through the link canal to the next tank. Therefore, no spill of water through paddy field and thereby no damages to the cultivation, and specially to the paddy field buds and the field and distribution channels.	Interviews of farmers in the model sites and Provincial Director of Irrigation, NCP
	2. Promotion of agriculture in the project target areas	Status of Achievement: Partially achieved Although there is no data available, it can be assumed that there should be significant contribution to the agriculture production as water is available and the number of cropping seasons (Maha, Yala and Inter-season) increased and the crops were diversified.	Interviews of farmers in the model sites and Provincial Director of Irrigation, NCP
	3. Improvement of economic situation of farmers	Status of Achievement: Partially achieved According to the farmers in the model sites, household income increased nearly by 50%, while there are also other factors such as depreciation of the Sri Lankan rupee. Source of income has been diversified by vegetable or inter-seasonal cultivation	Interviews of farmers in the model sites

### 3 Efficiency

The project cost slightly exceeded the plan (the ratio against the plan: 112%) and the project period was within the plan (the ratio against the plan: 96%). The project cost was more than the plan due to multiple factors. Outputs were produced as planned.

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

### 4 Sustainability

#### <Policy Aspect>

National policy framework Vistas of Prosperity and Splendour (2018-2024) can be considered as the government policy, while there is no national policy published by the current government. It does not mention specifically on irrigation development, but it always emphasizes on the sustainable development and local food production and export promotion which always link with irrigation.

#### < Institutional/Organizational Aspect>

Ministry of Mahaweli Development and Environment, the project execution agency, no longer exists after government reshuffle in 2018. Mahaweli Authority under the Ministry of Irrigation is responsible for the implementation of NCPCP and MWSIP, while this structure is not what JICA project had anticipated during the project period for the implementation of the cascade system development plan

FOs under each tank currently manage the grassroots-level or tank-level water management activities in consultation with relevant government service providers such as Department of Agriculture, Department of Irrigation, Department of Animal Production and Health in the provincial government. All these institutions work on respective mandated tasks and responsibilities, and some of the activities under the cascade system development plan such as intensification and diversification of crops, integrated decision making, inclusion of marginalize and vulnerable communities do not fully fit into the mandate of an institution and require coordination, which need coordination among the institutions.

#### <Technical Aspect>

Staff in the related institutions such as Department of Irrigation of the provincial governments and that of the central Ministry of Irrigation, Mahaweli Authority of Sri Lanka and Department of Agrarian Development have qualified human resources to properly implement the activities under the cascade system development plan. 14 officials participated in the counterpart training in Japan and over 10 staff are still working in the same or related organizations. Therefore, capacities of the human resources remain to sustain the knowledge and skills to implement the plan. After the project, staff from above institutions regularly participated in JICA Knowledge Co-Creation-Programmes (KCCP) and they were added to the new human resources pool of the irrigation related government organizations. Due to the government reshuffle, skills for coordination to implement the plan is not fully maintained at the central level.

<Financial Aspect>

There is no separate budget amount specifically for implementation of the cascade system development plan. However, all the counterpart institutions maintain considerable level of annual budget allocation including operation and maintenance activities of respective cascades, and enough financial resources are available for the implementation of activities under the plan up to certain level. For example, Department of Irrigation of NC provincial government secured budget of 300 million rupees for 2020 and 2021 respectively and 250 million for 2022 from the national budget. The budget for 2022 was smaller than the previous years due to financial crisis and the impact of the COVID-19 pandemic. Some other financial resources come from ongoing project financed by The World Bank and Green Climate Fund. At the central level, funding for the implementation of the 15 pilot projects or NCPCP in MWSIP Phase 2 has not been fully secured.

<Environmental and Social Aspect>

The project integrated environmental and social considerations as a component, including examination of alternative approaches considering environmental and social impacts, based on the concept of strategic environmental assessment, and scoping of environmental and social considerations in the proposed projects in the development plan. No negative impacts on the environmental and social aspects were observed during stakeholder interviews and site visits at the time of the ex-post evaluation. In addition, ADB's MWSIP Phase 2, in which the plan proposed by this project is partially integrated, has implemented measures to mitigate negative environmental impact such as soil conservation and waste disposal.

<Evaluation Result>

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

5 Summary of the Evaluation

The project prepared a cascade system development plan in the dry zones of the North Central Province and Northern Province of Sri Lanka. After the project completion, the proposed plan has not been fully utilized, but cascade systems have been managed at the local level. There were positive changes in the production of crops and income in the project model sites as water became steadily available and water management skills of farmers have improved. Some problems have been observed in terms of the institutional/organizational, technical and financial aspects of the implementing agency.

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

### III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

The role of the counterpart organization of the project, which was expected to lead the cascade system development plan, is now fragmented into several ministries, departments and provincial governments. Therefore, coordinating and decision-making forum or structure should be established collecting representation from all such organizations in one table to implement cascade system development plan efficiently and effectively. Based on the current government structure, the Ministry of Irrigation (at the central level) needs to lead the process to coordinate all irrigation and agriculture related institutions who have defined role in the cascade system development plan. The Ministry of Irrigation or Department of National Planning need to lead the process inviting all key stakeholders to make clear demarcation of the roles and responsibilities for the implementation of cascade system development plan to ensure policy, financial and institutional sustainability.

Lessons Learned for JICA:

At the time of detailed planning of the project, JICA and the Japanese consultants worked with the existing structures at that time (Ministry of Mahaweli Development and Environment in this project). Once the ministry dissolved or merge to some other ministry, there are no any responsible or accountable parties for the implementation of the proposed cascade system development plan, while the plan has been partially integrated to MWSIP. The Record of Discussion of this project should have mentioned the continuation and institutionalization after the project very clearly and identified the permanent government structure (departments) which should be responsible and accountable for the sustainability measures as well as how to institutionalize the project outcomes to generate expected level of impacts in the long-run, rather than ministries which are always changeable with government reshuffling.



Rehabilitated tank bund in the pilot site, Anuradhapura district increased water availability during dry season

Link canal reduced the flood disasters even during the rainy season