

Country Name	The Project for Monitoring of the Water Quality of Major Water Bodies
Democratic Socialist Republic of Sri Lanka	

I. Project Outline

Background	The Democratic Socialist Republic of Sri Lanka aimed to improve living standards in a sustainable manner in the process to achieve economic growth in the 2010s, and environmental protection was one of the key issues. The Central Environmental Authority (CEA) under the Ministry of Mahaweli Development and Environment is the agency responsible for the environmental protection. CEA issues the Environmental Protection License (EPL) to the prescribed activities to permit discharge of industrial effluent, etc. At the time of ex-ante evaluation, the percentage of compliance monitoring with the condition of EPL regarding wastewater was around 50%. The results of water quality monitoring of Kelani river, the water source of Colombo, showed variation of the concentration of the pollutants at the downstream of the river due to the disposal of treated and untreated wastewater from factories. It was urged to establish a system of appropriate water quality monitoring and inspection of factories on the river basin for the environmental protection.		
Objectives of the Project	The project aimed to enforce capacity of CEA in water quality management through the introduction of water body categorization, capacity enforcement in water quality analysis and monitoring, and development of information management system of water quality monitoring data, and thereby contributing to the appropriate implementation of water quality management in major water bodies. 1. Overall Goal: Water quality management in major water bodies is appropriately implemented by CEA. 2. Project Purpose: Enforcement capacity of CEA and its regional branch offices of the Kelani river basin on water quality management is strengthened.		
Activities of the Project	1. Project site: Whole area of Sri Lanka. Kelani river basin as the model site 2. Main activities: 1) To develop and introduce water body categorization. 2) To enforce capacity in water quality analysis of the laboratories including operation and maintenance of the equipment and development of the Standard Operating Procedures (SOP). 3) To enforce capacity in water quality monitoring of relevant organizations by supporting planning, sampling, reporting, development of guidelines, etc. 4) To develop and promote information management system of the water quality monitoring data. 3. Inputs (to carry out above activities) Japanese Side 1) Experts: 8 persons 2) Trainees received: 36 persons 3) Equipment: Equipment for laboratories Sri Lankan Side 1) Staff allocated: 54 persons in total 2) Office space 3) Operation cost		
Project Period	(ex-ante) February 2015-January 2018 (actual) March 2015-February 2018	Project Cost	(ex-ante) 314 million yen (actual) 254 million yen
Implementing Agency	Central Environmental Authority (CEA)		
Cooperation Agency in Japan	CTI Engineering International Co. Ltd., Oriental Consultants Global Co. Ltd.		

II. Result of the Evaluation

1 Relevance
<Consistency with the Development Policy of Sri Lanka at the Time of Ex-Ante Evaluation > This project was consistent with Sri Lanka's national development policy "Mahinda Chintana" (2010), which aimed to increase the percentage of population with access to safe drinking water to 94% by 2015 and 100% by 2020 and to improve the quality of water of Kelani river as the water source for Colombo. <Consistency with the Development Needs of Sri Lanka at the Time of Ex-Ante Evaluation > This project was consistent with the needs for capacity development in water quality management as mentioned in "Background" above. <Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation > The promotion of economic growth was among the priority areas of Japan's Country Assistance Policy for Sri Lanka (2012). This project was in line with the Country Assistance Policy because it aimed to improve capacity for environmental management and to contribute to the improvement of environment in urban areas which was to deteriorate with economic growth. <Evaluation Result > In light of the above, the relevance of the project is high.
2 Effectiveness/Impact
<Status of Achievement of the Project Purpose at the Time of Project Completion > The Project Purpose, "Enforcement capacity of CEA and its regional offices of the Kelani river basin on water quality management is strengthened" was achieved at the time of project completion as five indicators out of seven were achieved. CEA's divisions and regional offices enhanced their enforcement capacity of water quality management (Indicator 2). Guidelines and materials were developed under the project and they were utilized by all concerned divisions and regional offices of CEA (Indicator 3 and 5). Zoning and categorization were done for the Kelani River based on the water quality data (Indicator 4). Fifteen seminars, workshops and training were conducted (Indicator

6). There was no information to show that “CEA conducts self-evaluation on policy and system making capacity” (Indicator 1) or that on the percentage of staff who could explain how to use the guidelines at the time of project completion (Indicator 7).

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

The project effects have been continued till the time of ex-post evaluation. CEA divisions and regional offices conduct evaluation of the capacity in water quality management, and the achievement of Overall Goal shows the enhancement of their capacity. All guidelines and manuals prepared under the project are being utilized by all CEA laboratories and regional offices. In 2020, 22 water bodies were assessed under the improved methods. Seminars, workshops and training have been held since the project completion. All relevant staff can explain how to use the guidelines.

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

The Overall Goal, “Water quality management in major water bodies is appropriately implemented by CEA,” has been achieved. In addition to the existing Effluent Discharge Standards (2008), Regulations for Issuing Environmental Protection License and Hazardous Waste Management License (2008) and Prescribed Activity List (2008), drafted ambient water quality standards were reviewed and finalized by the project and gazette in 2019 (Indicator 1). Out of the main 103 water bodies in Sri Lanka, 15 were selected in 2019 to apply the water quality environmental management system developed under the project. Twenty-two water bodies were selected in 2020. It was a comparable increase from 4 in 2014 (Indicator 2 and 3).

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

No negative impacts have been observed.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is high.

Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results	Source
(Project Purpose) Enforcement capacity of CEA and its regional branch offices of the Kelani river basin on water quality management is strengthened.	Indicator 1 CEA conducts self-evaluation on their own capacity of policy and system making regarding water quality management such as nos. of proposals related to gazetting ambient water quality standards, introduction of ambient water quality zoning and categorization system, improvement of current EPL system, etc. based on the National Environmental Act (No.47 of 1980) and other related by-laws, and its evaluation results show improvement, compared with the initial stage of the Project.	Status of the Achievement (Status of the Continuation): Not verifiable (Partially achieved and continued) (Project Completion) As of January 2017, the project team was considering the following three sub-indicators for this indicator, by before-after comparison of the project. 1) Number of proposals relevant to water quality improvement 2) Number of proposals on categorization/classification of water bodies over the country 3) Evidence of improved capacity of CEA on pollution sources management by using the EPL system Project completion report does not mention how this plan was finalized or whether CEA’s self-evaluation on policy and system making capacity was conducted. (Ex-post evaluation) There is no information to show whether “CEA conducts self-evaluation on policy and system making capacity.” There are no data on the “number of proposals,” but CEA’s capacity on pollution sources management by EPL system is confirmed by its activities mentioned in Indicator 2 below.	source : JICA documents, questionnaire and interviews of CEA
	Indicator 2 CEA, concerned departments, and regional branch offices conduct self-evaluation on their own enforcement capacity of water quality management such as nos. of guidance to EPL holders (factories), nos. of penalty case, etc. based on the National Environmental Act (No.47 of 1980) and other concerned by-laws, and its evaluation results show improvement, compared with the initial stage of the Project.	Status of the Achievement (Status of the Continuation): Achieved (Continued) (Project Completion) An evaluation on the testing capacity for achieving reliable analytical results was done through an international performance evaluation program funded by the project. Eighteen testing parameters were performed, and the laboratory got satisfactory results for this program. The analysis capacity was evaluated through inter laboratory performance evaluation, using the Certified Reference Material (CRM) on an annual basis. The units, including regional offices, were assigned to the related activities including monitoring and inspection after evaluating their capacity. The criteria considered in the evaluation included the number of staff, their level of familiarity with activities, and necessary resources. At the completion of the project, the activities were streamlined and further guidance was given. The officers’ performance was improved, and the units were able to handle the assigned tasks. All staff showed considerable improvement compared to the initial stage of the project. (Ex-post evaluation) The laboratory participated in the interlaboratory comparison program conducted by the Sri Lanka Association for Testing Laboratories in 2020 and Industrial Technology Institute in 2021. Both these institutes are ISO/IEC 17043 accredited Proficiency Testing (PT) providers in Sri Lanka. All staff showed considerable improvement compared to the initial stage of the project. The progress monitoring system for each unit was introduced. Output indicator data below show that CEA has steadily conducted water quality	source : JICA documents, questionnaire and interviews of CEA

management activities, while stagnation has been observed in 2020 and 2021 due to COVID-19.

Monitoring and inspection of major pollution sources in the Kelani river (Output 3-3-2)

	2018	2019	2020	2021
Number of major pollution sources (Kelani)	2,947	3,149	3,207	3,308
Number of these sources monitored/inspected	2,376	2,500	1,500	750
Percentage	80.6%	80.3%	47%	22%

Due to COVID-19, CEA could not carry out the physical inspections and monitoring activities for all industries located in the Kelani river area. Documents related to the pollution control measures from the industries and reports on the effluent quality were evaluated by online meetings and discussions.

Under the new national program named “Surakimu Ganga” on conservation of rivers which started in 2021, measures have been taken to monitor all industries that discharge wastewater into any surface water bodies. At present, not all of these data have been gathered.

EPL acquisition (Output 3-3-4)

	Dec.2014	Feb.2018	2021
Number of EPL acquisition	21,365	23,784	26,543

Illegal or EPL-violating factories (Output 3-3-6)

	2018	2019	2020	2021
Filed cases	364	544	267	Data are not gathered

Update of database (Output 3-2-4 and 4-3)

EPL

	2018	2019	2020	2021
Updated data	24,782	25,372	25,923	26,543

Pollution sources inventory (PSI)

	2018	2019	2020	2021
Updated data	8,638	14,434	19,893	21,173

Note: PSI was started in 2018 with the project.

Indicator 3
The guidelines and other outputs developed through the Project are properly applied by all concerned departments and regional offices of CEA in charge for a nationwide promotion of water quality management.

Status of the Achievement (Status of the Continuation): Achieved (Continued) (Project Completion)

Following manuals, guidelines and materials were developed by the project and were utilized.

- Quality Manual of the Laboratory
- Sampling Method for Ambient and Effluent Water
- Ambient Water Quality Standards (drafted standards were reviewed and finalized under the project in 2017 and gazetted in 2019)
- Procedural Guidelines for categorization of Inland Surface Waters
- Inspection Guidelines for Water Quality Section
- Training Guide on the Guideline for Inspection
- Existing Industrial Pollution Control Guidelines for Textile Processing (reviewed and developed)
- Slaughterhouse and Poultry Dressing Industry
- EPL Promotion Materials
- Pollution Sources Inventory accessible via internet
- Pollution Source Inventory Guidelines
- Pages on water quality status of the Kelani River on the CEA Website
- Draft Guideline on Information Management

(Ex-Post Evaluation)

All guidelines and manuals prepared under the project are being utilized by all CEA laboratories and provincial offices. Some guidelines and manuals were further developed or simplified with the application experience and knowledge.

source : Project completion report, questionnaire and interviews of CEA

Indicator 4
The number of major water bodies and regional governments which propose zoning categorization of ambient water quality standard is at least one (1) in

Status of the Achievement (Status of the Continuation): Achieved (Continued) (Project Completion)

During the project, zoning and categorization were done for the Kelani River based on the water quality data.

(Ex-Post Evaluation)

Water quality monitoring for four major rivers (Ma Oya, Nilwala, Badulu Oya, and Kalu Ganga) started immediately after the project completion. Zoning and

source: questionnaire and interviews of CEA

	Sri Lanka	<p>categorization require water quality data for a considerable time and necessary works are in process.</p> <p>In 2020, water quality monitoring was carried out in 22 water bodies by CEA laboratories and the initial steps were taken for the categorization of these rivers. In 2021, the "Surakimu Ganga" program to protect and conserve 103 water bodies in the country was launched in line with the government's new policy framework "vistas of prosperity and splendor". Twenty-two water bodies were selected in 2020 to apply the water quality environmental management system developed under the project. It is going to be increased to 25 in 2021. (See Overall Goal Indicator 2 below)</p>																											
	Indicator 5 One (1) guideline and materials on zoning and categorization are developed and used.	<p>Status of the Achievement (Status of the Continuation): Achieved (Continued) (Project Completion)</p> <p>"Procedural Guidelines for Categorization of Inland Surface Waters" were developed and used.</p> <p>(Ex-Post Evaluation)</p> <p>They are being utilized. (See Indicator 3 above)</p>	source : Project completion report, questionnaire and interviews of CEA																										
	Indicator 6 More than 2 times of guidance are conducted by CEA to organizations which have responsibility for water quality management of target water bodies.	<p>Status of the Achievement (Status of the Continuation): Achieved (Continued) (Project Completion)</p> <p>Six technical seminars, eight workshops to introduce the PSI, and a seminar on EPL and PSI were held during the project period.</p> <p>(Ex-Post Evaluation)</p> <p>Workshops, training sessions and seminars on EPL and PSI, etc. have been held after project completion in 2018.</p> <p>2018 (after project completion): 18 times, 2019: 11 times, 2020: 8 times</p> <p>CEA could not hold planned seminars/workshops and training in late 2020 and 2021 due to COVID-19.</p>	source : Project completion report, questionnaire and interviews of CEA																										
	Indicator 7 More than 70% of staff in the concerned departments and regional offices of CEA in charge can explain how to use the guidelines and other outputs developed through the Project.	<p>Status of the Achievement (Status of the Continuation): Not verifiable (Achieved and continued) (Project Completion)</p> <p>No information on the project completion report.</p> <p>(Ex-Post Evaluation)</p> <p>All relevant staff (see table below) can explain how to use the guidelines and other outputs developed through the project.</p> <table border="1" data-bbox="526 1075 1260 1635"> <thead> <tr> <th>CEA division/regional office</th> <th>Total number of staff = Number of staff who can explain how to use the guidelines and other outputs developed through the Project</th> </tr> </thead> <tbody> <tr> <td>CEA lab- Central Laboratory</td> <td>11</td> </tr> <tr> <td>CEA lab- provincial Laboratory</td> <td>18</td> </tr> <tr> <td>Environmental Pollution Control Division (EPC) division (in the head office)</td> <td>12</td> </tr> <tr> <td>Western Province Office</td> <td>104</td> </tr> <tr> <td>Central Province Office</td> <td>55</td> </tr> <tr> <td>Southern Province office</td> <td>100</td> </tr> <tr> <td>Northern Province Office</td> <td>35</td> </tr> <tr> <td>Sabaragamuwa Province Office</td> <td>42</td> </tr> <tr> <td>Uva Province Office</td> <td>35</td> </tr> <tr> <td>Eastern Province Office</td> <td>48</td> </tr> <tr> <td>North Central Province Office</td> <td>31</td> </tr> <tr> <td>North Western Province Office</td> <td>27</td> </tr> </tbody> </table>	CEA division/regional office	Total number of staff = Number of staff who can explain how to use the guidelines and other outputs developed through the Project	CEA lab- Central Laboratory	11	CEA lab- provincial Laboratory	18	Environmental Pollution Control Division (EPC) division (in the head office)	12	Western Province Office	104	Central Province Office	55	Southern Province office	100	Northern Province Office	35	Sabaragamuwa Province Office	42	Uva Province Office	35	Eastern Province Office	48	North Central Province Office	31	North Western Province Office	27	source : Project completion report, questionnaire and interviews of CEA
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(Overall Goal) Water quality management in major water bodies is appropriately implemented by CEA	Indicator 1 The by-laws and/or regulations which stipulate roles and functions of a water quality management system are inaugurated by 2020.	(Ex-Post Evaluation) Achieved Ambient Water Quality Standards (2019) that assist evaluation of the status of the water quality and necessary policy decisions to control water pollution, were inaugurated. National Environmental Act and related regulations are being amended to include a series of provision.	source : Interview and questionnaire of CEA																										
	Indicator 2 The ratio of water bodies assessed/ managed by CEA by using improved water quality monitoring methods (system/ procedure) increases by 2020 compared with the initial stage of the Project	<p>(Ex-Post Evaluation) Achieved</p> <p>The ratio of water bodies assessed by the improved methods increased from 4% (2014) to 21.4% (2020). The number of major water bodies in Sri Lanka is 103.</p> <table border="1" data-bbox="526 1926 1292 2083"> <thead> <tr> <th></th> <th>2014</th> <th>2018</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td>Number of water bodies assessed by the improved methods</td> <td>4</td> <td>14</td> <td>15</td> <td>22</td> <td>25 Planned</td> </tr> <tr> <td>Percentage</td> <td>4%</td> <td>13.6%</td> <td>14.6%</td> <td>21.4%</td> <td>24.2%</td> </tr> </tbody> </table>		2014	2018	2019	2020	2021	Number of water bodies assessed by the improved methods	4	14	15	22	25 Planned	Percentage	4%	13.6%	14.6%	21.4%	24.2%	source : Interview and questionnaire of CEA								
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	<p>Indicator 3 The number of major water bodies with proposed the water quality environmental management system are at least one (1) in Sri Lanka by 2020 in accordance with the guidelines prepared by the Project.</p>	<p>(Ex-Post Evaluation) Achieved All 103 water bodies are managed by the water quality environmental management system. Since the inception of the EPL scheme, water quality environment management has been practiced. After completing the project, more organized management was set up. CEA is implementing “Surakimu Ganga” and all major 103 rivers are included in this program. The sampling for water quality data will be implemented with the budget support from the program.</p>	<p>source : Interview and questionnaire of CEA</p>
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3 Efficiency

The project cost was within the plan (81%) and the project period was as planned (100%). The JICA project team recognized that the project started in March 2015 when the first members were dispatched and the project continued for three years as per the original plan while the start and end dates were shifted. There was no change in the planned outputs. Therefore, the efficiency of the project is high.

4 Sustainability

<Policy Aspect>

Sri Lanka’s National Environmental Act No. 47 (1980), EPL and effluent discharge regulations, Ambient Water Quality Standards regulate water quality. “Surakimu Ganga” encourages local governments and related organizations as well as the general public to protect rivers. EPL system, PSI, and water quality monitoring activities promoted by the JICA project have been incorporated into this program.

<Institutional/Organizational Aspect>

CEA’s organizational structure remains the same. Secretariat to implement “Surakimu Ganga” was established. Project effects have been maintained by CEA’s current structure and staffing, but CEA submitted a request to the Ministry of Finance for additional staff to ensure sustainability after assessing the workload and staffing needs.

<Technical Aspect>

All relevant staff of CEA have sufficient skills and knowledge (see Project Purpose Indicator 7). All manuals prepared by the project are being used to train the new laboratory staff. At present, the inspection guidelines are distributed among the relevant divisions. CEA plans to achieve ISO 9001 quality management systems, and all documents related to each process have been gathered and included in this quality management system. All guidelines and manuals prepared by the project have been incorporated into this quality management system for the streamlining of all the processes done by CEA and for the continuation of the future usage.

<Financial Aspect>

The government provides a consolidated fund for the implementation of the activities promoted by the project. Rs 200 million has been allocated for “Surakimu Ganga.” The laboratory has been given a considerable amount of funding for the implementation of the accreditation program.

<Evaluation Result>

In light of the above, no problems have been observed in policy, institutional/organizational, technical or financial aspects of the implementing agency. Therefore, the sustainability of the project effects is high.

5 Summary of the Evaluation

The project achieved the Project Purpose, “Enforcement capacity of CEA and its regional branch offices of the Kelani river basin on water quality management is strengthened” at the time of project completion, and the effects continue. Overall Goal “Water quality management in major water bodies is appropriately implemented by CEA” was achieved as all 103 major water bodies in Sri Lanka are managed under the improved method. There are no major problems in policy, institutional/organizational, technical or financial aspects of sustainability. As for the efficiency, project cost was within the plan and the project period was as planned.

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

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

1. PSI system developed under this project is still in use, and some bugs of the software have not been fixed (there are problems with editing of entries, input of industry data, entry of data beyond 2021). It is recommended to hire an IT consultant immediately to fix the program.
2. PSI monitoring system needs to be developed to cater the following aspects: a) Mobile (Android and Apple) app to facilitate field works; b) Interface for point source to upload and update report for CEA review; c) PSI system further be developed issue letters on recommendation, rectification, and reminders, etc. by using system itself without manual drafting.
3. CEA monitoring division could develop an integrated activity monitoring system for zoning and categorization of water bodies to know where they are at the given point of time.
4. Management services division of the Ministry of Finance shall approve additional staff requirements that CEA had forwarded with a careful need analysis.
5. CEA could start disseminating water quality management details for the public to engage them in the process.
6. With the dissemination of information, CEA could make a plan how to address non-point sources. CEA could also study other countries’ approaches in this regard.

Lessons Learned for JICA:

1. It was evident that JICA consultant team had performed transformative leadership which essentially helped to adopt successful water quality Management system of Japan in Sri Lanka with untiring support from the counterpart officers. The Team had analyzed the existing systems and current levels to improve them in a participatory manner, not simply importing foreign systems. For example, the ambient water quality standards were drafted by the Sri Lankan members integrating past experiences and were finalized by the project through discussions among all members.

The Japanese project members respected the culture and practices of Sri Lanka. For example, in workshops or seminars, they intentionally included the lightening of a traditional oil lamp and arrangements of local food and snacks for participants. They actively participated in local festivals and religious functions. This nurtured a strong relationship and trust among the project members.

2.. The capacity and ownership of the counterpart were enhanced while working with the Japanese expert team, and the counterparts were able to include project activities under “Surakimu Ganga,” which is a new vehicle as a project exit strategy to ensure budget and necessary management support from the government.



Testing water quality parameters at Kelani River



Laboratory staff doing sample test



Sampling at Badulu Oya River



Testing water quality parameters at Badulu Oya River