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IMPLEMENTATION COMPLETION AND RESULTS REPORT

TF 99870

ON A

SMALL GRANT

IN THE AMOUNT OF USD 5.08 MILLION

TO THE

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

FOR

INCREASING HOUSEHOLD ACCESS TO DOMESTIC SANITATION IN  
GREATER COLOMBO (P111161)

September 25, 2019

Water Global Practice  
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## ABBREVIATIONS AND ACRONYMS

BOD	Biochemical Oxygen Demand
CAPEX	Capital Expenditure
CPF	Country Partnership Framework
DEWAT	Decentralized Wastewater Treatment System
EIRR	Economic Internal Rate of Return
ERD	Department of External Resources
GoSL	Government of Sri Lanka
GPOBA	Global Partnership on Output-Based Aid
GPRBA	Global Partnership for Results-Based Approaches
GRM	Grievance Redress Mechanism
IVA	Independent Verification Agent
M&E	Monitoring and Evaluation
NPV	Net Present Value
NWSDB	National Water Supply and Drainage Board
O&M	Operation and Maintenance
OBA	Output-based Aid
OPEX	Operational Cost
PDO	Project Development Objective
PMM	Department of Project Management and Monitoring
PMU	Project Management Unit
PPP	Public-Private Partnership
RBF	Results-based Financing
SCF	Standard Conversion Factor
Sida	Swedish International Development Cooperation Agency
SPEAR	Subproject Environmental Assessment Report
WHO	World Health Organization
WWTP	Wastewater Treatment Plant

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**DATA SHEET**

**BASIC INFORMATION**

**Product Information**

Project ID	Project Name
P111161	Increasing Household Access to Domestic Sanitation in Greater Colombo
Country	Financing Instrument
Sri Lanka	Investment Project Financing
Original EA Category	Revised EA Category

**Organizations**

Borrower	Implementing Agency
Democratic Socialist Republic of Sri Lanka	National Water Supply and Drainage Board

**Project Development Objective (PDO)**

Original PDO

The objective of the Project is to improve sanitation services to low-income households in Greater Colombo by increasing the number of sewerage house connections to existing and new sewerage networks and improving on-site sanitation services at household level.



**FINANCING**

	Original Amount (US\$)	Revised Amount (US\$)	Actual Disbursed (US\$)
<b>Donor Financing</b>			
TF-99870	5,080,000	4,894,840	4,894,840
<b>Total</b>	<b>5,080,000</b>	<b>4,894,840</b>	<b>4,894,840</b>
<b>Other Financing</b>			
Borrower/Recipient	3,240,000	6,800,000	4,560,000
Borrowing Agency	1,110,000	1,053,000	1,900,000
Local Beneficiaries	430,000	183,000	170,000
<b>Total</b>	<b>4,780,000</b>	<b>8,036,000</b>	<b>6,630,000</b>
<b>Total Project Cost</b>	<b>9,860,000</b>	<b>12,930,840</b>	<b>11,524,840</b>

**KEY DATES**

Approval	Effectiveness	Original Closing	Actual Closing
08-Jun-2011	22-Jun-2012	31-Dec-2015	31-Mar-2019

**RESTRUCTURING AND/OR ADDITIONAL FINANCING**

Date(s)	Amount Disbursed (US\$M)	Key Revisions
18-Dec-2015	0.23	Change in Results Framework Change in Components and Cost Change in Loan Closing Date(s) Change in Financing Plan Change in Disbursements Arrangements Change in Implementation Schedule
15-Dec-2017	2.31	Change in Loan Closing Date(s)
03-Oct-2018	3.78	Change in Disbursements Arrangements
31-Dec-2018	3.78	Change in Loan Closing Date(s)



**KEY RATINGS**

Outcome	Bank Performance	M&E Quality
Moderately Satisfactory	Moderately Satisfactory	Substantial

**RATINGS OF PROJECT PERFORMANCE IN ISRs**

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US\$M)
01	30-Oct-2013	Satisfactory	Moderately Satisfactory	0.00
02	12-Jan-2016	Moderately Satisfactory	Moderately Unsatisfactory	0.34
03	22-Jan-2016	Moderately Satisfactory	Moderately Unsatisfactory	0.34
04	14-Jun-2017	Moderately Unsatisfactory	Moderately Satisfactory	1.65
05	09-Mar-2018	Moderately Unsatisfactory	Moderately Unsatisfactory	2.86
06	23-Apr-2018	Moderately Unsatisfactory	Moderately Unsatisfactory	2.86
07	25-Oct-2018	Moderately Unsatisfactory	Moderately Satisfactory	3.78
08	29-Mar-2019	Moderately Satisfactory	Moderately Satisfactory	4.34

**ADM STAFF**

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## I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

### Context

1. The Sri Lanka Output-Based Aid (OBA) in the 'Increasing Household Access to Domestic Sanitation in Greater Colombo' was designed to address the degraded sanitary and environmental conditions of densely populated low-income settlements in the outskirts of Greater Colombo.
2. At the time of project preparation, the geographical coverage of the sewer network in Greater Colombo was less than 50 percent of the total area, mostly concentrated in the central area, while surrounding small towns had lower coverage ranging from 15 percent to 40 percent. The existing wastewater treatment plants (WWTP) were not adequate, and sewage flows were only screened before discharge to water bodies.
3. There were around 100 water customers for every one sewer connection in the project area. The majority of households that were not connected to the sewerage network, both poor and non-poor, had some form of on-site sanitation (either septic tanks or pits). According to estimates by the National Water Supply and Drainage Board (NWSDB), about 80,000 such tanks and pits existed throughout the Greater Colombo area, many of which were in poor condition and discharged into the environment – either directly into rivers and canals or into storm drains.
4. The very low rate of connection to sewers coupled with unregulated management of on-site sanitation resulted in high levels of contamination of the environment and cross contamination into the water supply system. Illegal, unregulated dumping of fecal sludge into the sewer network also caused blockages and contributed to poor performance of the whole network.
5. Australia and Sweden provided donor funding to the Global Partnership for Results-Based Approaches (GPRBA, formerly Global Partnership on Output-Based Aid [GPOBA]). Australia, a traditional donor of island nations in Oceania, hoped to see the testing of innovative approaches to sanitation for an island nation with a promising tourism sector. For Sweden, this project was meant to enhance the development impact of the Swedish International Development Cooperation Agency (Sida) as it was completing its support to Sri Lanka, a post-conflict nation on a path to becoming an upper-middle-income country.
6. Sida provided a US\$91 million concessional loan to the NWSDB to build two state-of-the-art WWTPs—in Ratmalana/Moratuwa to the south of Colombo and in Ja-Ela/Ekala to the north of Colombo. Sida invited GPRBA for parallel assistance in 2006 and GPRBA provided technical assistance to design a results-based financing (RBF) project. In 2010, a grant of US\$ 5.08 million for connecting 13,107 households and providing on-site sanitation to 2,300 households was committed by GPRBA.

### Project Development Objectives (PDOs)

7. As stated in the Grant Agreement, the PDO was *to improve sanitation services to low-income households in Greater Colombo by increasing the number of sewerage house connections to existing and new sewerage networks and improving on-site sanitation services at household level*. The PDO was not changed over the project period. While the PDO in the Commitment Paper differs from the one above, the version of the Grant Agreement will be used in the efficacy section below.



### Key Expected Outcomes and Outcome Indicators

8. The project was designed to meet the PDO by increasing house sewer connections and improving sanitation services in place. The three Key Outcome Indicators were: (a) number of new sewer household connections constructed under the project; (b) number of eligible low-income households provided with improved on-site systems; (c) new PPP framework for delivery of improved sanitation services in place; and (d) number of direct beneficiaries and its ratio of female.

### Components

9. The project provided improved sanitation facilities at a discounted fee, considering the income levels of the beneficiaries. It was designed to encourage the low-income households to join the project at an affordable cost, and gradually promote substantial cost recovery from the beneficiaries. Reducing the health risk of water-borne disease and creating a clean environment were expected higher level outcomes of the project.

10. Under the OBA approach, the grant financing to the GoSL would be released upon delivery of defined outputs, as verified by the Independent Verification Agent (IVA) that would monitor the condition of outputs six months after installation. The GoSL and NWSDB also agreed to a substantial amount of counterpart funding, which was originally US\$ 4.35 million (40 percent of total project cost).

11. The project consisted of two components as described below. The project used Results-Based Financing (RBF), formerly OBA, to ensure achievement of sustainable results. The initial construction fee for outputs was to be borne by counterpart funds and beneficiary contributions. The Grant subsidy from GPRBA would not be released until the IVA verified that the outputs satisfied the required criteria. For each quarterly verification, the IVA would carry out random sample checks of at least 7 percent of the households for which subsidies were requested.

12. **Component 1: New Household Connections to Reticulated (Networked) Sewerage (Original cost: US\$ 8.61 million; final cost: US\$ 9.01 million).** This component provided output-based subsidies to finance new sewer connections to low-income households. The household contribution for all connections to piped sewerage was set at US\$27, based on incomes and affordability levels. Output 1, related to household connections, was classified into six connection types depending on the geographic conditions and accessibility to sewer networks<sup>1</sup>. Each connection type had a different cost structure as summarized in Table 1. The decision tree to determine the most suitable connection type is presented in Annex 2.

13. **Output 1a: Direct connection to existing sewers** applied to households in the vicinity (less than 20 m away) of the main sewer line. For households equipped with an interconnection chamber built as part of the Sida-funded project, **Output 1a2: Direct connection within premises** was applied to complete the connection between the chamber and the house. For households not covered by the Sida-funded project, **Output 1a1: Direct connection full cost build out** delivered attached facilities in addition to the work provided through Output 1a2.

14. **Output 1b: Connections to conventional sewer extensions** involved construction of extension sewer lines along the road linking the households to the existing sewer, in addition to the works included in Output 1a. The installation of extension sewers followed the construction standards of NWSDB in terms of pipe depth, pipe diameter, and so on.

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<sup>1</sup> Detailed explanation and graphic illustration of each connection type is presented at the Project website.  
<http://www.GPRBASrilanka.lk/direct-connection.html>



**Table 1. Numbers and Cost Structures of Each Output Type (updated at 2015 restructuring)**

	1a. Direct connection		1b. Conventional sewer extension	1c. Simplified sewer extension		1d. Decentralized system	2. On-site system
	1a1	1a2		1c1	1c2		
Number of outputs (households)	725	750	392	1,083	1,500	565	3,785
Unit cost of output (US\$)	1,355	478	3,524	2,197	3006	825	800
Unit HH contribution (US\$)	27	27	27	27	27	27	13
Unit NWSDB contribution (US\$)	0	0	0	320	425	123	0
GOSL co-financing (US\$)	1,195	229	2,692	871	1,569	160	320
GPRBA unit subsidy (US\$)	133	223	535	979	986	515	466
GPRBA share (%)	9.8%	46.7%	15.2%	44.6%	32.8%	62.4%	58.3%

15. In contrast, **Output 1c1: Connections to simplified sewer extensions** applied simplified methods for the construction of extension sewers and smaller-diameter pipes for houses that faced narrow roads with less traffic, allowing lower unit construction costs than Output 1b (US\$ 2,197 compared to US\$3,524). The simplified sewer extension enabled the project to access the densely populated low-income settlements where streets were typically narrow and labyrinthine, making conventional excavation work unfeasible.

16. **Output 1c2: Connections to simplified sewer extensions with pumping** applied to settlements with characteristics similar to Output 1c1 but that were located in lowland areas where gravity drainage to the WWTP was not possible. Under this output, household connections and extension sewers were installed in the same manner as Output 1c1, but the project would also construct pump houses that would transfer the collected wastewater to existing main sewer lines to join the reticulated system. The pumps would be operated only when the sewage chamber fills. All monitoring and operation would be conducted remotely by NWSDB.

17. **Output 1d: Connections to small networks with decentralized treatment systems (DEWATs).** Decentralized wastewater treatment systems (DEWATs) are defined as new stand-alone wastewater treatment system. This output was appropriate for low-income collective housing that was too far from the existing central sewerage network. The system would comprise a combination of a septic tank and a chlorine dosing unit. The treated water would be drained directly into the sea, while the sludge would be removed for a fee once a year to be treated in one of the Sida-supported facilities. The ownership of DEWAT facilities was transferred to the local communities where apartment owners undertook operation and maintenance. There is one exceptional DEWAT (Rathmalana Tsunami Housing Scheme), the O&M of which is done by NWSDB with sewerage tariffs.

18. **Component 2: On-site sanitation improvements (Original cost: US\$ 1.25 million; final cost: US\$ 2.52 million).** In areas where sewers could not be provided or were inappropriate, eligible households would be offered ‘on-site sanitation improvements’. Either a new facility (septic tank) would be provided, or the existing facilities would be improved. As a part of PPP framework of the project, desludging would be entrusted to a licensed gully bowser services company on a contractual basis. Introducing such performance-based contracts would promote a novel way of managing on-site sanitation. The household contribution was set as US\$15. Desludging of the septic tank would be required on average every 12 months and cost US\$25. The project would subsidize 50 percent of the first-time desludging cost and 15 percent of the second, third and fourth desludging to encourage proper maintenance by the beneficiaries.



### Significant Changes During Implementation

19. As seen in the Datasheet, the project underwent four Level II restructurings. **The first restructuring** in December 2015 amended the Results Framework, increased the component and project costs from \$9,860,000 to \$13,116,000 and consequently changed the financing plan, and extended the closing date two years. The number of outputs was downscaled from 15,407 household to 8,800 (from 13,107 to 5,015 for Output 1 and from 2,300 to 3,785 for Output 2 respectively. See Annex 5 for details of restructuring). This was caused by unforeseeable price inflation in Sri Lanka during the project period (see paragraph 47 for details).

20. In accordance with the Project Implementation Manual, the unit subsidy amounts were adjusted several times to reflect the price escalation<sup>2</sup>. The average cost per connection increased from US\$ 679 in 2012 to US\$ 2,171 in 2014. As a transitional measure, the unit subsidy for each connection type was updated in 2014 as shown in Table 2. Yet there was significant financing gap, which led to the aforementioned restructuring<sup>3</sup>.

**Table 2. Applicable Subsidy Amounts (US\$ per connection)**

	1a. Direct connections		1b. Conventional extension	1c. Simplified extension		1d. DEWATs	2. On-site improvements
	1a1. Full cost	1a2. Within premise		1c1. gravity	1c2. pump		
Estimate as of 2010	180		254	143		254	158
Initial Design in 2012	100	100	254	315	368	419	313
Outputs realized in 2013	115	115	293	364	425	484	361
Outputs realized in Q1 & Q2 2014	117	117	297	368	430	490	366
Outputs realized in Q3 2014 onwards	133	223	535	979	986	515	466

21. **The second restructuring** in December 2017 extended the grant closing date by one year to ensure the output delivery of the project particularly for Output 2. **The third restructuring** in October 2018 amended the disbursement arrangement for Output 2 (see the next paragraph for the details). **The fourth restructuring** in December 2018 extended the grant closing date by three months to complete the ongoing works for Output 2.

22. **Subsidy scheme for on-site sanitation improvement (Output 2)** was gradually modified from the original to better fit the local situation and to streamline the verification procedures. At the project restructuring in 2015, the originally agreed eight-tranche subsidy payment system (12.5 percent each) was replaced by two tranches: i) 80 percent upon the installation/rehabilitation of on-site sanitation facility and ii) 20 percent upon the first desludging service provided six months after installation/rehabilitation. At the third restructuring in October 2018, the second tranche was waived allowing 100 percent of the unit subsidy to be released upon installation/rehabilitation as desludging was not required after six months but only after one year.

<sup>2</sup> A major adjustment was in 2014, when only one bid was received for Output 1c1 and the proposed unit cost was four times as high as the estimates.

<sup>3</sup> To accommodate this financial gap, in April 2014, the GoSL and NWSDB requested to increase the GPRBA grant and drop Output 2. The World Bank and GPRBA then prepared counterproposals that insisted on a) retention of Output 2 to the project and b) increased financial contribution by the GoSL.



II. OUTCOME

Assessment of Achievement of Each Objective/Outcome

Relevance

23. At the time of project preparation, sanitation was not referred to in the Country Assistance Strategy of the World Bank (2008–2012). However, in recognition of the high priority of this sector, the subsequent blended IDA-IBRD Country Partnership Strategy (2012–2016) set sanitation as priority under Target Area 3C, ‘Expanding social inclusion and equitable access’. This project remained the only sanitation operation till the Bank introduced sanitation components in two currently-ongoing projects, for the Metro Colombo Urban Development Project (P122735, 2012–2020) and for other areas (P147827, 2015–2020). The current Country Partnership Framework (CPF) for 2017–2020 continues to prioritize sanitation under Objective 2.3, ‘Improving living standards in lagging areas’.

24. The PDO remained substantially relevant and more urgent to achieve, as the underlying principle that the project would improve sanitation service to low-income households in fast-growing Greater Colombo remained sound, and the risk for tourism posed by untreated wastewater increased. The PDO remained aligned with the GoSL’s National Development Plan, including its most recent edition ‘Vision 2025’. Informed, among other things, by the project experience, the national policy on sanitation adopted in 2018 states that selection of the approach to household sanitation falls into two main categories: (a) on-site facilities and (b) toilets connected to a sewer and off-site treatment, which are exactly the focus of the project objective. The Project Management Unit (PMU) reported increasing demand from community and government stakeholders for scaling up the project services, which also demonstrates relevance of the project objective.

Efficacy

25. The project sought to improve sanitation services to low-income households in Grater Colombo through two means: (a) by increasing the household sewerage connections to existing and new sewerage networks; and (b) by improving on-site sanitation services. The flow of project funds and role of each stakeholder is shown in Figure 1.

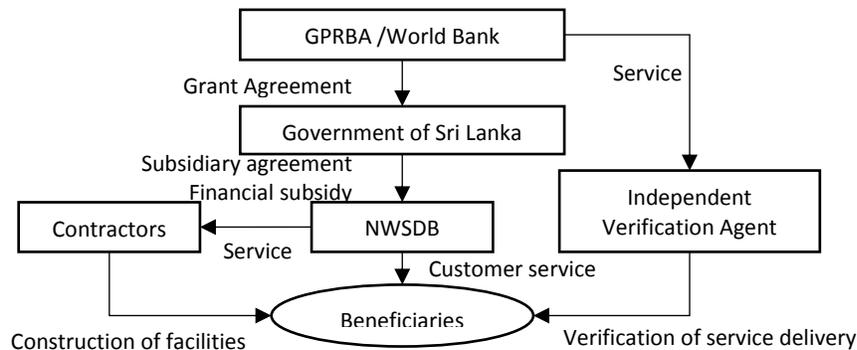


Figure 1. Project Funds Flow

26. In the case of Output 1, the first tranche (50 percent) of the GPRBA subsidy per output was reimbursed upon verification of satisfactory completion and commissioning, and the remaining 50 percent was released upon evidence of satisfactory service provision and issuance of sewerage bills six months after the commissioning. As for Output 2, the original design was to split the subsidy into eight tranches (12.5 percent each) and release them upon



completion and quarterly verifications. This was then changed to release 80 percent upon satisfactory completion and commissioning, and the remaining 20 percent upon satisfactory service provision and provision of the first desludging of septic tank, which usually takes more than six months after installation.

27. **Increasing household sewerage connections.** After the restructuring in 2015, the project demonstrated steady disbursement, and overall achievement in terms of delivered outputs marked 8,347 households compared to the target of 8,800 (95 percent of the target) with a total of 50.1 km<sup>4</sup> sewer pipelines laid at the close of the project, resulting in the number of direct beneficiaries reaching 49,247, with 50 percent estimated to be women. As a result of the project, NWSDB increased its customer base among households by almost a third in the Greater Colombo area and was prompted to take on more comprehensive spatial planning in the areas farther from the existing sewers. The increased wastewater discharge to the WWTP amounted to 3,589 m<sup>3</sup> per day, contributing to the improvement of financial revenue of NWSDB.

**Table 3. Achievement of PDO Indicators**

Indicators	Baseline	Actual	Original Target	Revised Target	% against revised target
Number of new sewer household connections constructed under the Project (Output 1) (Number, Custom)	0	4,793	13,107	5,015	96%
Number of eligible low-income households provided with improved on-site systems (Output 2) (Number, Custom)	0	3,554	2,300	3,785	94%
Direct project beneficiaries (Number, Custom)	0	49,247	77,035	51,920	95%
Female beneficiaries (Percentage, Custom Supplement)	0	50	50	50	100%
Low-income households provided with access to improved sanitation services under the Project (Number, Custom)	0	8,347	15,407	8,800	95%
New PPP framework (agreement with local authorities) for delivery of improved sanitation services in place (Number, Custom)	0	7	NA	4	175%

28. New sewer connections (Output 1) reached 95.6 percent of the revised target. Most of the new connections were delivered by the end of 2017, allowing NWSDB to collect wastewater tariffs to recover the O&M cost of the WWTP newly constructed by the Sida project. The positive effect of newly installed sewer connections is already evident in the project sites in terms of improved health and environment and even in terms of the local security situation (see ‘Other Outcomes and Impacts’ section for further details).

29. Improving on-site sanitation systems (Output 2). The project installed on-site sanitation systems upon the application by eligible households. A number of stakeholder meetings were conducted to encourage customer applications by explaining the benefits of the introduction of new on-site sanitation systems and the PPP based desludging system. By the end of the project, 3,554 households had received on-site sanitation improvements, representing 93.9 percent of the revised target of 3,785 households. Although most of the on-site systems were installed after 2017, the follow-up survey confirmed the reduced overflow of the septic tanks within the house premises, contributing to better sanitary conditions at project sites. The periodic desludging of filled septic tanks had already been carried out by private service providers for 680 households that had installation in the earlier stages, proving the validity of the newly introduced public-private partnership (PPP) framework. Under this PPP framework, 50 percent of the LKR 6,000 desludging fee is subsidized by NWSDB for the first desludging after

<sup>4</sup> 18.3 km for 160mm-225mm diameter pipes, 31.3 km for 110 mm diameter pipes and 0.5 km for 160 mm -250 mm diameter pipes.



installation, and 15 percent is subsidized for the second, third and fourth time, thus customers are encouraged to maintain the facility periodically (see also paragraph 43 for the details of PPP framework).

30. As for other PDO indicators, the higher number of new PPP agreements with local authorities than the target (7 achieved against the original target of 4) reflects that three more local authorities joined the project than originally planned.

**Table 4. Summary of Achievement against Planned Outputs (households)**

	Output 1. Total of Sewer Connections							Output 2. On-site improvements
	1a. Direct connections		1b. Conventional extension	1c. Simplified extension		1d. DEWATs	Output 1: Total of Sewer Connections	
	1a1. Full cost	1a2. Within premise		1c1. gravity	1c2. pump			
Planned	725	750	392	1083	1500	565	5015	3785
Actual completion	898	336	392	1,115	1,500	552	4793	3,554
%	123.8	44.8	100.0	103.0	100.0	97.7	95.6	93.9

31. The final progress report submitted by the IVA in March 2019 noted the overall good quality of works, satisfying the required standards, delivered through the project and proper operation and maintenance of the facilities by the beneficiaries. It also confirmed the punctuality and transparency of periodic reporting by NWSDB.

32. While the project fully achieved or exceeded four of the six PDO indicators, the targets related “within premises” fell short significantly, and the number of sanitation outputs delivered to the beneficiaries fell slightly short of the target. Hence efficacy is rated ‘**Substantial**’.

**Efficiency**

33. The average connection cost at the beginning of the project was US\$ 540 per output (US\$ 92 per person). This then increased to US\$ 1,490 per output (US\$ 253 per person) after the restructuring in 2015. When compared with global standards, a study by WHO<sup>5</sup> indicates average per capita cost for sanitation in entire Asia in 2005 US\$ 248 for household connection and US\$ 167 for on-site sanitation. Given the fact the prices inflated since 2005 to present (per capita GDP has also doubled), the project outputs were delivered in a globally competitive cost, indicating high ‘value for money’.

34. **Economic Internal Rate of Return (EIRR).** Despite the reduction in targets approved with the restructuring in 2015, delays resulting in extensions of the closing date by three and a quarter year and a 31% increase in the total cost, the project shows an EIRR of 33.7 percent, in contrast with the appraisal-stage estimate of EIRR 27.5 percent. This paradoxical result is explained by the increase in the value of unit benefit per beneficiary<sup>6</sup>, therefore due attention needs to be paid when comparing the absolute values of appraisal- and ICR-stage EIRR—if the same value of unit benefit as appraisal stage is assumed, the EIRR would have been 19.3 percent. In addition, it is also noteworthy that the unit benefit value used in the analysis relies on a generic regional study conducted by World

<sup>5</sup> World Health Organization: Regional and Global Costs of Attaining the Water Supply and Sanitation Target (Target 10) of the Millennium Development Goals. Geneva: World Health Organization; 2005.

<sup>6</sup> While appraisal-stage analysis assumes unit benefit of US\$ 22.55 per person per year in 2015 prices (base benefit of US\$ 14.47 as of 2000 and average inflation rate of 3 percent from 2000 to 2015), actual average inflation rate exceeded 6 percent, resulting in the unit benefit of US\$ 34.69 per person per year.



Health Organization (WHO);<sup>7</sup> thus the robustness of the analysis is relatively lower than that conducted particularly for the project area.

35. Considering these factors, appropriate interpretation of the results of the economic analysis should be the following: (i) the reduction in targets, project period extension and overall cost increase lowered the EIRR of the project; (ii) at the same time, the price escalation resulted in the increase of unit project benefit per beneficiary, and the increase in unit benefit was large enough to offset the decrease of EIRR mentioned above; and (iii) the project shows sufficiently high economic viability even when we leave the increase of economic benefit out of consideration, however the robustness of the analysis should be regarded as modest because of the generic methodology it relies on. See Annex 6 for details of the economic analysis.

36. In terms of **design and implementation**, the project saw significant implementation delays (39 months in total), cost overruns and a reduction of targets. Most of these are attributable to unforeseeable price escalations and high demand for contractors. However, the project could have been implemented more efficiently budget-wise and time-wise, if the project had been designed with a better understanding of the nature of a sanitation improvement project in low-income areas as well as the expected challenges in implementing PPP for on-site sanitation improvement (see Key factors section below.)

37. Given the modest robustness of economic analysis and the issues related to design and implementation, the efficiency of the project is rated **Modest**.

**Overall Outcome Rating**

38. Based on the assessment above and the project performance before the restructuring in 2015, relevance of the PDO is rated substantial, efficacy of the PDO achievement is rated Modest, and efficiency of the project rated Modest. The outcome rating of the project before restructuring is rated Moderately Unsatisfactory. After the restructuring, the efficacy rating improved to ‘Substantial’.

39. By applying a ‘split rating’ method, the overall outcome rating of the project is rated ‘Moderately Satisfactory’ as summarized in Table 5. It should be noted that the weighted factors in split rating method is determine by the share of disbursement, not the time period.

**Table 5. Application of Split Rating**

	Before Restructuring	After Restructuring
Relevance of Objective	Substantial	
Efficacy (PDO)	Modest	Substantial
Efficiency	Modest	
1. Outcome ratings	Moderately Unsatisfactory	Moderately Satisfactory
2. Numerical value of the outcome ratings <sup>8</sup>	3	4
3. Disbursement	US\$ 0.23 million	US\$ 4.66 million
4. Share of disbursement	5%	95%
5. Weighted value of the outcome rating (Row 2 X Row 4)	0.15	3.8
6. Final Outcome Rating	<b>Moderately Satisfactory</b> (0.15 + 3.8 = 3.95=4)	

<sup>7</sup> Hutton et al. (2004). See Annex 6 for the literature details. Sri Lanka is categorized in SEAR-B sub-region which also contains Indonesia and Thailand. Hence, all the analysis results in the paper reflects the situation of other SEAR countries than Sri Lanka.

<sup>8</sup> Highly Unsatisfactory (1); Unsatisfactory (2); Moderately Unsatisfactory (3); Moderately Satisfactory (4); Satisfactory (5); Highly Satisfactory (6)



## Other Outcomes and Impacts

40. **Environmental and health benefits.**<sup>9</sup> The project catalyzed documented changes in public hygiene at project sites. In the Badowita area covered under Output 1c2 (extension with pumps), for instance, the common toilet shared by the community frequently overflowed and other sewage collected in open gullies in the narrow alleys behind houses. In these locales the highest pre-project biochemical oxygen demand (BOD) reading was 480 mg/l, far above the industrial effluent discharge standard of 250 mg/l and discharge standard to open water bodies of 30 mg/l in Sri Lanka, indicating widespread organic pollution caused by sewage contamination. This dropped to an average BOD level of 9.9 mg/l after the project investment. Similar BOD improvements were observed in DEWAT schemes (Output 1d) in Lunawa housing complex (from 195 mg/l to 12 mg/l before and after the project) and direct connection site (Output 1a1) in Auburn (from 480 mg/l to 26 mg/l). There is no available record for pre-project BOD with on-site sanitation improvement sites (Output 2), but the sampled water from the top of the newly installed anaerobic filter indicated acceptable BOD value from 15 mg/l to 70 mg/l over the two-year monitoring period after installation.

41. While quantitative data on the cases of water-borne disease in the project site was not available, qualitative interviews with beneficiaries indicates an apparent decrease in sludge and wastewater in public spaces, hence decreasing the number of mosquitos and rats that are major disease carriers. In these area diseases such as diarrhea, skin rashes and dengue fever were noted to be common occurrences, but occurrence of these diseases decreased after the project implementation according to the interviews with beneficiaries. The project also mitigated the recurring overflow of septic tanks installed in the Output 2 beneficiary area, which used to cause serious health risk especially during floods.

42. **Socio-economic impacts.** The improvements to environmental conditions and public health described above had various socio-economic impacts to the beneficiary areas. For instance, in some settlements like Badowita, the general public stayed away from narrow alleys due to stagnant wastewater in the open gullies, drawing criminal activities such as drug dealing and other activities harmful to public security. The cleanup of these alleys through the project dramatically reduced criminal activities, according to the follow-up survey conducted by safeguard specialists (cf. Annex 7). The areas equipped with common toilet pits at pre-project time used to have frequent social conflicts related to collection of community fee for toilet pit desludging. Such conflicts are no longer observed after the project as the result of the transformation of the sanitation fee payment system from collective payment to individual payment through utility bill.

43. **Introduction of PPP for sanitation service.** The project has demonstrated a PPP approach for installation of treatment units and regularly scheduled desludging (against demand-based desludging). It demonstrated the concept of a universal sanitation service which enables households to become legitimate sanitation customers of the utility irrespective of whether services are provided by piped sewers or properly-managed and serviced on-site systems. With regular reporting of overflowing septic tanks discharging effluent to nearby drains and canals, such a system of regular desludging at scale could improve environmental conditions and public health considerably. The PPP bid was won by a consortium of a septic tank manufacturer (that invested around \$1 million into a new manufacturing facility for wastewater treatment units) and a septic tank-servicing company (that had trucks for emptying and hauling the fecal sludge). After it became clear that septic tank installation was lagging behind the

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<sup>9</sup> See Annex 7 for the detailed environmental and health impacts.



manufacturing schedule, NWSDB worked promptly and timely with the consortium to bring new partners that specialized in septic tank installation.

44. **Operations in low-income settlements.** Through the implementation of the project, contractors and NWSDB learned the unique nature of construction work in low-income settlement areas, where appropriate communications with residents are essential since the installation works inevitably result in the closure of entire stretches of narrow roads and where all household members tend to be away during the day, making in-premise works a challenge. These lessons are expected to help NWSDB with contractor selection and smooth implementation for similar works in the future.

45. **Targeting the poor and making sanitation affordable.** IVA reports and beneficiary interviews in the borrower's implementation completion report proved that the beneficiary eligibility criteria (small land plot, low-income neighborhood) were adequate for providing sanitation services to those who otherwise could not afford them, living below both the local poverty line and below the international US\$2/day benchmark for middle-income countries.

46. **Piloted sanitation solutions** could be applicable to other areas in Sri Lanka as well as other countries. NWSDB, a nation-wide utility with over 10,000 employees, tasked the first project manager to lead a unit responsible for training and knowledge management. In August 2018, this unit provided a three-day training for sanitation policy makers and engineers from Timor-Leste, an island country with similar sanitation challenges, with a concluding session with the NWSDB CEO and representatives of the Australian embassy and the World Bank. Piloted solutions were also presented at the World Water Week in Sweden in August 2017 and in several international fecal sludge management conferences held in India. A short YouTube video (2018) about the project entitled "New Approaches for Urban Sanitation in Sri Lanka" had been viewed over 2,000 times as of July 2019<sup>10</sup>.

### III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

#### Factors beyond the control of the GoSL and NWSDB

47. **Rapid cost escalation in Sri Lanka.** The project was heavily impacted by the rapid price escalation and high demand for construction workers, and an unforeseeable hike in unit project costs triggered thereby. The initial design study of the project was completed in 2010, and the estimated total project cost was US\$ 6.37 million. This was then updated by the World Bank during appraisal to US\$ 9.86 million, as reflected in the Grant Agreement. Although the unit cost estimate had been updated based on the construction price index released by the industrial association (ICTAD), the actual bid prices often exceeded the estimated price, leading to the December 2015 restructuring, which significantly updated unit prices. (See paragraph 19 for the restructuring in 2015 and Annex 5 for the evolution of unit prices.)

48. The project period coincided with an economic boom in Sri Lanka following the historic end to the 26-year-long civil war in 2009. During the first five years after the end of civil war, Sri Lanka experienced an average GDP growth rate of 6.8 per year, accompanied by an average inflation rate of 6.0% per year. Construction in particular went through strong expansion with annual growth averaging 19.1 percent between 2011 and 2016<sup>11</sup>. This attracted

<sup>10</sup> <https://www.youtube.com/watch?v=OOeJHLZtsQc>

<sup>11</sup> In 2011 the sector grew by 34.3 percent, followed by a 37.5 percent in 2012, according to the Central Bank of Sri Lanka.



more contractors to mega projects such as buildings and transport infrastructures, resulting in less appetite among contractors to engage in unfamiliar and small-scale contract packages.

49. **Coordination with WWTP project of Sida.** The project had its origin in Sida's request to supplement its WWTPs in Ja-ela/Ekala and Ratmalana by connecting low-income households to the sewers that would be constructed across the residential areas. Since Sida received significantly higher than anticipated bids at its tender, Sida decided to redesign the project scope excluding the originally planned reticulated sewerage network in residential areas. These developments led the GPRBA project to include conventional/simplified extensions (Output 1b and 1c), in addition to direct connection (Output 1a). However, the contractor of the Sida project for the Ratmalana WWTP and its vicinity went bankrupt in 2013, delaying the contract period for about 30 months. Hence the GPRBA project had to change its plan by switching the allocations for Ratmalana and Moratuwa under Output 1a2 to the areas of Dehiwala and Kolonnawa under Output 1a1. The Sida project was completed in 2016 and both WWTPs were functioning well, as of July 2019. These WWTPs treat the majority of fecal sludge from DEWATs (Output 1d) and individual on-site sanitation septic tanks (Output 2).

50. **Contractors' inexperience in sewer work in low-income settlements.** Most of the contractors awarded by the project had no experience in the envisioned works, hence leading to frequent contractual variations and contract period extensions. In the case of Ratmalana for Output 1c2 (simplified sewer extension with pump), for instance, the contractor faced difficulty in securing workers, because many workers refused to work in muddy, damp, unsanitary and unpleasant environments where the grey water from households stagnate. Communicating with beneficiaries to make appointments for on-premise connection works was not easy because residents tend to be out of their houses in the daytime. The contractor was compelled to compensate for the damage that unexpectedly occurred during demolition. Frequent rainfalls stalled the works schedule. As criminal activities were prevalent in the area, some construction materials were stolen. These factors cumulatively resulted in an extension of over 12-months of its US\$ 1.7 million contract package.

#### **Factors within the control of GoSL**

51. **Operation cost-bearing mechanism for on-site sanitation systems (Output 2).** The delays in achieving on-site sanitation are attributable partly to protracted disagreements over who should, and how to, collect the desludging fee for on-site sanitation facilities. The municipal councils of the beneficiary areas insisted that the desludging fee be included in the water supply bill so that beneficiaries would not neglect to pay the charges for their periodic desludging by binding the sanitation bill to the water supply bill. NWSDB, on the other hand, insisted they were authorized to collect the sewerage tariff only to households connected to the piped-sewer network. In April 2014, the PMU and other stakeholders proposed dropping on-site sanitation from the project and to use the surplus budget for household connections. The proposal was soon withdrawn through the mediation by the World Bank and the Project Steering Committee, and the respective municipal councils agreed to facilitate the proposed PPP arrangement. The deliberation nevertheless delayed the first tender publication until August 2015.

52. **Role of national government agencies in rectifying the project design.** After the restructuring in 2015, in addition to the implementing agency, the umbrella agencies such as Ministry of Water Supply and Drainage, Department of Project Management and Monitoring (PMM) and Department of External Resources (ERD) of the Ministry of Finance strengthened their commitment to support the project implementation. PMM and ERD in particular strengthened the monitoring mechanism of the project to assure the project delivery, which contributed to expedited output delivery after the restructuring.



### Factors within the control of NWSDB

53. **Size of contract package.** Because there had not been a major project to expand on-site sanitation systems in Sri Lanka, there were no large contractors to install septic tanks. In 2018, NWSDB procured an additional four contractors to reduce the installation quota of the original contractor, after which the pace of installation improved drastically. The capacity of the contracting industry therefore should be carefully assessed to prepare realistic implementation schedules.

54. **Initial low demand for on-site sanitation systems.** On-site sanitation improvement was a demand-driven program where septic tanks would be installed upon the application from the eligible beneficiaries. The beneficiaries were not very interested in the project partly because of a lack of understanding of the benefits to on-site sanitation and of how subsidy program worked. To stimulate beneficiary demand, the PMU conducted an extensive community mobilization and demonstration workshop. Similar efforts to raise stakeholder awareness need to be made for works such as this in the future.

## IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

55. **Quality of Monitoring and Evaluation (M&E).** The M&E framework was adequate to assess progress toward and achievement of the PDO. Proper outcome and intermediate indicators measured the number of connections installed under each output as well as collection rates of utility fees and the volume of discharged wastewater from the project site. These indicators were monitored regularly by the NWSDB-housed PMU and the results were submitted to the World Bank in quarterly reports. The Department of Project Management and Monitoring (PMM) under the Ministry of Finance of GoSL took on the role of double-checking project progress and early detection of potential problems. Especially after the restructuring of December 2015, to rectify the slow disbursement pace, the PMM strengthened the monitoring mechanism of the project by setting specific targets for each monitoring period.

56. The primary mandate of IVA was to verify the compliance of new connections with applicable standards and regulations, upon which the GPRBA subsidy was released. The IVA also played a significant role of assessing the post-project status of the installed facilities, conducting interviews with beneficiaries and providing feedback reports to NWSDB and GPRBA for any potential issues. While all GPRBA projects have third-party verification before disbursement, this project was one of the few where the IVA was hired by the World Bank rather than the implementing partner. This is because in Sri Lanka, the implementing partner was the service provider (except in the PPP of Output 2) and therefore had a conflict of interest. The IVA showed great commitment to the project with a team structure that included both national and international water and sanitation experts to ensure quality of verification.

57. **Financial Management.** The Grant Agreement specified the PMU would submit quarterly unaudited financial management reports at the latest 45 days after the end of each quarter and audited financial statements no later than six months after the date of the World Bank's request. These covenants were complied with throughout the project period.

58. **Procurement.** Most of the project procurement was for civil works related to the installation of sanitation facilities. The project experienced significant delays in some procurement. They were due mainly to higher-than-expected bidding prices and insufficient numbers of bidders (see paragraph 47 for more discussion on this issue). The fact that the local contractors were not familiar with the World Bank's standard bidding documents, which were



designed mainly for larger projects, was another reason for the fewer than expected bids. The high market prices were accommodated by the restructuring in 2015 by increasing the total project budget from US\$ 9.86 million to US\$ 13.12 million and reducing the target number of outputs from 15,407 to 8,800.

59. **Safeguards.** For each subproject, NWSDB prepared Subproject Environmental Assessment Reports (SPEARs) in compliance with the provisions set forth in the Project Environmental and Social Safeguards Framework (ESSF of September 2011). Each SPEAR was made available to the public for information and comments both on the NWSDB website and in the relevant Divisional Secretariat or Urban Councils, as appropriate. While some delays were experienced, SPEARs for all the subprojects were prepared and publicized. Among environmental safeguards, only OP 4.01 (Environmental Assessment) was triggered. The Environmental Management Plan included in SPEAR was implemented by NWSDB accordingly.

60. The project did not involve any private land acquisition, but only a transfer of public land. Nevertheless, OP 4.12 (Involuntary Resettlement) was triggered to monitor potential resettlement caused by the project. Most social impacts experienced throughout the project were positive ones to the project area. (See paragraph 40 for details.) The project defined selection criteria of eligible beneficiaries based on the land size of the housing (less than 20 perches) and monthly household income (LKR 30,000).

61. A Grievance Redress Mechanism (GRM) was established by the Ministry of City Planning and Water Supply. The project affected people could access the GRM either in-person at NWSDB offices or via telephone. Most complaints were made against the contractors for not paying the dues for the use of electricity, water, removal of discontinued pits and damages caused to roads. These issues were properly handled and resolved by the PMU.

62. **Sustainability.** The IVA reports that the quality of the installed sanitation facility remains effective. While about 18 percent of the outputs were installed more than three years ago, they demonstrate continued good performance and sufficient maintenance capacity of NWSDB and the local residences who got instruction on the O&M of facilities through stakeholder meetings conducted under the project. The PPP contractor already started annual desludging service for the households that had the septic tank installed early in the project (1700 households as of August 2019). The sludge collected is transported to authorized treatment facilities, substantializing the operational model envisioned by the project. In response to successful on-site sanitation management, increasing interest and demand from communities are being observed. The WWTP constructed through the concessional credit of Sida has been managed well from a technical point of view since its completion in 2016, and its operation and maintenance cost is covered by the revenues generated from the sanitation tariff.

63. In terms of financial sustainability, the sanitation tariff was quite low at project approval, covering only 18 percent of the necessary O&M costs and demanding the remaining 82 percent from cross subsidy. This was rectified by the Ministry of Water Supply by passing a cabinet paper in 2012 that proposed an increase of the sanitation tariff to 40 percent of the water bill to enhance cost recovery for sanitation O&M.

64. On the policy side, GoSL included sanitation as a priority goal in its National Development Plan (Mahinda Chinthanaya) in 2010. This was further strengthened by the national policy on sanitation approved in late 2017, which envisages scaling up of safe sanitation approaches piloted in this project.

65. **Scalability.** The project has demonstrated the potential for sanitation improvement works to enhance the hygienic environment of local settlements, which is evident from the increasing demand by residents to participate in the project. Considering that only 2 percent of the population of the Greater Colombo Area is connected to a



sewerage system and that most of the remaining 84 percent rely on on-site sanitation and suffer from recurring overflows, there is considerable potential demand to scale up the project for both the reticulated network and on-site sanitation improvement.

66. Through the implementation of the project, NWSDB gained substantial experience required for sanitation improvement in low-income settlements, for example public communication and facilitation with local communities, civil works arrangements in densely populated areas and innovative PPP processes for installation and desludging of on-site sanitation facilities. Such experiences will facilitate NWSDB's future implementation of similar works in smooth and efficient manner.

67. The major constraint for scale-up is financial resources. The beneficiary contribution to the project was merely 1.4 percent of the total cost (US\$ 21 out of US\$ 1,490 per connection on average), depending heavily on subsidies from GPRBA, NWSDB, and the GoSL. Although the project demonstrated technical and economic viability of urban sanitation improvement activities for low-income households in Sri Lanka, NWSDB needs to seek funding from GoSL and/or development partners to scale up the project. In this regard, the GoSL has recently requested the World Bank to support a new project on wastewater management scheduled to start in 2021/22 to scale up the approaches of the GPRBA project.

## V. LESSONS LEARNED AND RECOMMENDATIONS

68. **Application of different sanitation improvement systems, including PPP-based on-site sanitation, enabled efficient and accelerated expansion of sanitation coverage of Greater Colombo including low-income settlements.** The project demonstrated through its verification mechanism that sanitation improvement types piloted by the project, that is, direct connection, conventional/simplified sewer extension, DEWAT and on-site system, are all technically feasible and properly maintained by the beneficiaries and NWSDB. These multiple choices of sanitation improvement techniques allow NWSDB to pick an optimal method for each location depending on site-specific condition to minimize the cost while maximizing the technical viability. It was also demonstrated that these techniques are viable in low-income settlement areas. NWSDB increased its institutional capacity substantially through this project, which should lower administrative costs in the future scale-up.

69. The project has also demonstrated a PPP approach for installation of treatment units and regular scheduled desludging (against demand-based desludging). It demonstrates the concept of a universal sanitation service which enables households to become legitimate 'sanitation customers' of the utility irrespective of whether services are provided by piped sewers or properly-managed and serviced on-site systems. With regular reporting of overflowing septic tanks discharging effluent to nearby drains and canals, such a system of regular desludging at scale could improve the environmental health factors considerably.

70. **Project cost estimation during preparation needs to incorporate the potential price escalation and other contingencies to the extent possible.** The project spent much of its implementation period for restructuring the scope and unit cost to accommodate the higher-than-expected bid prices. This was caused mainly by two factors: (a) rapid price escalation and high construction work demand amidst the post-war economic boom for reconstruction (see paragraph 47); and (b) underestimation of unit project costs by design engineers on the works that the country had not experience in before (see paragraph 50). The first factor may be improved by carrying out extended macro-economic analysis including the review of the economic outlooks released by national and international authorities.



In principle, cost estimation at preparation stage should be done in conservative manner, but the fact that the country had been facing substantial reconstruction was worth considering. More active publicization of the tender across the industry could also attract more bids, leading to more competitive price. The second factor, cost estimation for works that were the first ever of their kind in the country, is hard to ameliorate with little clues to unforeseeable additional costs, yet reviewing the lessons learned through similar projects in other countries may help anticipate such hidden cost factors.

**71. Early mobilization of awareness programs and field facilitators for effective public engagement.** The project indicated the importance of enhancing public awareness and beneficiary participation for a sanitation improvement project. NWSDB successfully implemented community awareness programs for each project area, ensuring the beneficiary's understanding on the project concept, necessity of beneficiary cooperation and proper maintenance. The contractor, however, gave little importance to public engagement at the bidding stage, and faced difficulties in communicating with and gaining cooperation from the beneficiaries (see paragraph 50). This could be improved by incorporating the deployment of field facilitators, ideally recruited from the local community, in the terms of reference of the contractor procurement.

**72. Effective tariff collection mechanisms help enhance the cost recovery ratio for O&M.** It was evident through the project that sanitation tariffs are collected more smoothly when they are charged under the monthly household water supply bill, rather than collectively at community level. Collections of community-based sanitation charges for public toilet latrines before the project often caused conflicts between fee collectors and beneficiaries, resulting in low fee collection rates. This changed dramatically when the sanitation billing and collection system was transformed from collective to individual one. It also motivated customers to save water because the sanitation charge is determined based on the volume of water used. Collective sanitation tariff collection is still practiced in the areas covered by Output 1d (DEWAT), causing conflicts among residents, because O&M of DEWAT is managed by the residents' association of the housing complex.

**73. RBF/OBA as a way to change behavior of beneficiaries and project stakeholders.** The GPRBA grant became a commitment signal for the beneficiaries and the implementing partners, while the disbursement upon third-party verification of delivery made it impossible to renege on commitments. An interview with a Ministry of Finance representative revealed that it was the 5 percent grant disbursement figure in 2015 that prompted the Government to help NWSDB deliver, because the Government pre-financed some of the physical works. It was at that time that project documents (retendering works, PPP design with NWSDB and local authorities, and so on.) became a priority for a quick turnaround. Conversely, beneficiary demand for improved sanitation grew because they saw the Government deliver. Even though the project was the oldest in the GPRBA portfolio, the focus on delivery of both piped and on-site sanitation contributed to the recognition of sanitation as an important priority. After this project, the CPF and other larger projects of the World Bank, as well as the sanitation policy by the GoSL, included the concept developed through the project, proving the suitability of RBF as a financing instrument that focuses on testing solutions and going from ideas to delivery.



**ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS**

**A. RESULTS INDICATORS**

**A.1 PDO Indicators**

**Objective/Outcome:** Improved sanitation services by increasing the number of sewer house connections

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of new sewer household connections constructed under the Project (Output 1)	Number	0.00	13170.00	5015.00	4793.00
		22-Jun-2012	31-Dec-2015	31-Mar-2019	31-Mar-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Direct project beneficiaries	Number	0.00	77035.00	51920.00	49247.00
		22-Jun-2012	31-Dec-2015	31-Mar-2019	31-Mar-2019
Female beneficiaries	Percentage	50.00	50.00	50.00	50.00
		22-Jun-2012	31-Dec-2015	31-Mar-2019	31-Mar-2019

Comments (achievements against targets):



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Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Low-income households provided with access to improved sanitation services under the Project	Number	0.00	15407.00	8800.00	8347.00
		22-Jun-2012	31-Dec-2015	31-Mar-2019	31-Mar-2019

Comments (achievements against targets):

**Objective/Outcome:** Improved onsite sanitation services at household level

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of eligible low-income households provided with improved on-site systems (output 2)	Number	0.00	2300.00	3785.00	3554.00
		22-Jun-2012	31-Dec-2015	31-Mar-2019	31-Mar-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Direct project beneficiaries	Number	0.00	77035.00	51920.00	49247.00
		22-Jun-2012	31-Dec-2015	31-Mar-2019	31-Mar-2019



Female beneficiaries	Percentage	50.00 22-Jun-2012	50.00 31-Dec-2015	50.00 31-Mar-2019	50.00 31-Mar-2019
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Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Low-income households provided with access to improved sanitation services under the Project	Number	0.00 22-Jun-2012	15407.00 31-Dec-2015	8800.00 31-Mar-2019	8347.00 31-Mar-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
New PPP framework for delivery of improved sanitation services in place	Number	0.00 22-Jun-2012	0.00 31-Dec-2015	4.00 31-Mar-2019	7.00 31-Mar-2019

Comments (achievements against targets):

This indicates number of local authorities agreed with the framework agreement and implemented the PPP approach.



**A.2 Intermediate Results Indicators**

**Component:** Part A: New Household Connections to Networked Sewerage (Output 1)

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Collection ratio for connection fee to sanitation through water bills (Output 1)	Percentage	0.00 22-Jun-2012	85.00 31-Dec-2015	95.00 31-Mar-2019	99.00 31-Mar-2019

**Comments (achievements against targets):**

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Increased volume of wastewater (m3/d) discharged in a sewer under the Project (Output 1)	Cubic Meter(m3)	0.00 22-Jun-2012	0.00 31-Dec-2015	3900.00 31-Mar-2019	3589.00 31-Mar-2019

**Comments (achievements against targets):**

This is a newly added indicator during the restructuring in 2015

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Increase in piped sanitation	Percentage	0.00	0.00	37.00	38.00



coverage due to the project in NWSDB service area around Colombo		22-Jun-2012	31-Dec-2015	31-Mar-2019	31-Mar-2019
<p><b>Comments (achievements against targets):</b> This is a new indicator added during the restructuring in 2015</p>					
Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of eligible connections to a piped sanitation service in the project areas (Output 1)	Number	0.00 22-Jun-2012	13107.00 31-Dec-2015	5015.00 31-Mar-2019	4793.00 31-Mar-2019
Output 1a1: Direct sewerage connection full cost build out	Number	0.00 22-Jun-2012	725.00 31-Dec-2015	725.00 31-Mar-2019	898.00 31-Mar-2019
Output 1a2: direct connection within premises	Number	0.00 22-Jun-2012	750.00 31-Dec-2015	750.00 31-Mar-2019	336.00 31-Mar-2019
Output 1b: connections to conventional sewer extensions	Number	0.00 22-Jun-2012	392.00 31-Dec-2015	392.00 31-Mar-2019	392.00 31-Mar-2019
Output 1c1: Connections to	Number	0.00	2150.00	1083.00	1115.00



simplified sewer extensions		22-Jun-2012	31-Dec-2015	31-Mar-2019	31-Mar-2019
Output 1c2: Connections to simplified sewer extensions with pumping	Number	0.00	7300.00	1500.00	1500.00
		22-Jun-2012	31-Dec-2015	31-Mar-2019	31-Mar-2019
Output 1d: Connections to small networks with decentralized treatment systems (DEWAT)	Number	0.00	1790.00	565.00	552.00
		22-Jun-2012	31-Dec-2015	31-Mar-2019	31-Mar-2019
<b>Comments (achievements against targets):</b>					

**Component: Part B: On-site Sanitation Improvements**

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Sludge from households which on-site sanitation systems have been improved under the Project properly disposed of at an approved location (Output 2)	Percentage	0.00	100.00	100.00	100.00
		22-Jun-2012	31-Dec-2015	31-Mar-2019	31-Mar-2019
<b>Comments (achievements against targets):</b>					



**B. ORGANIZATION OF THE ASSESSMENT OF THE PDO**

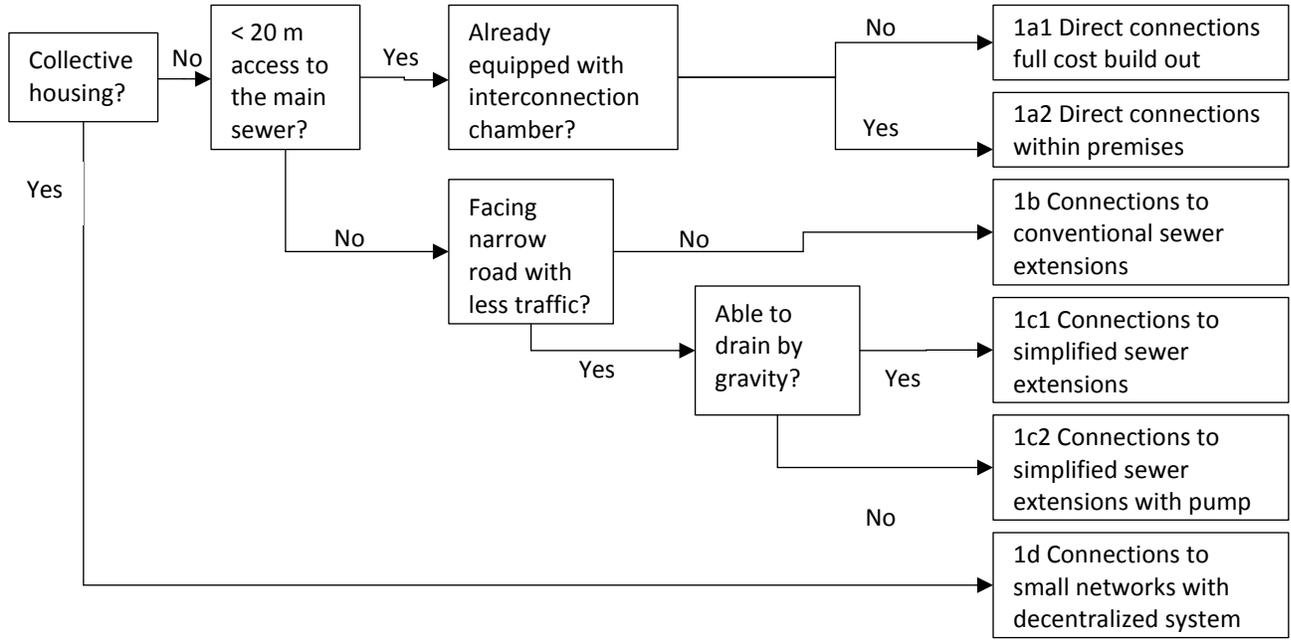
<b>Overarching</b>	
Outcome Indicators	<ol style="list-style-type: none"> <li>1. Direct project beneficiaries</li> <li>2. Female beneficiaries</li> <li>3. Low-income households provided with access to improved sanitation services under the Project</li> </ol>
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	<ol style="list-style-type: none"> <li>1. 49,247 direct project beneficiaries.</li> <li>2. 50% of female beneficiaries.</li> <li>3. 8,347 low-income households provided with access to improved sanitation services</li> </ol>
<b>Objective/Outcome 1</b>	
Outcome Indicators	<ol style="list-style-type: none"> <li>1. Number of new sewer household connections constructed under the Project</li> </ol>
Intermediate Results Indicators	<ol style="list-style-type: none"> <li>1. Collection ratio for connection fee to sanitation through water bills</li> <li>2. Increased volume of wastewater (m3/d) discharged in a sewer under the Project</li> <li>3. Increase in piped sanitation coverage due to the project in NWSDB service area around Colombo</li> <li>4. Number of eligible connections to a piped sanitation service in the project areas</li> <li>5. Output 1a1: Direct sewerage connection full cost build out</li> <li>6. Output 1a2: direct connection within premises</li> <li>7. Output 1b: connections to conventional sewer extensions</li> <li>8. Output 1c1: Connections to simplified sewer extensions</li> <li>9. Output 1c2: Connections to simplified sewer extensions with pumping</li> </ol>



	10. Output 1d: Connections to small networks with decentralized treatment systems (DEWAT)
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	1. 4,793 new sewer household connections constructed.
<b>Objective/Outcome 2</b>	
Outcome Indicators	1. Number of eligible low-income households provided with improved on-site systems. 2. New PPP framework for delivery of improved sanitation services in place.
Intermediate Results Indicators	1. Sludge from households which on-site sanitation systems have been improved under the Project properly disposed of at an approved location.
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	1. 3,554 eligible low-income households provided with improved on-site systems. 2. 7 new PPP framework.



ANNEX 2. DECISION TREE TO DETERMINE THE OUTPUT TYPE IN OUTPUT 1





**ANNEX 3. RECIPIENT, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS**



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**வெளிநாட்டு வளங்கள் திணைக்களம்**  
**Department of External Resources**

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My No

ERD/WB/GPOBA

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உமது இல  
Your No

දිනය  
திகதி  
Date

September 25, 2019

Country Director  
World Bank – Colombo Office

Dear Madam,

**Sri Lanka: GPRBA - Access to Sanitation Project (P111161)**  
**- Review of the Implementation Completion and Results (ICR) Report**

This refers to your letter dated September 09, 2019 on the above.

The primary objective of the project was to improve sanitation services to low-income households in greater Colombo area by increasing the number of sewerage house connections in existing and new sewerage networks and improving onsite sanitation services at household level.

The comments regarding the above ICR report received from Department of National Planning and Department of Project Management and Monitoring are attached herewith. (Annex 1 and Annex 2)

According to the project implementing agencies, Result Based Financing option creates difficulties in cash flow and causes delays of the project and as such, it is suggested to use Pre-Financing option in future operations. In addition to that it is suggested to increase salaries of the workers because, we observe that workers hesitate to work in sewerage sector due to concerns over sanitary effects.

After 2017, the project demonstrated a significant improvement in terms of financial and physical progress due to the intervention of Department of Project Management and Monitoring and External Resources Department of Sri Lanka. This has to be reflected in the ICR. Such centralized system may assist the implementing agencies in a context similar to Sri Lanka to deliver better results.

Further, the expertise of the Bank also crucial to keep the project on track. In this regard we wish to highlight the importance of frequent implementation support missions, close monitoring and better communication with the Central Government and the World Bank ( i.e. General Treasury including ERD and DPMM).

Thank you.

Yours Faithfully

**Hemantha Pabudusiri**  
Director  
for Director General

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பணிப்பாளர் தாயகம்  
Director General

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**தேசிய திட்டமிடல் திணைக்களம்**  
தேசிய கொள்கைகள், பொருளாதார அலுவல்கள், மீள்குடியேற்றம், புனர்வாழ்வளிப்பு, வடக்கு மாகாண  
அபிவிருத்தி மற்றும் இளைஞர் அலுவல்கள் அமைச்சு

**Department of National Planning**  
Ministry of National Policies, Economic Affairs, Resettlement & Rehabilitation, Northern Province  
Development and Youth Affairs

කොළඹ 01 මහානගරාධිපති (පළමු මහල), කොළඹ 01. செயலகம் (முதலாம் மாடி), கொழும்பு 01. The Secretariat (First Floor) Colombo 01

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My No

NP/PUC/WS/11/45

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உமது இல  
Your No

දිනය  
திகதி  
Date

23.09.2019

Director General,  
Department of External Resources.

**Sri Lanka: Increasing Household Access to Domestic Sanitation in Greater Colombo Project (GPOBA Grant Number TF099870)**

**Request for Review of Implementation Completion and Results (ICR) Report**

This refers to your letter No. ERD/WB/GPOBA dated 12.09.2019 on the above.

The World Bank has submitted the Review of the Implementation Completion and Results (ICR) Report of the above project and the primary objective of the project was to improve sanitation services to low-income households in Greater Colombo area by increasing the number of sewerage house connections to existing and new sewerage networks and improving onsite sanitation services at household level.

The comments of the NPD with regard to the above ICR report are as follows:

- 1) As per the Item 26 & 27 of ICR report, it is noted that the progress of new service connections (output 1) has reached to 95.6% of the original target and installation of on-site sanitation systems (output 2) has reached to 93.9% by the end of the project. Further, referring to the Item 29, final progress report submitted by the Independent Verification Agency is also highlighted that the project has overall good quality of works, satisfying the required standards, delivered through the project.
- 2) However, it is noted that the World Bank has rated the overall project outcome as "Moderately Unsatisfactory considering the factors such as three year project extension and the increased project cost. NPD noted that the reasons for project extension are mainly due contractor issues, less experiences on new concept of DEWAT, lack of awareness about the system by beneficiaries as well as cost overrun is mainly due to rapid price escalation,

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which is generally beyond the control. By considering the factors such as project progress, form of experienced project implementation issues, NPD suggests World Bank to rate the outcome of the project in an optimistic manner instead of "Moderately Unsatisfactory."

- 3) As of the Item 43, it is highlighted that this Piloted sanitation solution can be applicable to other areas in the country. However, overall rating of this pilot project gives negative impression, when proposing it into the other areas.
- 4) In addition, the ICR highlighted the major lessons learned and recommendations mainly related to the stages of planning, implementation and operation and maintenance of the project. Therefore, the implementing agency need to be considered these facts, when proposing similar kind of projects for other areas in future.

A handwritten signature in black ink, appearing to be 'S.S. Mudalige'.

S.S. Mudalige  
Director General



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Department of Project Management and Monitoring

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நிதி அமைச்சு  
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Your No.

ERD/WB/GPOBA

දිනය  
Date

24.09.2019

Director General  
Department of External Resources

Dear Sir,

Comments on Implementation Completion and Results Report - GPRBA- Access to Sanitation Project

This has reference to your letter of even number dated 12.09.2019 on the above subject. I wish to submit the following comments on the above report, based on the monitoring-evidence available with this Department:

1. The contents of the above report especially the evidence provided for assessment of the achievements; factors affected on implementation and outcomes and; lessons learned and recommendations are acceptable when comparing with the monitoring evidence available with this Department.
2. It is suggested to make specific recommendations to the NWS&DB ( as the main party in similar PPP arrangements in future) to:
  - i. avoid resistance from general public in low-income settlements (through broader consultation of residents and awareness);
  - ii. ensure early preparedness to undertake projects (to avoid lengthy extensions);
  - iii. ensure selection of competent contractors and consultants and;
  - iv. set-up a mechanism ( a way of community engagement for maintenance and supervision) to ensure the sustainability of established facilities.

Yours faithfully,

  
N.S.M.P. Ranjith  
Additional Director General  
For Director General



#### ANNEX 4. PROJECT TIME LINE

- 2006 Sida asked GPRBA to collaborate with its wastewater treatment plant project in Greater Colombo. GPRBA approved US\$250,000 technical assistance for detailed design of the new project.
- 2008 Sida and GPRBA agreed to expand the GPRBA project target to off-network area of Sida WWTP project.
- 2010 GPRBA approved US\$3.08 commitment for the project.
- 2012 Grant Agreement signed.
- 2014 Sida contractor went bankrupt.  
The project faced severe price escalation in tenders.  
The PMU proposed to downsize the number of beneficiaries from 15,407 to 5,015.  
Panel of Experts of GPRBA propose counter proposal to keep the beneficiary at 8,800.
- 2015 The GoSL approves additional financial contribution of US\$ 3.56 million.  
Amendment letter for project restructuring (project extension, change in Results Framework and disbursement arrangement) signed.
- 2017 Project restructuring (one-year extension) signed.
- 2018 Project restructuring (three-month extension and change in verification arrangement) signed.
- 2019 Project closed.



**ANNEX 5. EVOLUTION OF PROJECT COST STRUCTURE**

This annex presents the cost structures of each output type at different timing of the project period. The unit costs continued to increase since the pre-project period until the restructuring. This was partly because of the economic boom and rapid price escalation explained in the paragraph 47, but also partly because of the insufficient cost estimation during the project preparation phase.

**Table 5.1. Cost structure at the design study in 2010**

Output type	1a	1b	1c	1d	2	Total
# of output (HH)	1,392	1,876	2,810	5,169	4,028	15,275
Unit cost (US\$)	238	1,689	188	317	175	
Total cost (US\$)	331,296	3,168,564	528,280	1,638,573	704,900	6,371,613
Customer contribution (US\$)	30	30	30	30	15	
NWSDB contribution (US\$)	28	205	15	33	2	
GoSL co-financing (US\$)	-	1,199	-	-	-	
GPRBA subsidy (US\$)	180	254	143	254	158	

**Table 5.2. Cost structure at the project commitment in 2012 and restructuring in 2015**

Output type	1a1	1a2	1b	1c1	1c2	1d	2	Total
As of Project commitment in 2012								
# of output (HH)	725	750	392	2,150	7,300	1,790	2,300	15,407
Unit cost (US\$)	1,028	233	1,689	505	647	679	543	
Total cost (US\$)	745,300	174,750	662,088	1,085,750	4,723,100	1,215,410	1,248,900	9,855,298
Customer contribution (US\$)	30	30	30	30	30	30	15	
NWSDB contribution (US\$)	-	-	-	70	88	100	58	
GOSL co-financing (US\$)	898	103	1,405	90	161	130	157	
% GoSL co-finance	87.4%	44.2%	83.2%	31.7%	38.5%	33.9%	39.6%	
GPRBA subsidy (US\$)	100	100	254	315	368	419	313	
% GPRBA subsidy	9.7%	42.9%	15.0%	62.4%	56.9%	61.7%	57.6%	



As of Project restructuring in 2015								
Output type	1a1	1a2	1b	1c1	1c2	1d	2	Total
# of output	725	750	392	1,083	1,500	565	3,785	8,800
Unit cost of output	1,355	478	3,524	2,197	3,006	825	800	
Total cost (US\$)	982,375	358,500	1,381,408	2,379,351	4,509,000	466,125	3,028,000	13,104,759
Customer contribution (US\$)	27	27	27	27	27	27	13	
NWSDB contribution (US\$)	-	-	-	320	425	123	-	
GoSL co-financing (US\$)	1,195	229	2,692	871	1,569	160	320	
% GoSL co-finance	88.2%	47.9%	76.4%	54.2%	66.3%	34.3%	40.0%	
GPRBA subsidy (US\$)	133	223	535	979	986	515	466	
% GPRBA subsidy	9.8%	46.7%	15.2%	44.6%	32.8%	62.4%	58.3%	



## ANNEX 6. ECONOMIC ANALYSIS

### Background

Despite the solid economic growth and urban infrastructure development, the sanitation facility development of Greater Colombo still lags behind, with only 2 percent of households connected to sewer lines. Construction of the wastewater treatment plant boosted the city's capacity to treat sewage, but the high cost of sewer connection hinders low-income household from benefitting from such development.

The principal objective of the project is to increase the number of low-income households in Greater Colombo which benefit from improved sanitation systems and services through an output-based approach. Improved access to sanitation services should result in improved health and environmental conditions for the population living in targeted areas, by ensuring that domestic wastewater is effectively managed and appropriately disposed of.

### Methodology

Economic analysis of this project was conducted at the appraisal stage, the results of which can be found at the commitment paper of the project. The ICR stage economic analysis follows the methodologies adopted at appraisal, where the project benefit comprises of the health and opportunity benefit based on the estimation by Hutton et al. (2004).

The key assumptions used in the ICR-stage economic analysis are as following:

- i ) The period covered by the analysis is in accordance with the estimated project cycle of 20 years, spanning 2013 to 2033.
- ii ) All prices are converted to those of 2015, when the major project restructuring took place.
- iii ) The exchange rate of Sri Lanka Rupee to US dollar is based on the rate released by the Central Bank of Sri Lanka.
- iv ) The economic discount rate is 10 percent per year.
- v ) Standard Conversion Factor (SCF) is not applied to convert domestic financial prices to economic prices.<sup>12</sup>
- vi ) Average water consumption per connection of poor household is 12 m<sup>3</sup> per month, while that of non-poor household is 15 m<sup>3</sup> per month.

### Cost

The capital expenditure (CAPEX) used for the analysis was derived from the actual outputs delivered in each year and the unit cost for each output type, as summarized in Table 6.1.

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<sup>12</sup> (a) According to the Central Bank of Sri Lanka, the SCF in 2014 was 0.97, which translates to relatively small impact by the use of SCF, (b) the cost breakdown of domestic/import material and labor is not documented.



**Table 6.1. CAPEX Trend throughout the Project Period**

Year	2013	2014	2015	2016	2017	2018	2019
Outputs delivered	48	615	831	1,094	1,113	4,490	300
CAPEX (US\$)	65,040	739,769	810,968	2,971,939	2,475,173	5,791,876	240,000

The operational cost (OPEX) was calculated based on the actual unit O&M cost (US\$ 0.41 per cubic meter) and the estimated volume of water returned to the sewer, assuming average monthly water consumption of 12 m<sup>3</sup> per connection. The annual OPEX after the completion of the project amounted to US\$ 285,000 per year, which is equivalent to 2.2 percent of the CAPEX.

**Benefit**

Quantification of the benefit from sanitation improvement tends to be controversial due to the difficulty of: (a) identifying direct attribution of the project to the overall health trend in the project area; (2) quantification of benefit gained through reduced sickness; and (3) quantification of benefit gained through improved environment. The appraisal-stage economic analysis was conducted based on the methodologies proposed by Hutton et al. (2004)<sup>13</sup>, and the current ICR-stage analysis follows the same methodologies.

Hutton et al. (2004) defines the benefits from water supply and sanitation as the following sub-categories:

- 1) Direct expenditures avoided for health sector, due to less illness from diarrheal disease
- 2) Direct expenditures avoided for patient, due to less illness from diarrheal disease
- 3) Income gained, due to days lost from work avoided
- 4) Days of school absenteeism avoided
- 5) Productive parent days lost avoided, due to less child illness
- 6) Value of loss-of-life avoided
- 7) ‘Convenience’ – time savings

Respective sub-categories can be converted to monetary terms using the datasets that are commonly available across region or globally. (See Table 10 of the original paper.) As Hutton et al. do not provide figures for benefits of improved sanitation alone, the analysis used the difference between benefits accruing from water supply only because of the intervention from the provision of water and sanitation. The study found that time saving factor is by far (more than 50 percent of the total) the major contributor to the overall benefit followed by the savings by the health sector.

In the case of Sri Lanka, which is included in SEAR-B in WHO’s geographic categorization, the total regional benefit expected from the level 3 intervention, where everyone has access to improved sanitation service, is US\$ 6.8 billion for the 473 million population, resulting in a per capita benefit is US\$ 14.47 per year in the price standard of 2000. This was then converted to 2015 prices using the inflation rates, resulting in US\$ 34.69

<sup>13</sup> Hutton, Guy, Haller, Laurence & World Health Organization. Water, Sanitation and Health Team. (2004). Evaluation of the costs and benefits of water and sanitation improvements at the global level. World Health Organization. <https://apps.who.int/iris/handle/10665/68568>.



per year.

It should be noted that the analysis does not account for the benefits gained through improved environment, making the analysis relatively conservative.

**Results**

The results of the economic analysis and the sensitivity analysis are summarized in Table 6.2 Despite the reduction in targets with restructuring in 2015, delay due to extensions of the closing date by three years and increased total cost,<sup>14</sup> the project shows an EIRR of 33.7 percent, in contrast with the appraisal-stage EIRR of 27.5 percent. This paradoxical result is explained by the increase in the value of unit benefit per beneficiary,<sup>15</sup> therefore comparing the absolute values of appraisal- and ICR-stage EIRR may be misleading audiences—if the same value of unit benefit as appraisal stage is assumed, the EIRR would have been 19.3 percent.

**Table A6.2. Summary Results of Economic Analysis and Sensitivity Analysis**

	EIRR	NPV (US\$ million)
Base case	33.7%	7.80
O&M cost at 150% of the base case	33.0%	7.55
Benefit at 80% of the base case	25.1%	4.90
O&M cost at 150% and benefit at 80% of the base case	24.4%	4.65
(Appraisal stage)	27.5%	8.88

All the scenarios assumed for sensitivity analysis showed EIRR higher than the economic discount (10 percent) and positive NPVs, demonstrating the economic viability of the project. Increase in the O&M cost, which is very likely in growing economies like Sri Lanka, has negligible impact on the economic viability, while the decrease of benefit has relatively large impact.

In addition, it is also noteworthy that the unit benefit value used in the analysis relies on the generic regional study conducted by WHO, thus the robustness of the analysis is relatively lower than those conducted particularly for the project area.

<sup>14</sup> The number of direct beneficiaries decreased from 55,600 to 51,920, and the total cost increased from US\$ 9.86 million to US\$ 13.116 million after the restructuring in 2015.

<sup>15</sup> While appraisal-stage analysis assumes unit benefit of US\$ 22.55 per person per year in 2015 prices (base benefit of US\$ 14.47 as of 2000 and average inflation rate of 3 percent from 2000 to 2015), actual average inflation rate exceeded 6 percent, resulting in the unit benefit of US\$ 34.69 per person per year.



## ANNEX 7. ENVIRONMENT AND SOCIAL IMPACTS REPORT

### GPOBA - ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

#### Project Background

The National Water Supply and Drainage Board (NWSDB) has implemented Output-Based Aid (OBA) project titled “Sri Lanka – Increasing household Access to Domestic Sanitation in Greater Colombo Project”. The objective of the Project has been to improve sanitation services to low-income households in Greater Colombo by increasing the number of HH sewerage connections to existing and new centralized/decentralized sewerage networks and improving on-site sanitation services at household level. The project has also considered effective management and disposal of domestic wastewater, improving the overall health and environmental conditions of the people living in project areas.

#### Project Outputs

The key outputs of the project have been in the following categories.

- **Output 1:** new household connections to piped sewerage. Output 1 is further delineated into sub-outputs. The various outputs and sub-outputs are described in detail below:
  - Output 1a: “Direct connections” for households located close to (within about 20m of) an existing sewerage network.
  - Output 1b: “Connections to conventional sewer extensions”, extensions with conventional sewer technology for households located more than 20m from the main sewerage network.
  - Output 1c: “Connections to simplified sewer extensions”, extensions with simplified sewer (*also called shallow sewer or condominium sewer*) and connections for households located more than 20m from the main sewerage network (gravity or pumping).
  - Output 1d: “Connections to decentralized networks”, new stand-alone sewerage networks with decentralized wastewater treatment (“DEWAT”). This output has been offered to households located in areas where sewerage is technically feasible, but too far from the existing, central sewerage network to make an extension a viable economic option.
- **Output 2:** improvements to the performance and operation of on-site sanitation systems and services, through the construction or rehabilitation of on-site septic tank and soakage pits/trenches, including other sanitation facilities and regulated desludging services.

The determination of the specific output provided to a household has been based on the technical feasibility and proximity of existing NWSDB-managed sewer networks.



### **Project Benefits**

Some of the anticipated benefits by the project included increased number of HHs with connections to sanitation services; decreased risk of public health issues due to lessened contact with contaminated waste water; improved quality of waterways in and nearby beneficiary communities; and the testing of a potentially replicable model for improving sanitation in the rest of the country.

The project documents assume that the beneficiary HHs were already connected to water supply services and that all beneficiaries will be transferred to water supply Samurdhi tariffs with an average monthly consumption of 12 m<sup>3</sup>.

### **Objective and Method of evaluation**

This brief report has been the result of a rapid exercise carried out in order to qualitatively assess the achievement of some of the project benefits outlined above and examine if any socio-economic transformation towards 'improved living standards' has commenced in the project intervention areas.

The study included examination of project documents and Sub-Project Environmental Assessment Reports (SPEARS), discussion with project staff, evaluation of water quality results maintained in the project office and Focus Group Discussions (FGD) carried out with members of the community at two sample sites, Baduowita and Lunawa Housing Schemes and two field visits to Tsunami Housing Scheme, Auburn side and Ratmalana where onsite sanitation was being implemented to understand the pre- and post- project environmental quality and to ascertain the perceptions of beneficiary households (HHs) on what worked well and what didn't, whether consultations had been carried out and whether people were aware, process of site selection and the subsequent effect on land values, impacts during and post-construction, etc. The assessment also looked at the criteria used for the selection of beneficiary HHs and looked at the efficiency of the project grievance mechanism, among others.

### **Baseline Conditions**

No proper socio-economic baseline had been established for the project which can be used for comparison for before-after project scenarios. However, most of the project sites selected are low income settlements and some of the pre-project conditions coming out of the project documents summarise the pre-project situation as below:

100 water customers for every one sewer connection in project area; vast majority not connected but using septic tanks and pits instead. Quality on-site sanitation and desludging services inadequate leading to widespread health risks. Some of the causes identified include:

- Insufficient coverage of latrines leading to the sharing of facilities;
- Poor construction and maintenance of on-site sanitation facilities;
- Low-frequency of desludging due to high costs associated; and



- Lack of outlets for sewerage disposal.

## **Key Findings**

### **1. Baduowita simplified extension with pumping**

The Badovita Housing scheme is located in the Dehiwala Mount Lavinia Municipal Council area within the Ratmalana Divisional Secretariat. The project selected 5 housing schemes for simplified extension with pumping, named from stage 1 to stage 5. Nearly 1400 families resided in the Badovita area at the time of project planning with an estimated population of around 7000. A typical housing unit ranges from 540-820 square feet and a majority of them were considered to be below the poverty line. The project was completed in December 2016.



People of Baduowita have been severely affected due to the lack of sanitation facilities for years as a suitable sanitary waste water disposal system did not exist within the area. The pre- project situation at these sites was described as ‘hell on earth’ by one of the respondents in Baduowita. People shared common toilet pits which overflowed and needed to be emptied regularly, and the general conditions of these sites had been bad with ponds of stagnated sewage and waste water with overflowing man-holes (even twice a month) and open gullies. One respondent stated that trash traps on main drainage lines needed regular cleaning and since maintenance was not done in a timely manner, they faced a lot of difficulties as some traps were located inside houses. All in all, unsanitary conditions prevailed in the area making it less livable and as a result of water stagnation and contamination, diseases such as diarrhea, skin rashes and dengue fever were noted to be common occurrences. In addition, the pre- project environment had also invited many illegal activities (such as drugs) among the less fortunate residents of these schemes. The open gullies had been a popular place to hide narcotics and other illegal consumables.

It was highlighted that frequent social conflicts arose as a result of attempts to collect money (Rs 200-500 from a HH) to desludge overflowing pits. Pit waste was deposited



in the canal embankments without any containment. Depending on climatic conditions, the frequency of desludging increased/decreased from once in two weeks to once in two months. As some HH could not or did not want to contribute, conflicts arose. People expressed relief from such conflicts now that they no longer needed to bear extra costs to take care of overflowing sewage and wastewater.

The before-after pictures below speak for itself (see below)

### Sanitation and wastewater improvement under GPOBA



All toilets, kitchen base water lines, bathrooms in the scheme have been connected to a gravity sewer and the collected wastewater is pumped to the Soysapura Wastewater Treatment Plant (SWTP) via a network of collection lines fitted with pump houses. All pumping stations are automated and are operated and monitored by the SWTP plant office.

During the field visit to Baduowita, the improvement in the state of hygiene and 'livability' of the settlement was clearly evident. Those who joined the FGD stated their utmost satisfaction in the environmental improvements achieved under the project. The drains appeared to be fairly clean and devoid of bad odour. There is less occurrence of the aforementioned diseases, although such data could only be confirmed with data from the Ministry of Health. However, it should be no surprise that the significant improvements gained in environmental hygiene in the area should result in measurable positive public health outcomes. The following measurements of drain water quality carried out by the project office in Baduowita before and after the project bear adequate testimony to the significant 'livability' gains achieved.



**Baduowita -**

**Baduowita -**

visit

**Baduowita**  
in 2018 November

during the



**A**

**B**

**C**

**D**

**Images A, B, C, D : Four different alleyways in the Baduowita scheme showing dry drains devoid of water stagnation, flies and generally unhygienic conditions.**

According to the records of water quality maintained by the project office within



Baduowita, it is clearly evident that the surface water drains no longer collect sewage and kitchen wastewater. The highest pre-project BOD reading recorded from stage 1 has been 480 mg/l indicating widespread organic pollution caused by sewage/wastewater contamination in surface water drains which has dropped to an average BOD level of 9.9 mg/l after 2016 with project investments.

The most widely used parameter to measure water quality and used in the design of effluent treatment is the Biochemical Oxygen Demand (BOD<sub>5</sub>). It is a measure of the microbial activity in the water and reflects the level of organic pollution (demand for oxygen in the biochemical oxidation of organic matter) received by the water source.

The current maximum national regulatory limit for BOD<sub>5</sub> for industrial effluent discharged to agricultural land is 250 mg l<sup>-1</sup>; the limit for discharge to open water bodies is only 30 mg l<sup>-1</sup> and the proposed limits for ambient water quality range from 3 to 5 mg l<sup>-1</sup>. Accordingly, BOD levels in the sampled drains as well as the common well is only slightly higher than the proposed ambient standards which indicates low levels of organic pollution. The frequency of sampling in each catchment is varied and inconsistent and there is limited information on the sampling times and the prevalent climatic conditions, as a result a full interpretation of overserved variations among sampled parameters (mainly BOD and DO), is difficult. However, the general trend in water quality improvement in the post-project period is very evident.

Sample Area	Location	Parameter	Q2 2013 to Q2 2016 (7 samples in stage 1, 2 in other stages)	Q3/Q4 2016 to 2018 Q3 (5 samples in stage 1, 4 in stage 2 & 5 and 1 in stage 3)
			<b>Before the project (lowest and highest values recorded)</b>	<b>After the project (lowest and highest values recorded)</b>
Badovita	Ct 2, Stage 1	BOD (mg/l)	52.1 - 480	<b>9.5 -10.5</b>
		DO (mg/l)	0 - 0.6	0.44 – 1.1
		pH	6.8 – 7.54	7.16 -7.24
		Temp. (°C)	28.1-29.5	28.5 - 29.9
	Catchment 2, Stage 2	BOD (mg/l)	42 - 370	<b>9 -10</b>
		DO (mg/l)	0.55 – 0.64	2.73 - 3.33
		pH	NA	7.11 – 7.23
		Temp. (°C)	NA	28.9 - 29.4
	Catchment 1, Stage 5	BOD (mg/l)	30-42	<b>15 - 20</b>
		DO (mg/l)	0.69 – 2.09	0.54 – 0.83
		pH	NA	6.89 – 7.01
		Temp. (°C)	NA	29.4 - 29.9
	Catchment 3, Stage 3	BOD (mg/l)	20-28	<b>25</b>
		DO (mg/l)	1.73 – 4.5	1.48
		pH	NA	7.14
		Temp. (°C)	NA	29.5



	Common Well	BOD (mg/l)	NA	2.5 - 7.3
		COD (mg/l)	NA	8 - 18
		DO (mg/l)	NA	3.17 – 3.9
		pH	NA	7.22 - 7.62
		Temp. (°C)	NA	28 – 28.6

## 2. Lunawa DEWATs

The Lunawa Samudra Shakthi housing scheme is situated in the Moratuwa Divisional Secretary area to the south of the Colombo city. This is a low-income housing settlement managed under the Condominium Authority, with a total number of 160 housing units occupied by approximately 800 people. The scheme is located about 60m away from the sea in a low-lying flat area with a high-water table of approximately 1 meter.

Before project interventions in 2017, people residing in the scheme faced severe difficulties due to lack of adequate sanitary and waste water disposal facilities. Existing toilet pits were small and shared among many housing (as many as 16 units) units and frequently overflowed (partly owing to poor soakage due to proximity to the sea). The gully had to be called frequently causing many conflicts over payment collection (similar to what has been reported in Baduowita). The dislodged material was often buried on-site or open-dumped in a pit dug for the purpose in the backyard.

It was highlighted that families borrowed money to pay for frequent gully charges. Stagnant pools of wastewater in the backyards of flats was a common sight which turned into breeding ground for mosquitos. Drains were flowing with dirty water and were uncovered. The discussants informed that diseases such as skin rashes and dengue were a common occurrence.





Site: Before and After

### The Change implemented by GPOBA

The scheme received a Decentralized Wastewater system (DEWAT) from the GPOBA. All flats have been thus connected to a series augmented common septic tanks via a rehabilitated collection system, each of which is linked to an Anaerobic Baffled Reactor (ABR) and anaerobic filter for treatment. The treated effluent then flows to a common chlorination chamber through a gravity collection network which is finally connected to the



pump house. The treated effluent is then pumped into the sea via a 6m long outfall which is submerged at the end point 1.5 meters below the sea level.



People at the FGD expressed their utmost satisfaction regarding project achievements. The post-project change in the living environment is remarkably evident. There are no open drains, no smell, no stagnant pools of wastewater and no mosquito breeding. The area looks clean and out-of-pocket expenses for gullies and desludging no longer applies. However, there seems to be challenges in running the CBO who is tasked with managing the DEWAT and questions were raised about the project's sustainability if a major repair is needed.



**A**



**B**



**C**



**D**

**Images A, Alleyways**

**Lunawa Housing scheme showing dry conditions devoid of water stagnation. D : The Chlorination Chamber**

**B, C, : in the**

The project was completed in 2017 with almost 90% reduction in the BOD of the effluent discharged to the sea. The tolerance limits for discharge of wastewater to marine coastal areas for BOD is 100 mg/l, which has been exceedingly met by the DEWAT. The reason for relatively high COD is not known, however, the level in the treated effluent is in compliance with the national standards.



			Q4	Q2	Q3/Q4	Q1/Q2	Q3/Q4	2018	
			2015	2016	2016	2017	2017	Q1	2018Q3
Lunawa Samudra Shakthi Housing Scheme, Overflow	Soakage Pit Overflow	BOD (mg/l)	180	190	175	195			
		DO (mg/l)	0.71	0.9	0.59	0.61			
		pH			7.25	7.35			
		Temp. (°C)			28.9	29.2			
		BOD (mg/l)							12
	Treatment system outlet (Pumping station)	COD (mg/l)							142
		DO (mg/l)							0.82
		pH							7.27
		Temp. (°C)							28.7
		TSS							12

### 3. Tsunami housing scheme DEWAT

The Tsunami housing scheme is situated in the Ratmalana Divisional Secretary area to the south of the Colombo city. This housing scheme consists of 328 housing units. The scheme was implemented with a decentralized waste water treatment system (DEWAT) complete with a wetland for polishing, which fell into disuses and disrepair due to poor management causing severe hardship for the residents to dispose of their wastewater. Existing septic tanks frequently overflowed through open drains to the nearby canal. Collection lines were blocked and some of the sewers were damaged. The anaerobic filters, pumping station and the wetland were in a state of abandonment and damage. It was recorded that many complains have been sent to the Municipal councils from nearby people regarding overflowing of raw wastewater to the existing canal.



#### The Change implemented by the GPOBA

With funding from the GPOBA the wastewater treatment system in the housing scheme was fully repaired and resurrected. Since the early 2015 the treatment system has been operating well under direct maintenance and supervision of the NWSDB.



A



B



C



D

**A: common septic tanks, B: effluent leaving the anaerobic reactor C: clean alleyways D: Clear water leaving the treatment plant**

The field visit carried out in November 2018, did not include this site. However, the site has been visited in a previous mission. The site has been observed to be clean, with no stagnant pools of wastewater, no adverse odour and no blocked toilets (please see images below). The water quality records maintained by the project office for the WWTP effluent and the canal it finally discharges to are given in the table below. According to this data, there is significant drop in the BOD levels downstream of the point at which treated effluent is discharged to the canal. While there is also a notable corresponding increase in the canal DO levels, variations are observed with the lowest value of 0.77 mg/l recorded only once in the third quarter of 2018. This could be due to low flows in the canal or the presence of inorganic pollution coming from another point source. The quality of the effluent indicates high levels of treatment efficiency. While the limited data suggests an improving trend of the quality of the receiving waters, more investigations are needed to draw inferences on the impact of the overall ambient conditions in the canal.

Sample Area	Location	Parameter	Q1 2014 to Q1 2015	Q3 2015 – Q3 2018
Tsunami Housing Scheme- Weerasena Silva Mawatha	Downstream of TP discharge point in the canal	BOD (mg/l)	58 -225	8 - 30
		DO (mg/l)	0 – 2.65	0.77 -3.7
		pH	6.57 – 7.39	7.08 - 7.25
		Temp. (°C)	28.4	28.5 – 29.1
	Upstream of TP discharge	BOD (mg/l)	NA	18 - 30
		DO (mg/l)	NA	1.86 - 3.26



	point in the canal	pH	NA	7.33 -7.69
		Temp. (°C)	NA	28.2 - 29.2
	Effluent of Treatment plant	BOD (mg/l)	NA	3 - 11
		DO (mg/l)	NA	2.62 - 4.64
		pH	NA	7.16 - 7.86
		Temp. (°C)	NA	28.2 - 29.2

#### 4. Auburn side - Direct Connection

This settlement is situated in the Ratmalana, under the project 350 direct connections were installed for sewage and waste water with pumping. The field visit carried out in November 2018, did not include this site. However, the site has been visited in a previous mission.

**A: The pump house B: transparent water in the drain C: the public canal which**



**receives the treated effluent D: dry alleyways within the settlement.**

Similar improvements as in other settlements visited under the project has been observed. The drop in BOD and the increasing trend in the DO levels in drain water quality is significantly evident. The drains looked relatively clean but people complained that some houses exhibited poor practices such as throwing kitchen water and wash water directly into the drain. People expressed utmost satisfaction at the improvement gained by the project.

Sample Area	Location	Parameter	Q2 2013	Q1 2014	Q4 2014	Q1 2015	Q3 2015	Q4 2015	Q2 2016	Q3/Q4 2016	Q3/Q4 2017	2018 Q1
Aurban Side	Canal	BOD (mg/l)	480	255	330	104	120	90	30	80	33	26
		DO (mg/l)	0	0	0.4	0.3	2.14	0.61	1.38	3.14	3.1	2.9
		pH				6.83	6.8		7.3	7.55	7.32	7.22



		Temp. (°C)			29	28.4	28.4			29.2	29.1	28.9
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### 5. Onsite sanitation

A significant majority of households in Sri Lanka discharge sewage and wastewater to underground septic tanks and soakage pits. While this helps contain contamination and allow for some level of treatment onsite, it is also one of the major causes of shallow ground water pollution. The goal of this component has been to provide improved sanitation facilities for low income households which are located away from existing sewers and have sufficient space to install treatment units within the premises. This system consists of (i) installation of a pre-cast treatment unit (combination of septic tank and anaerobic filter) within the premises, (ii) connecting Kitchen and Black Water from the household through a catch pits to the treatment unit, (ii) installation of a precast soakage pit and connection of treated overflow lie to the soakage pit and (iv) period desludging. A desludging program via a subsidized system for a period of up to four years after completion of construction work has been arranged to ensure proper maintenance of the system. This scheme is implemented in Dehiwala, Ratmalana, Moratuwa, Ja-ela.



Sample Area	Location	Parameter	Q1/Q2 2017	Q3/Q4 2017	2018 Q1	2018 Q3
On Site Treatment Unit Effluents	1	BOD (mg/l)	35	40	38	70
		DO (mg/l)	0.66	1.13	1.7	3.9
		pH	6.47		6.9	7.6
		Temp. (°C)	30.3	24.3	28.4	24.6
		TSS			66	
	2	BOD (mg/l)	22	43	32	26
		DO (mg/l)	1.9	1.8	1.8	1.4
		pH	7.65	7.23	7.2	7.31
		Temp. (°C)	30.3	30	29.8	-
		TSS			40	-
	3	BOD (mg/l)	15	21	20	50
		DO (mg/l)	0.46	0.55	0.6	0.47
		pH	7.25	7.22	7.23	7.4
		Temp. (°C)	31.7	30.5	30	23.8

All water quality samples indicated in the table above has been taken in the post-project period from the top of the anaerobic filter (after treatment).

### **Socio-economic and environmental improvement**

Socio-economical transformation is obvious but no indicators have been set to monitor this. The environment visually looks better and the only indicator is the WQ.



- Consultations and awareness raising

It was evident (from both project documents and people's understanding) that extensive consultations and awareness raising had been carried out at all project sites. For example, it was found that these consultations had paved the way for the revision of selection criteria as it was found that the demand for applications were not forthcoming as the selection criteria had been too restrictive.

However, the focus group discussions (with mostly women in participation) brought out that it was not an issue of awareness raising but the non-comital nature of these communities that had left some HHs not able to uplift themselves. The FGD participants, represented by community leaders and other householders, stated that although the surrounding environment had been vastly improved, the poor attitudes of the 'formerly' underserved population has led to some HHs behaving and practicing old habits that leads to the detriment of the clean environment brought about by the Project. This said, the participants were of the view that continuous consultations and awareness raising was needed as people tend to forget very easily and that frequent awareness raising would have a positive effect on attitudinal change.

In one of the sites visited, out of a total of 1500 HHs, 500 – 600 HHs claimed to be Samurdhi recipients but had no idea that they have the privilege of requesting for a lower category payment (as stated in the Project document). This brings to question the efficacy of the awareness raising programs and recommends a more comprehensive approach to awareness programs.

- Impact on land values

One of the bigger impacts (as well as challenge) of the Project has been on the appreciation of land values in the immediate vicinity of the Project area. Land values, according to residents, have increased two to three-fold since the completion of Project. This had led the original residents to sell their properties allowing entry to a new group of people who allegedly don't seem to share the values of the remaining, old residents of the compound. This seem to have raised some tension among the community. During the FGD in Baduowita, it was stated that before 2016 average land value was 5 – 6 lakhs per perch but at present (with project improvements) a perch has reached 15 lakhs, prompting many to sell and reap the financial benefit to relocate elsewhere.

- Impacts during and post-construction

During construction, it was apparent that the Project had induced some influence and had establish a community development committee in each of the sites visited. While the committee in Badowita, for example, had a less prominent role but still had been instrumental in allocating the community welfare centre for the use of the contractor, the committee in Lunawa had to be more hands-on as the operation and maintenance of the sewer system was to be community driven.

Complaints have been made against the contractor, post-construction, for not paying their dues for the use of electricity, water, removal of discontinued pits and damages caused to road, etc,. These, however, seem to have fallen on deaf ears and are yet to be rectified.



- Pros and cons of community driven sewer systems

While the monthly charges for the sewer connections in Badowita were automatically deducted from the HHs water bill, this almost simple task has got complicated in Lunawa because of a community driven system. The community leaders in Lunawa has been made to rethink its strategy as the collection of HH payments and attending to major repairs have got them concerned about their financial capability.

The FGD participants pointed to the fact that the residents of the Lunawa housing scheme, for example, were from 10 different villages from Moratuwa, who had been resettled here following the 2004 Tsunami. Adding to this, the original residents have rented their houses, and this has made the collection of monthly sewer charges extremely troublesome. The newly appointed community leader, however, remains optimistic and stated that they will look at the expenses incurred and divide this by the 160 HHs included in the scheme. Each of the 20 buildings has been assigned a leader, who in turn will be made responsible for the collection of payments. The NWSDB plant nearby will be retained for technical support and an additional fund is being proposed for the undertaking of repairs.



**ANNEX 8. CLIENT ICR**

**Increasing household access to domestic sanitation in  
Greater Colombo, Sri Lanka**

Project Implementation Completion and Results Report (ICR)

**NATIONAL WATER SUPPLY AND DRAINAGE BOARD**

**MINISTRY OF WATER SUPPLY AND DRAINAGE**



## **ABBREVIATIONS AND ACRONYMS**

DEWATS	Decentralized waste water treatment systems
DS office	Divisional Secretary's office
GPOBA	Global Partnership for Output-based Aid
GOSL	Government of Sri Lanka
HHs	Households
ICTAD	Institute of Construction Training And Development
ICR	Implementation Completion and Results Report
IVA	Independent Verification Agent
LGA	Local Government Authorities
MCs	Municipal Councils
MCPWS	Ministry of City Planning and Water Supply
NGOs	Non-Governmental Organizations
NWSDB	National Water Supply and Drainage Board
O & M	Operation and Maintenance
PAD	Project Appraisal Document
PDO	Project Development Objectives
PHI	Public Health Inspector
PMU	Project Management Unit
PPP	Public Private Partnership
SIDA	Swedish International Development Agency
UsS	Underserved Settlements



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## PREFACE

The project: *Increasing Household Access to Domestic Sanitation in Greater Colombo* was ended on 31<sup>st</sup> March 2019, and this is the project Implementation Completion and Results Report, from the Receptient's side, prepared by an Independent Consultant (Eng.) U.N. Walisundara, as per the consultancy awarded by the Project Director (PD) Mr. Bandara, on 15<sup>th</sup> February 2019.

In preparing this ICR following process was followed.

- Reviewed the Project documents, Mission reports, and other Progress reports prepared by the project staff; had discussions with the Project Director and other relevant officials including the World Bank Representatives.
- Conducted several discussions with the Project staff and carried out a questionnaire survey through the project staff to get the feedback and the views of the beneficiaries. In addition, the Consultant visited some sites, conducted interviews (Question and Answer (Q & A) sessions) with different stakeholders. The details are given in Annex 2.1 to 2.10.

In general, the project has achieved the targets, accrued many benefits, derived lessons and more specifically, draw attention of funding agencies on the importance of improving sanitation facilities of low-income families in urban areas. In this process and programs, the project staff has carried out a challenging task (the contractor and the beneficiaries commended their services at the interviews) and the World Bank mission members have guided them to complete the project satisfactorily.

In order to make this ICR more practical, useful and user-friendly, followings details have been included;

- (i) Some photographs to emphasis the program and the results (Annex 1);
  - (ii) Answers given by different partners to the questions raised (Annex 2);
  - (iii) Results based on four indicators: Relevancy, Effectiveness, Efficiency and Sustainability. The Q & A model was used and marks were given to each in order to make justification, and to highlight the success, shortfalls and drawbacks, aiming to consider as lessons in future projects (Annex 3).
- The ICR Consultant wishes to thanks the Project Director, Eng. G.O.L.P. Bandara, Project Engineer, Eng. Dilshan Pathirana, Public Relation Officer, Mrs. Kumari Mallikaarchchi and the staff, for the immense cooperation given in organizing field visits, conducting questionnaire surveys and facilitating to obtain the data and information.



- The contents, observations and the comments made by the World Bank Mission members in their review reports were highly useful in formulating the report; expresses special thanks for them.
- Wish to convey the gratitude for the officers in various agencies (LGAs, DS offices, IVA and other) and the community leaders for giving observations and comments at the Q & A stage in order to complete this report satisfactorily.

## Project Overview and the Summary

- 1. The Project** - The Government of Sri Lanka (GOSL) entered into an agreement with the World Bank in December 2011 for implementation of the project - '**Increasing Household Access to Domestic Sanitation in Greater Colombo Area**' aiming to improve sanitary facilities of the low-income House Holds (HHs) in selected urban areas in Colombo Region. In addition to sanitation improvements, it was also expected to improve the health condition of low-income families and enhance the environmental conditions of the project area. The project commenced in June 2012 and completed on 31<sup>st</sup> March 2019 (approximately seven years). The total project cost USD 13.1 million was financed under three sources: 60% GOSL contribution, 39% as a grant from the Global Partnership on Output-based Aid (GPOBA), and about 1% as the beneficiary contribution. The total expenditure incurred under the project was USD 12.5 million (Rs. 1,584 million), which was 95% of the allocation, and the average cost incurred per HH was Rs. 186,571 (Table 5).
- 2. Methods Implemented** - The National Water Supply and Drainage Board (NWSDB) was the main implementing agency and the Local Government Authorities (LGAs - Municipal Councils, and Pradeshiya Sabas) and the Divisional Secretariats (administrative units) assisted and facilitated the program. The project implementation approaches (outputs) can be mainly categorized into five: (i) **Direct Method** - connected HHs sewer directly to existing or new sewers by gravity; (ii) **Extension Method** - connected through extended sewer lines by gravity; (iii) **Pumping Method** - connect sewer lines to the main chamber to flow by gravity and then pump to the disposal points ; (iv) **DEWATS** - sewer lines connect to Decentralized Waste Water Treatment Systems (DEWATS), and (v) **On-site** - improved on-site sanitation systems independently. Since the project focus was low-income HHS, two main selection criteria were used to select beneficiaries: (i) the land area of the HH should be less than 20 perches (506 sq. m) and (ii) the monthly income of the HH should be less than Rs. 30,000. The total number of HHs benefitted under the project was 8,489 (96% of the target). Average number of members in a HH is five, and hence the total population benefitted was 42,445.
- 3. Difficulties encountered** - Implementation of a sanitary improvement project, especially for existing small houses (slums and shanties) and low-income HHs in urban areas, is a challenging task. The congestion due to high-density of homes in small land plots with extended families, undesirable working environment, limited workspace, along with



different views, suggestions, and opinions by different house-owners cause various issues and retard the progress. As the contractor stated at the interview (Annex 2.7) – “Why should I engage in such difficult tasks when there were ample opportunities for direct and fresh contracts in irrigation, roads, and housing sectors?” According to him, there should be a good incentive to attract the contractors in future for similar sanitation projects. However, from national as well as community point-of-view, such improved sanitation facilities are essential, and if not, health and environmental situation in those areas would aggravate significantly.

- 4. Community views** - The interviews with some beneficiary groups (Annex 2.1 to 2.5) revealed that the project was a great blessing for them. They argued that the government invest vast sums of money for rural development, but no attention on the low income families in urban areas. They do not ask for employment opportunities or social welfare programmes, but the basic needs-water & sanitation. According to them, politicians give many promises during the election period, but simply forget after the elections. Therefore, the project intervention was highly commended by almost all the people participated in the discussion.
- 5. Appropriateness and the Demand** - Due to rapid population increase in urban areas, mainly due to the migration of people from rural to urban areas for seeking employment in service and industrial sector, their sanitary problem is getting worse. The World Bank intervention to initiate this pilot project was highly appropriate, and it has delivered many lessons to promote that facilities. At the initial stages, the project officers found it difficult to make aware of the advantages to the residents, but gradually, especially women realized the benefits; thus, the demand was rapidly increased - the project office has received about 1,500 applications, and 2-3 people visit the office every day enquiring the possibility of obtaining project facilities.
- 6. Integrated Approach** - Discussions with different stakeholders revealed that the integrated approach is far more suitable since many agencies involved in sanitation and other social activities in different ways. The Municipal Council is responsible in social welfare (e.g., removal of garbage, repair and improvements of roads), and as politicians, they are directly answerable to the people (Annex 2.8 - Interview with Deputy Mayor – Kasbewa). The NWSDB is competent in providing all the technical inputs. The Divisional Secretariat (DS office) has the administrative authority and the Public Health Inspector (PHI) attached therein is responsible for community health activities. Other field officers (Grama Niladari, Samurdhi, development officers) are also assigned to this office. In this context, the Divisional Project Coordination Committee comprising the officers in the above three agencies (NWSDB, LA and DS) is the best approach to coordinate and implement project activities. The Steering Committee consisting of representatives from all line-agencies will serve as the overall coordination body at the central level.



7. The project has delivered many positive outcomes and impacts. Discussions with some stakeholders, the results of the questionnaire survey and tests conducted by the project staff confirmed that they received following benefits:
  - (i) After the project, family life has become easy and comfortable; children go to school in time, family members can maintain privacy, and many prevailed issues have been resolved.
  - (ii) A clean and tidy environment has been created– no bad smells, no more effluent overflows and minimized other irritations.
  - (iii) The quality of groundwater has improved and thereby minimise the adverse effects on adjoining wells. (water quality tests proved the BOD value of the effluent water is highly satisfactory).
  - (iv) Since all grey water is conveyed through the sewerage system (this water was conveyed along the open drains before the project), the potential for increasing water-borne diseases are minimal. The bad odours and the nuisance of flies and mosquitoes are significantly reduced, and the children can play in dry areas (Annex 1 - photos).

In assessing the inputs and outputs, it can be stated that the project has delivered many positive results and denoted many good lessons to formulate a similar large-scale project.

## **PROJECT IMPLEMENTATION COMPLETION AND RESULTS**

### **REPORT (ICR)**

## **INCREASING HOUSEHOLD ACCESS TO DOMESTIC SANITATION IN GREATER COLOMBO, SRI LANKA**

### **A. Project Background**

#### **A1. Introduction:**

1. **The Project:** The Government of Sri Lanka (GOSL), through the NWSDB with the financial assistance from the World Bank, executed the sanitation improvement pilot project - Increasing Household (HH) access to domestic sanitation in Greater Colombo area, at a cost of USD 12.5 million, from 1<sup>st</sup> June 2012 to 31<sup>st</sup> March 2019. The project provided improved sanitation facilities for 8,343 low-income families live in the Divisional Secretary areas of Ratmalana, Moratuwa, Dehiwala, Kolonnawa, Ja-Ela, Ekala, and some two new areas (Gampaha and Minuwangoda) in adjoining district (Table 3). The project was located in NWSDB office in Wellawatta, headed by a Project Director, assisted by two Engineers, four Technical Assistants, Institutional Development officers, and other project staff.
2. The project was focussed on improving the sanitation, health, and environmental aspects of low-income families living in project areas. As per the rapid surveys and discussions, it was



revealed that the HHs had to undergo severe difficulties without proper sanitation facilities before the project and the family lifestyle had been disrupted; adversely affected the employment, education, and other routine activities. The most affected were the women and children, and as such, women played a prominent role during the project planning and implementation stages. Since most of the health and environmental factors have been directly bound with sanitation, many positive results leading to enhance the living conditions of the urban poor could be observed with the project.

## **A2. The importance of the pilot project in National Development Perspective:**

3. Improved sanitation facilities mean the improved lifestyle of the community. Millions of people suffer due to water-borne diseases such as diarrhoea, cholera, typhoid, and other infectious diseases, which can be minimised through proper sanitation management and creating a clean living environment. Hence, providing improved sanitation facilities to all citizens in the country has become one of the high priority areas of the government. As such, this pilot project intervention provides adequate and appropriate information, data, exposure, and lessons to plan, design, and implement a large-scale urban sanitation projects in future.
4. The absence of suitable sanitation facilities causes many adverse effects to the socio-economic status of the people, and thereby achieving the country's development goals. This state is more applicable to the urban poor. Although the government and non-governmental agencies have implemented several sanitation programmes for rural poor, such programmes focussing urban poor are rare and limited.
5. As per the survey conducted by Sevantha Urban Resource Centre jointly with Homeless International (UK) in 2012, the total Underserved Settlements (UsS) in Colombo city area is 1,735, the number of huts or cottages (slums and shanties) is 77,957, and the number of families lives therein is 123,185 representing a population of 470,542. The survey revealed 26.3% of the UsS need improved access for basic toilet facilities. The demands for basic facilities are continuously increasing due to the rapid migration of youths from rural to urban.
6. The Government scope is to provide water and sanitation facilities for all citizens by 2025. Therefore, urban sanitation, mainly to cover low-income families, is highly significant and has become a pressing need. Some challenges confronted in this sphere are, (a) lack of clear guidance and coordination among agencies, (b) non-availability of required facilities and financial resources (high priority is given to irrigation, roads, and drinking water developments, but sanitation is given a lower place), (d) inadequate monitoring of adverse effects and backstopping, and (e) lack of political attention, and low prestige and recognition.

## **A3. Project Description - Objectives, Activities, and expected Outputs and Outcomes**



7. **Project Development Objective (PDO)** - The PDO is to improve the sanitation services to low-income HHs in Greater Colombo area by increasing the number of household connections to existing and new sewerage networks, and improving on-site sanitation services at the household level.

In this pilot project, the improved sanitation facilities were provided at a discounted fee, considering their income levels. The main focus was to encourage them to join the project at an affordable cost, and gradually use them to new and improved systems. Minimising sanitation-related health issues and creating a clean environment were the other areas focused herein.

8. **Project Outputs** – The project comprises of two main outputs: **Output 1** - Providing new HH connections to piped sewerage systems, and **Output 2** - Improvements to the performance and operation of on-site sanitation systems and services (install improved septic tanks with treatment units and guide to regular desludging). The required output was determined based on the technical feasibility and the closer availability of NWSDB-managed sewer network.

**OUTPUT 1 – Sewer connections:** Under this system, all grey and black water from the HHs is conveyed to the nearest NWSDB sewerage network. Following four types (a, b, c, and d) of piped sewerage systems are used to provide new household connections:

**(1.a) “Direct connections”** – Provide direct connections to HHs located closer to (within about 20 m) an existing sewerage network. This is implemented in two categories:

**(1.a.1) “Direct connection full cost build out”** – under this category, all infrastructure facilities (i.e., interconnection chambers, manholes, pipe extensions) are constructed to convey all wastewater (grey and black water from outlets of the house, except drainage and rainwater) to the sewerage network belonging to the NWSDB, located along the nearest road.

**(1.a.2) “Direct connections within premises”** – under this category, limited infrastructure are developed at the premises of the beneficiary HHs; mainly developing the network to collect wastewater of the house to convey to the existing interconnection chamber, which has been built under previous SIDA project.

**(1.b) “Connections to conventional sewer extensions”** – Conventional sewer technology is used where sewerage is located under the roads with heavy traffic movements. Here, the necessary infrastructure facilities (extensions of lateral pipes and interconnection chamber) are constructed to extend the sewerage network to a group of houses located more than 20 m away from the main sewerage network. This method is used when the main sewerage line is located under the main roads, or the sewer lines are located at a depth over 2 m.

**(1.c) “Connections to simplified sewer extensions”** – simplified sewer extensions (also called ‘shallow’ or ‘condominium sewer’) consist of providing necessary infrastructure facilities to connect with a group of HHs located more than 20m from the main sewerage



network, which has two types:

**(1.c.1) Gravity-fed simplified sewer extensions:** here, the main sewer line is located less than 2 m deep, and hence, the new branch sewer line can directly be connected for conveying the wastewater under gravity.

**(1.c.2) Pumping-fed simplified sewer connections:** in this system, the wastewater is pumped into the main sewerage network.

**(1.d) “Connections to decentralised network”** – DEWATS is used to HHs located in areas where sewerage is technically feasible, but too far from the existing central sewerage network to make an extension. This system is provided to a cluster of houses.

**OUTPUT 2 - Onsite sanitation improvements** – This system is used in areas where sewers cannot be provided or are not appropriate. Here, either a new facility is provided, or the on-site existing sanitation facilities are improved, and desludging is entrusted to a licensed gully bowser services company on a contract basis. Introducing such performance-based contracts promotes the initiation of a novel way of managing on-site sanitation.

#### A 4. Comparison of advantages and disadvantages in each output type

9. **Combining some outputs:** Due to many similarities in nature and functions, and for reducing the complexity, the project has combined some outputs (output 1.a.1 & 1.a.2 joined, and output 1.b & 1.c.1 joined). Then it can be considered as five outputs (Aide memoir, August 2014), and the project had awarded the contracts under these five categories. Therefore, from here onwards, five main outputs are discussed and analysed in this report.

Table 1 presents the main characteristics of the five main outputs.

**Table 1: Applications and limitations of the main five outputs**

Main output	Sub Outputs	Applications and Limitations
<b>(1.a) Direct Connections:</b>  Provide direct connections to HHs located closer to existing sewerage network	<b>(1.a.1) “Direct connection full build cost”</b> <b>(1.a.2) “Direct connections within premises”</b>	<b>Applications:</b> (i) Easy and quick construction; (ii) Fewer maintenance problems to the beneficiaries; (iii) Cost is included into water bill to make payment easy and compulsory; (iv) All wastewater could be disposed through the system. (Before the project, this water was conveyed through open drains along the roads, creating many environmental issues).  <b>Limitations:</b> (i) The main sewerage network should be available at a closer distance (20m).
<b>(1.b) “Connections to conventional and simplified sewer extensions”</b> –  Construct necessary infrastructure to extend the sewerage network for main sewerage network of	<b>(1.b) “Connections to conventional sewer extensions”</b>  <b>(1.c.1) Gravity-fed simplified sewer extensions</b>	<b>Applications:</b> (i) Houses located along sub-roads can be brought under this system; (ii) Land saving; the previous latrine pit area can be used for some other purposes (since these lands are tiny (1-2 perches), even a small saving is highly beneficial); (iii) Clean environment; (iv) The monthly sewerage bill is about Rs. 250, which is added to the water bill.  <b>Limitation:</b> (i) The main existing sewer lines are deep (conventional sewer above 2 m depth, but simplified sewer less than 2m); (ii) Difficulties in constructing new sub-sewer lines due



houses.		to traffic or non-availability of adequate lands; (iii) Some latrines are located below the sewer line, hence cannot be connected.
<b>(1.c) Pumping-fed simplified sewer connections</b>	<b>(1.c.2) “Pumping-fed sewer connections”</b> –  Here, the wastewater is pumped into the main sewerage network.	<b>Applications:</b> (i) Can be used for cluster of houses in low line area or water logged area; (ii) The area is environment friendly after the project (iii) The NWSDB officials attend repair works at minimum cost (Rs. 750 per visit); (iv) The O & M cost included into water bills and payments make compulsory.  <b>Limitations:</b> (i) The need of more technical inputs during design & construction stages; (ii) The contractor had to work in existing latrine premises in small space, and thus, encountered many difficulties; (iii) High investment and the O&M cost.
<b>(1.d) “Connections to decentralised network”</b> – DEWATS	<b>(1.d) “Connections to decentralised network”</b> – DEWATS	<b>Applications:</b> (i) Independent from main sewerage network; (ii) Can be locally managed.  <b>Limitations:</b> (i) The HH groups (not individuals) should desludge their septic tanks, and make necessary repairs; (ii) The HHs in the ground floor have application and environmental issues in the absence of a suitable cleaning programme.
<b>Output 2 - “Onsite sanitation improvements”</b>	<b>Onsite sanitation system</b>	<b>Applications:</b> (i) Independent system that can be provided on the request of the HHs; (ii) Minimises groundwater pollutions and other adverse effects.  <b>Limitations:</b> (i) Proper annual desludging is a necessity; (ii) Difficulties in constructions at sites with the limited land area; (iii) The scattered nature of house locations instigate difficulties in construction and supervision.

**Annexe 1 provides some photographs to highlight the project implementation activities.**

**B. Project Implementation Arrangements**

**10. The project implemented work steps**

- (i) Identify the sites, make site visits, and study the technical suitability and feasibility of appropriate types or outputs (1.a, 1.b, 1.c, 1.d or 2).
- (ii) Conduct awareness programmes for the community in the area with the assistance of the officers in the DS office and LAs. The questionnaire survey revealed that more women (70%) participated in the training programmes.
- (iii) Call applications from the eligible beneficiaries, verify their eligibility and inform them to pay the beneficiary contribution. Sign an agreement with each beneficiary.
- (iv) Conduct detailed surveys and designs, and prepare cost estimates.
- (v) Educate the existing societies or form new groups from each housing cluster to coordinate and facilitate the programme.
- (vi) Plan and execute the necessary infrastructure to provide the agreed type sanitation facilities through a contractor following the procurement process.
- (vii) Guide, implement and facilitate desludging and other maintenance activities.



11. **Steering Committee** - The Secretary to the Ministry of City Planning and Water Supply (MCPWS) had chaired the Steering Committee meetings once in three months (as scheduled), where all officers in line agencies participated. The main activities performed were: (i) reviewed and approved the annual work plan and budget; (ii) discussed and resolved the issues with line agencies; (iii) reviewed the progress and provided necessary guidance to implement the programmes effectively.

12. **Independent Verification Agent (IVA)** - The project identified an experienced and qualified firm as an IVA to check and verify the outputs (designs, quality, and functionality) on a sample basis, assess the results, and recommend payments. The progress also was monitored quarterly, discussed with beneficiaries to ascertain the performances and reported the results to the World Bank officials.

**Under Output 1 (sewerage connections)**- if the work was satisfactorily completed, the IVA certified 50% of the unit subsidy payment, and the remaining 50% was paid after 06 months of continuous service of delivery.

**Under Output 2 (onsite sanitation)**, 80% of the subsidy was paid after delivering the service, and the balance 20% after 06 months.

Annexe 2.6 provides the IVA responses to five questions raised on the performance of work.

**C. Achievements of project outputs based on PDO outcome indicators**

**13. Performance Indicator 1: Output delivery progress**

The total number of HHs anticipated to provide improved sanitary facilities is 8,800, for benefitting a population of about 51,920. The achieved number is 8,343 HHs, and the population benefitted is 49,224 (Table 2).

**Table 2: Output delivery progress by the end of 2018**

Output No.	Output Type	Overall Targets (PAD)	Overall Target (Revised)	Outputs delivered	% of achievements
1.a.1	Direct Connections full cost built out	725	892	898	101%
1.a.2	Direct Connections within premises	750	583	336	58%
<b>1.a</b>	<b>Direct connections</b>	<b>1475</b>	<b>1475</b>	<b>1234</b>	<b>84%</b>
1.b.1	Connections to conventional sewer extensions	392	392	392	100%
	(1.c.1) Connections to simplified sewer extensions – under gravity	1083	1083	1113	103%
<b>1.b</b>	<b>Simplified and conventional connections</b>	<b>1475</b>	<b>1475</b>	<b>1505</b>	<b>102%</b>
<b>1.c</b>	<b>(1.c.2) Connections to simplified sewer extensions – pumping system</b>	<b>1500</b>	<b>1,500</b>	<b>1,500</b>	<b>100%</b>



1.d	Connections to decentralised networks (DEWATS)	565	565	552	98%
	<b>Sub Total of type 1</b>	<b>5015</b>	<b>5,015</b>	<b>4791</b>	<b>96%</b>
2	On-site sanitation improvements including new areas (Type 2)	3785	3,785	3,552	94%
	<b>Grand Total</b>	<b>8,800</b>	<b>8,800</b>	<b>8,343</b>	<b>95%</b>

**Observations:**

- (i) The overall progress of Output 1 is 96%, and Output 2 is 94%; the cumulative average is 95%; the achievement is satisfactory.
- (ii) Output 1.a - implementation of direct connection was easy and quick, and hence the targets of 1.a.1 could be achieved. However, under 1.a.2, the target had to be reduced due to unavoidable reasons (during project planning stage, part of the contract -from the interconnection chamber to main sewer line- had been awarded to a contractor under the SIDA project, but the contractor became bankrupt, and the work could not be completed as scheduled). Hence, the overall progress of 1.a was reduced to 84% of the revised target.
- (iii) Output 1.b - conventional sewer extensions and 1.c.1 simplified sewer extensions have also been completed as per the scheduled targets. After combining these two, the average progress was 102%, which is highly satisfactory.
- (iv) Output 1.c (former 1.c.2) - the pumping system was installed in Attidiya - Padowita area (1,500 HHs) and implemented successfully (questionnaire survey and interviews, Annex 2.3).
- (v) Output 1.d - DEWATS achieved the target results and was implemented mainly in three housing complexes (flats). The community residing in those houses highly appreciated the project interventions, since sanitary was a long and outstanding for them. (photos in Annexe 1).
- (vi) Output 2. Onsite sanitation – The target number could not be achieved due to various site issues in previous project areas, and therefore new areas (Minuwangoda and Gampaha DS areas) were identified in December 2017 and implemented successfully.

**14. Performance Indicator 2: Output delivery progress:** The number of HHs targeted and benefitted at the project area level.

**Table 3. Physical progress [Target (T) and Achievements (A)] at the project area level**

Area	1.a. – Direct connections		1.b convent. & simplified connections		1.c Pumping system		1.d DEWAT S		2. Onsite connections		Total		%
	T	A	T	A	T	A	T	A	T	A	T	A	
Rathmalana	290	182	147	112	1500	1500	328	328	485		2750	2122	77%
Moratuwa	293	154	153	105			237	224	450	562	1133	1045	92%



Dehiwala	400	398	481	790					950	1253	1831	2441	133%
Kolonnawa	492	500	296	186					950		1738	686	39%
Ja-Ela/Ekala			398	312					950	528	1348	840	62%
New areas										1209	1209	1209	100%
<b>Total</b>	<b>1475</b>	<b>1234</b>	<b>1475</b>	<b>1505</b>	<b>1500</b>	<b>1500</b>	<b>565</b>	<b>552</b>	<b>3785</b>	<b>3552*</b>	<b>8800</b>	<b>8343</b>	<b>95%</b>

\* Total of three previous areas (Moratuwa, Dehiwala, Ja-Ela/Ekala) = 2343;  
 New areas: Gampaha 165; Minuwangoda 208, Kesbawa/Maharagma/Piliyandala 836;  
 Total 1209, Grand total = 3,552.

**Observations:**

- (i) The reasons observed for the low progress in Ratmalana and Moratuwa areas under 1.a was the issue of the (formerly numbered as 1.a.2) SIDA project, which delayed the contract period for about 30 months. Those programmes were later transferred to Dehiwala and Kolonnawa areas and implemented under the 1.a.1 plan.
- (ii) In all five regions, the 1.b conventional system was successfully implemented.
- (iii) In Badowita, 1.c.2 - pumping system was completed satisfactorily; however, due to the complexity of the contract, nearly three years were needed to complete the project (Annex 2.7 interview with the contractor).
- (iv) Rathmalana & Moratuwa – 1.d DEWATS programme was completed satisfactorily within one year. The community gave their fullest cooperation to the contractor to complete the work effectively.
- (v) Output 2 – Constructions of this programme was relatively slow during the initial years, but accelerated after 2018. The achievements were as follows:

Year	June 2017	Jan 2018	March 2018	Dec 2018
No. HHs completed cumulative	9	490	1,302	3,552

**15. Results of other Performance Indicators:**

**15.1 Performance Indicator 3: The proportion of poor HHs in project areas demanding access to improved sanitation services (number requested, number eligible and provided).**

**Results:** The demand for improved sanitation significantly increased at the latter stages of the project, when project benefits were convinced. The community living in the neighbouring project areas also made requests to implement the programme in their areas. At present, the project office has received a large number of applications (about 1,200), but, due to site-specific issues, some requests cannot be fulfilled. For example, if the houses are located in a lower elevation than the main sewer, or the non-availability of adequate space for the septic tank, implementing the programme is impossible. Some low-income families who had not received the water connections also had to be eliminated. As per Tables 2 and 3, 95% of the progress could be achieved by Dec. 2018.



**15.2 Performance Indicator 4: The percentage of truckloads of wastewater and faecal sludge from project HHs disposed at approved locations (Monitoring records and data).**

**Results:** This applies to outputs 1.d (DEWATS) and 2 (on-site sanitation) programmes. The average truckload cost for desludging is Rs. 4,450; in the case where three families jointly hire a truck, the price per annum would be around Rs. 1,500 per family. As per project specifications, the NWSD involves and coordinate the desludging programs during the first four occasions at concessionary rates (initially, 50% of the cost, and in the balance 3 times, 85% of the cost should be borne by the beneficiary family). From that period onwards, the beneficiary HHs should take the entire cost. The Deputy Mayor in Kesbawa MC said at the interview that the community could not organise themselves for combined desludging programmes, but the MC could play a significant role since this is part of their responsibilities. This helps timely desludging and reducing the cost. Annexes 2.6 and 2.10 provide the interviews with Deputy Mayor and the gully bowser owner.

**15.3 Performance Indicator 5: Average water consumption and associated sanitation bill for low-income HHs having access through the OBA pilot. Assess the possibility of the recovery ratio for the connection fee through water bills.**

**Results:** The sanitation fee collection with water bills is an appropriate and sustainable method. The services of inputs (water supply) and outputs (removal of black & grey water) should be interlinked, and the user should bear the cost for both activities. Most of the surveyed HHs stated that the new system is convenient and affordable to them. The average bill values per HH per month are as follows:

Avg. water consumption	Cost of the water bill	Sanitation bill	% of water bill
12 m <sup>3</sup>	Rs. 310	Rs. 118	38%
15 m <sup>3</sup>	Rs. 370	Rs. 122.50	33%
20 m <sup>3</sup>	Rs. 800	Rs. 280	35%

On average, the sanitation bill is one-third of the water bill. The average connection fee is Rs. 50,000, and if planned to recover within five years, the monthly cost would be Rs. 833, which is relatively a high value. So, recovery of connection fee from low income groups would be a problem.

**16. Performance of the Impact Evaluation Indicators:**

The results of the key impact evaluation indicators are based on the questionnaire survey findings and discussions held with beneficiaries. Interviews were also held with several stakeholders (Annexes 2.1 to 2.10).

**16.1 Indicator 1 - Monitoring of faecal pollution in the project areas where on-site**



**sanitation improvements are performed (water quality testing in sample points).**

**Results:** The project conducted sample testing in seven locations and found the average value of output 2 (onsite sanitation) is an average of 24.5 mg/l. The approved average Biological Oxygen Demand (BOD) value of septic tank effluents is 150 - 200 mg/l (Washington State Department of Health, Research Report, 2004). It was also noted that the average affluent water BOD value of the DEWAT system was less than 10 mg/l. These results reveal the groundwater pollution has minimised due to project interventions. But more studies are needed to justify the cases.

**16.2 Indicator 2 - Effective and efficient coordination between NWSDB, Local Authorities (LAs), and private gully bowser companies (measured by satisfactory planning, financing, designing in constructing, and managing sanitation improvements).**

**Results -** During project planning and implementation stages, the LAs and DS officers offered their fullest cooperation in achieving satisfactory results. However, more coordination and integration is required during large-scale implementation. Some recommendations exposed during the discussions are as follows:

- (i) More responsibilities should be entrusted to line agencies during the planning stages to make more productive and sustainable programmes. They could be entrusted more responsibilities with the social part (conducting awareness, beneficiary selection, collecting community contribution and participation during construction), jointly with the NWSDB.
- (ii) The technical part including planning, designing, and construction is the NWSDB's primary responsibility.
- (iii) The public-private partnership should be strengthened to ensure sustainability, and the Municipal council must take more responsibilities after the project.

**16.3 Indicator 3 – The willingness of LAs to share responsibility with the NWSDB for long-term technical and financial management of the improved sanitation solutions, or to engage more formally with private gully bowser companies through competitively tendered performance-based contracts (set up and administered by NWSDB) to improve desludging of septic tanks.**

**Results:** The project has demonstrated a Public Private Partnership (PPP) approach for regular desludging. The project has issued invoices of concessionary rates to the HHs for desludging. The performances are at the first and second stages. Annexe 2.10 presents the views of the gully bowser owner.

**D. Project Cost**

- 17. Overall cost and expenditure:** Total Estimated cost of the pilot project is Rs. 1,876 Mn (USD 13.104 Mn) @ 1USD = Rs. 143.16, and Table 4 presents the cost contribution by



each agency. The expenditure incurred by 31<sup>st</sup> December 2018 was Rs. 1583.8 Mn (84% of the total allocation).

**Table 5. Cost contribution and cumulative expenditure as of Dec 2018**

Item	Amounts in million USD		Amounts in million SL Rs.		Expenditure Percentage
	Allocation	Expenditure	Allocation	Expenditure	
GPOBA (WB)	5.069	3.776	725.7	563.2	78%
GOSL	6.799	7.19	1124.13	1020.6	99.6%
NWSDB	1.053				
Beneficiaries	0.183		26.24		
<b>Total</b>	<b>13.104</b>	<b>10.905</b>	<b>1,876</b>	<b>1583.8</b>	<b>84%</b>

Observations and comments:

- (i) The depreciation of the rupee value against the US dollar was the reason to increase the available money for each component.

**18. Expenditure pattern (Rs. million)**

Activity	Dec 2012	Dec 2013	Dec 2014	Dec 2015	Dec 2016	Dec 2017	June 2018	Dec 2018	Total
<i>Output 1- Allocation</i>	3.3	250	480	348	220	274	84	100	
Expenditure	3.3	62.7	219.6	231.5	352.1	166.9	33.4	59.8	1129.3
<i>Output 2- Allocation</i>				100	498	150.7	100.2	150	
Expenditure				0	130.4	92.6	35.5	196.2	454.7
<b>Total Allocation</b>	<b>3.3</b>	<b>250</b>	<b>480</b>	<b>448</b>	<b>718</b>	<b>424.7</b>	<b>184.2</b>	<b>250</b>	
<b>Expenditure</b>	<b>3.3</b>	<b>62.7</b>	<b>219.6</b>	<b>231.5</b>	<b>482.4</b>	<b>259.5</b>	<b>68.8</b>	<b>256</b>	<b>1584</b>

Observations and comments:

- (i) Output 2 started implementation in June 2016.



## E. Challenges faced and solutions made during project implementation

**19. Challenges faced, and solutions made:** Due to nature and construction environment of the project, the officers and contractors had to undergo various difficulties and challenges during the construction stages. Most of the issues were beyond the control of the project staff, and as a result the project activities got delayed more than three years. Some major challenges confronted and actions taken are discussed below as lessons for future projects.

### **19.1 The Contractors' bid values were much higher when compared to the Engineer's estimate, and the number of interested contractors was also very limited. How was it affected in the project performance and what action could be taken to resolve it?**

Contractors' quoted high prices (about 2-3 times higher than the Engineer's estimate) due to difficulties they experienced in the working environment. Some contractors were reluctant to submit bids due to (a) many variations and unforeseen difficulties they have to encounter (some may not be estimated even) for which the extra cost could be very high; (b) workers were not willing to work even if the payments were made double the normal; some dislike to work in the existing toilet renovation environment, and do not attend for work regularly; (c) contractors prefer larger new projects - roads, buildings, irrigation - because such projects have favourable working conditions and are profitable.

**The solution made** – The project team discussed this issue with the World Bank missions, and finally agreed to revise the rates as per ICTAD monthly cost-conversion formula based on price escalation. The problem is yet not fully resolved, and the contractors' concerns were much over and above the approved revised costs (Annex 2.7 - Contractor's answers for some questions).

**Observations and comments** - Considering the practical difficulties and various unexpected issues emerged during construction stages, it is reasonable to quote high bid prices. Three main solutions emerged while discussing with various stakeholders.

- (i) **Rates should be increased** - The rate should be increased by 30-40% of the approved rates for standard work considering the working environment and the scale-of-work in each unit, or the profit margin for the approved rates can be increased.
- (ii) **More publicity should be given**- It is recommended to call ICTAD-qualified contractors and conduct a workshop to create awareness. So, more people tend to come and their ideas, views, and recommendations can be considered in future projects.
- (iii) **More beneficiary involvement** - At the beneficiary selection stage, a compulsory condition could be imposed that the beneficiary (or his representative) should work as labour under the contractor, and the contractor should agree to pay him reasonable daily wages.

### **19.2 The beneficiaries were selected based on two selection criteria: (i) the land size of the**



household should be less than 20 perches, and (ii) the monthly family income should be less than Rs. 30,000. The questionnaire survey indicated that some applicants were dropped due to non-compliance with the eligibility criteria, and some were not selected due to the levels of the sewer pipes (latrines were below the sewage lines) while some did not have adequate land space for septic tanks. How to resolve these problems to create a win-win situation?

**Solutions suggested:**

Though the project had planned to provide sanitary facilities to low-income families, the requests from others too should be considered favourably to achieve overall results. Most families who were not qualified to get this facility live in marginally above situation. Hence, it is proposed to obtain an extra charge from them based on their income levels and provide project facilities. Some modified designs can be used for other technical issues too. For example, if the level is lower, raising the toilet bed or introducing on-site sanitation could be a solution. Vertical cylindrical pre-cast septic tanks need relatively small area than the square ones. It is suggested to provide improved sanitary facilities to a maximum number of families to minimise hazardous effects.

**19.3 The beneficiary participation and coordination were inadequate in some areas. Most people go for employment or other work during the day time, and the contractors were compelled to postpone the work. The government officers work on office days, and one officer has to cover several areas. As such, it is rather difficult to coordinate and accelerate the work. The Field Officers highlighted this difficulty during the discussion. What are the appropriate solutions to overcome these issues?**

**Solutions suggested:**

- (i) Social mobilisation and training are vital components of these community development projects; hence, it is recommended to recruit Facilitators to implement the program effectively. The youths (one per project of about 100 - 150 families) can be selected from the area and recruited through the Municipal councils or village societies established under Divisional Secretariats, so they can conveniently work after office hours or during holidays.
- (ii) The selected persons should be provided with adequate training on social mobilisation, project activities, and construction supervision and get their services on performance basis. The Institutional Development Organisers recruited by the Department of Agrarian Services under World Bank-funded 'National irrigation Rehabilitation Project (1991-1998)' to strengthen the Farmer Organisations on irrigation rehabilitation work delivered highly successful results.

**19.4 The project introduced PPP (Public Private Partnership) for desludging is an innovative and appropriate approach. At present, it is functioning well, but some difficulties may occur in larger-scale implementation (Annexe 2.10– Answers given by the**



**gully bowser owner).**

**Solutions Suggested:**

Bowers are available in Municipal councils, purchased under various projects, and the operating cost is relatively less (Rs. 1,000 less than the private bowser cost). Therefore, private owners cannot compete and sustain the process. Hence, it is recommended to discuss with Municipal Councils and find an appropriate solution such as register the private bowser owners under Municipal Councils, and decide on a uniform rate, or identify the areas.

**F. Lessons and Recommendations**

- 20. Produce a video film to create awareness, training, and capacity building** – Initial awareness, follow up training, and capacity building programmes highly contribute to the success of the programme. Usually, the officers deliver speeches and explain regulations & procedures. However, people like to see past experiences and hear how the problems were resolved. Hence, it is suggested to produce a compelling video programme containing successful stories on former situations & problems prevailed, how the project was implemented with community contribution, problems encountered during implementation and how such issues were resolved, and finally, the benefits achieved. The video is an effective communication media for the projects of this type, to pass the message quickly and successfully.
- 21. Formation of Women and Youth Societies at the project level** – The preliminary work of the project should be well-planned and deliver the proper message. Most people living in small houses (slums and shanties) are poor and non-educated; so they do not agree immediately and watch what others do. They also try to get maximum project inputs and interventions. Convincing is a slow and time consuming process, in which, the Youth or Women societies in the locality can play a significant role. Since they are the groups earnestly requesting the project, their commitments and contribution should be obtained. They should be able to convert the programme into a demand-driven status than a supply-driven approach. This process can be accelerated and enhanced by obtaining the service of a suitable local Non-Governmental Organization (NGO).
- 22. Appoint Local Facilitators to obtain more community contribution** - The questionnaire survey with field officers revealed their difficulty in meeting beneficiaries during office hours. They were reluctant to visit sites after office hours or during weekends. As a solution, it is recommended to get the service of local youth with a basic education background (GCE O/L), who could be appointed as Facilitators for the project period. They can be selected from the societies in the area, and an allowance can be paid through the Municipal Council, based on the NWSDB recommendations.
- 23. Modify Selection Criteria to provide project facilities to all applied** - This type of project should be implemented for all residents who wish to obtain project benefits. The



selection criteria used (monthly family income should be less than Rs. 30,000, and the household land extent should be less than 20 perches) should be reconsidered. In the case where any HHs is rejected due to the above criteria, the anticipated overall results may not be achieved (e.g., minimising groundwater pollution and health hazards, preventing the release of grey water along open drains). Hence, it is recommended to use the data available in the Divisional Secretary's office (or conducting a new baseline situation analysis) to identify and categorise the applicants as (a) extremely poor, (b) poor, (c) low-income, and (d) medium class (above poverty level), and launch a suitable subsidy programme. The crucial factor here is the inclusion of all resident applicants of the area into the programme.

24. **Entrust more responsibilities to line agencies** - Having the corporation and involvement of all line agencies is a definite necessity in this programme. A more active role could be expected from the LAs and Divisional Secretary officers' by specifying the activities to each organisation. Notably, the involvement of the Public Health Inspectors is essential, and they should become active partners of the programme, rather than playing a passive role in providing assistance. The Deputy Mayor and the PHI stressed these points at the interviews with them. Though there are limitations in a pilot project, this integration approach should be considered seriously, when large scale project is implemented.
25. **Increase the rates of contract work** – The contract works in this project were unduly delayed mainly due to the contractor's problems; so achieving benefits also subsequently delayed. The workers were reluctant to work in sanitary sites and its surroundings, and hence, paying attractive daily wages is a necessity to get their services. Therefore, rate increase (about 30%) should be included in contracts, and some provisions should be made for unforeseen conditions. The inclusion of strict regulations in the contract agreement (e.g. deducting delay charges) and imposing close monitoring are the necessities to complete the work within the scheduled period.
26. **Add monthly sanitation bill to water bill:** The arrangements to add the sewerage bill to the water bill is a highly suitable approach, and people tend to save the water too. Usually, the sanitation bill is one-third of the water bill and the rates are affordable to a low-income family even. It was observed that the annual desludging cost is about Rs. 2,450 (shared the cost by two families), and the monthly fee is about Rs. 200. However, it was noted that this billing system was not introduced to some DEWATS programmes introduced for housing complexes (Lunawa Housing complex, Annex 2.4). It is recommended to include 'fee collection' system for them also for effective repair and maintenance, timely desludging, or to meet any running cost.



- 27. **Conduct workshops to share the experience** - It is proposed to conduct workshops and discussions with stakeholders to deliberate on the problems encountered and suggestions made to overcome them in future projects. The design and implementation defects should be discussed openly to make necessary modifications for the success of forthcoming projects. The experiences gained through the pilot project are critical, and these workshops should be held shortly (before forgetting) to share the findings.
- 28. **Short-term studies** – In any project, it is essential to conduct some short studies to identify the pre-project problems and to assess the benefits after the project. Normally the project officers get transfers or retirements after some years, and the new-comers may not well aware about the past situations; and no documentary evidence to prove the results achieved under the project. So, the base-line studies, annual publications, monitoring reports with case studies, performance assessment studies and impact studies are highly important to validate the results formulate new projects.

**G. ICR Rating details based on performance indicators**

No.	Rating	Details	Marks
1	Highly Satisfactory	<u>No shortcomings</u> in the relevant subject area	6
2	Satisfactory	<u>Minor shortcomings</u> in the relevant subject area	5
3	Moderately Satisfactory	<u>Moderate shortcomings</u> in the relevant subject area	4
4	Moderately Unsatisfactory	<u>Significant shortcomings</u> in the relevant subject area	3
5	Unsatisfactory	<u>Major shortcomings</u> in the relevant subject area	2
6	Highly Unsatisfactory	<u>Severe shortcomings</u> in the relevant subject area	1

Source: Implementation Completion and Results Report; OPCS World Bank

**Summary of the ratings given for different subject areas:**

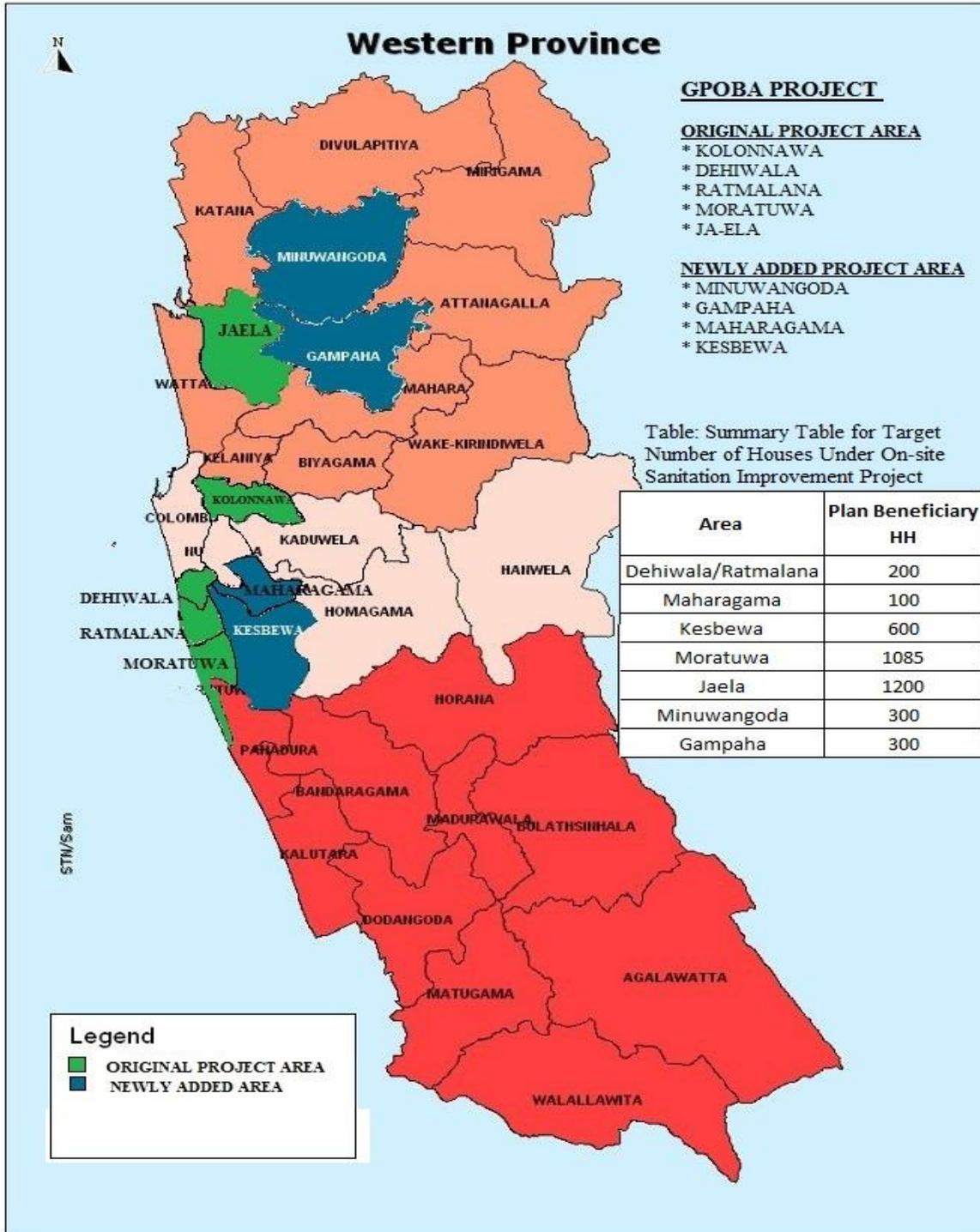
Project Performance	Marks	Rating
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<b>Criteria</b>	<b>given</b>	
1. Relevancy	5.6	Highly Satisfactory
2. Effectiveness	4.8	Satisfactory
3. Efficiency	4.9	Satisfactory
4. Sustainability	4.8	Satisfactory
<b>Overall Rating</b>	<b>5</b>	<b>Satisfactory</b>

*Note:* Annexe 3 provides the questions related to the four main criteria and the answers (justifications) made by the ICR Consultant.

**Annexe 1.1 Project area**





### Annexe 1.2 Some highlights of project activities



Participants were given opportunities to express their views and suggestions: One of their main requests was to include all without following selection criteria. Some requested to pay the community contribution (Rs. 3,450) in instalments. Finally, the project arranged to pay Rs. 1450 at the beginning and the balance in several instalments.



Rathmalana/Moratuwa main sewer network: The Google map facilitated planning and construction activities.



Many difficulties were encountered when laying sewer pipes in the middle of the roads. Some non-beneficiaries protested. However, the project made arrangements to attend the work in late hours and complete the job as soon as possible.



IC chamber/tank constructions: Badovita and Rathmalana benefitted 1500 HHs. All black and grey water flow to this tank, then filter and pump to the sea.



Before Project – DEWATS: The area was flooded, and the damaged toilets created many health hazards during rainy days.



After Project – Many environmental and health problems were resolved and made clean surroundings.



Before Project: Grey water conveyed along open drains, and many health issues prevailed.



After Project: Children having food on the dry floor (previously wastewater drained areas).



*In-situ* septic tank unit with filter material ; this type was constructed in normal (dry) areas.



Pre-cast septic tank units with anaerobic filters were installed in water-logging areas.



**Annexe 2: The results of the interviews held with different stakeholders**

**Annexe 2.1: Interview with a beneficiary under Output 1.a - Direct connections**

**Name and background information:** Mrs. M.T. Fernando (67); Orban-side Housing project, Dehiwala. The government settled 120 families in 1956, giving a land area of 03 perches per family. Now 2-3 extended families live in the same house. Sanitation was the major problem until the project implementation in May 2014.

**(I) What were the difficulties encountered before the project?**

- (i) Earlier, they had small toilet pits, which needed desludging in every 12-18 months. The cost was about Rs. 2,000. The grey water was conveyed along open drains in front of the houses (by the roadside); this created a constant bad smell, flies, mosquitos, and other health-related issues.
- (ii) Since this is an almost flat area, the premises are inundated, and the area is virtually flooded; so toilets got spilt-over and the residents face highly awkward situations.

**(II) To what activities did he/she got involved during the planning and implementation stages?**

- (i) Participation in awareness programmes and household-level discussions. All families in the housing complex agreed and implemented the programme.
- (ii) They assisted the contractor in numerous ways to achieve the programme successfully.

**(III) Has all those problems resolved under the project?**

- (i) Yes, now they do not have any sanitation and desludging issues. They highly appreciated the project interventions to resolve their long-standing sanitation issues.

**(IV) What were the difficulties encountered during implementation?**

- (i) No any major issue; the HHs discussed with the contractor and resolved minor issues in pipe laying and other.
- (ii) One low-income family could not get the sanitation facilities, as they did not have water connections (there should be a mechanism to resolve such problems in future projects).

**(V) Views on the sewerage fee included into water bill and other**

- (i) They stated that the adding of sanitation cost to water bill is a suitable arrangement. Here there are no defaulters; all will have to pay.
- (ii) The house-owner showed the 2019January bill. The family had used 14 m<sup>3</sup> of water, and the water bill was Rs. 467.84, and the sanitation cost was Rs. 269.10.



- (iii) They said that though there were no financial gains compared to the previous cost, the benefits are more from health and environmental perspectives.

**Annexe 2.2: Interview with a beneficiary under Output 1.b Conventional Extensions**

**Name and background information:** Mrs. K.P. Eudeen (72), Malwatta, Dehiwala; Average land extent 5 P, Number of families benefitted under the project is 300.

**(I) What were the difficulties encountered before the project?**

- (i) Earlier, the toilet pits were available and had to desludge annually; the cost for desludging was about Rs 2,500. The grey water was discharged to the open drains in front of the houses.

**(II) To what activities did he/she involved during the planning and implementation stages?**

- (i) Participated in training programmes and the following issues were raised by the community: (a) How the sanitation cost is computed; (b) What action to be taken if the system is blocked? (c) If someone constructs upstairs at a later stage, how will be the sanitation system implemented?
- (ii) The project officers had explained the implementation process and answered the questions. All agreed to join the programme and provide the necessary assistance.

**(III) Have all those problems resolved under the project?**

- (i) All sanitation problems have been resolved.

**(IV) What were the difficulties encountered during implementation?**

- (i) There were many construction difficulties. Mainly, the roads in which the pipes were laid had to be closed for about 2-3 days during the construction period. The excavation and pipe laying were executed section-wise, and constructions were mainly performed during the night to avoid inconveniences to the residents.
- (ii) Some houses were at a lower elevation than the sewer line. More approaches that are practical were followed, but some houses had to be dropped due to this reason.

**(V) Views on including the sewerage fee into water bill and other**

- (i) The sanitation cost is computed based on water consumption and added to the water bill. The community felt this is a suitable method, and people tend to control water usage and minimise wastage.
- (ii) The absence of desludging problem at present is highly convenient to people (otherwise, they have to spend time and cost for desludging). The sanitation problems encountered during the rainy period are minimised.



**Annexe 2.3: Interview with beneficiaries under Output 1.c Pumping system - Badowita**

**Name and background information:** A group of five (03 females and 02 males) participated in the discussion held at the temple on 22 Feb 2019. Mrs Ranjani Mapalagama (72) is the secretary of the Rural Development Society, and others are the committee members involved in and coordinated project activities. The housing scheme was established in 1993, and the land holding size is two perches. Almost all are low-income families, and their monthly family income is about Rs. 12,000.

**(I) To what activities did he/she involved in the planning and implementation stages?**

- (i) Participated in the training programme and later helped to train others in the area.
- (ii) Participated in exposure visits to see the successful projects in other regions and purification units maintained by NWSDB.
- (iii) Coordinated with other families and organised group discussions with officers, and made arrangements to collect the beneficiary contribution (Rs. 3,450) in several instalments and pay to the NWSDB office.

**(II) What were the difficulties encountered before the project?**

- (i) Before the project, there were several common, large septic tanks (one for about 40 houses) and the Municipal Council desludge them when requested (normally once in 2 months). Each beneficiary family had to pay about Rs. 200 for the process.
- (ii) When there was a delay in desludging (when gully bowsers were not available in the MC), the toilets were spilt-over, creating an extremely nuisance situation. Also, some families used to release grey water along open drains, and hence, the rear side of the houses was muddy, creating bad odours, and sites for breeding mosquitos, flies, and other insects.

**(III) Have all those problems resolved under the project?**

- (i) Yes, all the sanitation-related prevailed problems have been resolved under the new project. Now the environment is clean and dry.
- (ii) Now they do not need to go to MC monthly and wait for the gully bowser; those things happen automatically and satisfactorily. According to them, the success rate is 100%.

**(IV) What were the difficulties encountered during implementation?**

- (i) Usual problems associated with construction – dust, sound, and other issues related to the working environment. Some people living in the area worked under the contractor on daily wage basis.

**(V) Views on including the sewerage fee into water bill and other comments:**



- (i) Now the operational cost (pumping bill) is added to the water bill, which is about 35% of the water bill. The average water bill is Rs. 650, with an additional Rs. 220 for the sewerage (pumping system).
- (ii) Whenever there is a block or damage, Field officers in the Water Board come and rectify the situation, and charge Rs. 565 per visit.

**Annexe 2.4: Interview with beneficiaries under Output 1.d DEWATS – (a) Lunawa Housing flats (160 houses) and (b) Tsunami Housing Flats in Rathmalana (180 houses).**

**Name and background information:** From the societies, about five persons participated in the discussion held at housing sites. Mrs. Rosebel Perera (62) and D.H.A. Gomez (57, a Postman) had played a significant role during project implementation. Lunawa Housing project was established in 2005 and Tsunami Housing Flats in Rathmalana in 2008 after the Tsunami disaster. Average floor area of a house is 500 sq. ft. and the average family income per month is Rs. 20,000.

**(I) What were the difficulties encountered before the project?**

- (i) Earlier, there were common septic tanks for two housing complexes (16 families). After collecting the fees from the HHs, they request for desludging from the MC. Since the septic tanks were relatively small, frequent desludging were needed, which was costly and time-consuming.
- (ii) Due to the filling of septic tanks, toilets on the ground floor overflowed and created a very unpleasant and irritable situation. Hence, the families residing on the ground floor had to undergo numerous hardships and difficulties, especially during the heavy rainy period. There were frequent quarrels among the families on the ground floor and upper floors.

**(II) To what activities did he/she involved during the planning and implementation stages?**

- (i) Participated in the training and exposure visits on project activities.
- (ii) Coordinated with officers and made arrangements to collect the beneficiary contribution (Rs. 3,450) in several instalments and pay to the NWSDB office.

**(III) Have all the prevailed problems resolved under the project?**

- (i) Yes, all the sanitation problems have been resolved now. The septic tank area is now clean and dry so that the children can play. Now there is no issue even during the rainy period; it is a mental relief. According to them, the project was 100% successful.

**(IV) What were the difficulties encountered during implementation?**

- (i) Some people made objections during initial stages and refused to cooperate. Some even stole the contractor's material (cement, sand etc.). However, gradually, they changed and supported, especially after understanding the benefits, and the situation subsequently improved.



**(V) Views on desludging and other operation and maintenance activities:**

- (i) In both housing projects, the disposals are filtered and discharge into the deep sea by pumping. The beneficiaries should bear this pumping cost. The committee has arranged to collect Rs. 150 per family per month, and pay the bills, but not yet commenced.

**Note: Here also, if the sanitation cost was added to the water bill and the Operation and Maintenance were taken over by the NWSDB, the system would function systematically.**

**Annexe 2.5: Interview with a beneficiary under Output 2 - Onsite sanitation**

**Name and background information:** Mrs. Sawithri Liyanage (49) and Mr. Ajith Perera, Aththidiya, Dehiwala, residing in the region since 1990. The project provided sanitation facilities to 150 individual families in the area.

**(I) What were the difficulties encountered before the project?**

- (i) Before the project, they had shallow-pit latrines with the squatting pan system, which needed frequent (once in a year) emptying and removal.
- (ii) Big rats prevalent in the area used to burrow the toilet pits, and caused severe damages; they were a menace to the residents.

**(II) To what activities did he/she involved in the planning and implementation stages?**

- (i) Participated in the training programmes; read the given leaflets.

**(III) Have all the prevailed problems resolved under the project?**

- (i) Yes, almost all the problems have been resolved.

**(IV) What were the difficulties encountered during implementation?**

- (i) There were many construction issues due to water-logging in the area. Sometimes, fixing precast septic tank was difficult due to the floating effect.
- (ii) Some land plots were very small, and it was difficult to move the machines to transport the heavy septic tanks to the required locations (MC also highlighted this issue – Annex 2.8).
- (iii) Available space in some lands was highly limited (due to large houses), which created difficulties in locating the tank and the pit.

**(V) Views on desludging and other operation and maintenance activities:**



- (i) The septic tanks and sanitation facilities were given recently. The NWSDB gave the vouchers to HHs for desludging.
- (ii) As per project regulations, the HH should bear the cost for desludging as follows:

**Note: The average price for desludging (gully bowser fee) is Rs. 4,400; for the first round, the beneficiary pays Rs. 2,250, and the balance by the project. In the second round, the beneficiary cost is Rs. 3,825, and in the 3<sup>rd</sup> and 4<sup>th</sup> rounds, it is 3,825. The balance amounts are from the project. From the 5<sup>th</sup> round onwards, the beneficiary should bear the total cost.**

**Annexe 2.6: Interview with the Independent Verification Agent (IVA)**

**Name and background information:** (Answers not received yet)

**(I) To what activities IVA is involved in the planning and implementation stages?**

(i)

(ii)

(iii)

**(II) What were the difficulties encountered during IVA activities?**

(i)

(ii)

(iii)

**(III) What modifications you suggest to improve the performances?**

**(IV) Views on sustainability.**

**(V) What changes do you propose in launching a large-scale new project?**



### **Annexe 2.7: Interview with a Contractor who implemented several project activities**

**Name and background information:** Mr. Wijitha Herath, owner of the Enova Engineering, involved in pump house construction, sewer lines, and other pipe-laying operations (total contract value of the sub-projects implemented was Rs. 300 million).

**(I) It has been observed that the bid values were very high compared to the Engineer's estimate. What were the reasons?**

- (i) There were many unexpected variations. Notably, in the renovation of existing toilets and other, the quantity and cost variations were very high. In some places, the contractor has to spend more than double the allocated funds.
- (ii) When demolishing, more damages may occur, and the repair cost is high. Some HHs request extra work. The contractor cannot simply ignore these requests since he has to work in that environment for some period.

**(II) What were the difficulties encountered during implementation?**

- (i) People used to divert grey water to the rear side of the house, and the area was muddy, damp, and in unpleasant conditions. Many workers refused to work under such terms, and some asked for daily wages more than double. Some toilets overflowed while in some areas even walking was difficult. Many workers got sick and had to obtain medical treatments from hospitals. Hence, the working environment in these locations was almost unbearable.
- (ii) Some HHs were unaware of the existing sewer lines; hence, dig and search were necessary for many places to locate the old lines.

**(III) How long your contract was delayed? Why? What suggestions do you make to accelerate the work?**

- (i) The contract period had to be extended over one year due to unforeseen conditions – e.g., extra work, rainy condition, difficulties in finding good workers.
- (ii) Due to some unexpected reasons, the site had to be temporarily abandoned. For example, five youth worked under him, used to get drugs. In Badowita area, most youths use drugs, and they compel these village boys to test them and finally got addicted. The parents were furious and blamed the contractor on this situation. Some even started living with women in the area, forgetting their families. For a qualified and reputed contractor, such incidences create tense situations.

**(IV) Did you receive adequate community contribution and support? What suggestions do you make?**

- (i) Not at all. Almost none gave any help, but wait as observers and give various opinions. Some stole the construction material to sell for drugs.



- (ii) The project was completed satisfactorily due to the commitment and support of the project staff (technical and institutional officers). The contractor appreciated the contributions of the World Bank mission members and Pradeshiya Saba Member (Mr. Varuna).

**Annexe 2.8: Interview with the Deputy Mayor – Kesabewa Municipal Council**

**Name and background information:** Mr. K. Muhandiram Arachchi, Deputy Mayor, was involved in project activities from the beginning.

**(I) To what activities the MC engaged in the planning and implementation stages?**

- (i) Some awareness programmes were coordinated and facilitated, but more programs at cluster level were needed.
- (ii) The transparency of the beneficiary selection process and implementation procedure was insufficient. Some people questioned them at the meetings about the selection process and the reasons for not selecting some deserving families. As politicians, they found it difficult to answer such queries.
- (iii) The role and responsibilities of the MC are not defined clearly; hence, they participated in an ad-hoc manner.

**(II) What role can the MC play in improving the performances?**

- (i) The beneficiaries should be selected by a committee at Divisional level. The involvement of PHI is highly important.
- (ii) An independent agency must perform the eligibility-verification in the beneficiary selection process and should impose a grievance handling mechanism.
- (iii) The MC can support in planning and construction stages. Since the MC involves in all health & welfare activities, they can play a significant role in implementing the projects.

**(III) What modifications do you suggest to improve the performances?**

- (i) The families can be categorised based on their monthly income (four categories – high, medium, poor, very poor), and subsidy programmes can be introduced based on their income level.
- (ii) More local labour involvement is desirable. For example, the responsibility of excavating the soakage pit (4 ft. x 4 ft. x 12 ft.) can be given to the beneficiary HH and pay them with the approved rates. This will help to improve the standards, give an additional income to low-income families, and build a sense of ownership. Further, it will ensure their support for construction activities.

**(IV) How can sustainability (desludging) be improved?**



- (i) The MC has two large bowzers, and their operating cost is relatively low. People have the option to select a private bowser or the MC bowser. This helps to control the cost.
  - (ii) Purchasing more bowzers is possible if there is sufficient demand.
- (V) What changes do you propose in launching a large-scale new project?**
- (i) Modifying the beneficiary selection process.
  - (ii) Giving more responsibilities to MC during planning, implementation, and after-care programme.
  - (iii) Implementing more open and transparent mechanisms throughout the programme.

**Annexe 2.9: Interview with the Divisional Secretary in the Ja-Ela area and the PHI in Kasbawa area**

**Name and background information:**

**(I) To what activities the DS office involved in the planning and implementation stages?**

- (i)
- (ii)
- (iii)

**(II) What roles can the DS play in improving performances?**

- (i)
- (ii)
- (iii)

**(III) What modifications do you suggest to improve the performances?**

**(IV) What were the environmental or health improvements made in the area?**

**(V) What changes do you propose in launching a large-scale new project?**



**Annexe 2.10: Interview with the Gully Bowser Owner – Dehiwala area**

**Name and background information:** Mr. R.C. Edirisinghe, Partners of the company ‘Clean Environment Service Consultants’, Kandy.

**(I) How did you get involved in Project activities?**

- (i) Came to know from some friends about the project activities, and involved in desludging activities. They had 08 gully bowzers (04 owned and 04 hired), and those can be deployed if the work is available.
- (ii) Due to less work in the project, they have deployed their bowzers to remove industrial wastewater from factories. There they work as per the contract agreement and payments are made accordingly.

**(II) What were the practical problems you encountered during the desludging process?**

- (i) Gradually, they get less work; as such, they cannot maintain the bowzers.
- (ii) They request from the project to prepare a ‘master list of the beneficiaries’ and inform them. Without proper coordination, they cannot contact beneficiaries and provide the necessary services.
- (iii) The private bowzers cannot compete with the MC services. The MC bowzers have been provided under government assistance or donor funded programs, and hence they can operate at a lower cost. But private bowser owners have invested a capital. Some MC bowser operators make unapproved trips at a low cost and earn in illegal ways. All these are challenges for the sustainability of private bowser owners.

**(III) What modifications do you suggest to improve the Public-Private Partnership?**

- (i) Equal chances to be given for both public and private parties. A Master list should be prepared, and areas should be allocated; the cost ceilings also can be computed.
- (ii) In sewerage systems, the NWSDB charges sewerage disposal cost with water bills. A similar system can be introduced in desludging. Since all grey and black water conveyed to the septic tank, a reasonable sum (Rs. 250 per month with water bill) can be charged, to operate desludging at specified intervals.

**(IV) What was the community view on the desludging cost? Do you think they will continue the programme?**

- (i) The average bowser cost for desludging is Rs. 4,500. The cost could be reduced if 2-3 families jointly order the bowser, but somebody should organise it.
- (ii) If the project or the MC intervene and make some arrangements, it would benefit both parties.



**Annexe 3: Outcome Ratings**

**1. Relevancy: To what extent the project development objectives were consistent with the priorities of the development needs of the target group, Country (recipient), and the donor.**

No.	Assessment question	Answer	Rating
1.1	Did the project design focus on, and were objectives consistent with, the needs and priorities of the country in increasing the welfare and wellbeing of the target group?	Yes, the project design, focus, and objectives were consistent with the needs and priorities of the low-income families living in urban areas, and it is a priority development need of the country. Sanitation facilities of the beneficiaries and health and environmental factors in the area have improved significantly.	6
1.2	Are these characteristics, constraints, and opportunities at the pre-project stage still the same as today?	No, the questionnaire survey and community group discussions revealed that almost all the problems they had about the sanitation and environment cleanliness had been resolved. More requests receiving from the community in the adjoined areas to extend the project to their areas indicate the successfulness of the project.	6
1.3	Were all identified activities and outputs consistent for the attainment of proposed goal and objectives?	Yes, the two main outputs (pipe sewerage and onsite sanitation) were well-consistent with the development goals and objectives of the project.	6
1.4	Were external risks (or Assumptions) clearly identified?	75% yes. Most external risks were clearly identified. However, still there are some possibilities of facing them in future projects: e.g., Some HHs were dropped due to their monthly income level or the land extent; so the possibility there is a possibility of groundwater pollution and other adverse effects. Also, Output 1.a.2 was designed assuming that a part of the project would be performed under the SLIDA project; but it had not been implemented as planned. So, the progress was slow and behind the targets.	5
1.5	Were the proposed indicators relevant and adequate to monitor project implementation and results?	75% yes; there were five Performance Indicators (PIs) and three Impact Indicators (IIs), which are adequate to monitor the results. Nevertheless, one or two indicators have to be verified after conducting Assessment and Evaluation Studies. Since the project activities continued until the end (with several extensions), such studies could not be performed.	5
1.6	Were there any significant changes in the implementation arrangements, and if so, were these changes appropriate and timely?	There were several changes; (i) the target number of beneficiaries were reduced from 15,000 to 8,800 due to increased unit costs; (ii) the government contribution was increased by 100%; (iii) the project period was extended in three times due to implementation difficulties.	5
		Total marks	33
		<b>Average</b>	<b>5.6</b>

**2. Project effectiveness - Assess the extent to which the programme’s objective was achieved in both**



quantitative and qualitative terms. This involves analysing the results achieved at the output, outcome, and impact levels. Variations between initial and actual targets will be highlighted, and the external factors that had a bearing on project effectiveness will be explained.

No.	Assessment question	Answer	Rating
2.1	Were all activities implemented as planned? If not, what were the reasons?	75% yes, most of the outputs have been implemented as planned, but some could not be attended due to certain site conditions: e.g., location of some houses were lower than the main sewer lines, SLIDA project issues.	5
2.2	Were all expected outputs achieved in quantitative and qualitative terms?	Yes; The achievement in Output 1 was 96%, and Output 2 was 94% (Total 95%). The Outcome 2 – onsite sanitation target was 3,785, but could be achieved only 2,194 due to issues in site conditions. Therefore, new areas were identified, and additional 1,209 connections were completed (Tables 2 & 3).	5
2.3	Was the project implementation well monitored? Are all results at all levels accurately measured, quantified, and documented?	Physical progress (outputs) have been monitored satisfactorily; but some of the essential things are not adequately computed, such as the number of applicants rejected due to non-compliance of selection criteria, and the number dropped due to technical reasons. These data will be useful in formulating future projects.	5
2.4	Did all results meet expected quality standards? What were the constraints observed?	The quality of work is satisfactory. However, the design and implementation of methodologies should be rechecked and verified. For example, the appropriateness of the square-type precast septic tank compared to cylindrical deeper units for limited land plots; or fibre units which are cheap and low weight. The contractors have to work in an unpleasant environment and small spaces. Thus, the workers do not attend for work without additional incentives. Hence, paying higher daily wages is a necessity.	5
2.5	Were all results achieved within the original timeframe and budget?	Some delays happened in the timeframe due to difficulties encountered during implementation. The closing date of the project was extended for more than 3 years. The contracts were delayed due to site-specific problems and labour scarcity.	4
2.6	What are the external factors that facilitated or constrained output delivery, and the achievement of project objective?	Delays occurred in procurements: selecting a suitable contract firm for making pre-casting units for septic tanks. Due to the limited number of eligible sites for on-site sanitation, new Divisional Secretary areas were identified and selected from Dec 2017 onwards.	5
		Total	29
		<b>Average</b>	<b>4.8</b>

**3. Project efficiency: Assess how economically the project inputs and resources (funds, expertise, and time) were converted into results**



No.	Assessment question	Answer	Rating
3.1	What were the main expenditure patterns?	During the first four years, the expenditure was low (28% of the allocation up to the end of the year 2015); this increased gradually.	4
3.2	Were financial and budgetary resources spent as initially anticipated?	75% Yes, the investments have been made as per the revised plans. Some changes were made due to increased unit costs.	5
3.3	Were there deviations from original cost estimates and, if so, what were the reasons?	There were changes due to the increase in unit costs. The bids submitted by the contractors were very high (sometimes 2-3 times more than the Engineer's estimate) due to the problematic nature of work, and unforeseen tasks to be attended during implementation. All these were beyond the control of the project.	5
3.4	For the resources spent, were the outputs optimal? Could the project have produced more with the same resources or the same results with less money?	The limited field surveys conducted reveal that the project outputs can be considered as optimal. The project officers and other line agencies have paid their efforts to complete the project satisfactorily. Considering the possibility of having low-cost technologies could be beneficial.	5
3.5	<b>Quality of project management:</b> How well did the PMU coordinate and manage project activities? Were implementation timetables adequately met? Was the PMO adequately staffed?	The PMU was adequately staffed and coordinated the work and monitored the project effectively. NWSDB rates and quality control measures were implemented. The staff in the PMU was entirely dedicated and worked hard to achieve the results.	5
3.6	Were there appropriate arrangements in place for sound financial management, the flow of funds, record keeping, and timely preparation of financial reports?	As per the mission reports and other documents, financial management was continuously rated as satisfactory. The audit quarries were timely and appropriately attended. A few cash flow issues were raised in some occasions.	5
3.7	<b>World Bank interventions</b> - Did the WB provide adequate support through direct supervision and/or country presence? Were supervision missions useful and timely? Did the WB ensure pro-active problem identification, follow-up, and resolution?	The World Bank was highly supportive and resolved technical and financial issues throughout the project. They maintained an effective partnership and good rapport with the project staff. The missions had not visited during 2016 and 2017 (?). Their interventions for formulating a pilot project in this nature, with grant contribution, is highly appreciable and commendable.	5
3.8	<b>Government interventions:</b> Did the Line Agencies comply with the covenants of the loan agreement and the provisions of the Project Documents? Was the Project Steering Com. fulfilling its role adequately?	The service of Municipal Council and Divisional Secretary's office could have played a major role as they were partners of the programme. Their roles and responsibilities should be adequately stipulated in project manual and other documents. The Steering committee had functioned effectively in executing project activities.	5
		Total marks	39
		<b>Average</b>	<b>4.9</b>



4. **Sustainability:** Assess the likelihood that the benefits of project intervention will continue after project completion. It will also assess the possibility that actual and anticipated results will be resilient to risks beyond project life. The adequacy of the post-project strategy, as designed and implemented, will also be examined.

No.	Assessment question	Answer	Rating
4.1	Was an appropriate post-project strategy developed and implemented since the project start-up?	Yes; From the five outputs, NWSDB operate and maintain the first three (sewer connections) (1.a, 1.b, and 1.c), and a service fee is charged with the monthly water bills. In the other two types (1.d and 2), the beneficiaries should do annual maintenance (desludging). The PPP was introduced (with private bowser owners) to facilitate the programme. Some prevailing issues are given in Annex 2.10.	5
4.2	Is there sufficient local ownership for these approaches or investments? Is there interest and willingness among the concerned parties to continue with the promoted approaches or investments after project completion?	More responsibilities and authorities of urban sanitation are entrusted with local authorities. Hence, their involvement from the beginning is critical. They should involve in all social and maintenance (desludging) activities. In that context, their involvement was inadequate in this pilot project.	4
4.3	<b>Technical sustainability:</b> Are the approaches promoted by the project viable from a technical point-of-view? Do the beneficiaries have the necessary capacities and adequate funds for maintenance?	There is no issue in the first three outputs since the NWSDB maintain them. For 1.d and Output 2, though the beneficiaries have the know-how, the LA or the NWSDB must perform the post-project monitoring. The NWSDB provides urgent repairs and other technical inputs at a reasonable cost, which is a significant advantage to the community.	5
4.4	<b>Institutional sustainability:</b> Are the institutions supported by the project self-sufficient and viable?	The community organisations established or promoted by the project to facilitate implementation activities should be monitored and guided. They may not be able to resolve the problems at some stages. Therefore, the interventions of LAs are essential.	5
4.5	<b>Environmental sustainability:</b> Are the approaches and investments promoted by the project environmental-friendly? Can recurrent natural hazards endanger prospects of sustainability?	The project interventions resolved many environmental issues. Nevertheless, some disputes may occur during later stages. For example, if some HHs do not desludge as planned, and due to flooding during the rainy season, the possibilities of environmental degradation may emerge. Hence, continuous monitoring of the LA is a requirement. For that, they should become partners of this program.	5
		Total	24
		<b>Average marks given for Sustainability</b>	<b>4.8</b>