Initial Environmental Examination

Project number: 42459-014
May 2016

SRI: Additional Financing of Local Government Enhancement Sector Project – Kukurampola Water Supply Subproject

Prepared by the Ministry of Provincial Councils and Local Government for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 09 May 2016)

Currency unit	–	Sri Lankan Rupee (Rs)
Rs1.00	=	$ 0.0069
$1.00	=	Rs 145.97

ABBREVIATIONS

ADB	-	Asian Development Bank
BPL	-	below poverty line
CEA	-	Central Environmental Authority
CKD	-	chronic kidney disease
DCCCRM	-	Department of Coast Conservation and Coastal Resource Management
DSC	-	Design and Supervision Consultants
EDP	-	Economically Displaced Person
EIA	-	environmental impact assessment
EMP	-	environmental management plan
EPL	-	environmental protection license
FGD	-	focus group discussion
GND	-	Grama Niladhari Division
GRC	-	Grievance Redress Committee
GRM	-	grievance redress mechanism
GSMB	-	Geological Service and Mines Bureau
IEE	-	initial environmental examination
IGS	-	Income Generating Schemes
IOL	-	Inventory of Losses
LGESP	-	Local Government Enhancement Sector Project
LGIIP	-	Local Government Infrastructure Improvement Project
MIS	-	management information system
MPR	-	monthly progress report
MPCLG	-	Ministry Provincial Councils and Local Government
NGO	-	nongovernment organization
NWSDB	-	National Water Supply and Drainage Board
NIRP	-	National Involuntary Resettlement Policy
O&M	-	operation and maintenance
PAM	-	project administration manual
PMU	-	Project Management Unit
PPTA	-	project preparatory technical assistance
PMC	-	Project Management Consultants
RDA	-	Road Development Authority
PRDA	-	Provincial Road Development Authority
SPCU	-	Sub Project Coordination Unit
SPS	-	Safeguard Policy Statement

GLOSSARY

Pradeshiya Sabha	–	Local authorities established under the Pradeshiya Sabhas Act Number 15 of 1987. Smallest political unit in periurban and rural areas.

NOTE

In this report, "$" refers to US dollars.

CONTENTS

EXECUTIVE SUMMARY

1. The Local Government Enhancement Sector Project (LGESP) was approved by ADB on 29 September 2012 with an amount of $59 million equivalent from ADB's Special Fund Resources. The loan became effective on 29 November 2011 and the loan closing date is 31 December 2016. Ministry of Provincial Council and Local Government (MPCLG) is the executing agency, and subproject coordination unit (SPCU) is established in each provincial council (total seven) to supervise and coordinate and project implementation. LGESP has been supporting local infrastructure improvement and basic service delivery in less-developed areas in seven provinces (excluding the Northern and Eastern Provinces), based on a bottom-up, demand-driven approach. The additional financing is required to scale up a well-performing project. It includes (i) improvement of water supply systems in areas affected by chronic kidney diseases (CKD); (ii) improvement of local infrastructure and basic services delivery; and (iii) advancing policy reform of local government and strengthening their capacity.

2. **Additional Financing.** The additional financing will scale up the project that is performing well, by supporting water supply systems improvement in CKD-affected areas, and improving local infrastructure and basic services delivery and advancing local government policy reform and capacity strengthening in Pradeshiya Sabhas not supported previously.

3. **Impact and Outcome.** The impact will be local authorities' capacity financially and technically strengthened in less-developed areas of seven provinces in Sri Lanka. The outcome will be improved local infrastructure and services delivered effectively by local authorities or NWSDB in less-developed areas of seven provinces in Sri Lanka. The impact statement is unchanged. The outcome statement was changed because most of the water supply schemes in areas affected by CKD will be operated by NWSDB.

4. The additional financing has three outputs. Output 1 has been added for the additional financing.

5. **Output 1:** Water supply systems in CKD-affected areas improved. The additional financing will finance development and expansion of water supply systems in CKD-affected areas in the four provinces (Central, North Central, North Western, and Uva) to provide safe drinking water. The schemes include development of new water supply systems and expansion of existing systems, mostly run by NWS&DB. Facilities such as raw water intakes, water treatment plants, overhead tanks, and transmission and distribution networks are eligible for financing. About 30 schemes will be developed or expanded, and will be implemented by respective provincial councils with technical inputs and supervision support from NWSDB. Considering the nature and complexity of the schemes, the piped-network will be operated by NWSDB, except in local authorities which have adequate operational capacity. If local authorities are identified to be the appropriate entity to implement the subprojects, such local authorities will first have to submit a reform plan, as practiced in the original project, prior to the subproject implementation. PMU, through design and supervision consultants (DSCs), will provide capacity augmentation for construction supervision, when the resources available from NWS&DB are insufficient.

6. **Output 2:** Local infrastructure and basic service delivery improved. Social and economic infrastructure will be improved by newly participating local authorities. The approach will remain the same: 29 new Pradeshiya Sabhas from five provinces (Central, North Western, Southern, Uva, and Western) which have not been supported under the LGIIP and LGESP will first have to submit a reform plan approved through a council resolution, which will be reviewed and

confirmed by the Ministerial Committee of MPCLG to ensure that the minimum reform requirements are met. Then they will be qualified for the provision of a capital grant for infrastructure improvement. Eligible subprojects include (i) environmental infrastructure, (ii) economic infrastructure, (iii) public health infrastructure, and (iv) other local authority facilities. PMU, through DSCs, will support preparation of design and ensure the quality of the work. For both outputs 1 and 2, only the subprojects that meet the subproject selection criteria will be implemented.

7. **Output 3:** Local government policy reform advanced and capacity strengthened. The additional financing will support establishment of IT solutions, which were developed under the original project and installed in the original 108 Pradeshiya Sabhas, in 29 new Pradeshiya Sabhas, and further advance business process reengineering in both original and new Pradeshiya Sabhas. The activities will include (i) implementation support of the guidelines developed under the capacity development TA (CDTA), (ii) development and installation of additional software to simplify and increase efficiency of local administration, and (iii) capacity building programs to strengthen technical, financial, and administrative capacity of the original and new Pradeshiya Sabhas, provincial councils, and MPCLG.

8. **The subproject.** The proposed Kukurampola water supply project is an extension of the Buttala water supply scheme located in the Buttala DS division of the Moneragala district. The existing water tower sat a place called Deyatakirula site Buttalasupplies water to Buttala, Pelwattha areas in addition to Yundaganawa area. The proposed water supply project of NWS&DB starts from Buttala town and ends at junction near Buttala Hospital.The Deyatakirula water towers providing water to the proposed water supply project has the capacity of supplying 1000m3 per day. The total length of the proposed water project is 68 km which includes 11 km long 225 mm main pipe line to be laid from the Hospital junction toKukurampola junction on Pelwatta Kukurampola road via Burutha junction and another 57 km long 63-160mm supply pipe lines to be laid from Burutha junction to Kumaragama & Rahathangama village areas as shown in the figure 04.The area to be served under Kukurampola extension project of existing Buttala water supply scheme is situated basically on Pelwattha Kukurampola Road starting from Wellawaya Moneragala road approximately 10 km away from the Buttala town in the Moneragala district of Sri Lanka. The proposed extension of water supply covers 3 GN Divisions namely, Kumaragama, Kukurampola and Rahathangama. The current population in these areas is 6137 in 1730 households. The people living in these villages are presently using well water & stream water for drinking purpose. As at present 90 CKD patients have been clinically identified by the health authorities in these areas.

9. **Screening and assessment of potential impacts.** ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for environmental assessment are described in ADB's Safeguard Policy Statement (SPS), 2009. The subproject is a considered small-scale project and potential environmental impacts have been assessed using ADB Rapid Environmental Assessment Checklist for Water Supply. Then potential negative impacts were identified in relation to pre-construction, construction and operation of the improved infrastructure.

10. **Categorization.** Based on results of the assessment and ADB SPS, the subproject is classified as environmental Category B, i.e., the subproject is judged to be unlikely to have significant adverse environmental impacts. An initial environmental examination (IEE) is required to determine whether significant environmental impacts warranting an environmental impact assessment are likely.

11. This IEE aims to (i) provide critical facts, significant finding, and recommended actions; (ii) present the national and local legal and institutional framework within which the environmental assessment has been carried out; (iii) provide information on existing geographic, ecological, social and temporal context including associated facilities within the subproject's area of influence; (iv) assess the subproject's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic, and physical cultural resources in the subproject's area of influence; (v) identify mitigation measures and any residual negative impacts that cannot be mitigated; (vi) describe the process undertaken during project design to engage stakeholders and the planned information disclosure measures and the process for carrying out consultation with affected people and facilitating their participation during project implementation; (vii) describe the subproject's grievance redress mechanism for resolving complaints about environmental performance; (viii) present the set of mitigation measures to be undertaken to avoid, reduce, mitigate, or compensate for adverse environmental impacts; (ix) to describe the monitoring measures and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures; and (x) identify indicative costs and who is responsible for carrying out the mitigation and monitoring measures.

12. **Location of the subproject.** Kumaragama, Kukurampola & Rahathangama GN Divisionsare situated on either side of Pelwattha Kukurampola road approximately 2 km away from Pelwattha junction which is onWellawayaMoneragala Road. The distribution extension proposed for the said GN Divisions covers nineteen villages in the GNDs [Kumaragama (5), Kukurampola (10) & Rahathangama(4)]. The said GN divisions belong to Buttala DS division. NWS&DB is planning to lay around 5km long pipe line along Wellawaya Moneragala road from Buttala Hospital junction to Burutha Junction then turning from there it continues to Pelwattha Kukurampola road nearly 6km before commencing the real distribution network of 68 kms.

13. **Environmental Management Plan.** The subproject is unlikely to cause significant adverse impacts because: (i) the rapid sand filters will involve straightforward construction and operation, so impacts will be mainly localized; (ii) predicted impacts are localized and likely to be associated with the construction process and are produced because the process is invasive, involving excavation and earth movements; and (iii) being located mainly in an existing built-up area, will not cause direct impact on terrestrial biodiversity values. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels.

14. The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between PMU, SPMU, consultants and contractors. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (i) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensure that safety recommendations are complied with. The EMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures.

15. The contractor will be required to submit to SPMU, for review and approval, a site environmental plan (EMAP)) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per

EMAP; and (iv) budget for EMAP implementation. No works are allowed to commence prior to approval of EMAP.

16. A copy of the EMP/approved EMAP will be kept on site during the construction period at all times. The EMP included in the bid and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

17. **Consultations and disclosure.** Consultations with stakeholders, NWSDB engineers, and CEA have been conducted to discuss engineering and potential environmental issues. The main comments discussed at the meetings include requirement to carry out maintenance plan as scheduled by qualified staff, speed up the construction process, supply of water to all households, continuous supply of water, reduction of CKD affected people in the future and formation of committee on project monitoring. CEA confirms environmental clearance is not required for the subproject as the capacity and activities do not fall under category of "Prescribed Projects" in the National Environmental Act (NEA) of CEA. The public participation processes undertaken during project detailed design ensure that stakeholders and affected people are engaged during the preparation/finalization of the IEE. The planned information disclosure measures and process for carrying out consultation with affected people will facilitate their participation during project implementation. This IEE and any update/s and environmental monitoring reports will be publicly disclosed in ways and languages understood by stakeholders and affected people.

18. **Grievance Redress Mechanism.** The subproject will follow the existing GRM process established in the on-going LGESP. Assessment of the existing GRM shows that it has provided citizens with an effective platform for redress of their grievances. This IEE describes the existing GRM including informal and formal channels, time frame and mechanisms for resolving complaints about environmental performance.

19. **Findings and Recommendations.** The negative environmental impacts arising due to execution of the proposed water supply scheme are minor and negligible as compared to the long term Socio-economic and health benefits to be delivered to people of the project area. Negative impacts can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures as per EMP. It is recommended that (i) IEE be made part of the bid and contract documents to ensure that mitigation measures are appropriately budgeted and legally binding to the contractors; (ii) monitor diligently contractor/s EMP implementation by PMU, SPMU and consultants on EMP implementation by contractors; (iii) involve stakeholders in all phases of implementation and disclose relevant project related documents; and (iv) continue existing GRM process.

20. **Conclusion.** The subproject is unlikely to cause significant adverse impacts. As per ADB SPS, the subproject is classified as environmental Category B and does not require further EIA.

I. INTRODUCTION

A. Introduction

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B. Background of the IEE

6. **Screening and assessment of potential impacts.** ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for environmental assessment are described in ADB's Safeguard Policy Statement (SPS), 2009. The subproject is considered small-scale and potential environmental impacts have been assessed using ADB Rapid Environmental Assessment Checklist for Water Supply then potential negative impacts were identified in relation to pre-, construction and operation of the improved infrastructure.

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9. **Scope of IEE.** The IEE was based mainly on secondary sources of information and field reconnaissance surveys; as the subproject is of small scale, construction of the rapid sand filters will involve straight forward construction methods and impacts were assessed to be site-specific, short in duration and limited mostly to construction phase only, no field monitoring (environmental) survey was conducted. However, baseline monitoring on noise and dust levels will be conducted by the contractors prior to start of civil works to activities will be limited within permissible values, or not above the background values if these are above the permissible limits. Stakeholder consultation was an integral part of the IEE.

II. DESCRIPTION OF THE SUBPROJECT

A. Present Status

10. Due to geochemical condition of the province and use of agrochemicals in the agricultural sector of the Uva Province, the ground water quality and surface water quality have been dramatically deteriorated causing CKD to considerable number of people living in the Moneragala district and the people in adjoining villages of the lower part of Badulla district. The fluoride in soils is high and it gets dissolved and readily available in the groundwater. The main cause for CKD is due to consumption of inferior quality of water with high fluoride content by the poor farming community in these areas. It is crucial to mention that CKD is spreading very fast in the lower Uva area and with the objective of avoiding and minimizing the spread of CKD affected people in the lower Uva, Government of Sri Lanka requested ADB to extend the existing ADB funded "Puraneguma project" giving more priority to expand large scale water supply projects in the Uva in collaboration with NWSDB who has established and are managing large scale water supply schemes.

11. The Buttala water supply scheme is one of the large scale water supply schemes commenced in 1988 with the objective provision of clean drinking water for the people of

Buttala, Pelwattha, Mahagodayaya, Maligawila, Horabokka, Yundaganawa and 9 more Grama Niladhari Divisions (GNDs) of Buttala DS division and other surrounding suburbs. The main water sourcesof this scheme are the Menik Ganga intake situated in the Udagama GND and Kukmbukkan Oya intake at Gaminipura. The treatment plants of this scheme are located at Dickyaya & Kukmbukkana respectively has the capacity to purify 11000 m^3 of water per day. Also, it covers 11,333 families in above GNDs. There are five water storage tanks established at Deyatakirula/Gamudawa sites in Buttalawith a storage capacity of 4x80 & 1x 90 m^3 as shown in the figure 03.

12. The main water treatment plants located at Dickyaya & Kumbukkana villages operates under following steps to purify the water

(i) Aeration
(ii) Flocculation
(iii) Sedimentation
(iv) Filtration
(v) Chlorination

13. Appendix1 provides the detailed water treatment process. The water quality of treated water complies with given Sri Lanka Institute for standards (SLS) for drinking water as shown in Appendix 3.

14. As a practice the sludge is removed and spread in the nearby forested areas (not protected forest) and supernatant water is released to the nearby water body. It was observed and proved through discussions with the water engineers of NWSDB that Buttala water supply project has been in operation without creating any environmental hazards and social disharmony due to disposing of sludge and waste water to outside waters.

15. The water quality of treated water is at highest quality standard complying with the given SLS standards for drinking water. It is important that biological matters in the form of total Coliform bacteria and E-coli Bacteria are not present in the delivered water samples. In addition, overall raw water samples tested were at high quality drinkable status as compared to other numerous water sources of the Moneragala district.

B. Need for the Subproject

16. In order to fulfill the water requirement of 6137 people in Kumaragama, Kukurampola & Rahathangama GN divisions, NWS&DB is planning to lay around 5km long pipe line along Wellawaya Moneragala road from Buttala Hospital junction to Burutha Junction then turning from there it continues to Pelwattha Kukurampola road nearly 6km before commencing the real distribution network of 68 kms.

C. Details of the Subproject

17. NWSDB has prepared the details of the subproject and has first submitted to the office of the Commissioner of Local Government (CLG) in the Provincial Council (PC) along with the brief project report. A detailed project report (DPR) including detail designs, bill of quantities and cost estimates will be submitted to the CLG with the assistance of the subproject coordinating unit (SPCU) in the PC office and the GreenTech Consultant Ltd who work as the Consultants of the subproject.

18. The DPR is then submitted to the office of LGESP for its appraisal and approval of the subproject. Once the Project is approved, SPCU initiates the tender procedure to select a contractor to carry out the work. The work will be supervised by the technical staff of the NWSDB with the assistance of the staff of SPCU. The NWSDB will be responsible for the management of the construction work of the subproject. Select a contractor to carry out the work. The work will be supervised by the technical staff of the NWSDB with the assistance of the staff of SPCU. The NWSDB will be responsible for the management of the construction work of the subproject.

19. **Location.** Kumaragama, Kukurampola & Rahathangama GN Divisions are situated on either side of Pelwattha Kukurampola road approximately 2 km away from Pelwattha junction which is on Wellawaya Moneragala Road. The distribution extension proposed for the said GN Divisions covers nineteen villages in the GNDs [Kumaragama (Dewalegama, RajayeKotasa/Govt. Section, Settlement No.06, Settlement No.05 and Thalakolawewagama), Kukurampola (KovilPellassa, Nagasyaya, MahawelGammana, BogasyayaGammana, Elabadayaya, Gampalukotuwa, Elakandiya, Kumarapotha, Gonangalayaya and Erandugalayaya) &Rahathangama (Settlement No.10 (Mahasengama), Settlement No.09/11 (Medagalayaya), Settlement No.12/14 (Wandama/Pellassa) and Settlement No.15/16]. The said villages and GN divisions belong to Buttala DS division. NWS&DB is planning to lay around 5km long pipe line along Wellawaya Moneragala road from Buttala Hospital junction to Burutha Junction then turning from there it continues to Pelwattha– Kukurampolaroad nearly 6km before commencing the real distribution network of 68 kms.

20. **Details of the component:** NWS&DB is planning to lay around 5km long pipe line along Wellawaya Moneragala road from Buttala Hospital junction to Burutha Junction then turning from there it continues to Pelwattha Kukurampola road nearly 6km before commencing the real distribution network of 68 kms. The detailed design has been made and relevant Bill of Quantities (BOQ) has been finalized for bidding process. The detailed design was finalized after meeting with the local community other stake holders at the consultation meeting held on 29thJanuary2016. Figure 4provides the layout of main pipe lines and transmission lines as per detailed design. Table 1 provides the major features of the subproject.

Table 1: Major Features of the Proposed Water Supply Subproject

Major Features	Description	Location
Storage tanks (All ready functioning under Buttala WSS)	Storage Tanks at Buttala Town (1 No.-90m^3), Anapallama (2 Nos.-140m^3), Dickyaya (1No.-225m^3) , Deyatakirula (4Nos.-320m^3) &GamUdawa (1No.-90m^3) sites Buttala	Buttala Town, Anapallama, DickyayaDeyatakirula site & Gam Udawa site in Buttala
Distribution pipe line network (21 out of 29 GNDs are already provided with water under Buttala WSS)	The distribution line network is constituted of pipes with diameter ranging from 225 mm to 63 mm for the distribution mains including 12 mm pipes for house connections for a total length of 69 km.	As shown in Google figure. (Appendix 13)
Chlorination	Chlorine is added to the storage tank to disinfect the biological properties of water prior to distribution. Additional residual chlorine (RCL) is added to meet the standards of the Sri Lanka Standards Institute (SLSI) (0.2mg/l) at the last dead end of the distribution system. 20 minutes of	Treatment Plants at Kumbukkana&Dickyaya NWS&DB

Major Features	Description	Location
	retention period is provided for RCL at the storage tank.	
Intakes	One of the present two in takes is being improved to provide a supplementary of 1000m^3/day	Udagama (Menik Ganga) &GaminiPura(KumbkkanOya). [Intake rate @ 400m^3/hr]

D. Implementation Schedule

21. The subproject is to be implemented over a period of 24months. This excludes period for procurement of contractors. Twenty-four months would be for construction and finally commissioning after disinfection & testing the new network.

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

22. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments.

23. **Screening and categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories:

(i) **Category A.** Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
(ii) **Category B.** Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
(iii) **Category C.** Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
(iv) **Category FI.** Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all projects will result in insignificant impacts.

24. ADB Rapid Environmental Assessment (REA) Checklist for water supply and for urban development for municipal infrastructures will be used for the screening and categorization.

25. **Environmental Management Plan.** An EMP, which addresses the potential impacts and risks identified by the environmental assessment, shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.

26. **Public disclosure.** ADB will post thee safeguard documents on its website as well as disclose relevant information in accessible manner in local communities:

(i) for environmental category A projects, draft EIA report at least 120 days before Board consideration;
(ii) final or updated EIA and/or IEE upon receipt; and
(iii) Environmental monitoring reports submitted by the Project Management Unit (PMU) during project implementation upon receipt.

27. LGESP will not consider Category A subprojects. Preparation of IEE for Category B and Due Diligence Report for Category C subproject will follow the updated environmental assessment and review framework.

B. National Laws

28. **Responsibility of Environmental Management in Sri Lanka.** The National Environmental Act (NEA) was passed in 1981, and in 1982 the Central Environmental Authority (CEA) as a regulatory and enforcement agency was created. A cabinet-level ministry with the appointment of a Minister of Environment was created in 1990to handle the subject of environment and to ensure that environmental issues are given the required attention. The Ministry of Environment and Natural Resources (MENR) was set up in 1999 and formulated a National Environment Policy (NEP) in 2003, which is now being implemented. This policy set out the course of action needed in order to maintain Sri Lanka's natural resources and the living environment whilst allowing development projects to be implemented. Ministry of Mahaweli Development and Environment has been established on January 2015 and the mandate of environmental management of the country is now held with this new Ministry.

29. **Applicable environmental legislations:** The implementation of LGESP Additional Financing will be governed by Government of Sri Lanka environmental acts, rules, regulations, and standards. These regulations impose restrictions on the activities to minimize/mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure that projects are consistent with the legal framework whether national, state, or municipal/local. Compliance is required in all stages of the project, including design, construction, and operation and maintenance. National laws and regulations that can be relevant to the project are briefly described in the Table below.

Table 2: Applicable National Laws and Regulations

Laws and Regulations	Provisions and Main Content
National Environmental Act No.47 of 1980, Amendment No.56 of 1988, and other Amendments	The NEA is a framework environmental statue that makes provision for the protection, management and enhancement of the environment, for the regulation, maintenance and control of the quality of the environment, and for the prevention and control of pollution by implementing the subproject.
National Environmental (Noise Control) Regulations No. 01 of 1996	Regulates maximum allowable noise levels for construction activities during subproject activities
National Environmental (Protection & Quality) Regulations, No. 01 of 1990	Provides standards for discharging effluents into inland surface water during subproject activities.
Fauna and Flora Protection Act (1993)	An act to amend the fauna and flora protection ordinance (Chapter 469) of 1938, which provide for the protection and conservation of

Laws and Regulations	Provisions and Main Content
	the fauna and flora of Sri Lanka and their habitats; for the prevention of commercial and other misuse of such fauna and flora and their habitats, for the conservation of the biodiversity of Sri Lanka; and to provide for matters connected there with or incidental there to.
Felling of Trees Control Act No. 09 of 1951 as Amended through Act No. 30 of 1953	This Act sought to prohibit and control the felling of specified trees (mainly intended to stop indiscriminate felling of specified trees) in the country.
Water Resources Board Act No. 29 of 1964, Amendment No.42 of 1999	Control, regulation and development (including the conservation and utilization) of the water resources; the prevention of the pollution of rivers, streams and other water resources; the formulation of national policies relating to the control and use of the water resources.
The Soil Conservation Act, No. 25 of 1951 Amended in 24 of 1996	An act to make provisions for the enhancement and substances of productive capacity of the soil, to restore degraded land for the prevention and mitigation of soil erosion, for the conservation of soil resources and protection of land against damage by floods, salinity, alkalinity and drought and to provide for matters connected there with or incidental there to
Explosive Act No. 36 of 1976	To provide the control of explosions and regulations of matters connected with explosive activities.
Fisheries and Aquatic Resources Act 1996	The Act addresses the management, regulation, conservation and development of fisheries and aquatic resources during subproject activities.
Flood Protection Ordinance No. 04 of 1924	An ordinance for the protection of areas subjected to damage from floods. This includes declaration of flood areas, preparation of schemes for flood protection and other rules and regulations regarding flood in the country.
Geological Survey and Mines Bureau (GSMB) Act No. 33 of 1992	Regulates the exploration for minerals, mining, transportation, processing, trading in export of mineral products and usage of quarries and sand mines in the country.
Crown Land Ordinance Act No. 1947	The act dealing with allocation and control of Crown lands In Sri Lanka for private and government activities.
Irrigation Act No. 23 of 1983	An act to formulate policies and programmes in regard to the subjects of irrigation, reservoirs, water resources management and prevention of pollution of rivers, streams and other water recourses. Promotion, construction, operation and maintenance of irrigation schemes, drainage and flood control in the country.
Regulations of Local Authorities	Regulates and control actions and methods taken place within the command area relevant to the government laws and regulations.
National Water Supply and Drainage Board Act No 2 of 1974	This Act governs the supply and distribution of quality and safe drinking water to the Sri Lankan community. There are amendments made to this Act at different times.

30. **Applicability to the subproject.** The Kukurampola Water Supply Subproject does not fall within the category of “Prescribed Projects” listed in Gazette Extra-ordinary No. 772/22 of 24th June 1993 and subsequent amendments, which do not need to go through the EIA process and subsequent conditional approval from the CEA of the Ministry of Environment and Natural Resource (MENR). These may, however be subjected to an environmental review, if the Project Approving Agency (PAA) and the CEA deem it necessary. Further,

(i) The subproject **is not located within 100** m from the boundaries of or within any area declared under the National Heritage Wilderness Act no 4 of 1988.
(ii) The subproject **is not located within 100 m** from the boundaries of or within any area declared under the Forest Ordinance (Chapter 451).
(iii) The subproject **is not located within** coastal zone as defined in the Coast Conservation Act No 57 of 1981.
(iv) The subproject **is not located within** any erodible area under the Soil Conservation Act (Chapter 450).
(v) The subproject **is not located within** flood prone areas declared underFlood Protection Ordinance (Chapter 449).
(vi) The subproject **is not located within** low lying area of North Central Province which is a flood protection area declared under the Sri Lanka Land Reclamation and Development Corporation Act 15 of 1968 as amended by Act No 52 of 1982.
(vii) The subproject **is not located within** 60 meters from the bank of a public stream as defined in the Crowns Lands Ordinance (Chapter 454) and having width of more than 25 meters at any point of its course.
(viii) There **are no** reservations beyond the full supply level of a reservoir within the proposed subproject site.
(ix) The subproject **is not located within** any archaeological reserve, ancient or protected monument as defined or declared under the Antiquities Ordinance (Chapter 188).
(x) The subproject **is not located within** any area declared under the Botanic Gardens Ordinance (Chapter 446).
(xi) The subproject **is not located within**100 meters from the boundaries of, or within, any area declared as a Sanctuary under the Fauna and Flora protection Ordinance (Chapter 454).
(xii) The subproject **is not located** within 100m from high flood level contour of a public lake as defined by the Crown Land Ordinance (1947, 1949, and 1956) including those declared under Section 71 of the ordinance.
(xiii) The subproject **is not located** within 100m from the boundaries of or within any area declared under the Forest Ordinance (Chapter 451)
(xiv) The subproject **is not located** within the area declared under the Urban Development Authority Act No. 41 of 1978 and Act No. 4 of 1982 Section 29.

31. Table 3 summarizes the permits required for the subproject relevant to its implementation and activities.

Table 3: Key Permits needed for the subproject activities

Project stage	Clearance and Permits	Activity	Relevant Agency
Pre-construction stage (Although the clearances and approval should be obtained during the pre-construction stage and it is not valid throughout the project cycle. However thisshould be renewed once before the expiry date)	Industrial Mining License (IML)	Operation of borrow areas (material extraction sites)	GS&MB
	Environmental Protection License (EPL)	Operation of borrow areas (material extraction sites)	CEA
	Explosive Permits	Blasting activities	MoD
	Local Government Authorities Trade License	Operation of metal quarries, crushers, borrow areas, dispersal sites, labour camps	LAs

Project stage	Clearance and Permits	Activity	Relevant Agency
	Approval for removal of trees	Laying of main pipe lines along the ROW of roads	DS, DoF, DWLC,

DoF-Department of Forests, DWLC-Department of Wild Life Conservation, DS-Divisional secretariat, LAs-Local Authority, MOD-Ministry of Defense

C. Environmental Standards

32. **Environmental Protection License (EPL).**Discharge of waste to the environment is controlled by the National Environmental (Protection & Quality) Regulations No. 01 1990 (Gazette 595/16, 1990) and the amendments published in Gazette 1159/22 of 2000, under the NEA. These regulations establish the need for any person discharging waste to do so only under a license (Environmental Protection License or EPL) issued by the CEA, and in accordance with the gazetted discharge standards and criteria. The EPL can be issued up to three years (Gazette 1159/22).

33. **Status of EPL.**NWSDB does not need to obtain the EPL for operation of Dickyaya & Kumbukkana water treatment plants under the Buttala Water supply scheme. As its current Capacity is11,000m^3 per day less and it is required to obtain EPL from CEA if the capacity of WTP is minimum of 500,000m^3 per day. As the subproject will only involve withlaying of pipelines construction, the subproject will not require an EPL.

34. **Drinking Water Quality Parameters.** Appendix 3 provides the applicable National Standards of SRI Lanka Institute (SLI Guideline values to be complied with prior distribution of the water supply. The design of the subproject has taken into consideration the guideline values. It should be noted that results of water testing on treated water from Buttala WSS treated at Dickyaya & Kumbukkana conducted by NWSDB show compliance SLI standards. Results further show E-coli and Coli-form bacteria are not present in the treated water being delivered to consumers in the existing water supply areas.

IV. DESCRIPTION OF THE EXISTING ENVIRONMENT

A. Methodology Used for the Baseline Study

35. The IEE was based mainly on secondary sources of information and field reconnaissance surveys; as the subproject is involved with laying of pipe lines and replacing of two pumps, the laying of pipe lines will have some limited environmental impacts that are localized and short term as per the methodology of construction. However, baseline monitoring on noise and dust levels will be conducted by the contractors prior to start of civil works and they will be limited within permissible values, or not above the background values. If these are above the permissible limits. Stakeholder consultation was an integral part of the IEE.

36. A baseline survey was conducted to collect the data and information on physical condition, biodiversity status (habitat types, animals and plant species), land use pattern and socio-Economic structure of the project area. The line transect method and sampling were carried out about 50-100m from either side of road sections determined for burying pipelines in the proposed project area. The land use pattern up to 50m or impact influential area on both sides of the existing centre line of the existing road was studied through field visits made during the under mentioned period. The plant species, bird species were identified and recorded, and some of the biodiversity species were identified using taxonomic booklets. Group and individual

interviews were conducted to collect views of people in the area. Some government institutions like RDA, PRDA, PS and Forest department were consulted to get their views for implementation of the proposed project. GreenTech Consultants conducted the field assessments from 30thJanuary to 2nd February 2016 in the Moneragala district of Sri Lanka.

37. The literature survey broadly covered the following:

(i) Project details, reports, maps, and other documents available with the Design and Supervision Consultant (DSC) team of the on-going ADB-funded LGESP
(ii) Discussions with Feasibility Study team
(iii) Secondary data from previous project reports and published articles, and
(iv) Literature on land use, soil, geology, hydrology, climate, socioeconomic profiles, and environmental planning documents collected from Government of Sri Lanka agencies and websites.

38. A separate socioeconomic study was conducted to determine the demographic information, archaeological and religious places, densely populated pockets, and settlements.

39. The data collected was analyzed and interpretations made to assess the physical, biological, and socioeconomic features of the subproject site. The relevant information is presented in the succeeding paragraphs.

B. Physical Characteristics of the Subproject Area

40. **Location.** Kumaragama, Kukurampola & Rahathangama GN Divisions are situated on either side of Pelwattha Kukurampola road approximately 2 km away from Pelwattha junction which is on Wellawaya Moneragala Road. The distribution extension proposed for the said GN Divisions covers nineteen villages in the GNDs [Kumaragama (5), Kukurampola (10) & Rahathangama(4)]. The said GN divisions belong to Buttala DS division. NWS&DB is planning to lay around 5km long pipe line along Wellawaya Moneragala road from Buttala Hospital junction to Burutha Junction then turning from there it continues to Pelwattha Kukurampola raod nearly 6km before commencing the real distribution network of 68 kms.

41. **Geology, Geomorphology and Soil.** More than 90 percent of Sri Lankan rocks are metamorphic rocks that are metamorphic in high grades such as granulate and amphibolitesfacies. The North, North Western segment from Puttalam to Trincommalee consists mainly of Miocene age limestone, sedimentary formations deposited in Tertiary and Quaternary periods.

42. Most of the Sri Lankan crystalline rocks belong to Precambrian ages (older than 570 million years) while others are of more recent origin. This Precambrian age metamorphic rocks are sub divided into three major litho logical groups as High land, Wanni complex and Vijayan complex. Therefore, according to this categorization, a majority of the Anuradhapura district belong to the Wanni complex where Precambrian metamorphic rocks are prominent. Metasediments, Charnockitic gneisses, basic rocks, migmatites and granitic gneisses, granites and pegmatite are particularly present in this region

43. Reddish brown earth is the prominent soil type in the entire dry zone of country. Sri Lanka has been sub divided in to different agro- ecological zones considering soil type, rainfall and land use etc.In the project area, Reddish Brown earth, Low HumicGley soils and Grumusol soils are present.

44. **Topography and Climate.** Moneragala District has generally the flat and undulating terrain. A significant part of the district belongs to the dry zone of Sri Lanka and annual rain fall of the entire district is in the range of 1328 mm to 1821 mm with the highest rain fall recoded during the North-East monsoon period from October to January.

45. The evapo-transpiration is higher in most of part of Moneragala district including the area falling in to the proposed project area. The average temperature in the district varies from $26C^0$ to 29 C^0while the average annual temperature of the project area is between 29- 30 C^0. The highest temperature is 30 C^0 recoded from June to August of the year.(Ref. Table 4.)

Table 4: Climate Data of the Area

Parameter	District Figures
Temperature (C^0)	$26C^0$-29 C^0
Precipitation (mm)	1328-1821mm

46. **Hydrology and Drainage.** There are many man- made and natural water tanks scattered across the Buttala Divisional secretariat of the Moneragala district. Among the natural water bodies, MenikGanga, KirindiOya, KudaOyaand HedaOyaare prominent rivers /water ways feeding the agricultural areas and sustaining natural beauty of the district. Moreover, water bodies like Handapanagala, Inginiyagala, Lunugamvehera and Balaharuwa are some of the man- made water tanks providing water for human use and agricultural areas in the proposed project area. However, most of these water bodies go dry during the dry period from June to August of the year.

47. Surface drainage system in the Moneragala district is well existent as well established drains, canals and natural and man-made water bodies are present in most parts of the district. In the proposed project area, both side drains are present within the ROW limits of RDA from Buttala Hospital junction along the Wellawaya Moneragala road.

48. Also, from the starting point of Moneragala Wellawaya Road to Rahathangama area, there are areas like sugarcane plantations, paddy fields, small irrigation canals and natural water ways to receive surface drainage generated from rains. Hence, there will not be any drainage issues in the event of the proposed project being established in the area. On the other hand, there are no historic records drainage issues present in Moneragala district.

49. **Surface Water Quality.** The surface water is highly polluted due to addition of Agrochemicals, human fecal matters and accumulation of geochemically dissolved element like Mn, Cu, fluoride and chloride. The water quality parameters like low dissolved oxygen, high electric conductivity; high Ecoli bacteria and total Coli form bacteria have been noticed in surface water samples. Other main sources of pollution of surface waters in the Moneragala are the opening of drainage to water tanks and discharge of industrial effects to surface water sources.

50. It can be observed that in the proposed project area, it is very difficult to see surface water bodies within 500m distance from the proposed project area. Hence it can be concluded that contamination of surface water is highly unlikely situation in the project area of Kumaragama, Kukurampola & Rahathangama GNDs.

51. **Ground Water Quality.** Ground water in dug wells has high fluoride and chloride concentrations as well as increased total solids and high electrical conductivity as per the

water quality analysis carried out by WHO and NWS&DB for last 20 years. In general, geochemically, Na/K with CL- is high in the ground water in the Moneragala district especially during the dry period. It is also believed that high fluoride content in ground water has affected to cause dental fluorosis and Chronic Kidney Disease (CKD). Number of people suffering from CKD is on the increase despite medical treatments. It found that heavy elements like Cr,Mn and Cu are high in ground water too. Although the actual cause of CKD is not known, high fluoride content and total solids have affected seriously on the people of Lower Uva.

52. **Quality and Noise Level.** Since the selected road sections are mostly located within rural areas, sources of air quality pollutants are hardly found. Therefore, air quality in the entire project area appears to be good. However, there is a chance of deteriorating the air quality temporarily due to vehicular emissions and drifting of dust from gravel roads and other deteriorated roads.

53. Domestic sources of air pollution will include emissions from burning of forest patches for *Chena* cultivation (slash and burn cultivation), wood and kerosene burning stoves in settlements and villages. As the project area is rich in vegetation, all such emissions will be very well dissipated.

54. Vehicle Emission Test (VET) became mandatory with effect from 15th July 2008 to enforce environmental regulations and conform to the environmental standards on vehicle emission as per the Motor Traffic Act (Emission control) Regulation of 1994, 817/6, Part I, Section I. This move is a part of the efforts to improve the air quality in the island and this regulation is applicable for all construction sites if air quality is going to be deteriorated.

55. The subproject site mostly includes rural setting with a good vegetation cover. Therefore, the noise levels are relatively low. According to Schedules I and II of National environmental (Noise Control) regulations No.1 1996 (924/12), the study area belongs to “Low noise area”. Therefore, the ambient noise level of the area can be considered as 55 dB (A) during day time (06.00 hrs-18.00 hrs) and 45 dB (A) night time (18.00 hrs - 06.00 hrs). Rich vegetation in the subproject site acts as an efficient noise absorbent.

C. Ecological Characteristics of the Project Area

56. **Forests and ecological sensitive areas.** The main vegetation types existing in the district are dry mixed evergreen (dry monsoon forests) forests, and thorny shrubs forests. Out of these, dry mixed ever green forests are dominant and have been subjected to disturbances due to natural and anthropogenic activities and resulted in loss of mosaic of patches of forest cover in the past. The plant communities representing in the forest type are categorized as dominant, co-dominant (sub canopy), and understory and ground layer. The predominant feature in the dry ever green forests is the discontinuous tree canopy across the forest landscape. The proposed project area is located in Kumaragama, Kukurampola & RahathangamaGN divisions of Buttala DS secretariat. The proposed water supply project is not passing through any nature reserve and there is no any natural reserve close to the proposed project area.

57. **Distribution of faunal species.** The mammalian and avian biodiversity is profusely present in the dry mixed ever green forest in the Moneragala district.. The Threatened animal species include the Asian elephant (*Elephasmaximus*), Sloth bear (*Melursusursinus*) and leopard (*Pantherapardus*).Variety of herbivores such as the spotted deer (*Axis axis*), sambar (*Cervus unicolor*), barking deer (*Muntiacusmuntjak*), Mouse deer (*Tragulusmeminna*) and Wild boar (*Susscrofa*) are also living in these forests. It is understood that this forest is a shelter for

many migratory and native birds, and other reptiles. However, a list of existing fauna and flora is attached in the annex 08 for more information.

58. **Wetlands.** There are no wet lands in the Buttala DS division as classified by the Convention on Wetlands. The proposed project area is not located close to a marshy land too. Therefore, it can be concluded that there will not be any environmental impact on the wetland or marshy land due to implementation of the proposed project.

59. **Coastal Marine Environment.** The subproject is not located close to a coastal marine environment.

D. Socio Economic Profile

60. Kukurampola drinking water scheme is one of the projects identified for implementation in stage II under ADB assistance. It is expected to supply drinking water to villages in Kumaragama, Kukurampola & Rahathangama GN divisions situated in Buttala DS Division. The population in these GN divisions is 6137 in 1730 families. The male population is 3191 and female population is 2945.

Table 5: Aged wise distribution of population

Age	Male	Female	Total
0-5	291	269	560
6-15	781	721	1502
16-60	1726	1592	3319
Above 60	393	363	756
Total	3191	2945	6137

61. There is no diversity in population or in culture because the total population is Sinhala.

62. **Economy/Employment:** Traditionally these villages are farming villages. But at present the situation has been changed due to the changes in the socio-economic situation in the country and a significant portion of the farmers are now engaged in sugarcane cultivation &its related trades. According to the information available with the GNDs and in the *Sampath Pathikada* (2014) document released by ButtalaDS 1847(30.1%) villagers in those 3 GNDs are engaged in agriculture & livestock. The extent of sugarcane cultivated lands in the said GNDs is 9502 acres while the paddy is cultivated onlyin1401 acres since the popular crop in those areas is sugarcane. People grow sugarcane as Out growers of Pelwatta Sugar Factory which assists the farmers by providing farming inputs such as machinery, planting material, agrochemicals, etc.

63. According to the GNs there is possibility of cultivating both seasons in this year due to the prolonged rain in past months. Majority of families have few laying hens in their houses and it provide additional nutrition to family members. There are 76 families engaged in small scale poultry farming. 168 persons (2.7%) are employed in the government sector while 1093(17.8%) persons are engaged in private sector, majority being employees of Pelwattha Sugar Factory. Further 64 people are engaged in trade & service sector while 15 villagers in Rahatangama GND are involved in minor industries.

Table 6: Distribution of Employment Status

Employment category	ButtalaDS Division	Kumaragama, Kukurampola & RahathangamaGN Divisions
Agriculture/Livestock	27.2%	30.1%
Public sector	4.3%	2.7%
Privet sector	13.9%	17.8%
Self-employment	14.7%	8.6%
Unemployed	8.2%	4.2%

64. People live in the project area are more interested engaging sugarcane & tobacco cultivation as out growers of companies that give quick money rather than engaged in labor intensive activities.

65. **Housing &Sanitation:** All families have their own houses. About 85% of the houses are permanent houses completed with sheet roofing, plastering and cemented floor. The balance number of houses is in the process of completing according to the economic situation of the family.

Table 7: Housing Status

	Walls			Roof			
GN Division.	Bricks.	Cement/ Stone	Other.	Roof tile.	Asbestos	Corrugated	Other.
Kumaragama	401	96	36	235	171	118	11
Kukurampola	353	85	33	207	150	101	9
Rahathangama	406	97	38	238	173	119	11
TOTAL	**1160**	**278**	**107**	**680**	**494**	**338**	**31**

66. Out ofthe total number of 1730 families in the project area of 3 GNDs, 1547 families have their own sanitary facilities (i.e 89%) while the rest 183 families use common toilets. Pls. refer Table 08.

Table 8: Availability of Toilet Facility

GN division	Number of families	Individual toilet.	Using common toilet by family
Kumaragama	598	535	63
Kukurampola	527	471	56
Rahathangama	605	541	64

67. **Marketing:** Pelwattha junction and Buttalaare the main town for dwellers in this village. Community members in this village go to these towns for major purchases. There are about 35 small boutiques in the village from where the villagers can buy their day today needs. Majority of the farmers in the area in question is engaged in sugarcane cultivation as the out growers of Pelwattha Sugar Company. There is only one major vendor who purchases paddy& other agricultural harvest of the village farmers. However, during the harvesting season outside Lorries come to the paddy field itself to buy the harvest.

68. **Health:** Buttala District Hospital and Kukurampola Health center serve the people in theses villages. Child and Maternity clinic is conducted by MOH staff monthly in Buttala Clinic. A part from that the workers & their family members are allowed to get treatment from the medical unit established inside Pelwatta Sugar Factory. Ninety CKD patients have been the 3

GN Divisions. There is a General Practitioner doing private medical practice at Burutha Junction on Moneragala Wellawaya road.

69. **Education:** Children of Kumaragama, Kukurampola & Rahathangama villages go to Pelwattha Navodya MV which has classes up to Advanced level in science, commerce &arts streams. At present, there are about 800 children in this school. Further there are 2 more schools in the project area namely, Kumaragama KV & Kukurampola KV which have classes from 1-5 & 1-O/L respectively. Education level of the community is normal. Also, at the community consultation meeting, the participants expressed ideas in a more logical and practical way.

Table 9: Education level of the population

GN Division	Grade				
	1-5	6-11	O-L	A-L	Graduate
Kumaragama	574	283	558	65	7
Kukurampola	399	191	460	645	24
Rahathangama	1310	646	152	54	3

70. **Gender:** There is no incidence or reports about major incidents regarding domestic violence and generally violence against women. In the meantime women of these areas participate in farming &community activities.

71. **Drinking water:** All the families are waiting to welcome the new water scheme. Our casual discussion with the community disclosed their willingness to obtain water from the new scheme. Presently they take water from unprotected sources. However majority of them drink boiled water. As mentioned above with the revelation of the CKD issue, people of this village are interested in having safe and pure drinking water. Community members related stories about various ailments that the community members had to suffer in the past due to lack of safe drinking water. At present majority of community members used to bring safe drinking water from faraway places.AS per the Table 10 given below, no household family in the project area is getting the safe drinking water from NWS&DB. Majority of families fulfill their daily drinking water needs from private wells. They have suffered a lot not having safe and clean drinking water for their children.

Table 10: Source of drinking Water - Kumaragama, Kukurampola & Rahathangama GNDs

Source water	No of HHs in Buttala PS division	No of HHs in the Kumaragama, Kukurampola & Rahathangama GNDs
Wells managed by CBOs	4,173	20
Private wells	4,898	865
Tube wells	889	221
Pipe born water from NWS&DB	3942	0

72. **Communication:** According to the information provided by the officers in the DS and PS, villages in Kumaragama, Kukurampola and Rahathangama GN Divisions do not have land line telephone facilities. About 50% of the families use mobile phones for their day to day communication needs.

Table 11: Communication

Kumaragama, Kukurampola & Rahathangama GN Divisions	Land phone	Mobile phones
Number of Families.	0	776

73. **Electricity:** Majority of the families have electricity connection to their houses and others are waiting to get the connection under the programme called “Electricity to all” by Ministry of Power and Renewable Energy.

Table 12: Electricity of the project area

Kumaragama, Kukurampola & Rahathangama GN Divisions	With Electricity.	Without electricity.
Number of Families.	1549	181

E. Social and Cultural Characteristics

74. **Transport Service.** There are bus services to the Kumaragama, Kukurampola & Rahathangama GN Divisions. However, the community members are satisfied about the public transport service and a few privately owned buses are plying on these roads. With the expansion of the economy community members in these villages also have been able to own private mode of transport such as motor cycle or three wheelers.

75. **Temples**. 100% of the people in the subproject site are Buddhists and are going to Buddhist temples regularly. There are more than 06 Buddhist temples in the project area.

76. **Schools.** Three schools namely Pelwattha Navodya MV, Kukurampola KV & Kumaragama KV in the subproject site.

E. Site Specific Description of Environmental Conditions

77. Both man-made habitats such as home gardens, sugarcane plantations, paddy fields, and natural and semi natural habitats like, streams, scrubland and forest patches could be observed adjacent to the project area. Many of natural habitats within the project area have been subjected to disturbances due to natural and anthropogenic activities, and resulted in loss of mosaic of patches of forest cover in the past.

78. However, they retain some degree of naturalness despite numerous impacts. The Road running from Pelwattha Junction to Kukurampola junction has residential areas mixed with shops and abandoned areas. There are no natural forest patches or natural streams running across this road section. The road section selected for pipe laying along the Burutha Junction to Pelwttha - Kukurampola road has different land uses mixed with natural environment at different locations. Along this particular road section, one can observe quite a lot of sugarcane plantations done on small & large scale. Livestock farming is also a popular livelihood in this area. [Appendix 14 (c) & (d)].

V. ANTICIPATED IMPACTS AND MITIGATION MEASURES

79. **Screening and assessment of potential impacts.** The subproject is considered small-scale and potential environmental impacts have been assessed using ADB Rapid Environmental Assessment Checklist for Water Supply (Appendix 5) then potential negative

impacts were identified in relation to pre-construction, construction and operation of the improved infrastructure.

A. Pre-Construction

80. Discussions were carried out with design engineers about technical solutions to mitigate environmental impacts arising during implementation period of the subproject. Subsequently the subproject was looked at in the light of environmental concerns and construction methodologies complying with CEA and ADB SPS 2009.

81. Although there are some potential adverse environmental impacts, they are mostly temporary and localized. The net environmental impacts are positive and large. However, Potential negative impacts for subproject categories are summarized in Table 13. These can largely be avoided through proper subproject design or mitigated through adopting proper mitigation measures and management of the project which will be incorporated into contractors' contract documents.

B. Construction

82. Based on the REA Checklist, the subproject is unlikely to cause significant adverse impacts because: (i) only pipe laying along roads will be carried as major construction activities (ii) predicted impacts during construction are localized and likely to be associated with the construction process and are produced because the process is invasive, involving excavation and earth movements; and (iii) areas where civil construction activities are to go have no specific biodiversity impacts as only few smaller trees will be uprooted.(iv) no water ways or sensitive flood areas are intercepted during the construction.(v) no resettlement activities or relocation of utilities are needed as existing ROW is used for laying pipes.(vi) no voluntary or involuntary land acquisition is required (vii) minor traffic condition may be created in the project areas and near commercial establishments due to piling of materials and equipment's. The potential impacts identified include impact on air quality due to increased dust generation, increased noise levels, generation and disposal soil, traffic flows and increased soil erosion due to excavation works.

83. When working during dry periods, dust generation will be possible in town areas and it will affect residences and commercial establishments close to roads and to road users. Systematic watering in excavated sections will be the solution.

84. Noise level should be below 75dB(A). Machines used for drilling and mixing of concretes should not produce the sound level above 75db(A) and it should be measured using relevant equipment. Additionally, sound controlled devices on machineries and equipment need to be adopted as per CEA environmental regulations.

85. The foundation will be dug by the workforce as per engineering designs and as a result, the excavated soil is loaded to a lorry by a backhoe once the back filling is completed. Excavated soil will be covered with a tarpaulin cover while transporting. It will minimize the impacts on the environment and health of the people due to emissions of dust in the wind.

86. Excavation along existing road sections using medium level backhoe to lay PVC pipes will create minor scale impacts for road users. Proper traffic management system with appropriate sign boards should be established by the contractor.

87. It is advised to carry out the construction activities during the dry season especially from June to September of the year and avoid the construction during the rainy season as it will induce soil erosion and create run off condition on the site. Therefore to avoid soil erosion and increased silt run-off, excavated soil should not be stockpiled at the site and taken away as soon as the back filing is finished.

88. There will be no damage and interruption on the public utilities: Burying PVC pipes in trenches along roads may sometimes disturb the existing utility lines like Telecom lines, access to residences or other existing structures such as culverts and drains. NWS&DB has already identified such locations and will inform the contractor for necessary relocation or precautions if needed. Systematic and careful cutting of the earth and refilling after burying pipes will avoid potential damages on existing utilities and other permanent structures. Technical designs will also explain construction procedures. However, as per field observations, few small trees will have to be uprooted for laying of pipes.

89. Space is available in surrounding areas of the project for construction materials storage and staging area. Thus stock piling of construction materials, natural drainage paths at the site and surrounding will not be disturbed.

90. Storage of PE & DI pipes, other related materials and construction equipment's should not be done along road sides. The overall construction programme period needs to be shortened using sufficient labour force and equipment's as it will minimize the inconvenience on residents, commercial establishments and other transport services at construction sites.

91. Construction workers will be deployed from neighborhood to worksites.

92. The construction activities will be conducted during daylight hours to minimize the disturbances to local residents. Due to construction activities, access to the business premises located around the Kukurampola junction area may be disturbed during the day time. This could be reduced through adopting temporary access provisions and traffic sign boards as business accesses should not be disturbed unnecessarily. It is needed to mention that Kukurampola junction area has no a widely spread business network rather few small shops scattered around the junction. It is needed to inform the businessmen in advance about the proposed construction programme for better preparedness for proposed construction activities.

93. All organic and other forms of solid wastes generated will be disposed to CEA approved disposal yards. The excavated soil will be disposed to disposal yards directly.

94. Construction impacts from construction of the water supply system will cause inconvenience to the people in the area. The contractor should attempt to minimize inconveniences on people finishing off scheduled works in a specific area before opening another area for construction. It is important to maintain cleanliness of the construction area during the progress of work.

95. Natural drainage patterns in the project area will not be impacted by the construction activities as no diversion of canal or waterways will be made during the implementation of project activities.

96. Land use pattern and Livelihood activities including paddy field works will not affected by the project activities as the construction will be carried out only along the right of way of the

road(ROW) without invading private lands, residential areas and forest areas situated in the vicinity of the construction area

97. **Mitigation measures.** As discussed above, the potential impacts identified during construction include impact on air quality due to increased dust generation, increased noise levels, increased traffic flows due to road excavations for laying pipes and dumping of soils along roads, drainage issues due to piling of materials and disposal of soil, solid waste generation due to camping and increased soil erosion due to excavation works. Measures to mitigate the potential impacts are presented in Table 14. Both the contractor and NWSDB will be responsible for mitigation activities and monitoring of effectiveness of these measures. Supervision of the activities has to be done mainly through the respective SPCU and CLG.

C. Operation and Maintenance

98. The proposed water supply scheme will be operated and maintained by NWSDB. A sound operational and maintenance plan and schedules will be formulated by NWSDB prior to commissioning of the sub project.

99. Potential environmental impacts during operations and maintenance of the sub project include (i) possible water leakages through pipe joints (ii) generation of additional sludge and frequent back wash operations for filters and; (iii) increased sewage due to improved water supply system; and (iv) illegal water connections and wastage of water

100. This will be involved with regular checking and recording of performance for signs of deterioration, servicing and replacement of parts, etc. A small number of people will be employed to operate and maintain the water supply system.

101. The main requirement for maintenance of the transmission and distribution system will be for the detection and repair of leakages. Generally the existing flat topography and usage of good quality PE & DI pipes for construction ensures that pipeline breaks and water leakages are very rare and are mainly limited to joints between pipes. The repair of household connections and the provision of new connections to increase the number of people will reduce the incidence of illegal connections that are often a major source of leakages. There may be occasions to carry out pipe repairs based on the routine maintenance or on public complaints.

102. Monitoring of water quality and quantity should be done on regular basis by NWS&DB during the operational period. The water quality tests should be done by NWS&DB and relevant MOH office.

103. Proper maintenance of rapid sand filter and chlorination will be very important for successful operation of the project. During the periods of heavy rains or floods, it is advisable to clean the rapid sand filter with frequent back wash operations.

104. There may be increased back wash operations due to accumulation of more particles in filters at the Buttala WSS. As well, the sludge generated could be more in amount as the water demand has been increased due to the operation of the subproject. The Sludge generated is released to an abandoned forest area (non protected forest area) located in the back of Buttala WSS. The waste water is released to an open water body located in the vicinity.

105. Increased in sewage is anticipated due to improved water supply system. However, this impact is assessed to be not significant and can be mitigated as results of the socio-economic survey shows availability of sanitation facilities in households.

106. Waste materials are expected to be generated during operation and maintenance activities. However, these will be minimal and not significant as the treatment plants are considered as small-scale. Any waste that will be generated will be segregated. Reusable and recyclable materials will not be disposed.

107. **Mitigation measures.** As discussed above, the potential impacts identified during operation and maintenance include (i) possible water leakages through pipe joints (ii) generation of additional sludge and frequent back wash operations for filters and; (iii) increased sewage due to improved water supply system; and (iv) illegal water connections and wastage of water. Measures to mitigate the potential impacts are presented in Table 14. NWSDB will be responsible for mitigation activities and monitoring of effectiveness of these measures.

108. Table13 summarizes the potential impacts at different phases of subproject implementation, severity and duration. It can be seen that the potential impacts are during construction and operation and maintenance are not significant and temporary in duration. Table 14 provides the mitigation measures to ensure that impacts are within acceptable limits and remain insignificant throughout subproject implementation.

Table 13: Environmental Impacts during Construction and Operational Phases

Activity	Potential Negative Impacts	Severity	Duration
Pre-Construction Phase	Obtaining permits for use of ROW for burying pipe lines	N	T
	Approvals obtained for burrowing of earth	M	T+P
Construction Phase	Traffic congestion during road excavation	M	T
	Damages to existing roads	M	T
	Increased Noise and dust	N	T
	Impacts on existing habitats	N	T
	Damages to natural drainage pattern	N	T
	Waste generation and camping around	M	T
Operational Phase	Lowering water quality due to addition of affluent	N	T
		N	T
	Sludge generation	N	T
	Increased in sewage generation	N	T+P
	Possible negative impacts due to poor operation and maintenance (O&M) systems on the project by NWS&DB	N	T
	Possible negative impacts to quality and quantity of water supplied by the project and other water intakes	N	T
	Possible negative impacts to PVC pipes laid along roads due to allowing of all heavy vehicles to be parked	M	T
	Proper maintenance of Rapid Sand Filter (RSF)	N	T
	Generation of waste materials	N	T

N - Negligible, M - Moderate, S - Severe, T - Temporary, P - Permanent

Table 14: Mitigation Measures for Potential Environmental Impacts

Activity	Potential Negative Impacts	Mitigation Measures
Pre-Construction Phase	Permits to be obtained for cutting trees	Cut down branches of trees rather than removing.
	Approvals obtained for burrowing of earth	Source the materials from qualified suppliers
Construction Phase	Traffic congestion during road excavation	To implement a proper traffic control plan using sign boards, barricade tapes, and flag men.
		Alternative spaces to store materials/ park machineries need to be arranged.
	Damages to existing roads	Excavations to be carried out after study of design drawings. It will minimize unnecessary damages on roads
		Small to medium size machineries will be used for narrow roads.
	Dust generation	Regularly spray water on excavated soil surface to minimize generation of dust.
		When transporting all materials such as earth, sand and cement, cover them with tarpaulin to avoid spillage of materials and production of dust due to wind.
		Appropriate measures shall be in place to minimize the emissions of dust while handling, loading/unloading of materials
		Avoid transporting of excavated soils and mud during rainy days
	Increased noise level	Construction activities be carried out only during day time from 7am to 5.pm every day and limited night work be done for the concrete slabs. All machineries used in this regard will have noise control devices to reduce the sound level below 75 db as specified by CEA environmental regulations and as shown in the Appendix 8.
	Impacts on existing habitats	No endemic or endangered tree species are damaged and to control soil erosion, plant more trees in the project area and the neighborhood
	Damages to natural drainage pattern	No impact for drainage flow as drainage flows down along roads and surrounding areas.
	Waste generation and camping around	The solid wastes generated need to be removed to appropriate disposal yards
Operation and Maintenance Phase	Lowering water quality due to addition of affluent	No industries to be located around the water source and more Chlorine will be added to the water
	Sludge generation	Collect in an underground chamber and allow for settling and remove the solid sludge to abandoned forest areas

Activity	Potential Negative Impacts	Mitigation Measures
	Increased in sewage generation	The local community has well-built sanitation facilities and will manage the sewage generated
	Possible negative impacts due to poor operation and maintenance (O&M) systems on the project by NWS&DB	Measures will be taken to avoid poor operation and maintenance systems for the entire water project.
	Possible negative impacts to quality and quantity of water supplied by the project and other water intakes	Water quality and quantity tests to be carried out on regular basis (dry and wet periods) and no diversion of water from the primary water intakes to irrigation or other means.
	Possible negative impacts to PE pipes laid along roads due to allowing of all heavy vehicles to be parked	Pipelines laid in the passage of road ROW Is located far from parking areas
	Proper maintenance of Rapid Sand Filter (RSF)	Trained NWS&DB staff will be appointed to backwash RSF
	Generation of waste materials	Collect solid wastes and dispose to CEA approved disposal yards

VI. PUBLIC CONSULTATION AND INFORMATIONDISCLOUSURE

A. Consultations Conducted

109. Consultations with stakeholders, NWSDB engineers, and CEA have been conducted to discuss engineering and potential environmental issues. The main comments discussed at the meetings include request of clean drinking water from NWS&DB, stop CKD patients rising up in the area, support to be extended from the local community, willingness to donate land plots if needed, formation of local society to resolve environmental and social issues and monitor the project works, request of awareness programs to be conducted, equal distribution of water supply throughout the day, request of water connections to all the households, efficient communication for water pipe repairs and renovation of pipes and joints in the future.

110. In order to gather the public views on shaping the technical design and community friendly implementation process, public consultation meeting was held with the participation of all relevant stakeholders and in the presence of NWSDB staff at the Buttala Divisional Secretariat hall on 29th January & 15th February2016. NWSDB has explained technical, social and environmental aspects and health benefits to be delivered due to execution of the subproject in the area. Appendix 6 provides the report on public consultation.

111. Recommendations of the public consultation

(i) It is required to provide water connections to all households in the area.
(ii) It is required to conduct water quality tests at periodic intervals.
(iii) It is required to assess water quantity at periodic intervals.
(iv) The environmental and social issues will be resolved with the participation of local community.

Table 15: Summary of the Public Consultation Conducted

Date	Location	No. of participants	Participants	Topics Discussed	Issues Raised
29.01.2016	Divisional Secretariat-Buttala	Male-38 Female-44 Total -82	Regional & local Political authority, NWS&DB, MOH, DS, Safeguard Officers from Consultants & SPCU, Community Leaders, Beneficiaries	Rapid increase of the number of CKD patients in the area and desperate need of clean drinking water	The possibility of extending the pipe line further more.
15.02.2016	Divisional Secretariat-Buttala	Male-34 Female-56 Total -90	Regional & local Political authority, NWS&DB, MOH, DS, Safeguard Officers from Consultants & SPCU, Community Leaders, Beneficiaries	Beneficiary corporation in implementation the project specially during construction & maintenance phases	Responsibilities of Beneficiaries in operational activities, paying of monthly tariff etc.

B. Future Consultation and Disclosure

112. The public consultation and disclosure program with stakeholders will remain as a continuous process throughout the project implementation. During the construction and operation of the project, public consultation and institutional consultation will take place if there would be any necessity for discussing issues in respect of change of designs in association with Contractor and NWSDB. In order to avoid undue delays in implementation and completion of the project, it is required to identify the issues and points to be discussed at this stage and hold discussions with relevant organizations, institutions, CBOs and NGOs in the subproject site.

113. As well, minutes of the meeting recorded need to be attached to IEE report and the progress reports produced during the project period. The points discussed for adoption in the construction and operation activities has to be performed for enhancing the trust and mutual understanding of all stakeholders of the project.

C. Disclosure of information

114. Disclosure of information at an early stage of the project has many benefits such as to avoid any objections by the public towards successful project implementation, passing of misinformation in to the hands of public through ignited groups and local NGOs.

115. While disclosure of information can be done through the Divisional Secretariat and the Grama Niladari (village administrative officer) of the area, Farmer Based Organizations (FBOs), Community Based Organizations (CBO) and village societies are also possible sources of disseminating project related information.

116. Village leaders such as the head priest of the temple can also be resource persons for such an activity. The use of mass media to advertise the availability of the report could help information disclosure to other interested groups outside the subproject site.

117. According to the requirements of the ADB SPS, the draft IEE will be disclosed in ADB website before the Management Review Meeting (MRM) is held. The IEE report in Tamil/Sinhala versions also will be kept open for the public and other interested parties for comments at offices of NWSDB, DS secretary and PMU.

VII. GRIEVANCE REDRESS MECHANISM

118. Project-specific grievance redress mechanism (GRM) has been established to receive, evaluate, and facilitate the resolution of affected person's concerns, complaints and grievances about the social and environmental performance of LGESP. The GRM of the project has been prepared and accepted by ADB and disclosed in the project website The GRM chart providing information on receipt of complaints and levels of redress is displayed in all subproject sites, local authorities' offices, SPCU offices and other important places. The SPCU records all grievances received and address them on priority. To date all grievances are addressed at the stage of first tier.

119. The GRM aims to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project. The GRM is project-specific and not intended to bypass the government's own redress process; rather it is intended to address affected people's concerns and complaints promptly, making it readily accessible to all segments of the affected people and is scaled to the risks and impacts of the project.

120. The PMU and SPCUs will make the public aware of the GRM through public awareness campaigns. Grievances can be filed in writing using the Complaint Register and Complaint Forms (Appendix 7) or by phone with any member of the PMU or SPCU. The contact details of the respective SPCUs will serve as a main avenue for complaints and will be publicized through display on notice boards outside their offices and at construction sites. The safeguard documents made available to the public in an accessible version will include information on the GRM and will be widely disseminated throughout the corridor by the safeguards officers in the PMU and SPCUs.

121. **First tier of GRM.** The SPCU is the first tier of GRM which offers the fastest and most accessible mechanism for resolution of grievances. The Safeguards Manager – Social and Gender in the SPCU will be designated as the key officer for grievance redress. Resolution of complaints will be done at the earliest. Investigation of grievances will involve site visits and consultations with relevant parties (e.g., affected persons, contractors, traffic police, etc.). The Community Development Officer of the local authority or in the absence of Community Development Officer, any officer who is given the responsibility of this, would coordinate with the safeguards and gender manager of SPCU in redressing the grievances. Grievances will be documented and personal details (name, address, date of complaint, etc.) will be included unless anonymity is requested. A tracking number will be assigned for each grievance, including the following elements:

(i) Complaint Register and Complaint Forms (including the description of the grievance) with an acknowledgement of receipt given to the complainant when the complaint is registered;
(ii) Grievance monitoring sheet with actions taken (investigation, corrective measures); and
(iii) Closure sheet (Result of Grievance Redressal), one copy of which will be handed to the complainant after he/she has agreed to the resolution and signed-off.

122. The updated register of grievances and complaints will be available to the public at the SPCU office, construction sites, and other key public offices. Shall the grievance remain unresolved it will be escalated to the second tier.

123. **Second Tier of GRM.** The Social Safeguards and Gender Manager of SPCU will activate the second tier of GRM[1] by referring the unresolved issue (with written documentation), The Grievance Redress Committee (GRC) will be established before commencement of site works. A hearing will be called with the GRC, if necessary, where the affected person can present his and/or her concern or issues. The process will facilitate resolution through mediation. This local GRC will meet as necessary when there are grievances to be addressed. The local GRC will suggest corrective measures at the field level and assign clear responsibilities for implementing its decision at the earliest. The contractor will have observer status on GRC. If unsatisfied with the decision, the existence of the GRC will not impede the complainant's access to the Government's judicial or administrative remedies.
123. The safeguards and gender manager of SPCUs will be responsible for processing and placing all papers before the GRC, maintaining database of complaints, recording decisions, issuing minutes of the meetings and monitoring to see that formal orders are issued and the decisions carried out.

124. **Third tier of GRM.** In the event that a grievance cannot be resolved directly by the SPCUs (first tier) or GRC (second tier), the affected person can seek redress through third tier at the central level. . The third tier - Central Grievance Redress Committee consists of (i) Project Director as Chairman; and (ii) Legal Officer of MPCLG as member and Social Safeguard and Gender Officer of PMU as Member Secretary.

125. In case the grievance is not solved at this level, then the complainant can refer the same to the court of law.

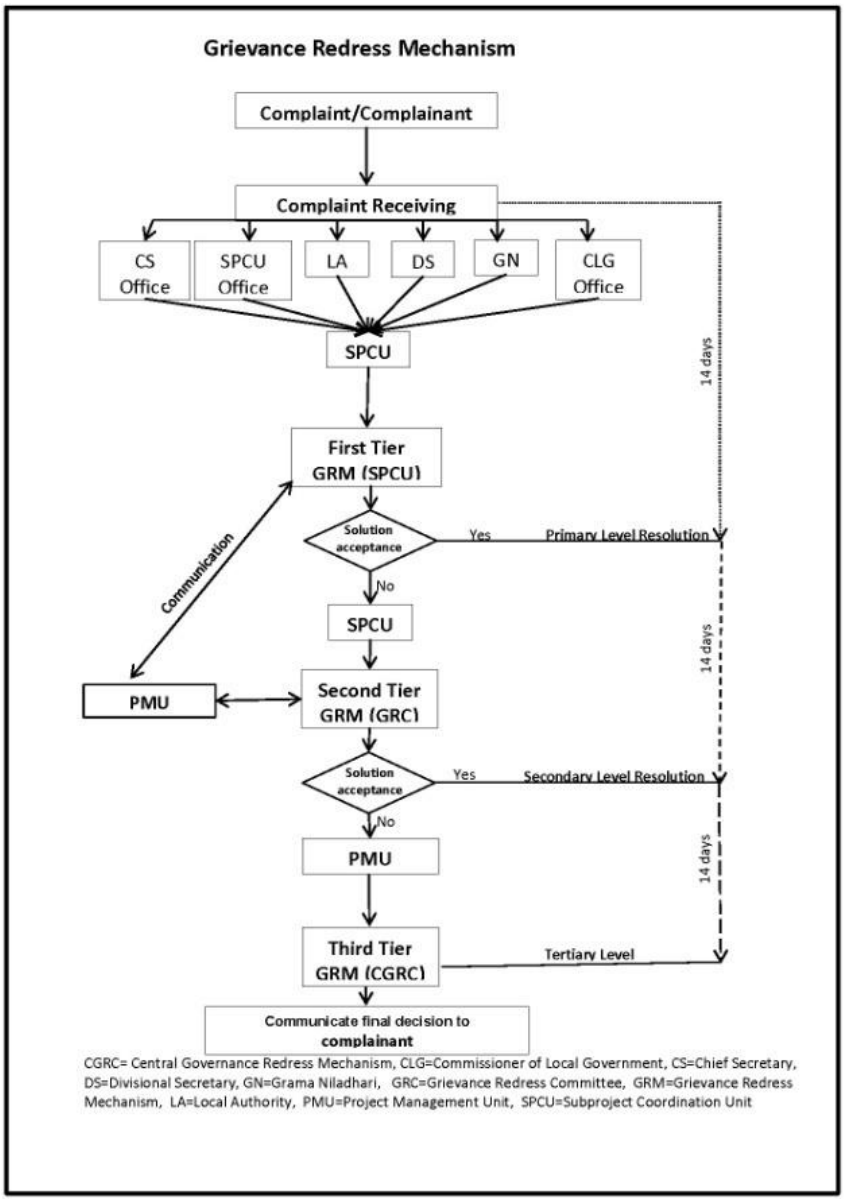
126. The detailed GRM is hosted in the project website.

127. The safeguard monitoring reports will include the following aspects pertaining to progress on grievances: (i) number of cases registered with the GRC, level of jurisdiction (first, second and third tiers), number of hearings held, decisions made, and the status of pending cases; and (ii) lists of cases in process and already decided upon may be prepared with details such as name, ID with unique serial number, date of notice, date of application, date of hearing, decisions, remarks, actions taken to resolve issues, and status of grievance (i.e. open, closed, pending).

128. All costs involved in resolving the complaints (meetings, consultations, communication and reporting and/or information dissemination) will be borne by the executing agency.

[1] The GRC will consist of the following persons (i) Commissioner of Local Government of the Province as Chairman, (ii) Divisional Secretary of the area; (iii) Chairman of the respective pradeshiya sabha; (iv) representative of nongovernment organizations and/or community based organizations working in the area as nominated by CLG; (v) Member of clergy of pradeshesiya area; (vi) Chairman of Samathamandal; (vii) Grama Niladhari of the area; (vii) Social Safeguard and gender Manager - as Member Secretary of the GRC. The functions of the local GRC are as follows: (i) resolve problems quickly and provide support to affected persons arising from various issues including environmental and social issues.

Figure 1: Tiers of GRM



VIII. ENVIRONMENTAL MANAGEMENT PLAN

129. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels.

130. The EMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between PMU, SPMU, consultants and contractors. The EMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (i) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensure that safety recommendations are complied with. The EMP

includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures.

131. The contractor will be required to submit to SPMU, for review and approval, a site environmental plan (EMAP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per EMAP; and (iv) budget for EMAP implementation. No works are allowed to commence prior to approval of EMAP

132. A copy of the EMP/approved EMAP will be kept on site during the construction period at all times. The EMP included in the bid and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

A. Safeguards Implementation Arrangements

133. The MPCLG is the executing agency. A National Steering Committee, headed by the Secretary of MPCLG, will provide policy guidance to the project. A ministerial committee, also headed by the Secretary of MPCLG, will be responsible for decisions on overall approvals and operational policies of the project.

134. A PMU in the MLGPC, headed by a Project Director, will be responsible for overall coordination, management, administration, project implementation, monitoring, and supervision. The PMU will function as the project office of the executing agency, will be in-charge of subproject appraisal and approval, and will ensure compliance with ADB loan covenants. An Environment Safeguards Officer (PMU ESO) will have the following responsibilities: (i) support project director in addressing all environment-related safeguards issues of the project; (ii) implement the EARF; (iii) monitor physical and on-physical activities under the Project; (iv) monitor implementation of safeguards plans; (v) guide the SPCUs as and when necessary; and (vi) endorse and/or submit periodic monitoring reports[2] received from SPCU to the PMU , project director, who will then submit these to ADB. It will also coordinate with national and state agencies to resolve inter-departmental issues, if any.

135. The PMU will be assisted by PMC Safeguard Specialist (PMC SS). The PMC SS will (i) review and finalize all reports in consultation with the PMU ESO; (ii) provide project management support, (iii) assure the technical quality of design and construction; (iv) review EIA/IEE/resettlement plan/indigenous peoples plan reports submitted by SPCUs; and (v) provide advice on policy reforms. In addition, the PMC SS will assist the PMU on the procurement needs and other project implementation aspects and shall play a central role in ensuring capacity building on environmental management of the PMU, contractors, and line departments through capacity development support and training.

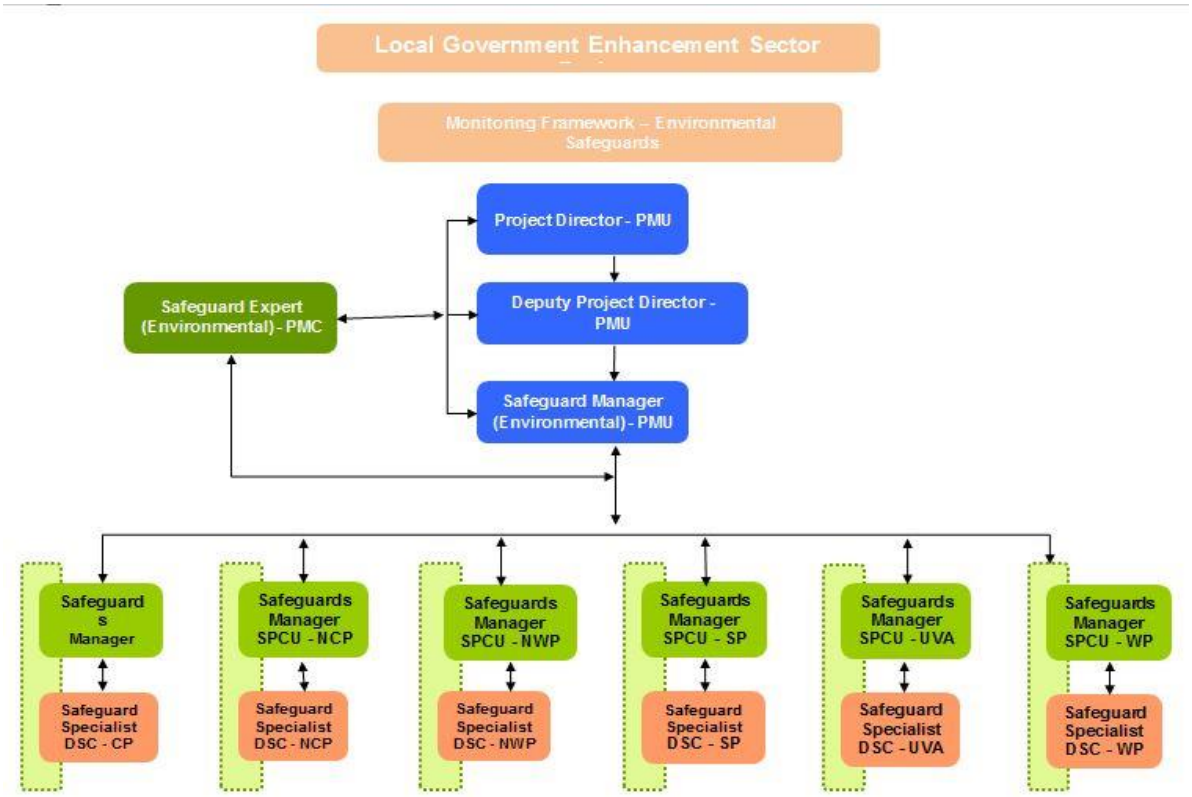
136. SPCU in each of the seven provinces will take responsibility for supporting subproject preparation, screening and endorsement, procurement, implementation monitoring including quality control and assurance and ensuring safeguards compliance. It is essential that Provincial Councils provide clear guidance to the target Pradeshiya Sabhas in their development planning

[2] The monitoring report will focus on the progress of implementation of the IEE/EIA and EARF, issues encountered and measures adopted, follow-up actions required, if any, as well as the status of compliance with subproject selection criteria, and relevant loan covenants.

and subproject identification process, to ensure coherence with the provincial physical development plans and facilitate collaboration among neighboring local authorities possibly for joint infrastructure development. Each SPCU will be headed by the Commissioner of Local Government who will be assigned as the Provincial Project Director and will be the administrative head. For each SPCU, a senior engineer will be appointed as the executive head and will be in-charge of the day-to-day activities of the unit. The Safeguard Manager of SPCU will be responsible for: (i) review of the EIAs/IEEs prepared by DSCs as well as the implementation of the EMP provided in each EIA/IEE; (ii) undertake surveys and record their observations throughout the construction period to ensure that safeguards and mitigation measures are provided as intended; (iii) implement and monitor safeguards compliance activities, public relations activities, gender mainstreaming activities and community participation activities; (iv) obtain statutory clearances from government agencies/other entities; and (v) coordinate for obtaining ROW clearances with related provincial and national agencies.

137. Environment Specialists will also be appointed as part of the DSC teams to (i) prepare IEEs in the detailed design stage; (ii) assist in the monitoring of EMP during construction stage; and (iii) prepare EIAs/IEEs for new subprojects, where required to comply with national law and/or ADB procedure.

Figure 1: Safeguards Implementation Arrangement



B. Institutional Capacity Development Program

138. The PMC SS will be responsible for training of PMU and SPCUs staff on environmental awareness and management in accordance with both ADB and government requirements. Specific modules customized for the available skill set shall be devised after assessing the capabilities of the target participants and the requirements of the project. The entire training will

cover basic principles of environmental assessment and management; mitigation plans and programs, implementation techniques, monitoring methods and tools. Typical modules that will be present for the training session would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in urban development projects; (iii) review of IEEs and integration into the subproject detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. The proposed training program along with the frequency of sessions is presented in Table 16.

Table 16: Training Program for Environmental Management

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
A. Pre-Construction Stage					
Awareness Workshop	Awareness of requirements of environmental safeguards in design, execution and managing the assets created under the project including procedures to be followed and approvals to be obtained.	Senior officers of MPCLG, NSC members and elected representatives of *Pradeshiya Sabhas*	Workshop	½ day	PMU with support of PMC and ADB (SLRM)
Sensitization Workshop	Introduction to Environment: Basic Concept of environment Environmental Regulations and Statutory requirements as per Government and ADB	*Pradeshiya Sabhas*, SPCU Staff	Workshop	½ Working Day	SPCU, DSC, PMU
Session I					
Module I	Introduction to Environment: Basic Concept of environment Environmental Regulations and Statutory requirements as per Government and ADB	*Pradeshiya Sabhas*, SPCU Staff	Lecture	½ Working Day	SPCU, DSC, PMU
Module II	Environmental Considerations in Urban Development Projects: Environmental components affected by urban development in construction and operation stages Activities causing pollution during construction and operation stages Environmental	*Pradeshiya Sabhas*, SPCU Staff	Workshop		SPCU, DSC, PMU

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
	Management Good Practices in Urban Infrastructure Projects				
Module III	Review of IEE and its Integration into Designs: IEE Methodology Environmental Provisions in the EMPs Implementation Arrangements Methodology of Assessment of Pollution Monitoring Methodology for site selection of burrow areas, waste disposal areas etc.	*Pradeshiya Sabhas*, SPCU Staff	Lecture and Field Visit	½ Working Day	SPCU, DSC, PMU
Module IV	Improved Coordination with other Institutions: Overview of the Project Environmental and Social Impacts Statutory Permissions Procedural Requirements Cooperation and Coordination with other Institutions. Requirement of target setting, team work and team building	*Pradeshiya Sabhas*, SPCU Staff	Lecture and/or Interactive Sessions		SPCU, DSC, PMU
Module V	Special Issues in the Project Bio-Diversity Assessment and Conservation Geomorphologic Assessment and Soil and Erosion Protection Statutory Permissions – Procedural Requirements Consultation and Counseling	*Pradeshiya Sabhas*, SPCU Staff	Lecture	½ Working Day	SPCU, DSC, PMU
	Working out responsibility chart and plan of action			½ Working Day	
B. Construction Stage					
Session II					
Module VI	Role during Construction Roles and Responsibilities of officials/ contractors/	*Pradeshiya Sabhas*, SPCU Staff	Lecture and/or Interactive Sessions	½ Working Day	SPCU, DSC, PMU

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
	consultants towards protection of environment Implementation Arrangements Monitoring mechanisms Introducing necessities of auditing, checks and balances				
Module VII	Monitoring and Reporting System	*Pradeshiya Sabhas*, SPCU Staff	Lecture and/or Interactive Sessions	½ Working Day	SPCU, DSC, PMU

ADB = Asian Development Bank, DSC = Design and Supervision Consultants, MPCLG = Ministry of Provincial Councils and Local Government, PMU = project management unit, SLRM = Sri Lanka Resident Mission, SPCU = subproject coordination unit.

C. Staffing Requirement and Budget

139. The costs for environmental safeguard activities which are responsibilities of the PMC and DSC are included in respective consultant packages. The cost of mitigation measures during construction stage will be incorporated into the contractor's costs. Thus, remaining costs related to environmental safeguards cover the following activities:

(i) Conduct of IEE or EIA studies, preparing and submitting reports and public consultation and disclosure;
(ii) EPL applications, if required;
(iii) Conduct of environmental monitoring for baseline data generation and long-term surveys along with GIS based mapping and infrastructure system;
(iv) Replacement and maintenance of trees, if required; and
(v) Conduct of environmental capacity-building lectures and workshops for creating awareness.

140. The indicative costs of these various inputs are shown in Table 17.

Table 17: Indicative Cost of EMP Implementation

Item	Quantity	Unit Cost (US$)	Sub-total Cost (US$)	Source of Funds
Administrative Cost				
(i) Public Consultations	Lump sum per province (7 provinces)	$1,000	$7,000	Project Cost - PMU Costs (to be paid under incremental administration cost)
(ii) Environmental Monitoring				
(a) Design Stage to establish baseline environmental	Lump sum per province (7 provinces)	$3,000	$21,000	Project Cost - PMU Costs (to be done under the guidance of PMC / SPCU by SPCU staff and accounted under incremental administration cost.

Item	Quantity	Unit Cost (US$)	Sub-total Cost (US$)	Source of Funds
data				
(b) Construction Phase		-	-	Civil Works Contractor Costs
(c) O&M		-	-	*Pradeshiya Sabhas'* cost
(iii) Landscaping and tree-planting	Lump sum per province (7 provinces)	$2, 000	$14,000	Civil Works Contractor Costs
(iv) Capacity Building Expenses	Lump sum per province (7 provinces)	$1,000	$7,000	On job training is done by PMC / DSC - Any other workshops and/or sessions on these will be under Project Cost - PMU Costs and accounted under Capacity Building expenditure.

* This costs are overall project. Subproject specific cost will be spent under the respective contracts

D. Environmental Management Plan

141. The contractor will be required to submit to SPMU, for review and approval, a site environmental plan EMAP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per EMAP; and (iv) budget for EMAP implementation. No works are allowed to commence prior to approval of EMAP.

E. Environmental Monitoring Program

142. Table 19 shows the proposed environmental monitoring program for the project. It includes all relevant parameters, location, responsibility of mitigation and monitoring, method and frequency of monitoring.

Table 18: Environmental Management Plan

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Source of Funds
Pre-Construction Phase	Permits to be obtained for cutting trees	Cut down branches of trees rather than removing.	Contractor	NWSDB, SPCU and CLG	Left trees in the project area	Contractor's, cost
	Approvals obtained for burrowing of earth	Source the materials from qualified suppliers.	Contractor	NWSDB SPCU and CLG	Field reports and observations	Contractor's, cost
Construction Phase	Traffic congestion during road excavation	To implement a proper traffic control plan using sign boards, barricade tapes, and flag men.	Contractor	NWSDB SPCU and CLG	Field reports and observations	Contractor's, cost
		Alternative spaces to store materials/ park machineries need to be arranged.	Contractor	NWSDB SPCU and CLG	Field reports and observations	Contractor's, cost
	Damages to existing roads	Excavations to be carried out after study of design drawings. It will minimize unnecessary damages on roads	Contractor	NWSDB SPCU and CLG	Field reports and observations	Contractor's, cost
		Small to medium size machineries will be used for narrow roads.	Contractor	NWSDB SPCU and CLG	Field reports and observations	Contractor's, cost
	Dust generation	Regularly spray water on excavated soil surface to minimize generation of dust.	Contractor	NWSDB SPCU and CLG	Field report and complaints if any	Contractor's, cost
		When transporting all materials such as earth, sand and cement, cover them with tarpaulin to avoid spillage of materials and production of dust due to wind.	Suppliers	NWSDB SPCU and CLG	Field report and complaints if any	Contractor's, cost

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Source of Funds
		Appropriate measures shall be in place to minimize the emissions of dust while handling, loading/unloading of materials	Contractor	NWSDB	Field report and complaints if any	Contractor's, cost
		Avoid transporting of excavated soils and mud during rainy days	Contractor/ Engineer/ Consultant	NWSDB SPCU and CLG	Field report and complaints if any	No cost
	Increased noise level	Construction activities be carried out only during day time from 7am to 5.pm every day and limited night work be done for the concrete slabs. All machineries used in this regard will have noise control devices to reduce the sound level below 75 db as specified by CEA environmental regulations and as shown in the Appendix 8.	Contractor	NWSDB SPCU and CLG	Noise reports	Contractor's cost
	Impacts on existing habitats	No endemic or endangered tree species are damaged and to control soil erosion, plant more trees in the project area and the neighborhood	Contractor	NWSDB SPCU and CLG	Field report and complaints if any	Contractor's cost
	Damages to natural drainage pattern	No impact for drainage flow as drainage flows down along roads and surrounding areas.	Contractor	NWSDB SPCU and CLG	Field report and complaints if any	Contractor's cost

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Source of Funds
	Waste generation and camping around	The solid wastes generated need to be removed to appropriate disposal yards	Contractor	NWSDB ,SPCU and CLG	Field reports	Contractor's cost
Operation and Maintenanc e Phase	Lowering water quality due to addition of affluent	No industries to be located around the water source and more Chlorine will be added to the water	NWSDB	NWSDB	Reports on maintenance operation	Operational cost borne by NWSDB
	Sludge generation	Collect in an underground chamber and allow for settling and remove the solid sludge to abandoned forest areas	NWSDB	NWSDB	Maintenance reports	Operational cost borne by NWSDB
	Increased in sewage generation	The local community has well-built sanitation facilities and will manage the sewage generated	Local community	Public health inspectors	Field reports and public health inspector's report	Not required
	Possible negative impacts due to poor operation and maintenance (O&M) systems on the project by NWS&DB	Measures will be taken to avoid poor operation and maintenance systems for the entire water project.	NWSDB	NWSDB	Field reports	Operational cost borne by NWSDB
	Possible negative impacts to quality and quantity of water supplied by the project and other water intakes	Water quality and quantity tests to be carried out on regular basis (dry and wet periods) and No diversion of water from the primary water intakes to irrigation or other means.	NWSDB	NWSDB	Field reports	Operational cost borne by NWSDB

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Source of Funds
	Possible negative impacts to PVC pipes laid along roads due to allowing of all heavy vehicles to be parked	Pipelines laid in the passage of road ROW is located far from parking areas	NWSDB	NWSDB	Field reports	Operational cost borne by NWSDB
	Proper maintenance of Rapid Sand Filter (RSF)	Trained NWS&DB staff will be appointed to backwash RSF	NWSDB	NWSDB	Field reports	Operational cost borne by NWSDB
	Generation of waste materials	Collect solid wastes and dispose to CEA approved disposal yards	NWSDB	NWSDB	Field reports	Operational cost borne by NWSDB

Table 19: Environmental Monitoring Program

Environmental Monitoring Program Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
Pre-Construction Phase	Permits to be obtained for cutting trees	Cut down branches of trees rather than removing.	Contractor	NWSDB, SPCU and CLG	Left trees in the project area	Project area	Before commencing
	Approvals obtained for burrowing of earth	Source the materials from qualified suppliers rather attempting to burrowing from sites	Contractor	NWSDB SPCU and CLG	Field reports and observations	Location around	Before commencing
Construction Phase	Traffic congestion during road excavation	To implement a proper traffic control plan using sign boards, barricade tapes, and flag men.	Contractor	NWSDB SPCU and CLG	Field reports and observations	Project area	weekly
		Alternative spaces to store materials/ park machineries need to be arranged.	Contractor	NWSDB SPCU and CLG	Field reports and observations	Project area	Once three months

Environmental Monitoring Program Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
	Damages to existing roads	Excavations to be carried out after study of design drawings. It will minimize unnecessary damages on roads	Contractor	NWSDB SPCU and CLG	Field reports and observations	Project area	Once two months
		Small to medium size machineries will be used for narrow roads.	Contractor	NWSDB SPCU and CLG	Field reports and observations	Project area	Once every month
	Dust generation	Regularly spray water on excavated soil surface to minimize generation of dust.	Contractor	NWSDB SPCU and CLG	Field report and complaints if any	Project area	weekly
		When transporting all materials such as earth, sand and cement, cover them with tarpaulin to avoid spillage of materials and production of dust due to wind.	Suppliers	NWSDB SPCU and CLG	Field report and complaints if any	Off the project site	weekly
		Appropriate measures shall be in place to minimize the emissions of dust while handling, loading/unloading of materials	Contractor	NWSDB	Field report and complaints if any	Project site	weekly
		Avoid transporting of excavated soils and mud during rainy days	Contractor/ Engineer/ Consultant	NWSDB SPCU and CLG	Field report and complaints if any	Project site and off the site	monthly
	Increased noise level	Construction activities be carried out only during day time from 7am to 5.pm every	Contractor	NWSDB SPCU and CLG	Noise reports	Project site	Daily

Environmental Monitoring Program Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
		day and limited night work be done for the concrete slabs. All machineries used in this regard will have noise control devices to reduce the sound level below 75 db as specified by CEA environmental regulations and as shown in the Appendix 8.					
	Impacts on existing habitats	No endemic or endangered tree species are damaged and to control soil erosion, plant more trees in the project area and the neighborhood	Contractor	NWSDB SPCU and CLG	Field report and complaints if any	Project site	Once Six months
	Damages to natural drainage pattern	No impact for drainage flow as drainage flows down along roads and surrounding areas.	Contractor	NWSDB SPCU and CLG	Field report and complaints if any	Project site	Once three months
	Waste generation and camping around	The solid wastes generated need to be removed to appropriate disposal yards	Contractor	NWSDB ,SPCU and CLG	Field reports	Project site	Once three months
Operation and Maintenance Phase	Lowering water quality due to addition of affluent	No industries to be located around the water source and more Chlorine will be added to the water	NWSDB	NWSDB	Reports on maintenance operation	Water source	weekly

Environmental Monitoring Program Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
	Sludge generation	Collect in an underground chamber and allow for settling and remove the solid sludge to abandoned forest areas	NWSDB	NWSDB	Maintenance reports	IWTP	Daily
	Increased in sewage generation	The local community has well-built sanitation facilities and will manage the sewage generated	Local community	Public health inspectors	Field reports and public health inspector's report	Local area	Once three months
	Possible negative impacts due to poor operation and maintenance (O&M) systems on the project by NWS&DB	Measures will be taken to avoid poor operation and maintenance systems for the entire water project.	NWSDB	NWSDB	Field reports	IWTP and project area	Once every month
	Possible negative impacts to quality and quantity of water supplied by the project and other water intakes	Water quality and quantity tests to be carried out on regular basis (dry and wet periods) and No diversion of water from the primary water intakes to irrigation or other means.	NWSDB	NWSDB	Field reports	IWTP and project site	Once month
	Possible negative impacts to PVC pipes laid along roads due to allowing of all heavy vehicles to be parked	Pipelines laid in the passage of road ROW is located far from parking areas	NWSDB	NWSDB	Field reports	Project site	Once three months

Environmental Monitoring Program Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
	Proper maintenance of Rapid Sand Filter (RSF)	Trained NWS&DB staff will be appointed to backwash RSF	NWSDB	NWSDB	Field reports	IWTP	Daily
	Generation of waste materials	Collect solid wastes and dispose to CEA approved disposal yards	NWSDB	NWSDB	Field reports	IWTP	Weekly

IX. MONITORING AND REPORTING

143. The PMU will continue to monitor and measure the progress of EMP implementation. The monitoring activities will be corresponding with the subproject's risks and impacts and will be identified in the EIAs/IEEs for the subprojects. The PMU and SPCUs will continue to undertake site inspections, document review to verify compliance with the EMP and progress toward the final outcome and recording information of the work, deviation of work components from original scope.

144. DSC will submit monthly monitoring and implementation reports to SPCU, who will take follow-up actions, if necessary. SPCU will submit the quarterly monitoring and implementation reports to PMU who will then submit to the project director. The PMU will submit semi-annual monitoring reports to ADB. The suggested monitoring report format is in Appendix 9. Project budgets will reflect the costs of monitoring and reporting requirements. For subprojects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis. Monitoring reports will be posted in a location accessible to the public.

145. For projects likely to have significant adverse environmental impacts, the executing agency will retain qualified and experienced external experts to verify its monitoring information. The executing agency will document monitoring results, identify the necessary corrective actions, and reflect them in a corrective action plan. The executing agency, in each quarter, will study the compliance with the action plan developed in the previous quarter. Compliance with loan covenants will be screened by the executing agency.

146. ADB will review project performance against the executing agency's commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB will carry out the following monitoring actions to supervise project implementation:

(i) conduct periodic site visits for projects with adverse environmental or social impacts;
(ii) conduct supervision missions with detailed review by ADB's safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
(iii) review the periodic monitoring reports submitted by executing agency to ensure that adverse impacts and risks are mitigated as planned and as agreed with ADB;
(iv) work with executing agency to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to re-establish compliance as appropriate; and
(v) Prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

X. CONCLUSIONS AND RECOMMENDATIONS

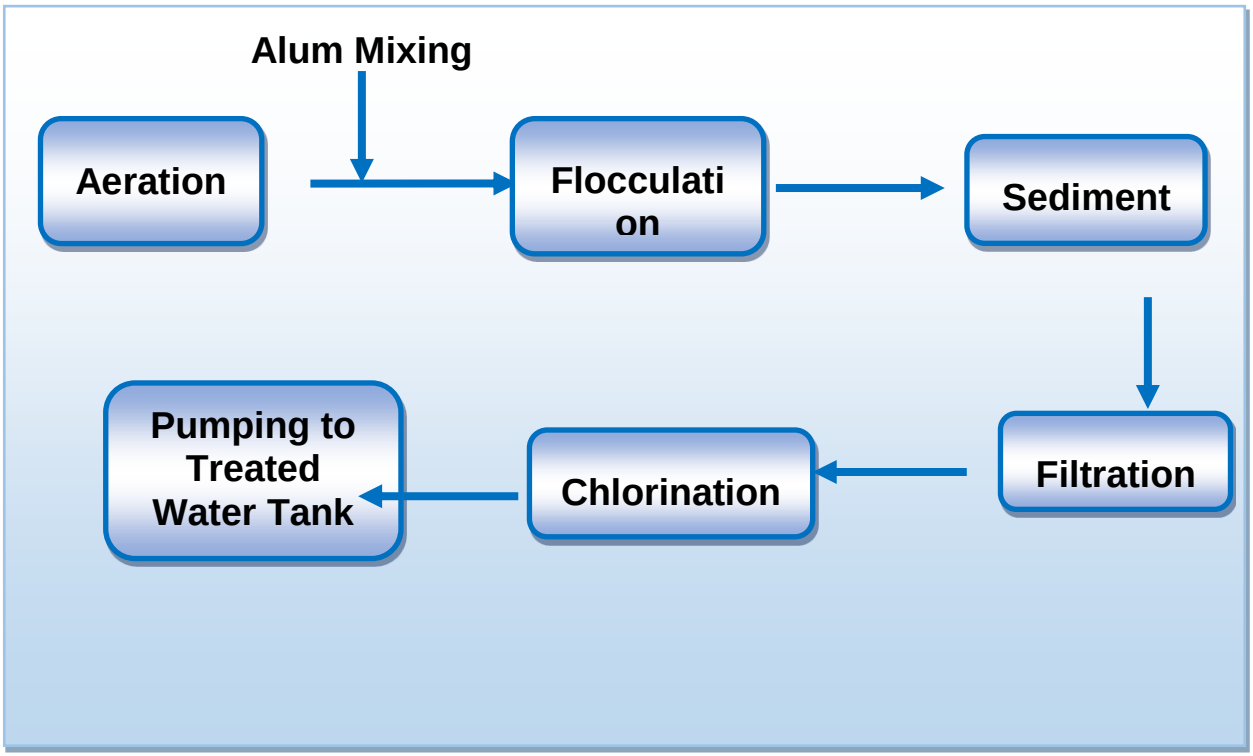
147. The negative environmental impacts arising due to execution of the proposed water supply scheme are minor and negligible as compared to the long term Socio-economic and

health benefits to be delivered to people of the project area. During the dry period from June to August, water quantity and quality should be carefully assessed by NWS&DB as the water level of the Menik Ganga & Kumbukkan Oya may go down due to climatic changes in the area. Negative impacts can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures as per EMP.

148. It is recommended that (i) IEE be made part of the bid and contract documents to ensure mitigation measures are appropriately budgeted and legally binding to the contractors; (ii) monitor diligently contractor/s EMP implementation by PMU, SPMU and consultants on EMP implementation by contractors; (iii) involve stakeholders in all phases of implementation and disclose relevant project related documents; and (iv) continue existing GRM process.

149. **Conclusion.** The subproject is unlikely to cause significant adverse impacts. As per ADB SPS, the subproject is classified as environmental Category B and does not require further EIA.

Appendix 1: Detailed Water Treatment Process



Aeration:
Dickyaya & Kumbukkana water treatment plants are conventional surface water treatment plants that has a fairly standard sequence of processes. At the same time, the process of aeration takes place by pumping the Pre-Chlorinated water through a special structure to mix with sufficient amount of Air/Oxygen. This aeration will dispel the bad odour, gases dissolved in water and reduce the water hardness to some extent. Depending on the PH value of water, lime liquid is added to increase the pH value. In addition, pre Chlorination is done to disinfect the raw water at the inception of the treatment process. By Pre-Chlorination, algae, biological matter like Bacteria and viruses are killed or neutralized in their Capacity to activate.

Flocculation:
After screening out large objects like fish and sticks, coagulant chemicals/ Alum (Alminium Sulfate) are added to the water to cause the tiny particles suspended in the water. The coagulants make the water cloudy to be attracted to each other and form “flocs.” Flocculation—the formation of larger flocs from smaller flocs—is typically achieved using gentle, constant mixing of the water to encourage particles and small floc to “bump” into each other, stick, and form larger floc. Once the flocs are large and heavy enough to be settled, the water moves into quiet sedimentation or settling basins.

Sedimentation:
Waters exiting in the flocculation basin enter the sedimentation basin or called it as a clarifier or settling basin. It is a large tank with low water velocities, allowing floc to settle to the bottom. The sedimentation basin is best located close to the flocculation basin. Hence, the transition between two processes does not permit the settlement or floc s to break up. The sedimentation basins are generally rectangular flowing from one end to another end for the effective sedimentation process. The particles settled down in the bottom are washed to the waste water

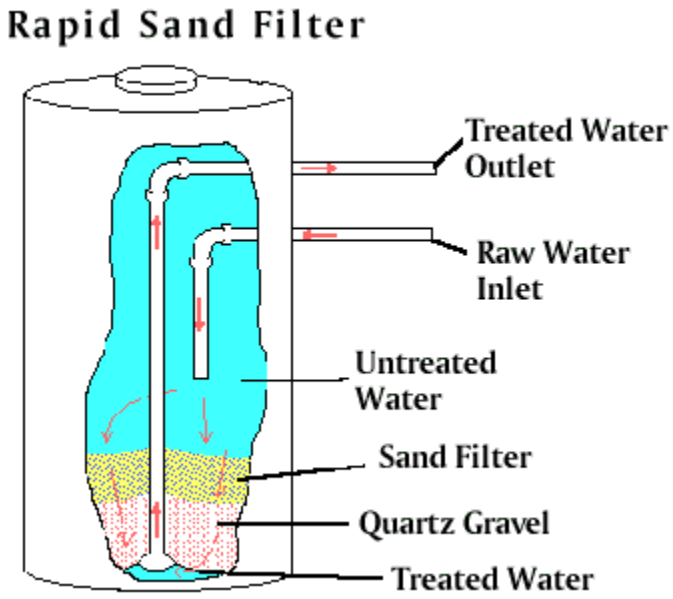
tank called “Thinkner” where the water is allowed to settle for 24 hours. After 24 hours, the super-Nated water is passed through another pipe to a separate chamber where super-nated water is released to a nearby natural water body after testing the water quality. This water analysis has proved that the water released after treatments meets the surface water quality standards of CEA. The sludge produced due to sedimentation is discharged to the forest areas where it can be absorbed to the surface of the soil. This forest area has sufficient ground cover to disperse the sludge in the area. However, the sludge lagoons or the dry beds need to be built up in order to remove the water and make the sludge dry in dry beds.

Filtration:

When most of the solids have settled out, the water is passed through rapid sand filters (RSF) that consist of top sand layer and granular or pebble type layer down the sand layer. This is a conventional shallow sand bed structure allowing to filter the water. The larger particles in the water retain on the top of the sand layer while the small particles of organic sediment left in the rapid sand filter are eaten by microscopic organisms including bacteria and protozoans which 'stick' in the layers of slime that form around the sand particles. The clean water which passes through the filter is safe to drink.

This RSF has much greater water treatment filtration rate and the ability to clean automatically using back wash system. The RSF does not use biological filtration and depends primarily on mechanical straining, sedimentation, impaction, interception, adhesion and physical adsorption. In the rapid sand water filter, the complete filtration cycle (filtration and back washing) occurs sequentially.

This rapid sand filters can be cleaned by passing water upward through the filter after blowing compressed air up through the bottom. This air blowing process breaks up the clog and allows to back wash with the water. The back wash water is passed through pipes and ends in a waste water tank where it can retain for about 2 hours. After settling the impurities, the water is released to the natural open water body. This water is much cleaner and meets the surface water quality standards of CEA as per required criteria.



Chlorination:

Chlorination is used for disinfection of water and in the Dickyaya & Kumbukkana treatment Plants, gas chlorination is used. Neutralization plant has been installed to overcome any hazardous accidents. 1000kg gas Chlorine tonners are being used in the treatment plant. Chlorine is added to the sump to disinfect the biological properties of water prior to distribution. Additional residual chlorine (RCL) is added to meet the standards of the Sri Lanka Standards Institute (SLSI) (0.2mg/l) at the last dead end of the distribution system. 20 minutes of retention period is provided for RCL at the storage tank.

Appendix 2: Results of Treated Water Quality Testing

(3)

Regional laboratory Monaragala

National water supply & Drainage Board,

Tel./ Fax : 055 2277158 e-mail : harsha.pereraka@gmail.com

Date:05.04.2016

WATER QUALITY REPORT - Physical & Chemical

1 Client / Organization : NWS&DB
2 . Laboratory Sample No. :
3 . Source of Sample : Buttala Raw water
4 Location of Sample : Menic gaga
5 . Date & Time of Collection : 01.03.2016
6 . Sample collected by :
7 . Report to be sent to :

	Requirement(SLS614:2013 Part 01) Maximum	Results
PHYSICAL QUALITY		
Colour (Hazen unit)	15	5
Turbidity (N.T.U.)	2	1.58
CHEMICAL QUALITY		
pH	6.5-8.5	8.33
Electrical Conductivity	750 µS/cm	287.00
	Results in mg/l	
Total dessolved solids	2000	nt
Chloride (as Cl)	250	10
Total Alkalinity (as $CaCO_3$)	200	128
Free Ammonia (as NH_3)	0.06	nt
Nitrate (as NO_3)	50	0.4
Nitrite (as NO_2)	3	0.011
Fluoride (as F)	1	0.47
Total Phosphates (as PO_4)	2	0.54
Magnesium	140	nt
Total Hardness (as $CaCO_3$)	250	90
Total Iron (as Fe)	0.3	0.08
Sulphate (as SO_4)	250	0
Manganese	0.05	nt
Calcium hardness	240	nt

Remarks;

This report is issued for the information of the client. It shall not be published in total or in part without the written authority of the General Manager, National Water Supply & Drainage Board. This report is limited specifically to this specimen.

..... Chemist

..... Laboratory Assistant

Regional chemist
National water supply &
Drainage Board
Monaragala

(4)

Regional laboratory Monaragala

National water supply & Drainage Board,
Tel./ Fax : 055 2277158 e-mail : harsha.pereraka@gmail.com

Date:05.04.2016

WATER QUALITY REPORT - Physical & Chemical

1 Client / Organization : NWS&DB
2 . Laboratory Sample No. :
3 . Source of Sample : Buttala treated water
4 Location of Sample : Treated water stock tank
5 . Date & Time of Collection : 26.02.2016
6 . Sample collected by :
7 . Report to be sent to :

	Requirement(SLS614:2013 Part 01) Maximum	Results
PHYSICAL QUALITY		
Colour (Hazen unit)	15	10
Turbidity (N.T.U.)	2	2.15
CHEMICAL QUALITY		
pH	6.5-8.5	8.07
Electrical Conductivity	750 µS/cm	422.00
	Results in mg/l	
Total dessolved solids	2000	nt
Chloride (as Cl)	250	12
Total Alkalinity (as $CaCO_3$)	200	114
Free Ammonia (as NH_3)	0.06	nt
Nitrate (as NO_3)	50	0.8
Nitrite (as NO_2)	3	0.010
Fluoride (as F)	1	0.30
Total Phosphates (as PO_4)	2	0.48
Magnesium	140	nt
Total Hardness (as $CaCO_3$)	250	110
Total Iron (as Fe)	0.3	0.21
Sulphate (as SO_4)	250	1
Manganese	0.05	nt
Calcium hardness	240	nt

Remarks:

his report is issued for the information of the client. It shall not be published in total or in part without the written uthority of the General Manager, National Water Supply & Drainage Board. This report is limited specifically to this pecimen.

..... Chemist

Regional chemist
National water supply &
Drainage Board
Monaragala

..... Laboratory Assistant

Appendix 3: Drinking Water Quality Standards

PHYSICAL AND CHEMICAL QUAILTY (SLS 614 : 2013)

No.	Sri Lanka Standards SLS 614 : 2013	Units	Maximum Requirement
1	Appearance		
2	Colour	Hazen	15
3	Turbidity	NTU	2
4	pH Value		6.5 – 8.5
5	Electrical Conductivity	µs/cm	-
6	Chloride (as Cl^-)	mg / l	250
7	Total Alkalinity (as $CaCO_3$)	mg / l	200
8	Total Hardness (as $CaCO_3$)	mg / l	250
9	Nitrate (as NO_3^-)	mg / l	50
10	Nitrite (as NO_2^-)	mg / l	3
11	Sulphate (as SO_4^{2-})	mg / l	250
12	Fluoride (as F^-)	mg / l	1.0
13	Total Phosphate (as PO_4^{3-})	mg / l	2.0
14	Total Iron as Fe	mg / l	0.3
15	Total Dissolved Solids	mg / l	500
16	Residual Chlorine (as OCl/HOCl)	mg / l	1.0
17	Manganese (as Mn)	mg / l	0.1
18	Magnesium (as Mg)	mg / l	30
19	Calcium (as Ca)	mg / l	100

BACTERIOLOGICAL QUAILTY (SLS 614: 2013)

No.	Type of Bacteria	SLS 614:2013	
		Pipe born water	Well water
1	Total number of all types of Coli form bacteria present in 100 ml sample at 37 °C	< 3	< 10
2	Number of *E. coli* in 100 ml of sample at 44 °C	0	0

PARAMETERS CONCERNING TOXIC SUBSTANCES

01	Arsenic (as As)	mg / l	0.01
02	Cadmium (as Cd)	mg / l	0.003
03	Total Chromium (as Cr)	mg / l	0.05
04	Cyanide (as CN)	mg / l	0.05
05	Lead (as Pb)	mg / l	0.01
06	Mercury (as Hg)	mg / l	0.001
07	Selenium (as Se)	mg / l	0.01

Appendix 4: List of Flora and Fauna Found in the Vicinity of the Subproject Site

(a) The common faunal species identified in the surrounding project areas

Group	Species Name	Common Name	Local Name	Status
Mammals	*Elephasmaximus*	Elephant	Aliya	Threatened
	Pantherapardus	Leopard	Diviya	Threatened
	Melursusursinus	Sloth Bear	Walasa	Threatened
	Hystrixindica	Porcupine	Ittawa	Indigenous
	Funambuluspalmarum	Palm squirrel	Leena	Indigenous
Birds	*Gallus lafayetii*	Sri Lanka Jungle fowl	Walikukula	Endemic
	Magalaimazeylanica	Brown headed Barbet	PolosKottaruwa	BrR
	Oriolusxanthomus	Black-hooded Oriole	Kahakurulla	BrR
	Streptopeliachinensis	Spotted Dove	AluKobeiyya	BrR
	Loriculusberyllinus	Sri Lanka Hanging parrot	GiraMalitta	Endemic
Reptiles	*Calotescalotes*	Green garden Lizard	Pala katussa	Indigenous
	Varanusbengalensis	Land monitor	Thalagoya	Indigenous
	Varanussalvator	Water monitor	Kabaragoya	Indigenous
	Daboiarusselli	Russell,s viper	Tithpolonga	Indigenous
Butterflies	*Graphiumagamemnon*	Green Jay	Kola Papilla	Indigenous
	Catopsiliapomona	Lemon emigrant	Kahapiyasariya	Indigenous
	Melanitisphedima	Dark Evening Brown		Indigenous

BrR-Breeding Resident

(b) List of Flora in the surrounding project area

Species Name	Common name	Life form	Conservation Status
Manilkarahexandra	Palu	Tree	Native
Chloroxylonswietenia	Burutha	Tree	Native
Drypetessepiaria	Weera	Tree	Native
Phyllanthusemblica	Nelli	Tree	
Prosopisjuliflora	Kalapu-andara	Herb	Invasive
Euphorbia tirucalli	Nawa-handi	Herb	Native
Acacia abumean	Kukul-katu	Small tree	Native
Phoenix pusilla	Indi	Small tree	introduced
Salvadorapersica	Malithtan	Small tree	Native
Dichrostachyscinerea	Katu-Andara	Small tree	Native
Borassusflabellifer	Tal	Tree	Native
Cassia auriculata	Rana-wara	Small tree	Native
Vemoniazeylanica	Pupula	Small tree	Native
Cappariszeylanica	Sudu-welangiriya	Small tree	Native
Carissa spinarum	Heen-karamba	Small tree	Native
Alseodaphnesemecarpifolia	Wewarana	Tree	
Canthiumcoromandelicum	Kara	*Herb*	Native
Croton laccifer	Kepptiya	*Shrub*	Native
Berryacordifolia	Halmilla	*Tree*	Native
Eupatorium odoratum	PoddisinnoMaran	*Shrub*	Native
Lantana camara	Gadapana	*Shrub*	Invasive

Species Name	Common name	Life form	Conservation Status
Wattakakavolubilis	Anguna	Herb	Native
Cocciniagrandis	Kowakka	Herb	Native
Sapium insigne	Tel-kaduru	Small tree	Native
Diospyrosebenum	Kaluwara	Tree	Native
Flueggealeucopyrs	Katupila	Shrub	Native
Tamarindusindica	Siyabala	Tree	Introduced
Ziziphusoenoplia	Eraminiya	Liana	Native
Limoniaacidissima	Divul	Tree	Native
Chloroxylonswietenia	Burutha	Tree	Native
Tragiaplukenetii	Walkahabiliya	shrub	Nativu
Cissusquarangularis	Hirressa	Shrub	Native
Sarcostemmabrunonianum	Muwakirriya	Shrub	Nativu

Appendix 5: Completed ADB REA Checklist for Water Supply

Screening questions	Yes	No	Remarks
A. Project siting **Is the project area…**			
• Densely populated?		✓	The population distribution shows that the project area is not densely populated.
• Heavy with development activities?		✓	
• Adjacent to or within any environmentally sensitive areas?		✓	No environmentally sensitive areas are located within the Project
• **Cultural heritage site**		✓	
• **Protected area**		✓	No forest is located near the project area
• **Wetland**		✓	
• **Mangrove**		✓	
• **Estuarine**		✓	
• **Buffer zone of protected area**		✓	
• **Special area for protecting biodiversity**		✓	
• **Bay**		✓	
B. Potential environmental impacts Will the project cause…			
• Pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff?		✓	Not applicable.
• Impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	Not applicable. There are no historical/cultural monuments/areas within or adjacent to subproject sites.
• Hazard of land subsidence caused by excessive ground water pumping?		✓	Not applicable.
• Social conflicts arising from displacement of communities?		✓	No displacements required. Subproject sites are within ROWs of public roads
• Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		✓	Not applicable.
• Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?	✓		Raw water is purified through addition of chlorine
• Delivery of unsafe water to distribution system?		✓	The distributed water will be treated and ensured to comply with the National Drinking Water Quality

Screening questions	Yes	No	Remarks
			Standards.
• Inadequate protection of intake works or wells, leading to pollution of water supply?		✓	Not applicable. Well-protected MenikGanga intake at Udagama & KumbukkanOya intake at Gaminipura have been established.
• Over pumping of ground water, leading to salinization and ground subsidence?		✓	Not applicable.
• Excessive algal growth in storage reservoir?		✓	The water is chlorinated and there is no chance for algal growth
• Increase in production of sewage beyond capabilities of community facilities?		✓	Not anticipated. Community is having good sanitation facilities.
• Inadequate disposal of sludge from water treatment plants?		✓	Minimal sludge to be generated. Dried sludge will be used as soil conditioner and fertilizer in the greenbelt and nearby forested areas.
• Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		✓	Residences are located away from the WTP.
• Impairments associated with transmission lines and access roads?		✓	Not applicable.
• Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.		✓	At Dickyaya & Kumbukkana the facilities provided for receiving, storing, and handling of chlorine and other hazardous chemicals are as per the standards.
• Health and safety hazards to workers from handling and management of chlorine used for disinfection, other contaminants, and biological and physical hazards during project construction and operation?		✓	Well protected hazard management measures are in place at the Buttala WSS.
• Dislocation or involuntary resettlement of people?		✓	No involuntary resettlement impacts envisioned. Lands for the subproject are government-owned
• Disproportionate impacts on the poor, women and children, indigenous peoples or other vulnerable groups?		✓	Not anticipated. The contractor will be encouraged to hire local workers from the local labor force.
• Noise and dust from construction activities?	✓		Anticipated during construction activities. Temporary increase in noise level and dusts may be caused by excavation equipment, and the transportation of equipment, materials, and people. The impacts are negative

Screening questions	Yes	No	Remarks
			but short-term and site-specific within a relatively small area. and reversible through mitigation measures. Good construction practices will mitigate noise and dust, and will be specified in the EMP.
• Increased road traffic due to interference of construction activities?	✓		Traffic management measures will be adopted along the construction sites with proper signage and traffic plans.
• Continuing soil erosion/silt runoff from construction operations?	✓		Due to excavation and run-off from stockpiled materials. The impacts are negative but short-term and site-specific and reversible through mitigation measures. Good construction practices will mitigate soil erosion and silt runoff and will be specified in the EMP.
• Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?		✓	Back wash operations will be adopted for every 24 hours and mud and other impurities will be removed from the sedimentation and filtration beds.
• Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		✓	The project will include development of O&M manuals to ensure facilities are kept in working condition, including checking and maintenance of distribution network. Any distributed water must comply with the National Drinking Water Quality Standards.
• Accidental leakage of chlorine gas?		✓	Not applicable as protective measures have been implemented atButtala WSS.
• Excessive abstraction of water affecting downstream water users?		✓	Not applicable.
• Competing uses of water?		✓	
• Increased sewage flow due to increased water supply		✓	Not applicable. Households have adequate sanitation facilities
• Increased volume of sewage (wastewater from cooking and washing) and sludge from wastewater treatment plant		✓	
• Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Improved management systems through capacity building and institutional development will ensure reduced burden on services and infrastructure.

Screening questions	Yes	No	Remarks
• Social conflicts if workers from other regions or countries are hired?		✓	Priority in employment will be given to local residents.
• Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		✓	Not applicable. Construction will not involve use of explosives and chemicals during the construction phase.
• Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		✓	Work areas will be clearly demarcated with signage and safety barriers, and access will be controlled. Only workers and project concerned members will be allowed to visit the operational sites.

Screening Checklist Prepared By: Karuna Susil Senevirathne

Position: Safeguard Expert (Environmental)
Date Prepared: 25.04 2016

Appendix 6: Records of Public Consultation

Date Conducted. : 29th January 2016

Time : 9.00AM.

Venue : Divisional Secretariat - Buttala

Participants:

1. Mr. JagathPushpakumara, (a former minister for coconut development) Project Director for Special Projects- Uva
2. Medical Officer of Health (MOH), Buttala
3. GramaNiladhari- Kumaragama, Kukurampola&Rahathangama Divisions.
4. Assistant Divisional Secretary-Buttala
5. Project Engineer/ SPCU (Uva)
6. Two Divineguma Development Officers.
7. Rural water Supply Engineering Assistant- NWS&DB /Moneragala
8. OIC NWS&DB Buttala WSS
9. Two Divineguma Mangers-DS Buttala Office
10. Technical Officer –Buttala DS
11. Two Uva Provincial Council Members of Moneragala District
12. Safeguard Manager- SPCU-Uva.
13. Community members from Kumaragama, Kukurampola&Rahathangama GNDs

The community consultation meeting was summoned with the assistance of GramaNiladhari and the officers from the PS and DS offices in Buttala. Main objective of the meeting was to explain the design related to water supply scheme and get the consent of the community and other stake holders.

Main topics discussed

- Objectives of the water supply project and contribution of LGESP and ADB.
- Laying of pipe line for water supply scheme and related design.
- Services provided by the sub project especially in relation to CKD.
- GRM mechanism.

Participants were educated on matters related to above topics. The community members were interested in the final benefits they will receive after completion of the project. Especially they wanted to know whether all the families in the area are going to get pure and safe drinking water. Officer who represented the NWS&DB explained about the technical aspect of the water supply scheme. Officers from the LGESP explained the social and environmental matters related to the project activities. However all the participants expressed their gratitude towards the government and the ADB funded project for making arrangements to supply pure and safe drinking water to their village.

Medical Officer of Health (MOH), Buttala explained the existing situation of the area in particular to the Chronic Kidney Disease (CKD). He explained that the source of origin of the problem is still unknown, but many researches have claimed residues of agrochemicals as one of the main contributory factors to the problem. The people in the Buttala area are becoming more and more vulnerable to the disease due to poor quality of the drinking water. Hence, MOH is at present conducting a door to door survey to get the latest information of incidence of CKD in the area. Therefore the quality of drinking water is very curtail to curtail the spreading of the disease.

The Project Director- Special Projects Uva reiterated the need and the importance of having quality drinking water especially for Rahathangama, Kumaragama and Kukurampola Grama Niladhari divisions as number of CKD patients reportedly high in such areas. Members of the provincial council representing the Buttala highlighted the difficulties faced by the people in the area to get better water. They further pointed out that CKD is not like other diseases, it affects the family economy badly due cost incurred on treatments and other related care and medications.

Villagers representing Rahatangama GN division described that number of kidney patients in the area are increasing even at present there are about 30 patients suffering from the disease. Drinking water for the area is very limited and even the quality is very poor. The situation becomes very serious during dry season; in August and February. People of the Kukurampola and Kumaragama GN divisions explained the similar experiences and requested the Water Board and PuraNeguma Project to support the proposed water project and avoid them continuously being prone to this unfortunate disease further. Everybody in the audience agreed the request and pledged the fullest cooperation as beneficiaries to implement the project successfully.

Representatives of Water Board Monaragala and PuraNeguma Project Unit – Uva briefly explained the design of the project and plan of implementation methodology. Further informed the community that they would be consulted regularly in the process of implementation in the future and the next Public Consultation Meeting was scheduled to be held on 15th February 2016 with more beneficiaries.

After a lengthy and constructive discussion, all the participants thanks the PuraNeguma project for solving a lifelong problem they have faced. A monitoring committee with representatives from the community was formed with the aim of facilitating smooth implementation of the project activities.

Members of the monitoring committee.

1. GramaNiladhariKumaragama,Kukurampola&Rahathangama.
2. R.M. LathaRatnayaka (071- 1703750)
3. K.M. Thilakarathne (071- 7890360)
4. W.M. BandaraMenika
5. D.M. RanjaniAshoka Mala.
6. R.M. AnulaRathnayake (072-1561281).
7. H.M. ChathraPriyantha (071-8650208)

Appendix 7: Complaint Register and Complaint Forms

(To be available in Local Language)

The _____Project welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

Shall you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date		Place of registration	
Contact Information/Personal Details			
Name:		Gender: __Male ___ Female	Age:
Home Address			
Village / Town			
District			
Phone no.			
E-mail			
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your grievance below: If included as attachment/note/letter, please tick here: ___			
How do you want us to reach you for feedback or update on your comment/grievance?			

FOR OFFICIAL USE ONLY

Registered by: (Name of Official registering grievance)			
Verified thru:	___ Note/Letter	___ E-mail	___ Verbal/Telephonic
Reviewed by: (Names/Positions of Official(s) reviewing grievance)			
Action Taken:			
Whether Action Taken Disclosed:		____ Yes	___ No
Means of Disclosure:			

Appendix 8: Applicable Noise Level Standards

PERMISSIBLE NOISE LEVELS IN ACCORDANCE WITH NOISE CONTROL REGULATIONS

Maximum Permissible Noise Levels (as L_{Acq} T) at Boundaries of the land in which the noise source is located shall not exceed the limits set out below.

Area	L_{Acq} T, dB(A)	
	Day Time	**Night Time**
Low Noise (Pradeshiya Sabha area)	50	45
Medium Noise (Municipal Council/Urban Council area)	63*	50
High Noise (EPZZ of BOI & Industrial Estates approved under part IVC of the NEA)	70	60
Silent Zone (100 m from the boundary of a courthouse, hospital, public library, school, zoo, sacred areas and areas set apart for recreation or environmental purposes)	50	45

* Provided that the noise level should not exceed 60 dB (A) inside existing houses, during day time.

Maximum permissible Noise levels at Boundaries of the land in which the source of noise is located in L_{Acq} T for construction activities.

Construction Activities

L_{Acq} T, dB (A)

Day Time	Night time
75	50

The following noise levels will be allowed where the background noise level exceed or is marginal to the given levels in the above table.

(a) For low noise areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise level + 3dB (A)
(b) For medium noise areas in which the background noise level exceeds or is marginal to the given level	Measured Background Noise level + 3dB (A)
(c) For silent zone in which the background noise level exceeds or is marginal to the given level	Measured Background Noise Level + 3dB (A)

BOARD OF INVESTMENT OF SRI LANKA

Appendix 9: Suggested Monitoring Report Format

SAMPLE Semi-Annual Environmental Monitoring Report Template

This template must be included as an appendix in the EIA/IEE that will be prepared for the project. It can be adapted to the specific project as necessary.

Introduction

- Overall project description and objectives
- Description of sub-projects
- Environmental category of the sub-projects
- Details of site personnel and/or consultants responsible for environmental monitoring
- Overall project and sub-project progress and status

No.	Sub-Project Name	Status of Sub-Project				List of Works	Progress of Works
		Design	Pre-Construction	Construction	Operational Phase		
		☐	☐	☐	☐		
		☐	☐	☐	☐		
		☐	☐	☐	☐		

Compliance status with National/ State/ Local statutory environmental requirements

No.	Sub-Project Name	Statutory Environmental Requirements	Status of Compliance	Action Required

Compliance status with environmental loan covenants

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

Compliance status with the environmental management and monitoring plan

- Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.
- There should be reporting on the following items which can be incorporated in the checklist of routine Environmental Site Inspection Report followed with a summary in the semi-annual report send to ADB. Visual assessment and review of relevant site documentation during routine site inspection needs to note and record the following:
    - What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries;
    - If muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads;
    - adequacy of type of erosion and sediment control measures installed on site, condition of erosion and sediment control measures including if these were intact following heavy rain;
    - Are their designated areas for concrete works, and refuelling;

- Are their spill kits on site and if there are site procedure for handling emergencies;
- Is there any chemical stored on site and what is the storage condition?
- Is there any dewatering activities if yes, where is the water being discharged;
- How are the stockpiles being managed;
- How is solid and liquid waste being handled on site;
- Review of the complaint management system;
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Appendix 10: Summary Monitoring Table

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Overall Compliance with CEMP/ EMP

No.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

Approach and methodology for environmental monitoring of the project

- Brief description on the approach and methodology used for environmental monitoring of each sub-project

Monitoring of environmental Impacts on Project Surroundings (ambient air, water quality and noise levels)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Noise Quality Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Monitoring Results)	
			Day Time	Night Time

Appendix 11: Sample Environmental Site Inspection Report

Project Name
Contract Number

NAME: _____ DATE: _____
TITLE: _____ DMA: _____
LOCATION: _____ GROUP: _____

WEATHER CONDITION:
_____

INITIAL SITE CONDITION: _____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory _____ Incident _____Resolved _____ Unresolved _____

INCIDENT:
Nature of incident:
_____

_____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition Yes

Signature
_____

Sign off

_____ _____

Name **Name**
Position **Position**

Appendix 12: References

1. Forest Department, 2010. Integrated Strategic Environmental Assessment Project, Uva Province, Forest Cover Assessment and Identification of Forests and Other Ecological Sensitive Areas for Conservation funded by UNDP.
2. Moneragala DistrictPhysical Environment. V. S. Attanpola, R. H. C. Dabrera, A. A. M. Irfan, A. M. P. D. M. Abeyweera, Luke Bott.
3. National Environmental Act No 47 of 1980 and its Amendments/Rules and Regulations published in the Extraordinary Gazette Notifications in 1992 and 2006.
4. SampathPethikade of Buttala Divisional Secretariat Division, 2014/15.

Appendix 13: Maps related to the water supply sub project

Figure 2: Schematic diagram of the Kukurampola Water Supply Sub project

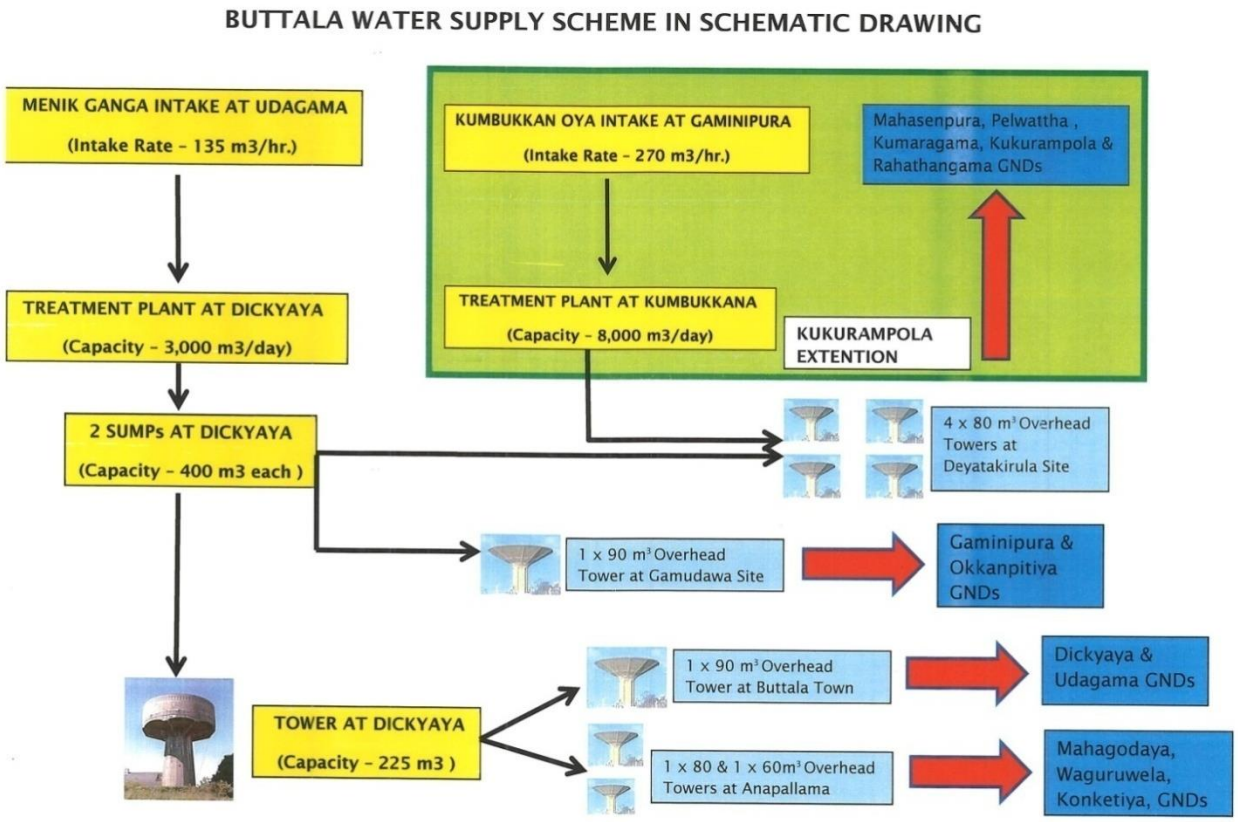


Figure 4: Final Designs of the Kukurampola Water Supply sub project

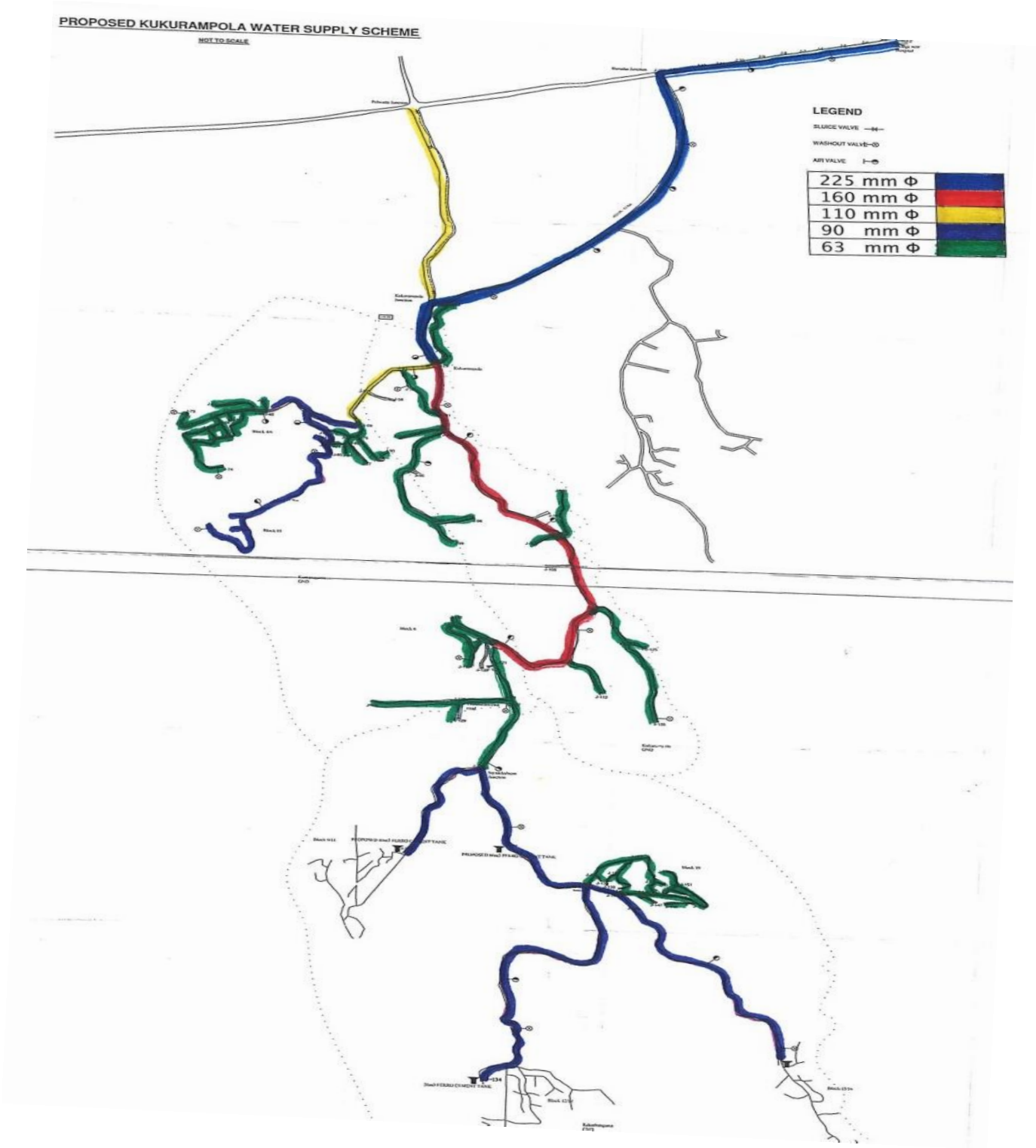


Figure 5: Map showing the Land Use Pattern in the project area

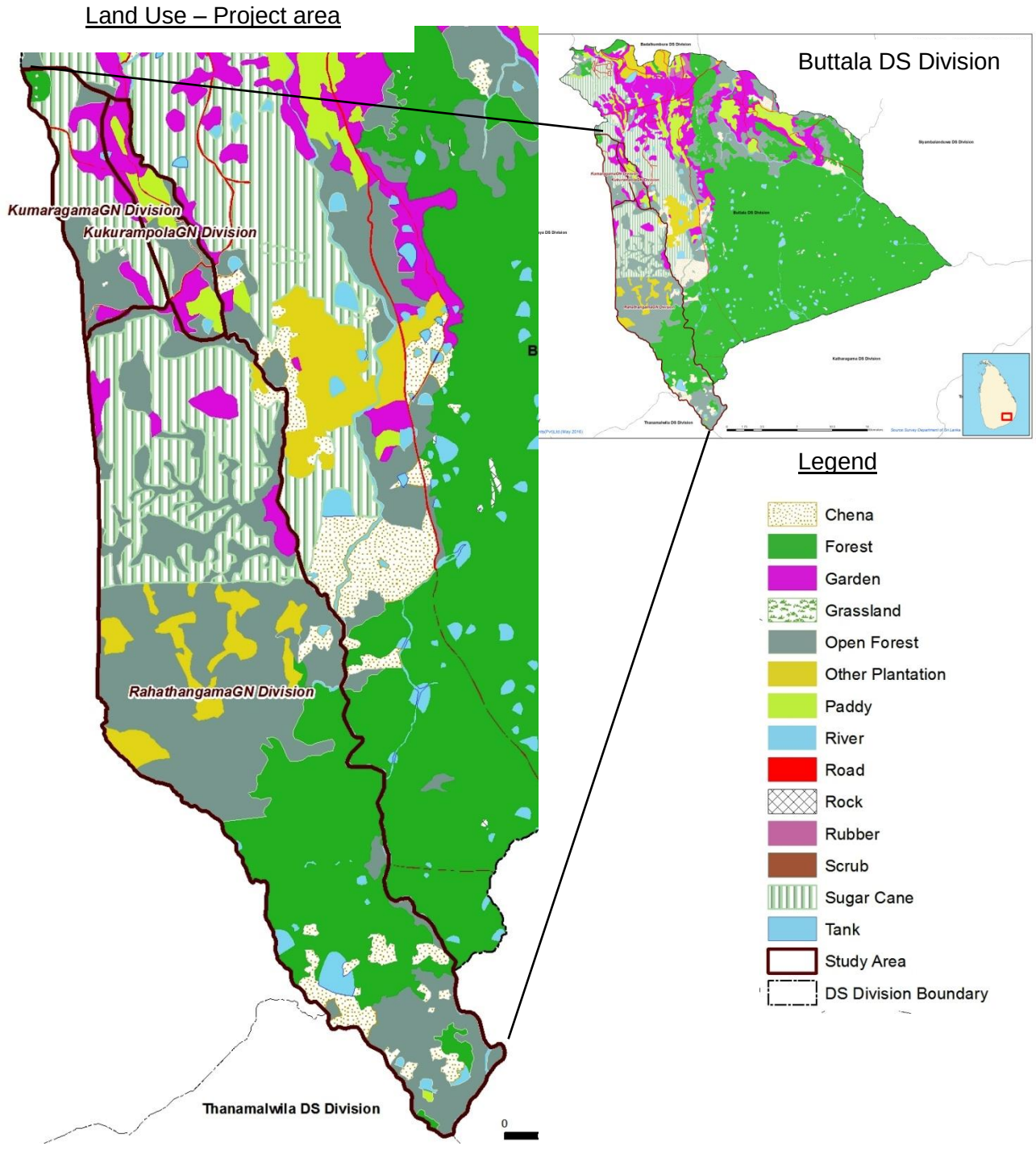
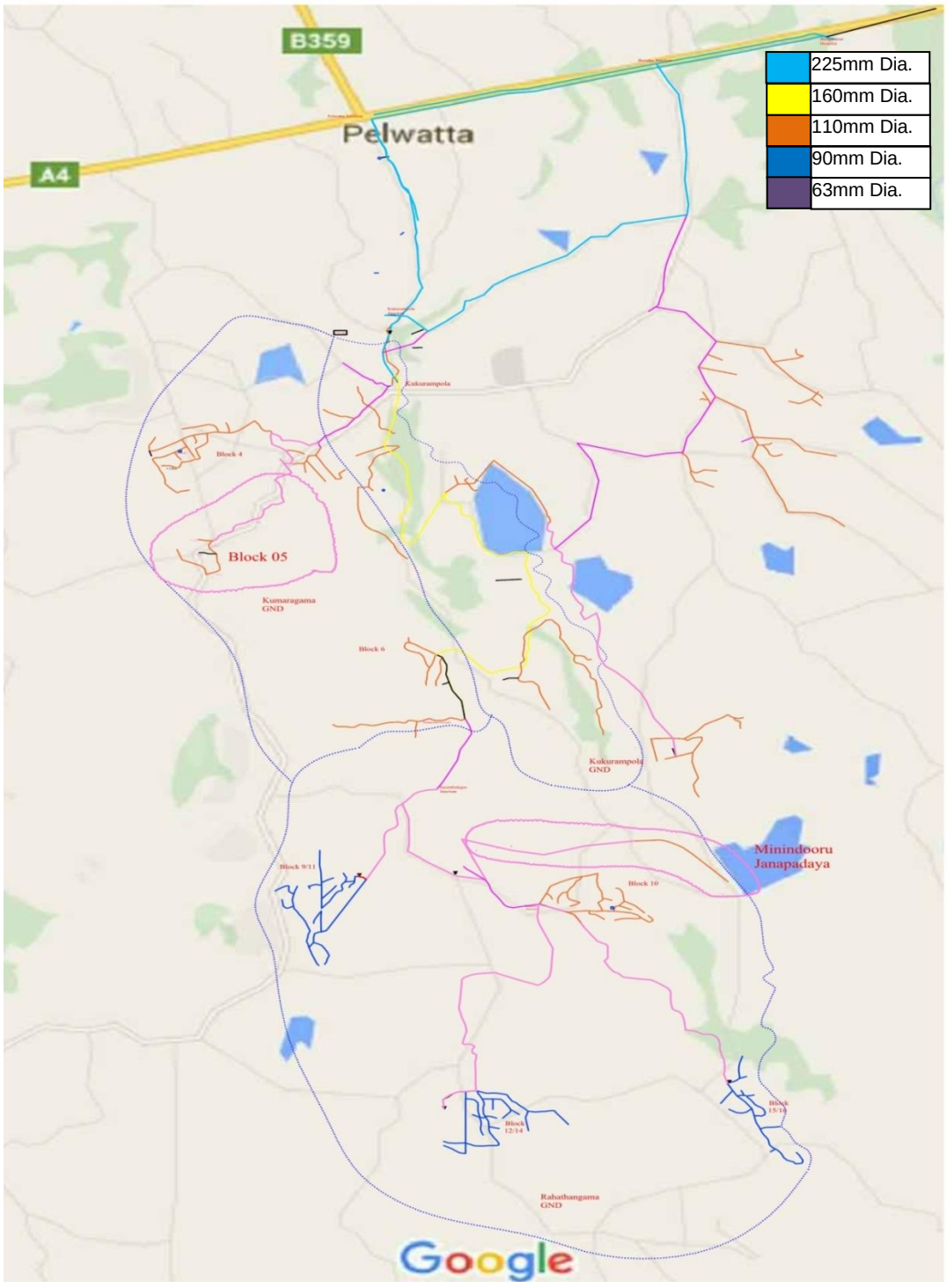


Figure 6: Map showing pipe line laying in the proposed area



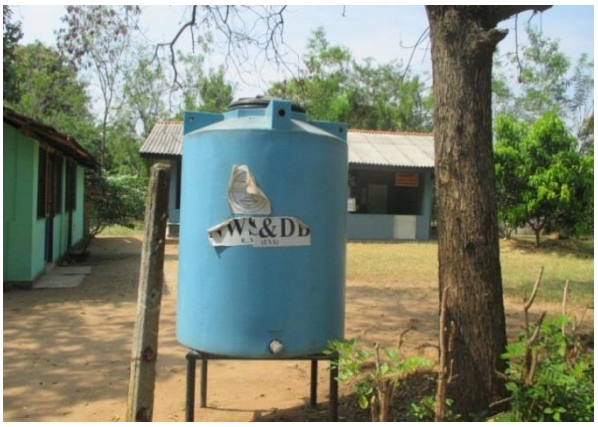
Appendix 14: Photographs of the project area

(a) Water Treatment Plant at Dickyaya

(b) Storage tanks at DeyataKirula site Buttala

(c) Sugarcane Plantations in Kukurampola

(d) Livestock is a popular livelihood in Kukurampola area



(e)Water being distributed by NWS&DB at Kukurampola Area

(f)The present end point of Buttala Water Supply Scheme on Wellawaya Moneragala Road

(g) Existing intake at Menik ganga being improved to cater Kukurampola demand

(h)Public Consultation at Buttala Divisional Secretariat -29.01.2016

Appendix 15: Consent Application Letters

09/03/2016 (4)

ජාතික ජල සම්පාදන හා ජලාපවහන මණ්ඩලය
தேசிய நீர் வழங்கல் வடிகாலமைப்புச் சபை
National Water Supply & Drainage Board

ප්‍රාදේශීය සහය සේවා මධ්‍යස්ථානය (ඌව)
பிரதேச உஷா மத்திய நிலையம் (ஊவா)
Regional Support Centre (Uva)

විශාඛා මාවත - බණ්ඩාරවෙල
விசாகா வீதி, பண்டாரவெளை
Visaka Mawatha, New Road, Bandarawela.

නියෝජ්‍ය කාමන්ත්‍රාධිකාරී (ඌව)
பிரதி பொது முகாமையாளர் (ஊவா)
Deputy General Manager (Uva)

දුරකථන / தொலைபேசி / Telephone: 057-2224417 Direct; 057-2222417 Ext. 32; 057-2221417 ADSL

ෆැක්ස් / பெக்ஸ் / Fax: 057-2223417

මගේ අංකය / உங்கள் இல. / My No. .....

ඔබේ අංකය / உமது இல. / Your No. .....

දිනය / திகதி / Date: 02.03.2016

Provincial Director,
Uva Provincial Office,
Provincial Road Development Authority,
Bandarawela.

Dear Sir,

Kukurampola Water Supply (Extension) Project
Subject-Request for road approval for laying of pipes

Cronical Kidney Disease (CKD) is a prominent disease in Buttala area. People who are living in the Kukurampola, Kumaragama and Rahathangama GND's are suffering from CKD.Main reason for the CKD is assumed as unsafe drinking water. Above mentioned project has been started under ADB funds to mitigate the CKD risk.
In this project, some of the distribution mains have been designed to be laid along PRDA roads. The road section is from Burutha junction to Siyambalagas junction along the road. The designs were carry out to minimize the road damage in the project. Designs of the distribution system are in final stage. Proposed pipe laying plan has been attached here too.

So please be kind enough to inform the possibility for a joint inspection and submit the estimate for the road reinstatement to proceed.

Your positive feedback in this regard would be highly appreciated.

Thanking you.

.....
Eng. K Pratheepan
Assistant General Manager (Uva)

CC:-
1. Addl.Gm(S/E) - For kind information, please
2. Senior Engineer (Puranaguma) - For kind information, please

ප්‍රධාන කාර්යාලය / பிரதான அலுவலகம் / Head Office
දුරකථන - සභාපති / தொலைபேசி - தலைவர் / Telephone - Chairman 01-12634488
කාමන්ත්‍රාධිකාරී / முகாமையாளர் / General Manager 01-12636446
ප්‍රධාන කාර්යාලය / பிரதான அலுவலகம் / Head Office 01-12635281, 01-12635247, 01-12634631, 01-12635827, 01-12638999
ලිපිනය / முகவரி / Address : ජ. පෙ. අංකය / த. பெ. இல / P.O.Box 14
ගල්කිස්ස, ගාල්ල පාර, රත්මලාන. / கல்கிசை, காலி வீதி, இரத்மலானை. / Mt.Lavinia, Galle Road, Ratmalana
Tlx. 21482 NWSDW CE
Fax. 636449, 637178, 635999

MINISTRY OF WATE

09/03/2016 (3)

ජාතික ජල සම්පාදන හා ජලාපවහන මණ්ඩලය
தேசிய நீர் வழங்கல் வடிகாலமைப்புச் சபை
National Water Supply & Drainage Board

ප්‍රාදේශීය සහය සේවා මධ්‍යස්ථානය (ඌව)
பிரதேச உஷா மத்திய நிலையம் (ஊவா)
Regional Support Centre (Uva)

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பிரதி பொது முகாமையாளர் (ஊவா)
Deputy General Manager (Uva)

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මගේ අංකය / உங்கள் இல. / My No. .....

ඔබේ අංකය / உமது இல. / Your No. .....

දිනය / திகதி / Date: 02.03.2016

Provincial Director,
Uva Provincial Office,
Road Development Authority,
Bandarawela.

Dear Sir,

Kukurampola Water Supply (Extension) Project
Subject-Request for road approval for laying of pipes

Cronical Kidney Disease (CKD) is a prominent disease in Buttala area. People who are living in the Kukurampola, Kumaragama and Rahathangama GND's are suffering from CKD.Main reason for the CKD is assumed as unsafe drinking water. Above mentioned project has been started under ADB funds to mitigate the CKD risk.

In this project, some of the distribution mains have been designed to be laid along RDA roads. The road section is from Buttala base hospital to Burutha junction along the A4 road. The designs were carry out to minimize the road damage in the project. Designs of the distribution system are in final stage. Proposed pipe laying plan has been attached here too.

So please be kind enough to inform the possibility for a joint inspection and submit the estimate for the road reinstatement to proceed.

Your positive feedback in this regard would be highly appreciated.

Thanking you.

.....

Eng. K Pratheepan
Assistant General Manager (Uva)

CC:-

1. Addl.Gm(S/E) - For kind information, please
2. Senior Engineer (Puranaguma) - For kind information, please

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ලිපිනය : තැ. පෙ. අංකය / முகவரி : த. பெ. இல / Address : P.O.Box 14
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