Initial Environmental Examination

Project number: 42459-014
May 2016

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

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

CURRENCY EQUIVALENTS

(as of 20 May 2016)

Currency unit	–	Sri Lankan Rupee (Rs)
Rs1.00	=	$ 0.0069
$1.00	=	Rs 145

ABBREVIATIONS

ADB	-	Asian Development Bank
AF	-	Additional Financing
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
EDP	-	Economically Displaced Person
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
EPL	-	Environmental Protection License
FGD	-	Focus Group Discussion
IEE	-	Initial Environmental Examination
IGS	-	Income Generating Schemes
IOL	-	Inventory of Losses
GRC	-	Grievance Redress Committee
GRM	-	Grievance Redress Mechanism
GSMB	-	Geological Service and Mine Bureau
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
NCP	-	North Central province
NGO	-	Nongovernmental Organization
NWSDB	-	National Water Supply and Drainage Board
NIRP	-	National Involuntary Resettlement Policy
O&M	-	operation and maintenance
PS	-	Pradeshiya Shabha
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	-	Subproject 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.

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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 NWSDB. 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 NWSDB 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 *PradeshiyaSabhas*, provincial councils, and MPCLG.

8. **The subproject:** Thirappane GN division is situated about 30 km way from Anuradhapura along A9 road. The Thirappane water supply project is an extension of the Kekirawa water supply project implemented in the Anuradhapura district. The proposed project starts from about 150 m away from A9 road (Kekirawa - Maradankadawala road) along the Puddukkulama - Mannakulama road and will be extended across villages of Mannakulama, Pethis Rambewa and Athungama and finally meets the A9 main road from where the main water supply line will be laid along the A9 road from 116 Km post to 120 Km post. Total length of the Thirappane water supply scheme is about 23 km. This proposed project will cover Aluth Punchikulama, Thirappnegama, Wanamal Uyana, Mannakkulama and Pethis Rambewa GN divisions in the Thirappane DS division. Also, Heenukkiriyawa GN in the Kekirawa DS division will be covered partly by the proposed project. The pipe sizes to be laid along the main line extension will be 160 mm, 110 mm and 100 mm while the distribution lines will include mainly 63 mm and 90 mm.

9. About 2440 people will be provided with pure and safe drinking water by this project. The water supply for the proposed water supply will be 351 m^3 per day and the number of new water connections will be 610. The people living in these villages are presently using well water for drinking purpose. Around 21 numbers of CKD patients have been identified in these areas and it has become the responsibility of National Water Supply and Drainage Board (NWSDB) to provide drinking water to these villages. During the dry period (June to October), these people face drinking water shortage. And also the ground water is not suitable for drinking purpose due to poor quality.

10. The Kekirawa water supply scheme receives water from Kalawewa water tank as the primary water source and the water treatment plant located at Ihalagama village has purification capacity of 18000 m^3 per day. As these villages are located in distant places and the NWSDB has planned to use two existing water towers for the extension of pipe line. The Ranawiru village tower will supply water to Aluthpunchikulama along the A9 road. Thonigala water tower will supply water to Pethisrambawa and Heenukkiriyawa

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11. **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.

12. **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.

13. 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.

14. **Location of the subproject.** The proposed project starts from about 150 m away from A9 road (Kekirawa - Maradankadawala road) along the Puddukkulama - Mannakulama road and will be extended across villages of Mannakulama, PethisRambewa and Athungama and finally meets A9 main road from where the main water supply line will be laid along A9 road from 116 Km post to 120 Km post. Total length of the Thirrappane water supply scheme is about 23 km. This proposed project will cover AluthPunchikulama, Thirappnegama, Wanamal Uyana, Mannakkulama and PethisRambewa GN divisions in the Thirappane DS division. Also, Heenukkiriyawa GN in the Kekirawa DS division will be covered partly by the proposed project. The new water supply is fed from the Ranaviru and Tonigala towers.

15. **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.

16. 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.

17. 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.

18. 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.

19. **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.

20. **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.

21. **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.

22. **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

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.

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8. The people living in these villages are presently using well water for drinking purpose. Around 21 numbers of CKD patients have been identified in these areas and it has become the responsibility of National Water Supply and Drainage Board (NWSDB) to provide drinking water to these villages. During the dry period (June to October), these people face drinking water shortage. And also the ground water is not suitable for drinking purpose due to poor quality.

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B. Background of the IEE

10. 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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13. 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 trenches and laying of pipes 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 and activities will be limited within permissible values or not above the background values if these are above the permissible limits. Stakeholder consultation is an integral part of the IEE.

II. DESCRIPTION OF THE SUBPROJECT

A. Present Status

14. Due to geochemical condition of the province and continuous use of agrochemicals in the agricultural sector, the ground water and surface water quality levels have been dramatically deteriorated causing CKD to considerable number of people living in the Anuradhapura district. At present, there are 21 CKD affected patients living in the proposed project area.

15. The people living in the proposed project area use ground water as the main water source. The ground water is contaminated with high fluoride content and other heavy elements. As well, the ground water level is dramatically reduced during the period from June to September of the year. Hence the residents and children face severe drinking water shortage and are forced to buy pure drinking water from RO plants and other water selling locations.

16. The main cause for CKD is due to consumption of inferior quality of water by the poor farming community in these areas. It is crucial to mention that CKD is spreading very fast in the NCP and with the objective of avoiding and minimizing the spread of CKD affected people in the NCP, 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 NCP in collaboration with NWSDB who has established and are managing large scale water supply schemes in the NCP.

17. Three community based water supply schemes operating in the proposed project area have no adequate pure drinking water supply as three ground water wells provide water them. Hence, the people including infants and children have faced drinking water shortage and have no access for safe and pure drinking water from outside. On the other hand, areas covering the Thirappane town and suburbs are having important government institutions, commercial establishments and residential areas. This area had no pure and safe drinking water ever since except ground water from wells.

18. The Kekirawa water supply scheme is one of the largest scale water supply schemes commenced in 1985 with the objective provision of clean drinking water for large extent of residential and commercial areas.

19. The main water treatment plant located at Ihalagama village operates under following steps to purify the water

- Aeration
- Flocculation
- Sedimentation
- Filtration
- Chlorination

20. Appendix1 provides the detailed water treatment process. The water quality of treated water complies with given water quality standards of Sri Lanka Institute for standards (SLS) 2013 for drinking water as shown in Appendix 3.

21. The sludge produced is removed from sludge lagoons and spread in the nearby forested area (not protected area) and banana plantation. The supernatant water is released to the nearby water body. It is important to mention that the quantity of sludge produced from the treatment plant has not been estimated and the water quality of supernatant water has not been analyzed by NWSDB over last few years. However, existing sludge lagoons and dry beds will be upgraded under this "Puraneguma project" \in the latter part of 2016. Under the new project, the sludge disposal system, estimation of sludge quantity and analysis of supernatant water will be streamlined and recorded for proper operation and maintenance purpose of the treatment plant. It was proved through discussions with water engineers of NWSDB that Kekirawa water supply project has been operating without creating any environmental hazards and social disharmony due to disposing of sludge and waste water to outside.

22. The 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 free in the treated water delivered to the people. In addition, raw water samples tested were at high quality drinkable status as compared to other numerous water sources of the Anuradhapura district.

B. Need for the Subproject

23. The residents of the proposed project area use groundwater for drinking which is highly contaminated due to presence of fluoride and heavy elements. The water level of wells is reduced during the period from June to October and creates severe water shortage for the people seeking water from outside sources like RO plants and other water selling locations. As per statistics, 21 CKD patients have been reported in the project area. Therefore, 691 families (projected number of beneficiary families) living in the project area include children, infants and elderly people need to have access to clean and safe drinking water from NWSDB. As a result, the new Thirappane water supply extension should be executed from Puddukkulama-Mannakulama road to 120 Km post of A9 road across few villages.

C. Details of the Subproject

24. 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 Resource Development Consultant Ltd (RDC) who work as the Consultants of the subproject.

25. 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.

26. Location. The Proposed project starts from about 150 m away from A9 road (Kekirawa-Maradankadawala road) along the Puddukkulama - Mannakkulama road and will be extended across villages of Mannakkulama, Pethis Rambewa and Athungama and finally meets A9 main road from where the main water supply line will be laid along A9 road from 116 Km post to 120 Km post. Total length of the Thirappane water supply scheme is about 23km. This proposed project will cover Aluth Punchikulama, Thirappnegama, Wanamal Uyana, Mannakkulama and Pethis Rambewa GN divisions in the Thirappane DS division. Also, Heenukkiriyawa GN in the Kekirawa DS division will be covered partly by the proposed project. The new water supply is fed from the Ranaviru and Tonigala towers.

27. Details of the component: NWS&DB is planning to lay around 19 km long pipe line starting from Puddukkulama - Mannakkulama road to inside few villages until the pipeline is met again on the A9 road at 116 Km post. Thereafter, about 4 km long main pipe line will be laid and extended up to 120 km Post. Under this new water supply project, only new pipe laying will take place for provision of water. 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 and other stake holders at the consultation meeting held on 2nd May 2016. Table 1 provides the major features of the subproject.

Table 1: Major Features of the Proposed Water Supply Subproject

Major Features	Description	Location
Transmission and distribution pipe line network	The Proposed project starts from Puddukkulama-Mannakkulama road and will be extended across villages of Mannakkulama, Pethis Rambewa and Athungama and finally meets the A9 main road from where the main water supply line will be laid along the A9 road from 116 Km post to 120 Km post. The pipe sizes to be laid along the main line extension will be 160 mm and 110 mm while the distribution lines will include mainly 90 mm and 63 mm.	As shown in the drawing Figure 3.

D. Implementation Schedule

28. The subproject is to be implemented over a period of 15 months. This excludes period for procurement of contractors. Fifteen months would be for construction and finally commissioning of the new water supply project.

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

29. 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.

30. 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.

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

32. 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.

33. 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.

34. 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

35. 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 1990 to 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.

36. 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 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

Laws and Regulations	Provisions and Main Content
	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.

37. Applicability to the subproject. The Thirappane 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 needs not 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,

- 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.
- The subproject **is not located within 100 m** from the boundaries of or within any area declared under the Forest Ordinance (Chapter 451).

- The subproject **is not located within** coastal zone as defined in the Coast Conservation Act No 57 of 1981.
- The subproject **is not located within** any erodible area under the Soil Conservation Act (Chapter 450).
- The subproject **is not located within** flood prone areas declared under Flood Protection Ordinance (Chapter 449).
- 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.
- 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.
- There **are no** reservations beyond the full supply level of a reservoir within the proposed subproject site.
- The subproject **is not located within** any archaeological reserve, ancient or protected monument as defined or declared under the Antiquities Ordinance (Chapter 188).
- The subproject **is not located within** any area declared under the Botanic Gardens Ordinance (Chapter 446).
- 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).
- 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.
- The subproject **is not located** within 100m from the boundaries of or within any area declared under the Forest Ordinance (Chapter 451)
- 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.

38. 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 this should 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,

DoF-Department of Forests, DS-Divisional secretariat, LAs-Local Authority, MOD-Ministry of Defense

C. Environmental Standards

39. 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).

40. Status of EPL. NWSDB does not need to obtain the EPL for operation of Ihalagama water treatment plant (IWTP) under the Kekirawa Water supply scheme. As its current Capacity is18000 m^3 per day which is much less than 500,000 m^3 per day the minimal requirement for obtaining the EPL from CEA. As the subproject will only involve with laying of pipelines construction, the subproject will not require the EPL from CEA.

41. 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 IWTP conducted by NWSDB show compliance with 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

42. The IEE was based mainly on secondary sources of information and field reconnaissance surveys as the subproject is involved with laying of pipe lines only. 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 if the noise and dust values will be limited within permissible levels, there will not be any environmental impacts on the local community in the project. If these are above the permissible limits, stakeholder consultation will be an integral part of the IEE.

43. 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 50-100 m from either side of road sections determined for burying pipelines in the

proposed project area. The land use pattern up to 50 m 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 and bird species were identified and recorded. 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. Resource Development Consultants (RDC) conducted the field assessments from 2nd May 2016 in the Thirappane Divisional Secretariat of the Anuradhapura district of Sri Lanka.

44. 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.

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

46. 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

47. Location. The Proposed project starts from about 150 m away from A9 road (Kekirawa-Maradankadawala road) along the Puddukkulama-Mannakkulama road and will be extended across villages of Mannakkulama, Pethis Rambewa and Athungama and finally meets A9 main road from where the main water supply line will be laid along A9 road from 116 Km post to 120 Km post. Total length of the Thirappane water supply scheme is about 23km. This proposed project will cover Aluth Punchikulama, Thirappnegama, Wanamal Uyana, Mannakkulama and Pethis Rambewa GN divisions in the Thirappane DS division. Also, Heenukkiriyawa GN in the Kekirawa DS division will be covered partly by the proposed project.

48. 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 amphibolites facies. The North, North Western segment from Puttalam to Trincommalee consists mainly of Miocene age limestone, sedimentary formations deposited in Tertiary and Quaternary periods.

49. 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. Meta sediments, Charnockitic gneisses, basic rocks, migmatites and granitic gneisses, granites and pegmatite are particularly present in this region

50. 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 Humic Gley soils and Grumusol soils are present.

51. Topography and Climate. The Proposed project area is flat and undulating terrain. No hilly or mountainous areas are falling in the project area. The project area receives the water from November to February during the North –Eastern monsoonal rain. The average annual rainfall received to this area is about 1800mm and the driest months prevail from June to October causing depletion of ground water level.

52. The evapo-transpiration is higher in most of Anuradhapura climatic zones including the proposed project area. The average temperature in the project area varies from $29C^0$ to 34 C^0. The highest temperature is 36 C^0 recoded from June to October of the year as shown in the Table 4.

Table 4: Climate Data of the Area

Parameter	Figures
Temperature (C^0)	$29C^0$-34 C^0
Precipitation (mm)	1250-1960 mm

53. Hydrology and Drainage. The Periyakulam water tank is situated about 800m away from the proposed project area and there are no natural streams running along roads proposed for pipe laying. Except 5-7 km of the roads, majority of roads are in gravel form and have no concrete line drains either side of roads. Therefore, run off generated during the rainy season flow down to gravel drains. However, the concrete side drains have been established at some lengths along the Kekirawa - Maradankadawala A9 road. Hence, the drainage over flows across the roads and leads to low land areas causing some soil erosion.

54. Surface Water Quality. The surface water is highly polluted due to addition of Agrochemicals, human fecal matters and surface drainage receiving due to absence of proper drainage system. It has been proved that geochemically dissolved elements like Mn, Cu, fluoride and chloride are high in concentration as compared to content of the surface waters in the country. As well, 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 of the Thirappane area and surrounding areas..

55. It can be observed that in the proposed project area, it is very difficult to see surface water bodies within 500 m distance from the proposed project area. Hence it can be concluded that contamination of surface water is highly unlikely situation due to implementation of the proposed project.

56. 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 the North –Central province (NCP). 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 has been 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 in Anuradhapura district.

57. Air 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.

58. Domestic sources of air pollution will include emissions from burning of agricultural wastes, other domestic solid wastes, 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.

59. 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.

60. 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

61. Forests and ecological sensitive areas. The proposed project site is located in the rural residential and paddy field areas and forest patches are not intercepted except small teak plantation in the Athungama area.

62. Few trees like Mara, Teaks, and Siyabala may be uprooted due to construction of trenches for pipe laying in the project area. Branches of trees will be trimmed as required along the roads. However the list of flora and fauna existing along roads is mentioned in the Appendix 4 and about 20 trees may be cut down for the civil construction works of the project.

63. Distribution of faunal species. As described above, ecologically sensitive areas like mangroves, marshy areas and wetlands do not exist in the project area. Hence, sensitive faunal species like threatened birds, mammals, reptiles and other animals are not existent in the project area. However, common birds like crows, parrots, alukobeiiya are abundantly residing in the area.

64. Wetlands. There are no wet lands in the Anuradhapura district 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.

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

D. Socio Economic Profile

66. Under the special scheme of supplying pure and safe drinking water to CKD prone area, NWSDB has planned to extend the pipe line to supply pure and safe water to villages in Aluth Punchikulama, Thirappanegama, Wanamal Uyana, Pethis Rambawa GN Divisions in Thirappane DS area and Heenukkiriyawa GN Division in the Kekirawa DS area. Details of the population and expected coverage are as follows. Villages are situated in a distance about 500 to 950 m interior along the A9 road between Thirappane and Maradankadawala.

Table 5: Project covering GN divisions

GN Division.	Population.	Proposed coverage population.
Aluth Punchikulama.	806	288
Thrappanegama	718	232
Wanamal Uyana.	1328	240
Mannakkulama	575	400
Pathis Rambawa	679	660
Heenukkiriyawa.	1071	620

Source: Above data is based on NWSDB

67. As these villages are located in distant places and the NWSDB has planned to use two existing water towers for the extension of pipe line. The Ranawiru village tower will supply water to Aluth Punchikulama along the A9 road. Thonigala water tower will supply water to Pethis Rambawa and Heenukkiriyawa. Number of new connection will be 610 and volume of water will be 351 m^3/day.

68. The area is coming under the administration of the Divisional Secretary's office in Thirappane and Thirappane Pradeshiya Sabha. Socio Economic profile of the area is given below.

Table 6: Population Details

GN Division.	Number of Families.	Female.	Male.	Total.
Thirappanegama.	309	526	498	1024.
Aluth Punchikulama.	98	780	811	1591.
Mannakullama.	262	375	353	728
Pathis Rambawa.	269	404	387	791.
Wanamal Uyana.	398	635	634	1269
Heenukkiriyawa.	280	567	511	1078

Source: Above data is based on Sampath Pathikada, 2014.

Table 7: Population Distribution

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GN Division.	0-5		6-15		16-60		Above 60	
Thirappanegama	34	28	126	119	320	314	46	37
Aluth Punchkulama	102	98	195	211	338	372	145	130
Mannakulama	43	33	62	73	233	216	37	31
Pathis Rambawa.	29	18	132	119	178	203	65	47
Wanamal Uyana.	59	63	88	84	466	460	22	27
Heenukiriyawa.	68	60	180	170	235	221	67	60

Source: Above data is based on Sampath Pathikada, 2014

69. Population details show that female population is great than the male population. Other important feature is that the number of dependents in families is quite high. Total number in depending age groups 0- to 15 and above 60 is very high compared to the working age group 16 to 60. When it is taken in relation to the vulnerability against the CKD epidemic, it is justifiable the water supply project.

70 It is observed that there are considerable numbers of Samurdhi recipients in these villages.

- Thirappanegama - 47
- Aluth Punchikulama - 65
- Mannakkulama - 78
- Pethis Rambawa - 126
- Wanamal Uyana - 123
- Heenukkiriyawa - 154

(Source- DS Office).

Table 8: Employment Status

GND.	Government.		Private.		Self Employment		Foreign Employment		Agriculture		Other	
	F	M	F	M	F	M	F	M	F	M	F	M
Thirappanegama	28	13	24	7	8	14	12	2	230	252	0	0
Aluth Punchkulama	15	19	3	7	8	3	23	3	290	348	2	4
Mannakulama	7	24	20	6	6	10	10	14	98	127	12	8
Pathis Rambawa.	8	6	5	4	4	3	32	4	129	153	0	0
Wanamal Uyana.	45	85	55	69	55	35	6	2	94	188	31	24
Heenukiriyawa.	21	17	34	23	45	28	9	3	89	167	12	18

M: Male, F: Female (Source: Above data is based on Sampath Pathikada, 2014)

71. Employment details show that women are leading in government sector employment. In all other GN Divisions, women have surpassed men in achieving places in government sector jobs. Figures show that similar numbers of persons are engaged in private sector too. It is observed that considerable number both men and women are engaged in self-employment. However, large number is engaged in agriculture related activities. Another important factor is large number of women have gone for foreign employment.

Table 9: Land use pattern

Coverage of Land.	Home Garden	Land Hectors	Percentage
Reservation.	-	254.46	0.9
Home Garden.	-	2168.58	7.5
Agri-Crops.	Coconut.	44.5	0.1
	Other Crops.	410.4	1.4
	Paddy.	4497	16.
Forest Land.	Forest.	5012	17.5
	Forest Cultivated.	57	2
	Shrub land.	2301	8
Wild life Reservation	-	525.	1.8
Water.	Tanks, Canals.	2692.7	9.4
Other	-	970	3.3
Rocks and Sandy	-	598	2.1
Total.	-	28591.64	100

Source: Above data is based on Sampath Pathikada, 2014

72. Figures related to land use pattern show that majority of land has been allocated for paddy cultivation. It is a natural tendency as facilities have been given for paddy cultivation. Second largest portion of land is allocated for home gardening. This is due to the fact that number of houses has gone up in the project area and on the other hand, majority of people think that the vegetables free from pesticide and other chemicals should be used for consumption. As well, the home gardening has been limited to home consumption and commercial level cultivation is done at chena cultivation. As a result of this situation, the land area covered by chena cultivation has been increased compared to 2012.

Health Status

73. It is observed that the community members of this area are living a generally satisfactory life in relation to health status. General awareness on health related matters is satisfactory.

74. According to the information collected by DS office is that about 97% of the population use individual toilets while balance 3% shares with the family members, parents and grandparents. About 96% of community members live in completed houses with roofing sheets and cemented floor while balance members are in the process of building their houses according to their economic status.

75. General facilities for helping to maintain good health is satisfactory. There are two rural hospitals within the area covered by these GN Divisions. MOH office at Thirappane conducts normal maternal and child health clinics in villages with PHI and the Family health Mid Wife.

76. There are few private clinic centers served by government doctors where the community members go for treatment in the evenings. On the other hand as these villages are situated along the A9 road, people can go to hospitals in Anuradhapura and Kandy for special treatment.

77. Drinking water is the only problem that these community members cannot solve easily. According to the health and social sources, all people are satisfied with normal well water till the eruption of the CKD epidemic happened. According to the information available at the DS team 90% of the members have dug wells and others get water from sources like tap lines and canals.

78. At present, all the community members are concerned about the water that they drink. With the awareness created by multitude media, all people are trying to get pure and safe drinking water. Majority of community members have cultivated a practice to get bottled drinking water or using purified water from RO plants. At the community meetings held at village level, all people continuously demanded for pure and safe drinking water.

Electricity and Communication

79. According to the information collected from DS office, about 92% of households have electricity and the balance number is waiting to get the service in the near future.

Transport.

80. During the field visit, it was observed that there is a road network that connects with all villages with each other and with the main road A9. There is a well operated bus service on main roads and all the families own private transport facilities such as motor cycles and three wheelers.

E. Site Specific Description of Environmental Conditions

81. The proposed project site is running through paddy fields, residential areas, home gardens, barren lands and chena farming areas. The houses are sparsely located in village areas and most of the raids are gravel roads and few roads are concrete roads except the main asphalted A9 road. In the Athungama area, small teak plantation and abandoned chena farming areas can be observed. The gravel roads that are to be excavated for laying pipes have enough road width though the out the road network. Some roads are partially eroded due to high rain fall condition in the area. The section of A9 road for about 4 Km will be used for laying pipes both LHS and RHS. This A9 road has sufficient road width for constricting tranches for pipe lines. However, water bodies are not located within 500m of the project area. The sensitive environment areas are not seen within the project area.

V. ANTICIPATED IMPACTS AND MITIGATION MEASURES

82. 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

83. 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.

84. 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 10. These can largely be avoided through proper subproject design or mitigation through adopting proper mitigation measures and management of the project which will be incorporated into contractors' contract documents.

B. Construction

85. 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 Thirappane town 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.

86. 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.

87. Noise level should be below 75 db (A). Machines used for drilling and mixing of concretes should not produce the sound level above 75 db (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.

88. Trenches 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.

89. 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.

90. It is advised to carry out the construction activities during the dry season especially from June to October 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.

91. 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.

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

93. Storage of PVC 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 as it will minimize the inconvenience on residents, commercial establishments and other transport services at construction sites.

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

95. 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 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.

96. 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.

97. 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.

98. 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.

99. 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.

100. 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 11.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

101. 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.

102. 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 waste water due to 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

103. 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.

104. 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 PVC 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.

105. Monitoring of water quality and quantity should be done on regular basis by NWSDB during the operational period. The water quality tests should be done by NWSDB and relevant MOH office.

106. 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.

107. There may be increased back wash operations due to accumulation of more particles in filters at the IWTP. 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) and banana plantation located in the back

of IWTP. The waste water is released to an open water body located in the vicinity of the IWTP. However, the existing sludge lagoons and dry beds will be upgraded under the "Puraneguma project" in the latter part of 2016. Under the new project, the sludge disposal system, estimation of sludge quantity and analysis of supernatant water will be streamlined and recorded for proper operation and maintenance purpose of the treatment plant.

108. 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.

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

110. 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 waste water from increased back wash operations (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 11. NWSDB will be responsible for mitigation activities and monitoring of effectiveness of these measures.

111. Table10 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 11 provides the mitigation measures to ensure that impacts are within acceptable limits and remain insignificant throughout subproject implementation.

Table 10: 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
	Approvals obtained from Irrigation Department for use of stream side	N	T
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
	Amount of Sludge generated	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 NWSDB	N	T
	Possible negative impacts to quality and quantity of water supplied by the project and to 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
	Possible negative impacts to PVC pipes suspended along the stream	N	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 11: 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

Activity	Potential Negative Impacts	Mitigation Measures
		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 the existing CBO pipelines	No such CBO water scheme has been implemented in the area.
	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
	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 to other water intakes	Water quality and quantity tests to be carried out on regular basis (dry and wet periods) and diversion of water from the primary water intakes to irrigation or other means will be stopped.
	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
	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 INFORMATION DISCLOUSURE

A. Consultations Conducted

112. 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 increasing number of CKD patients 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.

113. 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 Thirappane Predeshiya Shabha office on 2nd May 2016. 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.

114. Recommendations of the public consultation

- All households in the area should be given the water connections.
- Water quality tests at periodic intervals should be conducted as scheduled.
- Assessing water quantity at periodic intervals should be done as scheduled.
- The environmental and social issues should be resolved with the participation of local community.

Table 12: Summary of the Public Consultation Conducted

Date of consultation meeting	Place held	Consultation tool	Aim of the meeting	Participants	Issues raised
02/05/2016	Thirappane Predishiya Sabha, Thirappane	Group discussion and individual interviews.	To educate the people of Thirappane about the potential environmental and social issues and delivery of pure drinking water with the support of NWS&DB and PMU.	Local residents of Thirapnne and officers from Thirappane PS, DS,NWS&DB and SPCU, RDC, Forest Department and Grama Niladari.	Water connections to all households, Supply good quality water, change of the technical design, Resolving social and environmental issues and reducing CKD patients

					through provision of clean drinking water.

B. Future Consultation and Disclosure

115. 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.

116. 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

117. 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.

118. 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.

119. 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.

120. 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

121. 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 redresses 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.

122. 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.

123. 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.

124. 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:

- 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;
- Grievance monitoring sheet with actions taken (investigation, corrective measures); and
- 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.

125. 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.

126. **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

[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 pradeshiyasabha; (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) GramaNiladhari of the area; (vii) Social Safeguard and gender Manager - as Member Secretary

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.

127. 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.

128. 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 Redressal 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.

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

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

131. 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).

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

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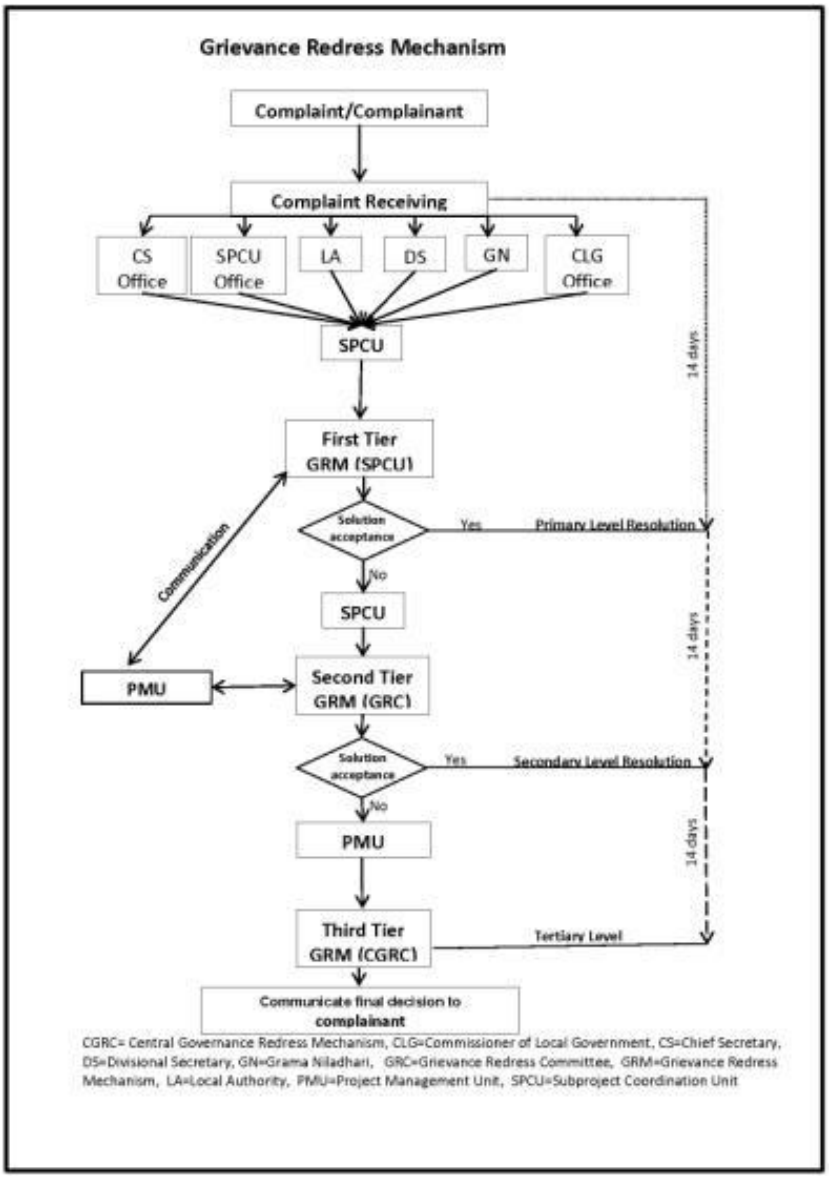
of the GRC. The functions of the local GRC are as follows: (i) resolve problems quickly and provide support to affected persons arising from various issues including environmental and social issues.

Figure 1: Tiers of GRM



VIII. ENVIRONMENTAL MANAGEMENT PLAN

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

134. 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.

135. 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.

136. 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

137. 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.

138. 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 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.

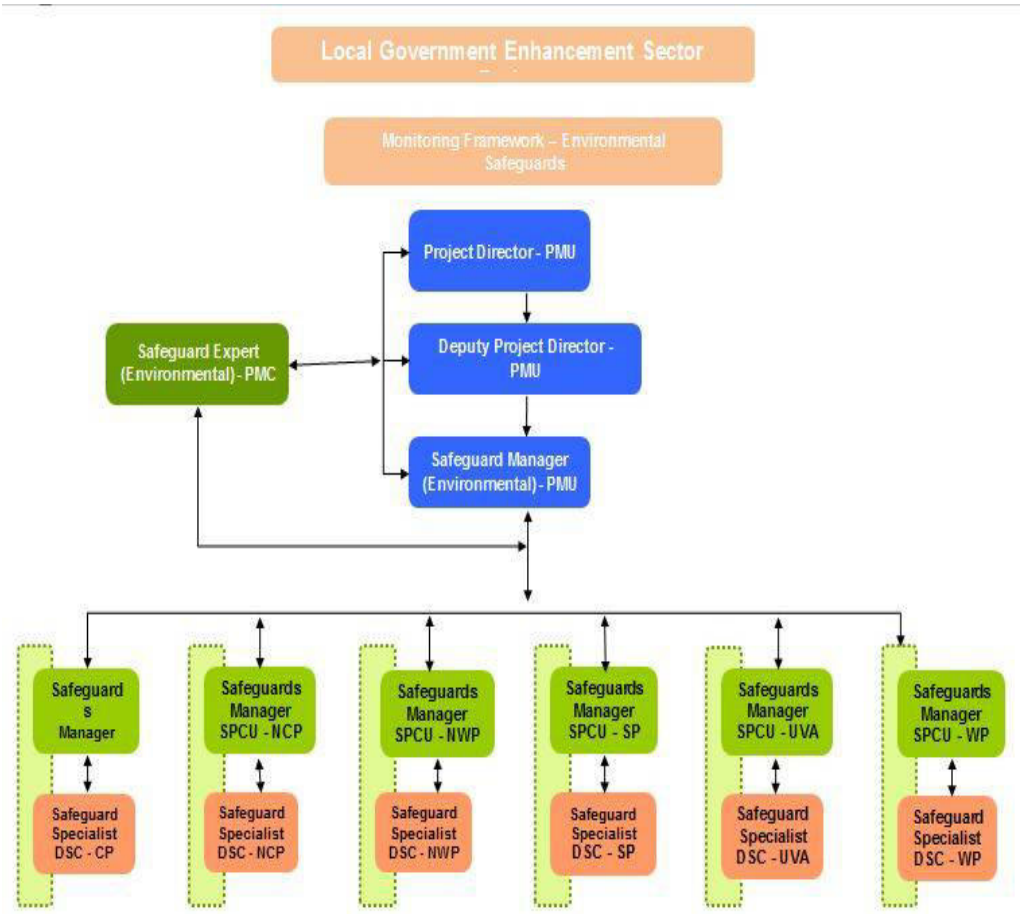
139. The PMU will be assisted by PMC Safeguard Specialist (PMC SS). The PMC SS will (i) review and finalize all reports in consultation with the PMU ESO; (ii) provide project management support, (iii) assure the technical quality of design and construction; (iv) review EIA/IEE/resettlement plan/indigenous 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.

140. 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 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.

141. .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 2: Safeguards Implementation Arrangement



B. Institutional Capacity Development Program

142. 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 13.

Table 13: 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 safeguard s 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	*Pradeshiya Sabhas*, SPCU Staff	Lecture	½ Working Day	SPCU, DSC, PMU

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
	Statutory requirements as per Government and ADB				
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 Management Good Practices in Urban Infrastructure Projects	*Pradeshiya Sabhas*, SPCU Staff	Workshop		SPCU, DSC, PMU
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	*Pradeshiya Sabhas*, SPCU Staff	Lecture and/or Interactive Sessions		SPCU, DSC, PMU

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
	Procedural Requirements Cooperation and Coordination with other Institutions. Requirement of target setting, team work and team building				
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/ consultants towards protection of environment Implementation Arrangements Monitoring mechanisms Introducing necessities of auditing, checks and balances	*Pradeshiya Sabhas*, SPCU Staff	Lecture and/or Interactive Sessions	½ Working Day	SPCU, DSC, PMU
Module VII	Monitoring and Reporting System	*Pradeshiya Sabhas*, SPCU	Lecture and/or	½ Working	SPCU, DSC, PMU

Program	Description	Participants	Form of Training	Duration/ Location	Conducting Agency
		Staff	Interactive Sessions	Day	

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

143. 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.

144. The indicative costs of these various inputs are shown in Table 14.
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Table 14: 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 data	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.
(b) Construction Phase		-	-	Civil Works Contractor Costs
(c) O&M		-	-	*PradeshiyaSabhas'* cost
(iii) Landscaping and tree-planting	Lump sum per province (7 provinces)	$2, 000	$14,000	Civil Works Contractor Costs
(iv) Capacity	Lump sum	$1,000	$7,000	On job training is done by PMC /

Building Expenses	per province (7 provinces)			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

145. 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 EMP implementation. No works are allowed to commence prior to approval of EMAP

E. Environmental Monitoring Program

146. Table 16 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.

Table15: 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 to surrounding areas.	Contractor	NWSDB SPCU and CLG	Field report and complaints if any	Contractor's cost
	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

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Source of Funds
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	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 on quality and quantity of water supplied by the project	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
	Possible negative impacts to PVC pipes laid	Pipelines laid in the passage of road ROW is located far from parking areas	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
	along roads due to allowing of all heavy vehicles to be parked					
	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 16: 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

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 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	Project site	Daily
	Impacts on existing habitats	No endemic or endangered tree species are damaged and to control soil erosion, plant more trees in the	Contractor	NWSDB SPCU and CLG	Field report and complaints if	Project site	Once Six months

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
		project area and the neighborhood			any		
	Damages to natural drainage pattern	No impact for drainage flow as drainage flows down along roads and to 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
	Sludge generation	Collect in an underground chamber and allow 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	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

Activity	Potential Negative Impacts	Mitigation Measures	Responsible for Mitigation	Responsible for Monitoring	Parameter/s to be Monitored	Location	Frequency
	by NWS&DB						
	Possible negative impacts on quality and quantity of water supplied by the project	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
	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

147. 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.

148. 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.

149. 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.

150. 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.

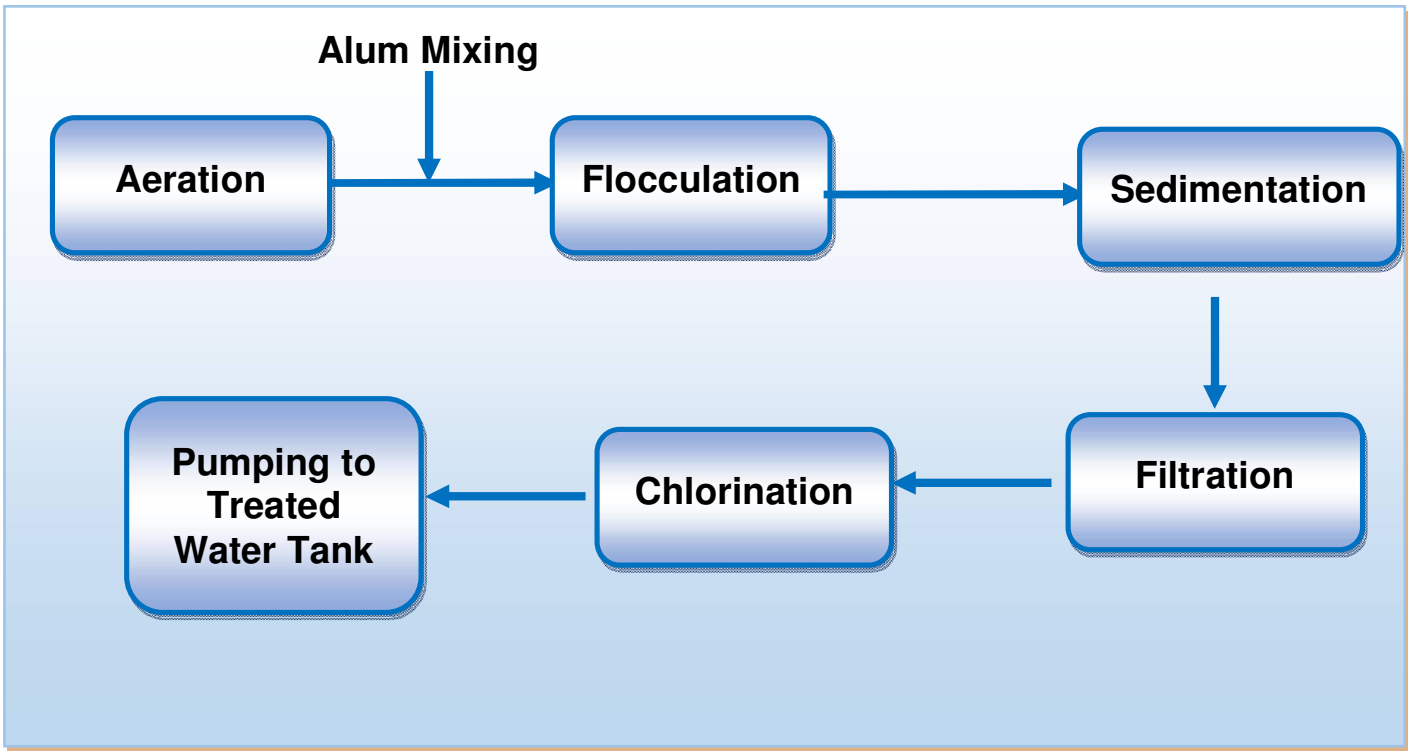
X. CONCLUSIONS AND RECOMMENDATIONS

151. The negative environmental impacts arising due to execution of the proposed water supply scheme weigh less 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 October, water quantity and quality should be carefully assessed by NWS&DB as the water level of the Kalawewa water tank may be reduced due to severe drought condition in the area. Negative impacts can be mitigated to acceptable levels through proper change of engineering design and application of recommended mitigation measures and procedures as mentioned in the EMP/EMAP.

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

153. 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:
The Kekkirawa water treatment plant is a conventional surface water treatment plant 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 (AlminiumSulfate) 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.

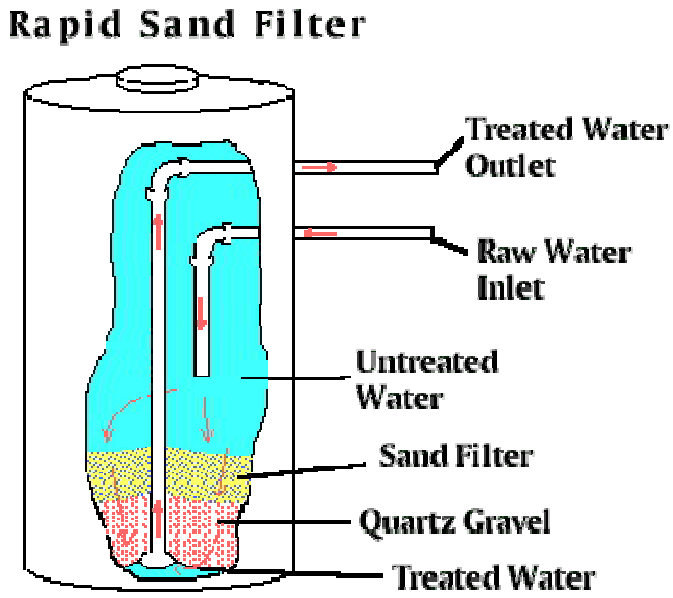
Sedimentation:
Waters exiting in the flocculation basin enter the sedimentation basin or called it as a clarifier or settling basin. It is a large tank with low water velocities, allowing floc to settle to the bottom. The sedimentation basin is best located close to the flocculation basin. Hence, the 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. It has been planned to establish dry beds in the second phase of the Capacity improvement.

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.

These 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 treatment Plant, 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 Tests

NATIONAL WATER SUPPLY & DRAINAGE BOARD
REGIONAL LABORATORY, ANURADHAPURA
Tel : 025 2222296, Fax : 025 2225609, E mail : anu.reg.lab@gmail.com

1. WATER SUPPLY SCHEME : Ihalagama

2. SAMPLE COLLECTED DATE : 2016.03.02

3. LABORATORY REG. NO. & SAMPLING POINT :

No.	Time of sampling	Sampling Point
451	13.05	Kala wewa
452	12.58	Intake (Yodha ela)
453	12.17	Settled water
454	12.15	Filtered water
455	12.13	Sump
456	12.09	Tap at I/Mangalapura vidyalaya
457	13.21	Tap at Thalawa rd
458	13.38	HC Ranaviru village
459	12.40	Tap at Diyawara gammanaya
460	13.15	HC Vijithapura rd
461	13.17	Tap at Kalakarambewa

4. SAMPLE COLLECTED BY : Mr. Sudath Dayarathne -Lab Attendant

5. REPORT REQUIRED BY
1 Manager (O&M)
2 District Engineer (Anuradhapura)
3 OIC Ihalagama

Results:

Parameters	Units	Maximum Requirement	451	452	453	454	455	456	457	458	459	460	461
PHYSICAL AND CHEMICAL QUAILTY (SLS 614 - 2013)													
Colour	Hazen	15	30	28	08	06	10	06	05	05	05	07	07
Turbidity	NTU	2	6.25	5.42	0.78	0.35	1.18	0.64	0.39	0.16	0.27	0.52	0.44
Electrical Conductivity at 25°C	µs/cm		262	264	259	263	263	286	273	270	276	270	272
pH		6.5 - 8.5	8.17	8.13	7.99	7.60	8.08	8.11	7.98	7.58	7.75	7.61	7.43
Chloride (as Cl^-)	mg / l	250	30	30	-	-	30	-	-	-	-	-	-
Total Alkalinity (as $CaCO_3$)	mg / l	200	130	130	-	-	110	-	-	-	-	-	-
Total Hardness (as $CaCO_3$)	mg / l	250	120	120	-	-	120	-	-	-	-	-	-
Nitrates as NO_3^-	mg / l	50	0.44	1.32	-	-	1.32	-	-	-	-	-	-
Nitrites as NO_2^-	mg / l	3	0.016	0.013	-	-	0.009	-	-	-	-	-	-
Sulphate(as SO_4^{2-})	mg / l	250	02	04	-	-	10	-	-	-	-	-	-
Fluorides (as F^-)	mg / l	1.0	0.38	0.36	-	-	0.38	-	-	-	-	-	-
Total phosphate (as PO_4^{3-})	mg / l	2.0	0.45	0.51	-	-	0.54	-	-	-	-	-	-
Iron (as Fe)	mg / l	0.3	0.01	0.05	-	-	0.11	-	-	-	-	-	-
Free Ammonia (as NH_3)	mg / l	0.06	-	-	-	-	-	-	-	-	-	-	-
Residual Aluminium	mg / l	0.2	-	-	-	-	0.050	-	-	-	-	-	-
Total Dissolved Solids	mg / l	500	168	169	166	168	168	183	175	173	177	173	174
Residual Chlorine	mg / l	1.0	-	-	-	-	1.35	1.31	1.18	0.21	1.15	0.60	1.00
BACTERIOLOGICAL QUALITY (SLS 614 - 2013)													
Coliform bacteria	Per 100 ml	0	TNTC	TNTC	-	-	0	0	0	0	0	0	0
E-Coli Bacteria	Per 100 ml	0	TNTC	TNTC	-	-	0	0	0	0	0	0	0

TNTC - Too Numerous to count.

Recommendation:

Bacteriological, tested basic physical and chemical quality of the samples are satisfactory.

14.03.2016
Date

Regional Chemist
National Water Supply & Drainage Board
Regional Laboratory
Anuradhapura.

Regional Chemist

Appendix 3: Drinking Water Quality Standards

DRINKING WATER QUALITY PARAMETERS

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 project Site

(a) The common faunal species identified in the project area

Group	Species Name	Common Name	Local Name	S.Status
Mammals	*Hystrix indica*	Porcupine	Ittawa	Indigenous
	Funambuluspalmarum	Palm squirrel	Leena	Indigenous
Birds	*Passer domesticus*	House Sparrow	Gekurulla	Indigenous
	Centropussinensis	Greater Coucal	Ati-Kukula	Indigenous
	Copsychussaularis	Oriental Magpie Robin	Polkichcha	Indigenous
	Streptopeliachinensis	Spotted Dove	AluKobeiyya	Indigenous
	Loriculusberyllinus	Sri Lanka Hanging parrot	GiraMalitta	Indigenous
Reptiles	*Varanusbengalensis*	Land monitor	Thalagoya	Indigenous
	Varanussalvator	Water monitor	Kabaragoya	Indigenous
	Daboiarusselli	Russell's viper	Tith polonga	Indigenous
Butterflies	*Graphiumagamemnon*	Green jay	Kola Papilla	Indigenous
	Melanitisphedima	Dark Evening Brown		Indigenous

BrR-Breeding Resident

(b) List of Flora in the project area

Species Name	Common name	Life form	Conservation Status
*Albizzia**molucana***	Mara	Tree	Introduced
Limoniaacidissima	Divul	Tree	Native
Mangiferaindica	Mango	Tree	Introduced
Terminalia arjuna	Kubuk	Tree	Native
Phyllanthusemblica	Nelli	Tree	Native
Berryacordifolia	Halmilla	*Tree*	Native
Gliricidiasepium	Wetimara	Tree	Introduced
Syzygiumcumini	Maadan	Tree	Native
Morindacitrifolia	Ahue	Tree	Native
Cocusnucifera	coconut	Tree	Introduced
Prosopisjuliflora	Kalapu-andara	Herb	Invasive
Tamarindusindica	Siyabala	Tree	Introduced
Ziziphusoenoplia	Eraminiya	Liana	Native
Tragiaplukenetii	Walkahabiliya	shrub	Nativu
Cissusquarangularis	Hirressa	Shrub	Native

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		✓	
• 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 before delivery and it is ensured to comply with the National Drinking Water Quality Standards.
• Inadequate protection of intake		✓	Not applicable. Well-protected

Screening questions	Yes	No	Remarks
works or wells, leading to pollution of water supply?			Ihalagama water sump has 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 banana plantation 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.		✓	We designed office and warehouse have been built at the site of WTP.
• 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 IWTP
• 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 but short-term and site-specific within a relatively small area. and reversible through mitigation measures. Good

Screening questions	Yes	No	Remarks
			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 that 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 at IWTP
• 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 the reduced burden on services and infrastructure.
• 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,		✓	Not applicable. Construction will not involve use of explosives and

Screening questions	Yes	No	Remarks
and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?			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: W.M. Lalith Perera

Position: Environmental Specialist
Date Prepared: 04.05 2016

Appendix 6: Records of Public Consultation

Venue.- Conference Hall- Thirappane Pradeshiya Sabha
Date- 2nd May 2016

Participants.

1. Ven.Sudharshan Thero.
2. Secretary- Pradeshiya Saba.
3. Technical Officer
4. Community Development Officer.
5. GramaNiladhari- Wanamal Uyana.
6. GramaNiladhari- Thirappanegama.
7. Development office-Thirappane DS Office.
8. Development officer- Mannakkulama.
9. Development officer- Wanamal Uyana.
10. GramaNiladhari- Thrappanegama.
11. Team Leader- RDC
12. Safeguards Consultant - RDC.
13. Safeguards Manager - SPCU.
14. Participants- 118.

Community Consultation meeting was organized with the assistance of the DS and PS office of Thirappane . Secretary and staff members of Thirappane Pradeshiya Sabha gave extra support to organizers to make the meeting successful because the Secretary was the main facilitator in many work implemented under LGESP works in the area. Officers of PS and DS took special effort, because the communities coming under their preview were suffering to a greater extent due to lack of pure and safe drinking water. All the stakeholders and more than hundred community members participated with great enthusiasm. Following main topics were discussed in detail at the Community Consultation Meeting.

- 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.
- Rights of indigenous people and minority groups in relation to implementation of community projects under ADB financial assistance.

Process of the Meeting.
At the beginning of Officers of the RDC Consultancy office explained the legal and social aspect of the project implementation. Project objectives were explained and community members were requested to cooperate with the implementation work to obtain the maximum benefit of the water supply project in the wake of the CDK epidemic. Pipe laying design was given to the community representative to get their feedback on the coverage of the all houses in the village. Community members showed some new areas where the pipe line should be extended.

Explained about the GRM Mechanism developed by the project and explained that the grievances and complains should be genuine and practical. Further it was explained that the project activities will be implemented in such a way that no person or the properties belonging to a person will be harmed or damaged. Community members mentioned that they extend their fullest cooperation because the project will solve one of the greatest problems they faced in their life time.

Explained the project policy on minority groups, indigenous people and gender sensitivity. Community members clearly explained that these issues are not relevant to these areas because all the community members living a harmonious life.

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Special issues came up at the CC meeting.

Some community members had their doubts whether the houses situated in by roads will get the water connection. Project office Team Leader explained that the objective of the project is to provide safe drinking water to all the houses. As such all the houses situated in the divisions will get the water connection.

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Some community members came from other G|N Divisions wanted to know whether they can get new extension through the same project. Project Team Leader explained that it will be possible through a new project proposals.

Community coordinating committee was formed to ensure the smooth running of the project and diffusion of information on project related matters.

Community committee was formed by the community members with the aim of communicating with the project staff and solving problems that may come up during the construction stage for the smooth completion of the project.

Meeting was concluded with a happy note in every body. Community members pledged their support to implement the project successfully.

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:
_____I
ncident 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 [ ] No [ ]

Signature
_____

Sign off

_____ _____

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

Appendix 12: References

1. ADB Safeguards Policy Statement, 2009.
2. National Environmental Act No 47 of 1980 and its amendments/Rules and regulations published in the Extraordinary Gazette Notifications in 1992 and 2006.
3. Forest Department, 2010. Integrated Strategic Environmental Assessment Project, Forest Cover Assessment and Identification of Forests and Other Ecological Sensitive Areas for Conservation funded by UNDP.
4. Gunatillake, N., Pethiyagoda, R. and Gunatillake S.-2008-Biodiversity of Sri Lanka.
5. Sampath Pethikade of Thirappane and Kekirawa Divisional secretariats, 2015.

Appendix 13: Maps related to the water supply sub project

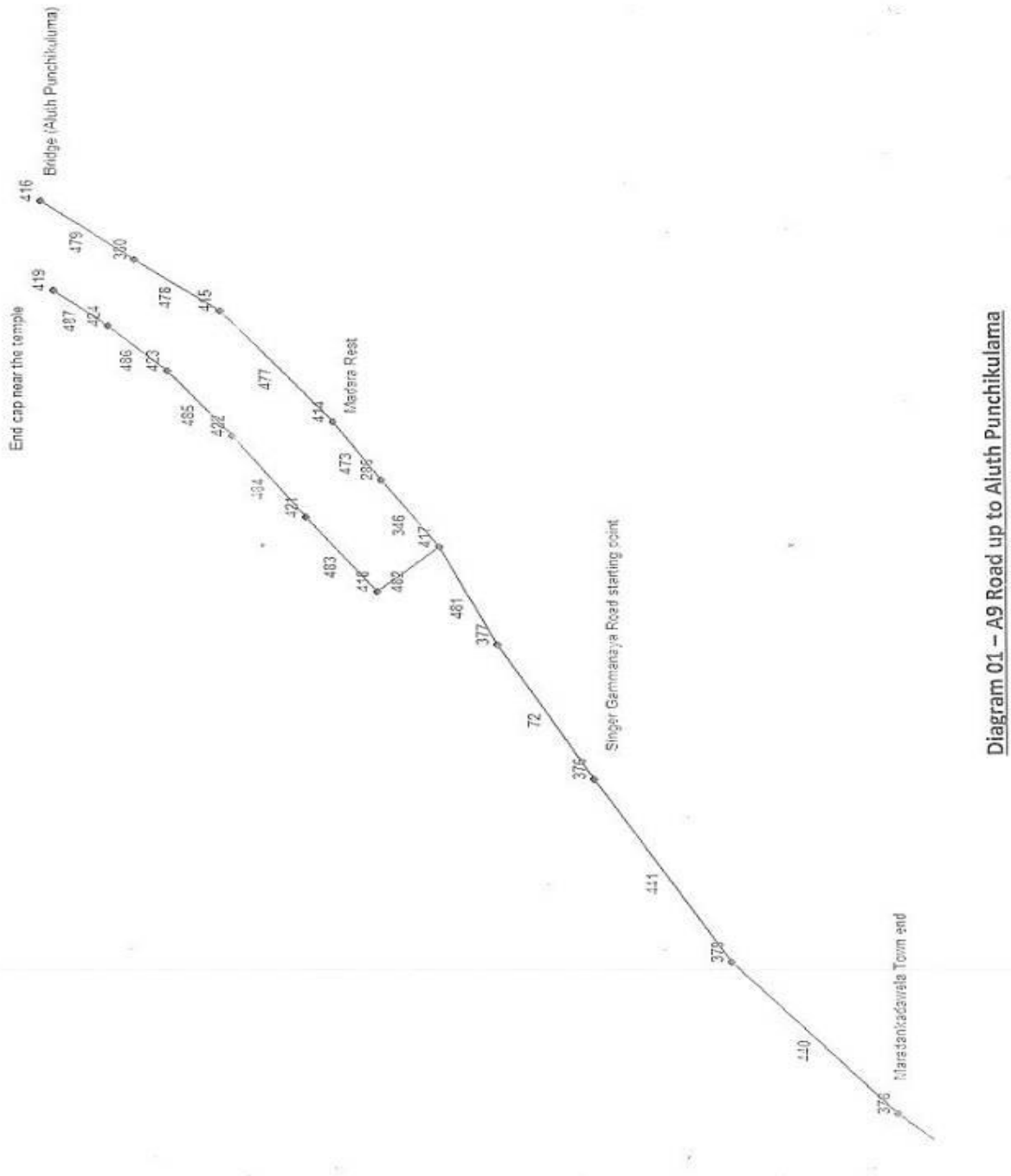


Diagram 01 – A9 Road up to Aluth Punchikulama

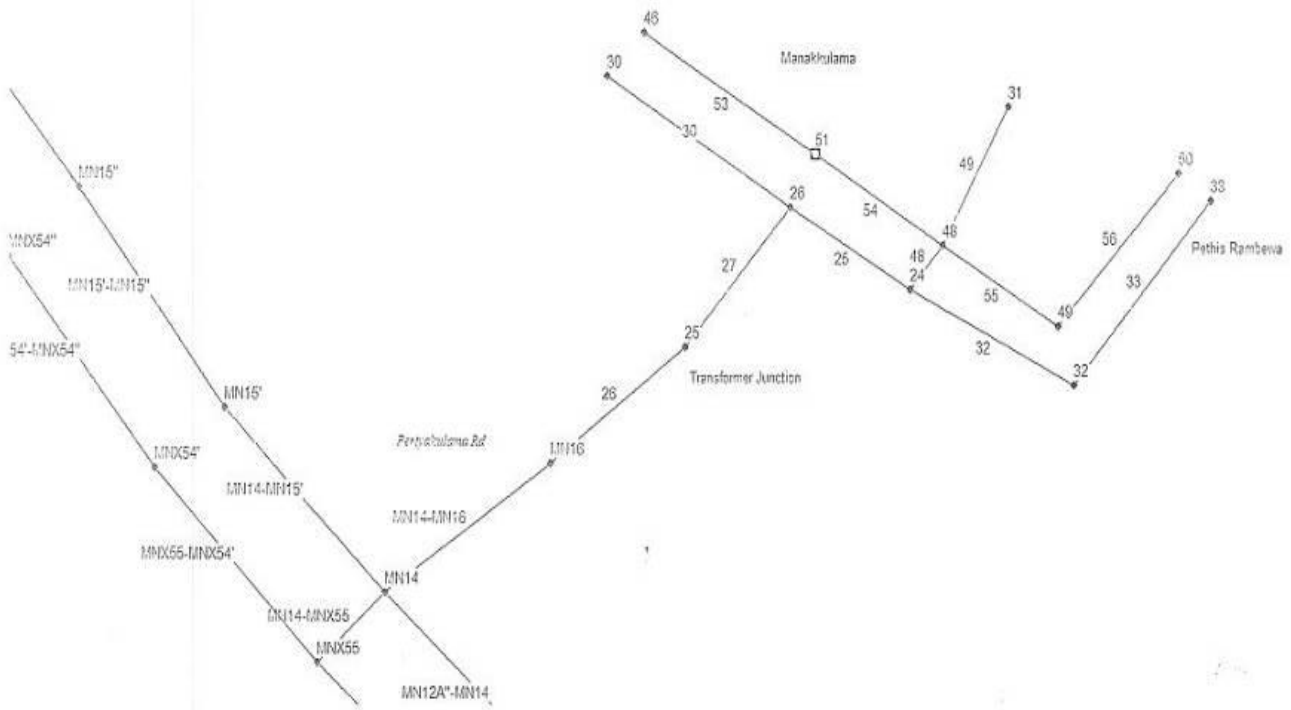


Diagram 02 – Periyakulama Road up to Pethis Rambewa

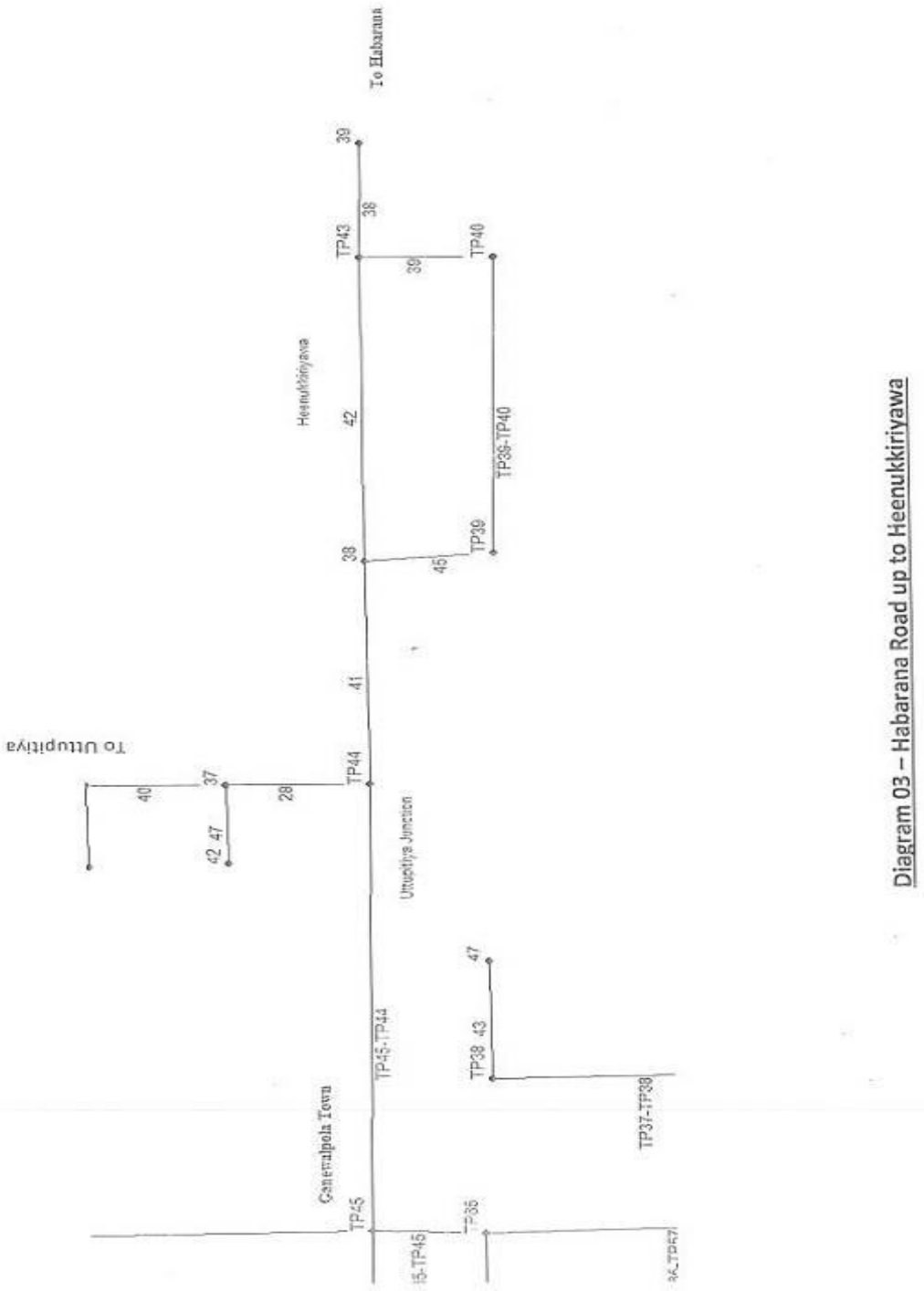


Figure 3: Final lay out of the Thirappane water supply sub project

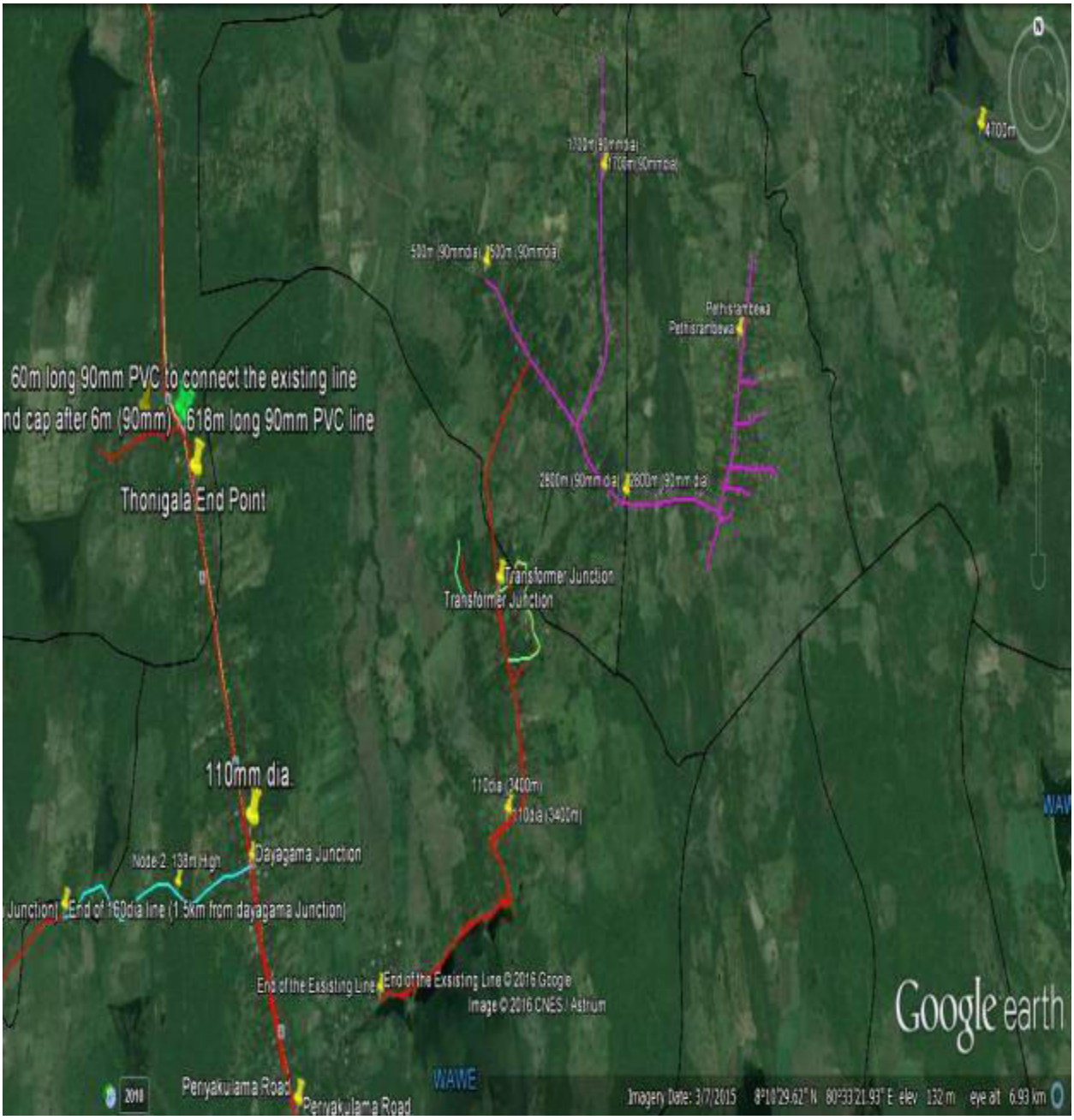


Figure 4: Map showing the pipe lay out in the proposed Project area

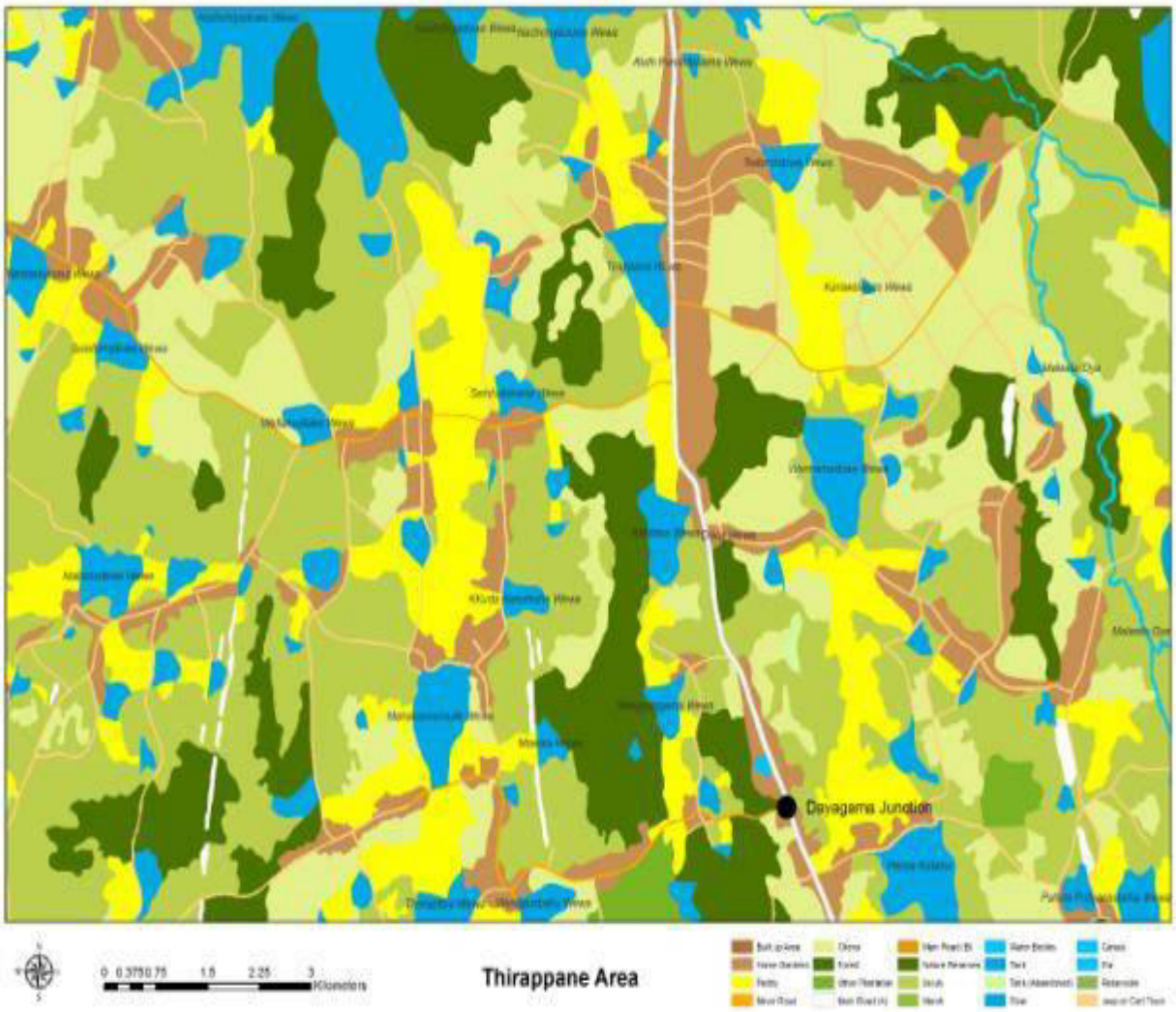
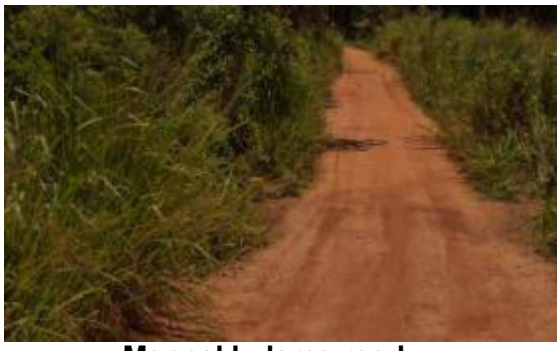


Figure 5: Map showing Land use of the proposed area

Appendix 14: Photographs of the project area

A9 road at Periyakulama

Puddukkulama Road



Mannakkulama road

Mannakkulama road

Athungama village road

Athungama village road

Pethis Rambewa road

Heenukkiriyawa road

A9 road at 116 Km post

A9 road near 120 km post

Appendix 15: Letters of Consent

මාර්ග සංවර්ධන අධිකාරිය
வீதி அபிவிருத்தி அதிகாரசபை
Road Development Authority

පළාත්බාර අධ්‍යක්ෂ කාර්යාලය - (උතුරු මැද පළාත)
மாகாண இயக்குநர் அலுவலகம் - (வடமத்திய மாகாணம்)
Provincial Director's Office - (North Central Province)

Provincial Director: T.P:-025-2235201 Fax:025- 2236886 Email : pdncp@rda.gov.lk
Administrative Officer : T.P :-025-2222115 gmail : rdapdncp@gmail.com Accountant : T.P :-025-2234116

My No: RDA/PD/NCP/W/104
22.12.2015

NWS&DB RECEIVED 04 JAN 2016 REGIONAL SUPPORT CENTER North Central

Assistant General Manager (N.C.)
National Water Supply & Drainage Board,
Regional Support Centre (NC),
GodageMawatha,
Anuradhapura.

Seeking Approval For 110 mm., 160 mm. & 225 mm. dia PVC Pipe Laying. Reinstatement of Trench Excavated for Pipe Laying at Kandy – Jaffna Road (115+300 km. - 117 + 300 km. Thirappane Water Supply Scheme).

This refers to your letter No: P&D/G/RDA/G/901-VII dated 11.06.2015 addressed to me. As per the agreement between R.D.A. & N.W.S. & D.B. made 08 28.04.2012 reinstatement should be done by you after trenching. Accordingly please make following payments on the estimate prepared by us for this project.
Reinstatement of Trench Excavated for Pipe Laying at Kandy – Jaffna Road (115+300 km. to 117 +300 km. Thirappane Water supply Scheme).

R.D.A. Supervision Charges	Rs.	529,862.16
N.B.T. (2/98)	Rs.	10,813.51
VAT 11% of (B+C)	Rs.	59,474.32
Amount for Supervision with VAT& N.B.T.	Rs.	600,150.00
R.D.A. Deposit	Rs.	1,059,724.00

Please send me a cheque amounting to Rs. 600,150.00 as supervision charges in favour of "Director General Road Development Authority" along with a cheque/Bank Guarantee amounting to Rs. 1,059,724.00 (Bank Guarantee Format attached) valid for 02 years as a deposit for granting approval.
(Rental charges has been removed).

Please send the attached agreement form after obtaining your Chairman's signature to forward to R.D.A. Chairman's signature early.

Provincial Director,
North Central Province.

Copy to : 1. Chief Engineer, R.D.A., Anuradhapura. – f. i. & n. a.
2. Senior Accountant, R.D.A., (N.C.P.) – f. i.