Periodic Financing Request Report

Project Number: 47381-005
MFF Number: 0088
December 2017

Democratic Socialist Republic of Sri Lanka: Mahaweli Water Security Investment Program (Tranche 2)

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 1 December 2017)

Currency Unit	–	Sri Lanka rupee/s (SLRe/SLRs)
SLRe1.00	=	$0.0065
$1.00	=	SLRS153.60

ABBREVIATIONS

ADB	–	Asian Development Bank
EIA	–	environmental impact assessment
EMP	–	environmental monitoring plan
FFA	–	financing framework agreement
km	–	kilometer
MDP	–	Mahaweli Development Program
MFF	–	multitranche financing facility
MLBCRP	–	Minipe Left Bank Canal Rehabilitation Project
MMDE	–	Ministry of Mahaweli Development and Environment
NCPCP	–	North Central Province Canal Program
NWPCP	–	North Western Province Canal Project
OCR	–	ordinary capital resources
PIU	–	project implementation unit
PMDSC	–	project management, design and supervision consultant
PMU	–	program management unit
Q	–	quarter
SPS	–	Safeguard Policy Statement
UECP	–	Upper Elahera Canal Project

NOTES

In this report, "$" refers to United States dollars.

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TRANCHE AT A GLANCE

1. Basic Data — **Project Number:** 47381-005

Project Name	Mahaweli Water Security Investment Program - Tranche 2	**Department/Division**	SARD/SAER
Country	Sri Lanka	**Executing Agency**	Ministry of Mahaweli Development & Environment
Borrower	Sri Lanka		

2. Sector	**Subsector(s)**	**ADB Financing ($ million)**
✓ Agriculture, natural resources and rural development	Water-based natural resources management	210.00
	Total	**210.00**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information**	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Adaptation ($ million)	105.00
Environmentally sustainable growth (ESG)	Disaster risk management Eco-efficiency Natural resources conservation	Climate Change impact on the Project	High

4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Governance and capacity development (GCD)	Institutional development	No gender elements (NGE)	✓
Knowledge solutions (KNS)	Application and use of new knowledge solutions in key operational areas Pilot-testing innovation and learning		

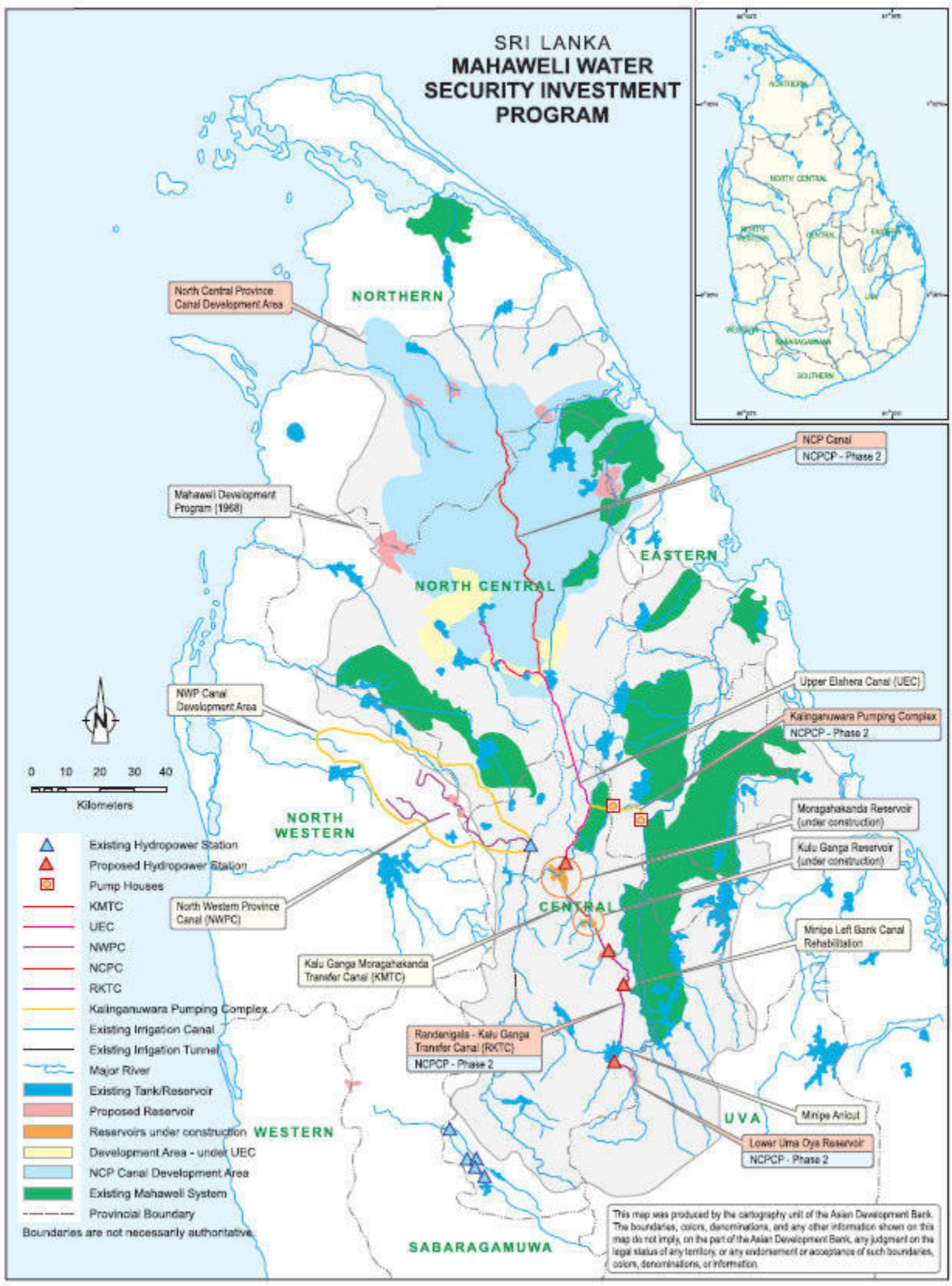
5. Poverty and SDG Targeting		**Location Impact**	
Geographic Targeting	No	Rural	High
Household Targeting	No		
SDG Targeting	Yes		
SDG Goals	SDG2, SDG6, SDG9		

6. Risk Categorization: Low

7. Safeguard Categorization **Environment:** A **Involuntary Resettlement:** B **Indigenous Peoples:** C

8. Financing

Modality and Sources	**Amount ($ million)**
ADB	**210.00**
Sovereign MFF-Tranche (Concessional Loan): Ordinary capital resources	31.00
Sovereign MFF-Tranche (Regular Loan): Ordinary capital resources	179.00
Cofinancing	**0.00**
None	0.00
Counterpart	**32.00**
Government	32.00
Total	**242.00**


SRI LANKA
MAHAWELI WATER SECURITY INVESTMENT PROGRAM
NORTHERN
NORTH CENTRAL
EASTERN
NORTH WESTERN
CENTRAL
UVA
WESTERN
SABARAGAMUWA
SOUTHERN
North Central Province Canal Development Area
Mahaweli Development Program (1968)
NWP Canal Development Area
North Western Province Canal (NWPC)
Kalu Ganga Moragahakanda Transfer Canal (KMTC)
Randenigala - Kalu Ganga Transfer Canal (RKTC)
NCPCP - Phase 2
NCP Canal
NCPCP - Phase 2
Upper Elahera Canal (UEC)
Kalinganuwara Pumping Complex
NCPCP - Phase 2
Moragahakanda Reservoir (under construction)
Kalu Ganga Reservoir (under construction)
Minipe Left Bank Canal Rehabilitation
Minipe Anicut
Lower Uma Oya Reservoir
NCPCP - Phase 2
N
0 10 20 30 40
Kilometers
Existing Hydropower Station
Proposed Hydropower Station
Pump Houses
KMTC
UEC
NWPC
NCPC
RKTC
Kalinganuwara Pumping Complex
Existing Irrigation Canal
Existing Irrigation Tunnel
Major River
Existing Tank/Reservoir
Proposed Reservoir
Reservoirs under construction
Development Area - under UEC
NCP Canal Development Area
Existing Mahaweli System
Provincial Boundary
Boundaries are not necessarily authoritative.
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I. BACKGROUND

1. The Mahaweli Water Security Investment Program will accelerate economic activities in Sri Lanka's northern dry zone region by transferring surplus water from the Mahaweli river basin for irrigation, drinking and commercial purposes.[1] It will develop bulk water conveyance and storage infrastructure planned under the North Central Province Canal Program (NCPCP), a high priority government program that will support completion of the Mahaweli Development Program (MDP), which started in 1973.

2. Key components of the MDP were completed in the 1980s, notably several irrigation systems and large dams for hydropower; however, the planned components for water transfers to the northern dry zone were not implemented, largely because of the prolonged conflict. After the conflict ended in 2009, the government prioritized completion of the MDP by initiating the NCPCP. The investment program supports the government's sector objective of ensuring water availability to water users; providing water in adequate quantities with improved management; enhancing productivity and water user efficiency; and addressing the spatial variation of water availability, climate change and disaster vulnerability as described in the Public Investment Programme 2017–2020.[2] The outcome will be access to water resources for agricultural and drinking purposes in project areas secured.

3. ADB and the government signed the financing framework agreement (FFA) for the investment program on 23 April 2015. On 24 June 2015, the Board approved the provision of loans to Sri Lanka under a multitranche financing facility (MFF) of up to $453 million equivalent to be implemented from July 2015 to December 2024. The MFF comprises three tranches and uses the time-slicing approach, with individual tranche outputs that cover elements of the overall facility's outputs: (i) new and improved water conveyance and storage infrastructure constructed; (ii) systems for improving water resource management productivity developed; and (iii) multidisciplinary investment program management operational. Output 1 under the investment program will implement three projects: (i) the Upper Elahera Canal Project (UECP), comprising about 101 kilometers (km) of water conveyance infrastructure linking the existing reservoirs at Kalu Ganga, Moragahakanda, Huruluwewa, Eruwewa, and Mahakanadara, which supply existing irrigation and town supply schemes; (ii) the North Western Province Canal Project (NWPCP), which will construct about 91 km of new and rehabilitated conveyance channels and two new reservoirs at Mahakithula and Mahakirula to transfer water from the Dambula Oya River and Wemedilla reservoir to supply existing irrigation and town supply schemes; and (iii) the Minipe Left Bank Canal Rehabilitation Project (MLBCRP), which will increase storage in its head reservoir and rehabilitate about 74 km of existing canals to improve conveyance and reliability of service to existing farmers.

4. Tranche 1 was approved for $150 million on 2 July 2015, signed on 17 September 2015, and became effective on 26 October 2015. Tranche 1 finances the following outputs:

(i) **Output 1: New and improved water conveyance and storage infrastructure constructed.** This output includes construction of: (a) about 6.2 km out of 101 km

[1] ADB. 2015. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to the Democratic Socialist Republic of Sri Lanka for the Mahaweli Water Security Investment Program.* Manila.

[2] Ministry of National Policies and Economic Affairs. 2017. *Public Investment Programme, 2017-2020*. Colombo, which highlights the vulnerability of Sri Lanka to the adverse impacts of climate change. Primary impacts include an increase in the frequency and intensity of disasters, including prolonged droughts, flash floods and landslides; heightened variability and unpredictability of rainfall patterns; increased temperatures; and sea level rise.

of conveyance channels under the UECP; (b) about 22.7 km out of 90 km of conveyance channels under the NWPCP, including partial construction of the Mahakithula and Mahakirula Reservoirs, and Mahakithula Inlet Tunnel; and (c) all works under the MLBCRP.

(ii) **Output 2: Systems for improving water resources management and productivity developed.** This output comprises a study on improving system efficiencies and water productivity to investigate inefficiencies within the existing conveyance and irrigation systems and constraints to improving water productivity. The study will recommend on-farm and system-wide improvements that may be incorporated into subsequent tranches or future phases of the NCPCP.

(iii) **Output 3: Multidisciplinary investment program management operational.** This output supports effective program management, preparation of detailed designs, and construction supervision.

5. On 2 October 2017, ADB received the government's periodic financing request for tranche 2, totaling $210 million, to continue implementation of the investment program (as detailed in paragraph 11). Approval of tranche 2 is critical in order to initiate the construction of a 28 km tunnel, which is expected to take about 7 years. Therefore, construction must proceed in 2018 to meet the investment program's closing date of December 2024. Tranche 2 is included in the ADB country operations business plan, 2017–2019 for Sri Lanka.[3]

II. ASSESSMENT OF IMPLEMENTATION

6. Output 1 has 10 contracts for civil works, 6 of which have been awarded and are under implementation. The remaining contracts will be awarded before the second quarter (Q2) of 2018. Output 2 comprises a consulting package to study and recommend interventions for improving system efficiencies and water productivity, for $3.4 million equivalent. This package is under recruitment and the firm will be mobilized in Q1 2018. Implementation of Output 3 is ongoing; the program management, design and supervision consultant (PMDSC), for $21.6 million equivalent, was mobilized in December 2015. The overall project performance rating is "on-track". As of 11 December 2017, cumulative contract awards were $59.24 million, or 107% of the projected amount of $55.57 million; cumulative disbursements were $26.32 million, or 86% of the projected amount of $30.66 million. Overall physical progress is at 13%.

7. The cost of works packages financed under tranche 1 have increased from $130 million at approval to $170 million. The increases are due to revised engineering cost estimates, design improvements, and additional design features responding to safeguard requirements. The scope of the investment program has not changed. To address the increases, the last works package awarded under tranche 1 will be financed under multiple tranches.

8. The program management unit (PMU) established under the Ministry of Mahaweli Development and Environment (MMDE) is responsible for coordination, management, monitoring, and supervision of the investment program. Three separate project implementation units (PIUs) have been established under the PMU, one for each project, to assist with project implementation and monitor day-to-day construction activities.

9. The safeguards requirements for tranche 1 have been implemented satisfactorily. The PMU and PIU are staffed with competent environment staff and are supported by the PMDSC international and national environment specialists. Site-specific environmental management

[3] ADB. 2016. *Country Operations Business Plan: Sri Lanka, 2017–2019*. Manila.

plans were included in each contract package. The first two environmental monitoring reports (EMPs) have been disclosed on ADB's website. Tranche 1 involves land acquisition for the NWPCP and related involuntary resettlement; the resettlement plans have been implemented and monitoring reports are disclosed on ADB's website. After completing detailed design during tranche 1 implementation, further due diligence for the MLBCRP and the access road for the NWPCP was undertaken. This confirmed that no additional land acquisition is needed. The implementation of the tranche 1 resettlement plan is proceeding satisfactorily and all payments to affected households will be completed by February 2018. The institutional arrangement for implementing the investment program's social safeguards has been established under tranche 1. The PMU and PIUs have employed resettlement officers that are supported by the PMDSC. A grievance redress mechanism was established and regular information dissemination meetings are held with people living in the project and affected areas. This institutional arrangement will be continued for tranche 2.

III. PERIODIC FINANCING REQUEST

A. Impact and Outcome

10. Tranche 2 is aligned with the following impact: agricultural production improved and economic growth sustained in the North Central, Central, North Western, and Eastern Provinces of Sri Lanka (program defined).[4] It will have the following outcome: new and improved water conveyance and storage infrastructure constructed.

B. Outputs

11. Tranche 2 will have the following two outputs:

(i) **Output 1: Completion of new and improved water conveyance and storage infrastructure increased.** Output 1 includes construction of about 21 km out of 101 km of conveyance channels under the UECP, including (a) partial construction (about 15.7 km) of a 28 km tunnel, using the tunnel boring machine and drill and blast construction methods;[5] and (b) partial construction (about 5.3 km) of about 8.8 km of new tunnels and channel using the drill and blast construction method.[6] Output 1 will also include the continuation of construction activities under the NWPCP, including continuing construction of the Mahakithula and Mahakirula Reservoirs, and the Mahakithula Inlet Tunnel that will be initiated under tranche 1.[7]

(ii) **Output 2: Multidisciplinary investment program management operational.** Output 2 includes project management recurring costs.

C. Investment and Financing Plans

12. Tranche 2 is estimated to cost $242 million (Table 1).

[4] This impact was formulated following the previous DMF guidelines. However, it remains aligned with the NCPCP and Public Investment Programme, 2017-2020.

[5] A works package (UEC-ICB-2A) for the 28 km tunnel will be awarded under tranche 2, with a cost estimate of $314 million. It will be financed under tranche 2 ($138.5 million) and tranche 3 ($175.5 million).

[6] A works package (UEC-ICB-2B) for the 8.8 km tunnels and canals will be awarded under tranche 2 with a cost estimate of $49 million. It will be financed under tranche 2 ($30 million) and tranche 3 ($19 million)

[7] A works package (NWPC-ICB-1) will be awarded under tranche 1 with a cost estimate of $67 million. It will tentatively be financed under tranche 1 ($20 million), tranche 2 ($30 million) and tranche 3 ($17 million).

Table 1: Tranche Investment Plan
($ million)

Item		Amount[a]
A.	**Base Cost**[b]	
	1. Completion of new and improved water conveyance and storage infrastructure increased	198.47
	2. Multidisciplinary investment program management operational	22.13
	Subtotal (A)	**220.60**
B.	**Contingencies**[c]	**1.89**
C.	**Financing Charges During Implementation**[d]	**19.51**
	Total (A+B+C)	**242.00**

[a] Includes taxes and duties of $32 million to be financed from government resources in the form of a cash contribution.
[b] In mid-2017 prices.
[c] Physical contingencies computed at 10% for civil works and equipment. Price contingencies computed at 1.5% annually on foreign exchange costs and 6.0% annually on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.
[d] Includes interest and commitment charges. Interest during construction for the ADB regular loan has been computed at the 5-year US dollar fixed swap rate plus a spread of 0.5%. Commitment charges for an ADB regular loan are 0.15% per year to be charged on the undisbursed loan amount. Interest during implementation for the ADB concessional loan has been computed at an interest rate of 2% per year.
Source: Asian Development Bank.

13. The government has requested (i) a regular loan of $179 million from ADB's ordinary capital resources, and (ii) a concessional loan of $31 million from ADB's ordinary capital resources to help finance the project. The regular loan will have a 20-year term, including a grace period of 5 years, an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility, a commitment charge of 0.15% per year (the interest and other charges during construction to be capitalized in the loan), and such other terms and conditions set forth in the loan agreement. The concessional loan will have a 25-year term, including a grace period of 5 years, an interest rate of 2.0% per annum during the grace period and thereafter, and such other terms and conditions set forth in the loan agreement. The financing plan is in Table 2.

Table 2: Summary Financing Plan

Source	Amount ($ million)	Share of Total (%)
Asian Development Bank	210.0	86.8
Ordinary capital resources (regular loan)	179.0	74.0
Ordinary capital resources (concessional loan)	31.0	12.8
Government	32.0	13.2
Total	**242.0**	**100.0**

Source: Asian Development Bank.

14. Climate adaptation is estimated to cost $105 million. ADB will finance 100% of adaptation costs.

D. Implementation Arrangements

15. The implementation arrangements are summarized in Table 3 and described in detail in the updated facility administration manual (Appendix 4).

Table 3: Implementation Arrangements

Aspects	Arrangements		
Implementation period	January 2018–December 2021		
Estimated completion date	31 December 2021 (closing date: 30 June 2022)		
Management			
(i) Oversight body	The PSC established under tranche 1 will continue to provide policy direction on matters relating to the investment program. The committee is chaired by the MMDE secretary and comprises representatives of key collaborating agencies. It will continue to review implementation and provide guidance.		
(ii) Executing agency	MMDE		
(iii) Implementation unit	The PMU established under tranche 1 will continue to be responsible for coordination, management, monitoring, and supervision of the investment program. A UEC PIU has been established under trance 1 and will continue to assist project implementation and monitor day-to-day construction works under tranche 2.		
Procurement	UEC-ICB-2A[a]	1 contract	$314 million
	UEC-ICB-2B[b]	1 contract	$49 million
	Shopping	TBD	TBD
Consulting services	The program management, design and supervision consultant was recruited under tranche 1 and will continue supporting the PMU and PIU to implement tranche 2.		
Retroactive financing and advance contracting	Advance contracting and retroactive financing is proposed for civil works, consulting services, and PMU and PIU operation costs. Retroactive financing will be considered for eligible expenditures not exceeding 20% of the loan amount incurred prior to loan effectiveness, but not earlier than 12 months prior to the signing of the loan agreement.		
Disbursement	The loan proceeds will be disbursed in accordance with ADB's Loan Disbursement Handbook (2017, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.		

ADB = Asian Development Bank, ICB = international competitive bidding, MMDE = Ministry of Mahaweli Development and Environment, PIU = project implementation unit, PMU = program management unit, PSC = program steering committee, TBD = to be determined, UEC = Upper Elahera Canal

[a] The package will be financed under tranche 2 ($138.5 million) and tranche 3 ($175.5 million).

[b] The package will be financed under tranche 2 ($30 million) and tranche 3 ($19 million).

Source: Asian Development Bank.

E. Project Readiness

16. Project readiness is high. The PMDSC was recruited under tranche 1 and they will continue assisting the government to implement tranche 2. All designs and bid documents for tranche 2 works packages have been completed. The first works package under tranche 2 was advertised on 27 March 2017, with contract award to take place in Q1 2018. The second works package will be advertised in Q1 2018 and awarded by Q4 2018. Environmental and social safeguards were assessed following ADB's Safeguard Policy Statement (2009) (SPS). The environmental impact assessment (EIA) for the UECP was prepared in 2014 and has been updated in 2017 through an addendum to accommodate design changes. Land acquisition is proceeding and will not prevent initiation of works.

F. Advance Contracting and Retroactive Financing

17. The FFA allows for advance contracting of civil works and consulting services, subject to ADB procedures. Advance contracting for all works packages under tranche 2 has been initiated. The FFA allows, subject to ADB policies and procedures, retroactive financing of the expenditures

incurred towards civil works, consulting services and PMU and PIU operation costs eligible under advance contracting, if the expenditures are incurred during the period 12 months prior to the signing of the related loan agreements, and do not exceed an amount equivalent to 20% of each individual loan. The government requested retroactive financing under tranche 2.

IV. DUE DILIGENCE

A. Technical

18. The investment program finances 38.6 km of tunnel construction using tunnel boring machines (about 20 km) and drill-and-blast methods (about 18.6 km), of which tranche 2 will implement about 10 km of tunnel using a tunnel boring machine and about 11 km using drill and blast methods. All designs have been prepared taking account of international best practices and familiarity with the associated technologies and local conditions. Extensive ground investigations have been undertaken along the tunnel alignments and will guide final designs. Lessons have also been applied from the ongoing Upper Uma Oya Project in Sri Lanka that uses a tunnel boring machine.

19. The designs for the investment program's conveyance and storage works have considered climate change risks and vulnerabilities (footnote 1). Climate change may lead to (i) temperature increases, resulting in an increase in crop water demand and reduced crop productivity; (ii) a change in the frequency and intensity of increased precipitation events, which may lead to increased runoff, causing erosion and siltation of water courses, flooding and landslide events; and (iii) decreased precipitation, which will result in higher soil moisture deficits, and lead to an increase in irrigation demand and reduced crop yields. The designs have accounted for projected increases in evapotranspiration and floods, and reductions in water availability.

B. Economic and Financial

20. The economic and financial analyses undertaken for the NCPCP have been updated to reflect the latest cost estimates and prices, and indicate that the NCPCP is economically viable and financially sustainable. Increased agricultural production is the most important quantifiable economic benefit, accounting for about 90% of total benefits. Other quantifiable benefits include increased provision of raw water for domestic, municipal, and industrial uses; and increased hydropower generation. The indirect benefits of induced economic activities and investments by the NCPCP's upstream water infrastructure were not quantified, although they are expected to be significant. These include broader regional economic growth and improved food and political security. A risk-modeling framework accounting for variances in capital and recurring costs, and future crop yields was used to estimate the value of the project benefits. The economic analysis indicates that the project is economically viable with a mean economic internal rate of return of 12.05%. The risk model indicates there is a zero probability that the economic internal rate of return will be less than the 9% minimum threshold.[8] The government has committed to financing the operation and maintenance costs and periodic replacement cost of the investment program infrastructure from its own resources; these will not exceed 2.2% of the total annual budget of MMDE and the Department of Irrigation.

[8] Although farmers' incomes are expected to increase, no revenue will flow directly to MMDE or the Mahaweli Authority of Sri Lanka from the project. Accordingly, an assessment of the financial internal rate of return of the project and its comparison against the weighted average cost of capital is not meaningful. An incremental recurrent cost analysis was performed instead to ensure that adequate budget provisions can be made to operate and maintain project assets.

C. Governance

21. **Financial management.** An updated financial management assessment of MMDE (Appendix 14) was carried out in accordance with ADB guidelines.[9] The overall risk assessment for the project is *low* and the assessment concludes that the PMU has appropriate financial management capacity to implement the investment program.

22. **Procurement.** The procurement of goods and works will follow ADB's Procurement Policy (2017, as amended from time to time). An updated procurement capacity assessment (Appendix 13) concluded that the overall procurement risk for the project is *moderate*. ADB has provided procurement training to the PMU and government evaluation committees and the PMDSC is supporting MMDE in the preparation and evaluation of bids.

23. **Anticorruption.** ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and MMDE. The specific policy requirements and supplementary measures are described in the updated facility administration manual.

D. Poverty, Social, and Gender Dimensions

24. The investment program will improve socioeconomic conditions in the northern dry zone region. By providing secured and increased irrigation water supplies, it will improve the livelihoods of more than 70% of investment program-affected beneficiaries who cultivate land with irregular and uncertain irrigation water supplies. Most paddy lands are cultivated in both the *Maha* and *Yala* cultivation seasons,[10] and the rural poor who depend largely on occasional agricultural labor for their livelihoods will benefit from more opportunities to improve their household incomes. Tranche 1 has employed local unskilled construction workers, and the investment program is providing opportunities for local communities to benefit from their involvement as construction workers.

25. Contractors will be required to implement appropriate measures to protect the health and safety of men and women who work at the construction sites. Contractors, in close coordination with the program management unit, will conduct awareness programs on the prevention of sexually transmitted infections, drug use, gender issues, and core labor standards. The investment program is classified as general intervention, because it supports poverty reduction indirectly. Although the investment program will provide the same opportunities for women to work in the construction activities as men, tranches are classified as no gender elements because the activities will be limited to construction of major infrastructure for conveying and storing water.[11]

E. Safeguards

26. **Environmental Safeguards.** The UECP is classified as category A for the environment in accordance with ADB SPS. The UECP EIA was prepared in 2014 and disclosed on ADB's website in January 2015. The EIA has been updated to address design changes. The environment assessment and review framework has also been updated to describe the grievance redress mechanism that has been established (Appendix 9). About 95% of the channel trace

[9] ADB. 2005. *Guidelines for the Financial Management and Analysis of Projects*. Manila.

[10] *Maha* and *Yala* refer to the two monsoons: *Maha* refers to the northeast monsoon, which occurs from December to February, and *Yala* to the southwest monsoon, which occurs in May to September.

[11] This will be reviewed for tranche 3, which could be classified as *some gender benefits* if investments will improve secondary and tertiary distribution systems with farmers' organizations.

under tranche 2 falls within the jurisdiction of the Department of Wildlife Conservation or the Forest Department. The main activities to be funded under tranche 2 are tunneling and construction of temporary and permanent access roads. Impacts include (i) generation of waste material, comprising tunnel spoil that requires disposal (about 27 ha); (ii) land clearance for construction of access to and ventilation shafts for the tunnels, and temporary and permanent access roads; and (iii) other construction-related impacts such as vibration, noise and dust. The tunnel spoil can be reused for road construction, but temporary disposal sites are required. Design changes will result in a slight increase in tunnel muck as compared to that documented in the EIA. New disposal sites have been identified and additional access roads proposed. The work includes widening or rehabilitation of 12 km of existing roads and the construction of 2 km of new access roads. The environmental impacts of these design changes are addressed in an addendum to the EIA, which includes additional ecological surveys. Construction of tunnels in lieu of cut and cover canals will minimize impacts on forest and wildlife reserves. The grievance redress mechanism in operation under tranche 1 will continue under tranche 2. Stakeholders were consulted on the design changes. Each works package includes updated EMPs. The EIA addendum and updated EMPs were disclosed on ADB's website on 11 October 2017.

27. The PMU and PIU environment specialists will monitor the implementation of the EMPs and recommend corrective actions as required. The PMDSC will continue to support the PMU and PIU. In addition to the PMDSC's present staff, an additional environment specialist will be appointed to work with the PIU. The PMDSC and PMU environment specialists will continue to train the contractors in preparation for implementing their respective EMPs.

28. **Involuntary resettlement**. Two civil works packages will be contracted under tranche 2. Due diligence found that the UEC-ICB-2B package will not involve any land acquisition. However, the UEC-ICB-2A package will require the permanent acquisition of about 1,655 square meters of land for expansion of access roads, affecting 74 people from 21 land plots; of these, 6 plots have no title (i.e., are encroached land). For both packages, the contractors will require temporary land for construction facilities, such as work camps and batching plants. These facilities will be in areas owned by MMDE and areas managed by the Department of Forest and the Department of Wildlife Conservation, for which MMDE will obtain permits prior to implementing the works. On this basis, tranche 2 is categorized as B in accordance with the ADB SPS. The resettlement plan for the UEC-ICB-2A package was prepared in accordance with the ADB SPS and government requirements on land acquisition. The resettlement plan for UEC-ICB-2A (Appendix 10) was disclosed on ADB's website on 25 August 2017, and the due diligence report for UEC-ICB 2B (Appendix 11) was disclosed on 30 August 2017.

29. **Indigenous peoples.** Tranche 2 will not involve areas owned and inhabited by indigenous people and will not affect indigenous people. Therefore, the tranche is categorized as C in accordance with the ADB SPS.

F. Risks and Mitigating Measures

30. Major risks and mitigating measures are summarized in Table 4, and described in detail in the updated risk assessment and risk management plan (Appendix 12).

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigating Measures
Unforeseen ground conditions and extreme weather conditions lead to delays in implementation	Comprehensive ground investigations have been conducted during the design phase. A tunnel boring machine will be used to construct most of the 28-kilometer Upper Elahera Canal Project tunnel, which will help expedite implementation and minimize construction risks. The contracts for tunnel construction include penalty clauses. During implementation, a systematic risk management program will be used to identify risks and advise on mitigation actions.
Climate change impacts on water availability exceed projections.	The sensitivity of climate change projections was assessed under the water balance study for the North Central Province Canal Program. The water balance is being updated under tranche 1 and will include an updated assessment. As an adaptation response, the capacities of canals, reservoirs and spillways have been increased. Implementing interventions recommended under the Improving System Efficiencies and Water Productivity package, financed under tranche 1, to address on-farm water management will be further considered and should help mitigate adverse impacts.

Source: Asian Development Bank.

G. Risk Categorization

31. Tranche 2 is categorized as complex because the total ADB loan amount exceeds $200 million and the tranche's environment safeguard categorization is A.

V. ASSURANCES

32. The government and MMDE have assured ADB that implementation of the project shall conform to all applicable ADB policies including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the facility administration manual and loan documents.

33. The government and MMDE have agreed with ADB on certain covenants for the project, which are set forth in the loan agreements.

VI. RECOMMENDATION

34. On the basis of the approval by ADB's Board of Directors for the provision of loans under the multitranche financing facility in an aggregate principal amount not exceeding $453,000,000 to the Democratic Socialist Republic of Sri Lanka for the Mahaweli Water Security Investment Program, it is recommended that the President approve the proposed tranche as described in para. 13 and such other terms and conditions as are substantially in accordance with those set forth in the loan agreements for the proposed tranche.

DESIGN AND MONITORING FRAMEWORK FOR TRANCHE 2

Impacts the Project is Aligned with

Agricultural production improved and economic growth sustained in the North Central, Central North Western, and Eastern Provinces of Sri Lanka (program defined)

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
Outcome New and improved water conveyance and storage infrastructure constructed	By 2024: a. Kalu Ganga-Moragahakanda Transfer Canal (9 km) and Upper Elahera Canal (92 km) commissioned (2017 baseline: 0) b. North Western Province canal, two new reservoirs, and associated infrastructure commissioned (2017 baseline: 0)	a-b. Project progress reports	Climate change impacts on water availability exceed projections.
Outputs 1. Completion of new and improved water conveyance and storage infrastructure increased	By 2021: 1a. Additional 21% of 101 km conveyance channel linking Kalu Ganga and Mahakandara reservoirs constructed (2017 baseline: 0) 1b. Additional 45% of Mahakithula and Mahakirula Reservoirs, and Mahakithula Inlet Tunnel constructed (2017 baseline: 0)	1a-b. Project progress reports	Unforeseen ground conditions and extreme weather conditions lead to delays in implementation
2. Multi-disciplinary investment program management operational	By 2019: 2a. PFR for tranche 3 submitted to ADB (2017 baseline: n.a.) 2b. Tranche 2 outputs delivered on time and within budget (2017 baseline: n.a.)	2a. PFR documents 2b. MMDE financial records and progress reports	

Key Activities with Milestones

1. Completion of new and improved water conveyance and storage infrastructure increased

1.1 Award UEC-ICB-2B contract for constructing 8.8 km conveyance channel linking Kalu Ganga and Moragahakanda reservoirs (December 2017)

1.2 Award UEC-ICB-2A contract for constructing 28 km tunnel (October 2018)

2. Multi-disciplinary investment program management operational

2.1 PMU prepares PFR for Tranche 3 to ADB (May 2019)

2.2 PMU prepares necessary reporting documents to the government and ADB (continuous)

Inputs
ADB: $179 million (regular loan) and $31 million (concessional loan) Government: $32 million
Assumptions for Partner Financing
Not Applicable

ADB = Asian Development Bank; DMF = design and monitoring framework; ICB = international competitive bidding, km = kilometer; MMDE = Ministry of Mahaweli Development and Environment; PFR = periodic financing request, PMU = Program Management Unit, UEC = Upper Elahara Canal,
Note: Output 2 was grandfathered from the facility DMF prepared under the old DMF guidelines.
Source: ADB.

Updated Facility Administration Manual

Project Number: 47381
Loan Numbers: Tranche 1 – 3267/68
Tranche 2 –

November 2017

Democratic Socialist Republic of Sri Lanka: Mahaweli Water Security Investment Program

CONTENTS

Facility Administration Manual Purpose and Process

The facility administration manual (FAM) describes the essential administrative and management requirements to implement the project on time, within budget, and in accordance with the policies and procedures of the government and Asian Development Bank (ADB). The FAM should include references to all available templates and instructions either through linkages to relevant URLs or directly incorporated in the FAM.

The Ministry of Mahaweli Development and Environment (MMDE) is wholly responsible for the implementation of ADB-financed projects, as agreed jointly between the borrower and ADB, and in accordance with the policies and procedures of the government and ADB. ADB staff are responsible to support implementation including compliance by the MMDE of its obligations and responsibilities for project implementation in accordance with ADB's policies and procedures.

At loan negotiations, the borrower and ADB shall agree to the FAM and ensure consistency with the Loan agreements. Such agreement shall be reflected in the minutes of the Loan Negotiations. In the event of any discrepancy or contradiction between the FAM and the Loan Agreements, the provisions of the Loan Agreements shall prevail.

After ADB Board approval of the project's report and recommendations of the President changes in implementation arrangements are subject to agreement and approval pursuant to relevant government and ADB administrative procedures (including the Project Administration Instructions) and upon such approval they will be subsequently incorporated in the FAM.

ABBREVIATIONS

ADB	=	Asian Development Bank
DMF	=	design and monitoring framework
DOI	=	Department of Irrigation
EARF	=	environmental assessment and review framework
EIA	=	environmental impact assessment
EMP	=	environmental management plan
FAM	=	facility administration manual
GDP	=	gross domestic product
ICB	=	international competitive bidding
ICS	=	International consultant selection
IEE	=	initial environmental examination
KMTC	=	Kalu Ganga – Moragahakanda Transfer Canal
MASL	=	Mahaweli Authority of Sri Lanka
MIWRM	=	Ministry of Irrigation and Water Resources Management
MLBC	=	Minipe Left Bank Canal
MMDE	=	Ministry of Mahaweli Development and Environment
MWSIP	=	Mahaweli Water Security Investment Program
NCB	=	national competitive bidding
NGOs	=	nongovernment organizations
NWPC	=	North West Province Canal
PAI	=	project administration instructions
PIU	=	project implementation unit
QCBS	=	quality- and cost-based selection
SCP	=	Stakeholder Communications Plan
SOE	=	statement of expenditure
SPS	=	Safeguard Policy Statement
SPRSS	=	summary poverty reduction and social strategy
TOR	=	terms of reference
UEC	=	Upper Elahera Canal

I. INVESTMENT PROGRAM DESCRIPTION

1. The investment program will accelerate the economic activities of Sri Lanka's northern dry zone region[1] by transferring surplus water of the Mahaweli river basin for irrigation, drinking and commercial purposes. It will develop bulk water conveyance and storage infrastructure planned under the North Central Province Canal Program (NCPCP), a high priority development program of the government[2] that will support completion of the Mahaweli Development Program (MDP) which started in 1970.[3] Water management practices will also be strengthened.

2. Sri Lanka has abundant water resources with a mean annual rainfall of about 1,860 mm. However, the water distribution is skewed in time and space. Most rain falls during two distinct monsoons: during December to February and May to September. Furthermore, most rain falls in the southwest and central highlands, called the "wet zone," during both monsoons with an annual rainfall typically exceeding 5,000 mm. In comparison, the country's lowlands are dry, particularly in the "northern dry zone" region where the mean annual rainfall is less than 1,500 mm, and there are regular droughts. The available freshwater per annum per capita[4] is only1,200 m^3 which is less than half of the national average at 2,600 m^3 and below the threshold of 1,700 m^3 denoting water stress. The water scarcity in the region would further deteriorate due to the growing population and anticipated climate change.

3. Over the past millennia, local communities have managed this water stress by constructing many small cascade systems of reservoirs, transfer canals and irrigation schemes. These have been sufficient to provide supplementary irrigation only for a single paddy crop each year and limited storage for drinking water supply. In many places, communities rely on groundwater, some of which is contaminated causing high incidences of chronic kidney disease. The limited availability of water resources constrains the agricultural and commercial production of the region suppressing social and economic development. The gross regional domestic product per capita in the northern dry zone is about 30% lower than other regions.

4.

5. In the 1960s, under the MDP, the government initiated developments to augment water within these cascade systems with available water resources from the Mahaweli River, the country's largest river which starts in the wet zone and has abundant river flows, using large transfer canals and reservoirs. Key components of the MDP were completed by the mid-1980s, but its completion was halted owing to resource constraints and conflict. Since then, the government has updated the MDP accounting for socio-economic changes and national development priorities. The government's current priorities and investment roadmap for the irrigation and water resources sector are described in the Public Investment Programme 2017-2020.[5] This focuses on non-structural and structural investments to ensure availability of adequate water quantities. Agricultural production from irrigation systems will be increased by: improving water management, productivity, and system efficiencies to meet rising demands; minimizing spatial variations in water availability by developing trans-basin diversions to transfer available water to dry zone areas; and, increasing resilience to climate change. Providing additional and clean drinking water supplies to dry zone communities is also a key priority.

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[1] The northern dry zone region mainly comprises North Central, North Western and Eastern Provinces.

[2] Ministry of National Policies and Economic Affairs. 2017. *Public Investment Programme, 2017-2020*. Colombo.

[3] The Asian Development Bank (ADB) provided project preparatory technical assistance. ADB. 2014 *Proposed Multitranche Financing Facility SRI: Water Resources Development Investment Program*. Manila.

[4] Technically termed as the annual per capita water endowment that is the notional volume of water in cubic meters defined by the volume of accessible/reliable freshwater available each year, and is allocated as a notional allowance to each person.

[5] Footnote 3, page 1.

6. These priorities will be addressed by completing the NCPCP which comprises the outstanding MDP components. The NCPCP is estimated to cost approximately $1,640 million and will be implemented in two phases. The investment program will finance Phase 1 which includes (i) key upstream investments of the NCPCP that will transfer water from the Mahaweli River to existing reservoirs in the Central, North Central and North Western Provinces, and (ii) rehabilitation of an existing irrigation system located in the lower reach of the Mahaweli River to improve its water management. Phase 1 comprises the following three projects:

(i) The Upper Elahera Canal Project (UECP) comprises two components. The first component is the 9 km Kalu Ganga-Moragahakanda Transfer Canal (including a 8km tunnel) that transfers water between the Kalu Ganga and Moragahakanda Reservoirs.[6] The second component is the Upper Elahera Canal that connects the Moragahakanda Reservoir to the existing reservoirs: Huruluwewa, Eruwewa and Mahakanadarawa via 82 km of canals (including a 28 km tunnel). These reservoirs supply existing irrigation and water supply schemes.

(ii) The North Western Province Canal Project (NWPCP) will construct 96 km of new and upgraded canals (including a 940 m tunnel) and two new 25 m tall earth gravity dams impounding the Mahakithula and Mahakirula Reservoirs. It will transfer water from the Dambulu Oya River and the existing Nalanda and Wemedilla Reservoirs to command existing irrigation and water supply reservoirs.

(iii) Minipe Left Bank Canal Rehabilitation Project (MLBCRP), located in the downstream reaches of the Mahaweli River, will: (a) add upstream storage by heightening the headwork's weir by 3.5 m, (b) construct new automated intake gates to the left bank canal and emergency spill weirs to both left and right bank canals; and (c) rehabilitate the 74 km Minipe Left Bank Canal to improve conveyance and reliability of service to existing farmers.

7. The investment program also supports preparation of Phase 2 projects that will develop additional transfer canals and reservoirs to allow additional water be diverted from the Mahaweli River and extend the system to additional existing reservoirs in the North Central Province. The government plans to implement Phase 2 from 2021 to 2030 under separate financing, possibly with ADB's support. It may comprise the following projects: (i) Kalinganuwara Pumping Complex Project; (ii) Lower Uma Oya Reservoir Project; (iii) Randenigala-Kalu Ganga Transfer Canal Project; and (iv) North Central Province Canal Project. With Phase 2, Mahaweli river water may eventually augment drinking water supplies to Jaffna and Kilinochchi, complementing an ongoing ADB-financed water supply and sanitation project.[7] Figure 1 shows the projects of Phase 1 and 2. Figures 2-3 show the three projects under Phase 1.

8. The investment program's impact will be improved agricultural production and sustained economic growth in the North Central, Central, North Western and Eastern Provinces. Its outcome will be secured access to water resources for agricultural and non-agricultural purposes in the project areas. The outputs will be (i) Output 1: new and improved water conveyance and storage infrastructure developed, (ii) Output 2: systems for improving water resources management and productivity developed, and (iii) Output 3: efficient multi-disciplinary investment program management operational. Each tranche of the MFF finances slices of the investment projects.

[6] These reservoirs are currently under construction.

[7] ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Loans and Technical Assistance Grant to Sri Lanka for the Jaffna and Kilinochchi Water Supply and Sanitation Project.* Manila.

9. The investment program will address key non-structural sector priorities through two consulting packages. Firstly, the “improving system efficiencies and water productivity” package investigates existing inefficiencies within the existing conveyance and irrigation systems, constraints to improving water productivity, and will recommend on-farm and system-wide improvements; structural recommendations will be incorporated into civil packages for implementation under subsequent tranches and possibly under Phase 2. The second consulting package, “strengthening integrated water resources management,” will recommend programs for modernizing policy and governance frameworks, and institutional strengthening, to improve national water resources planning and operational procedures.

10. The FAM has been updated to include Tranche 2 which will finance continuation of works under the UECP and NWPCP.

Figure 1: Map of Investment Program

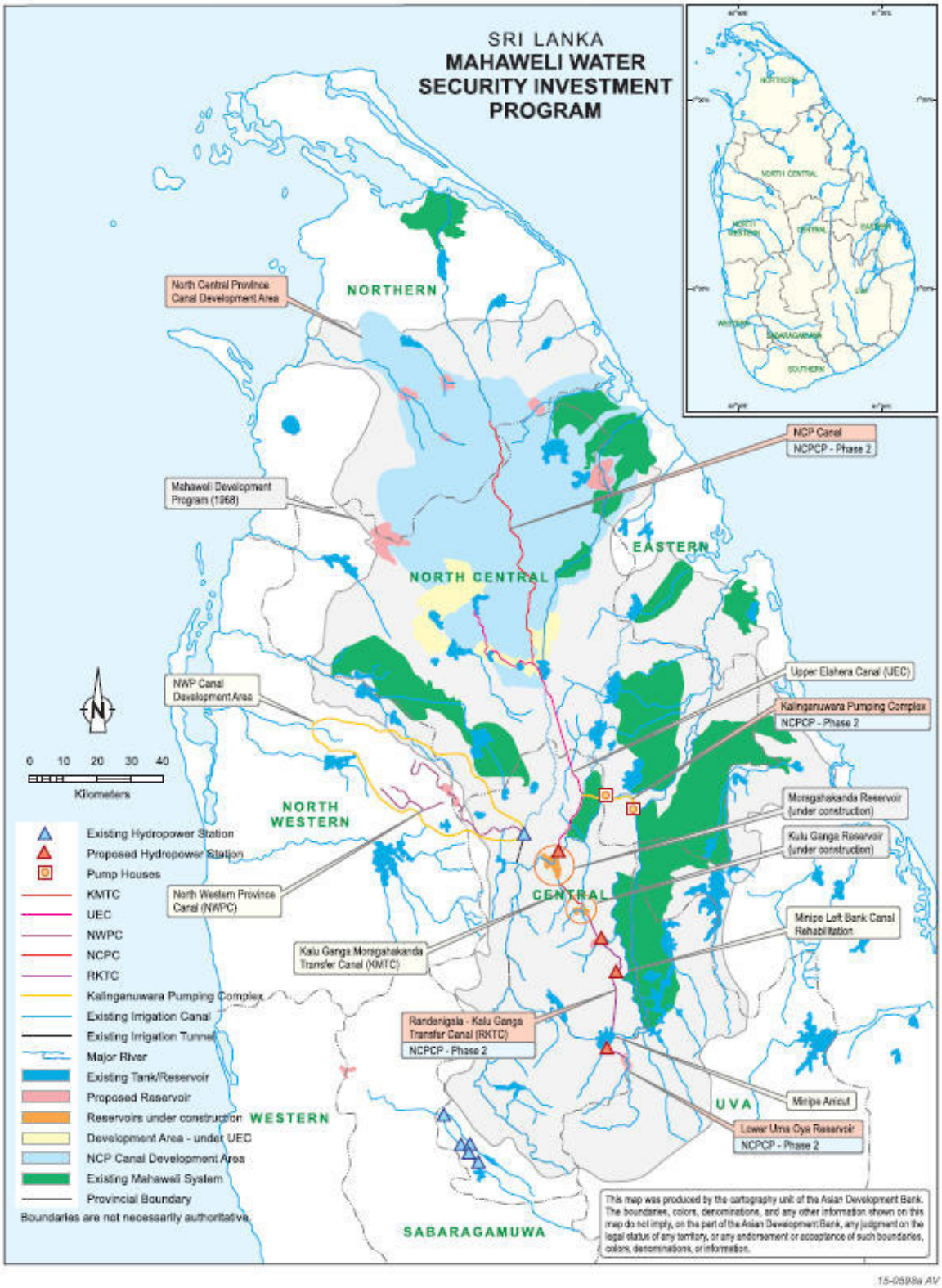


Figure 2: Map of MLBCRP

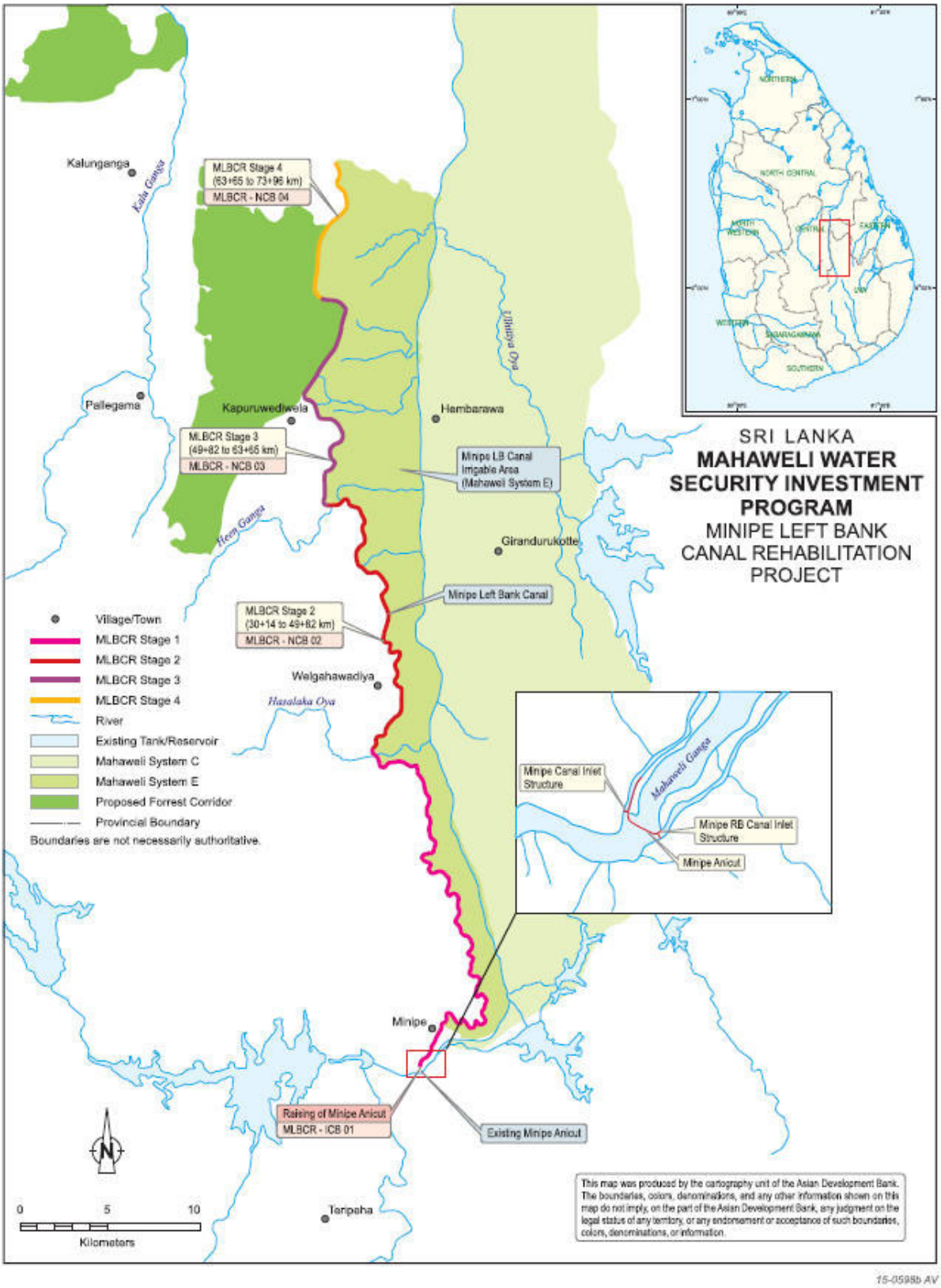


Figure 3: Map of UECP

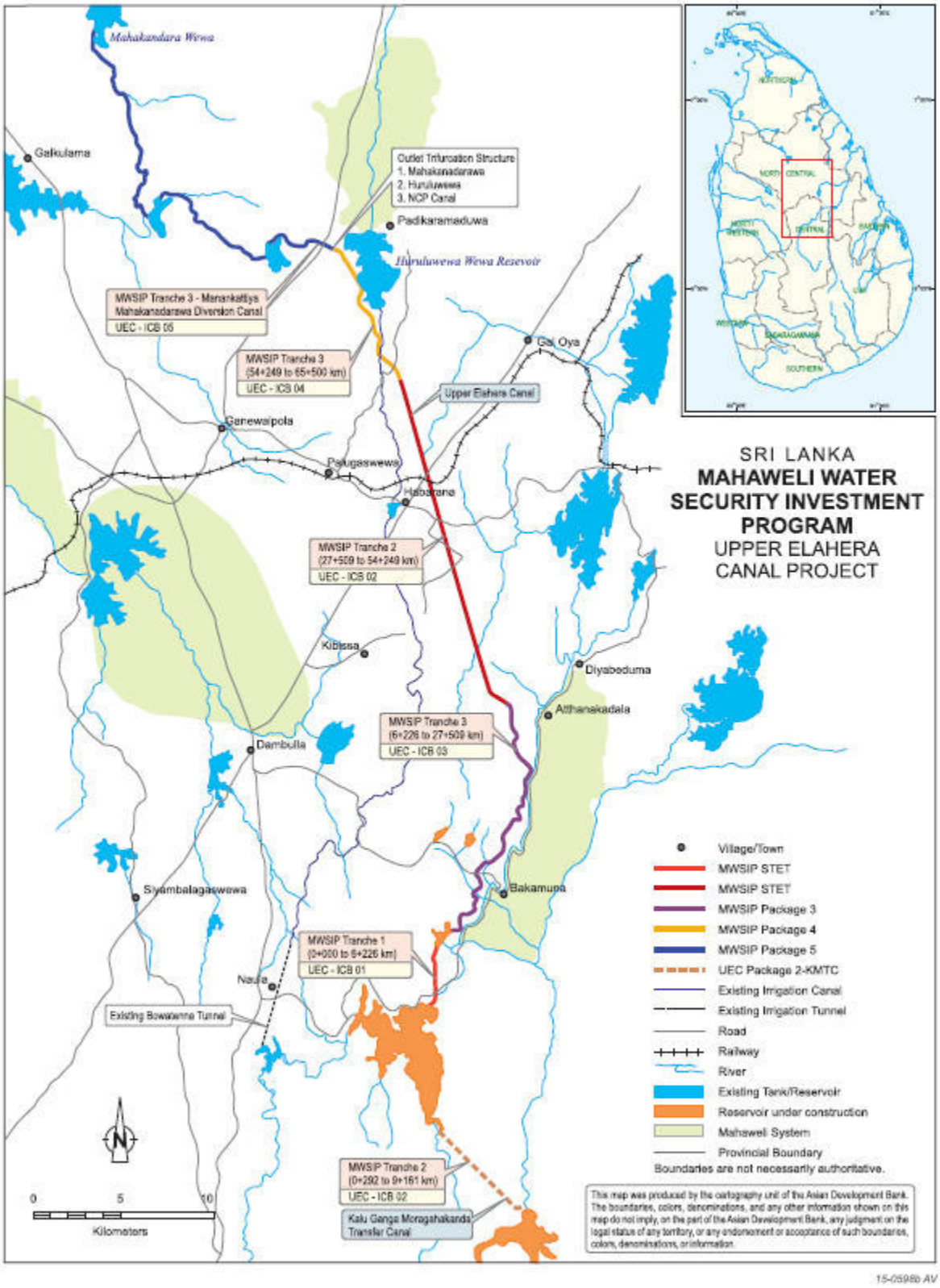
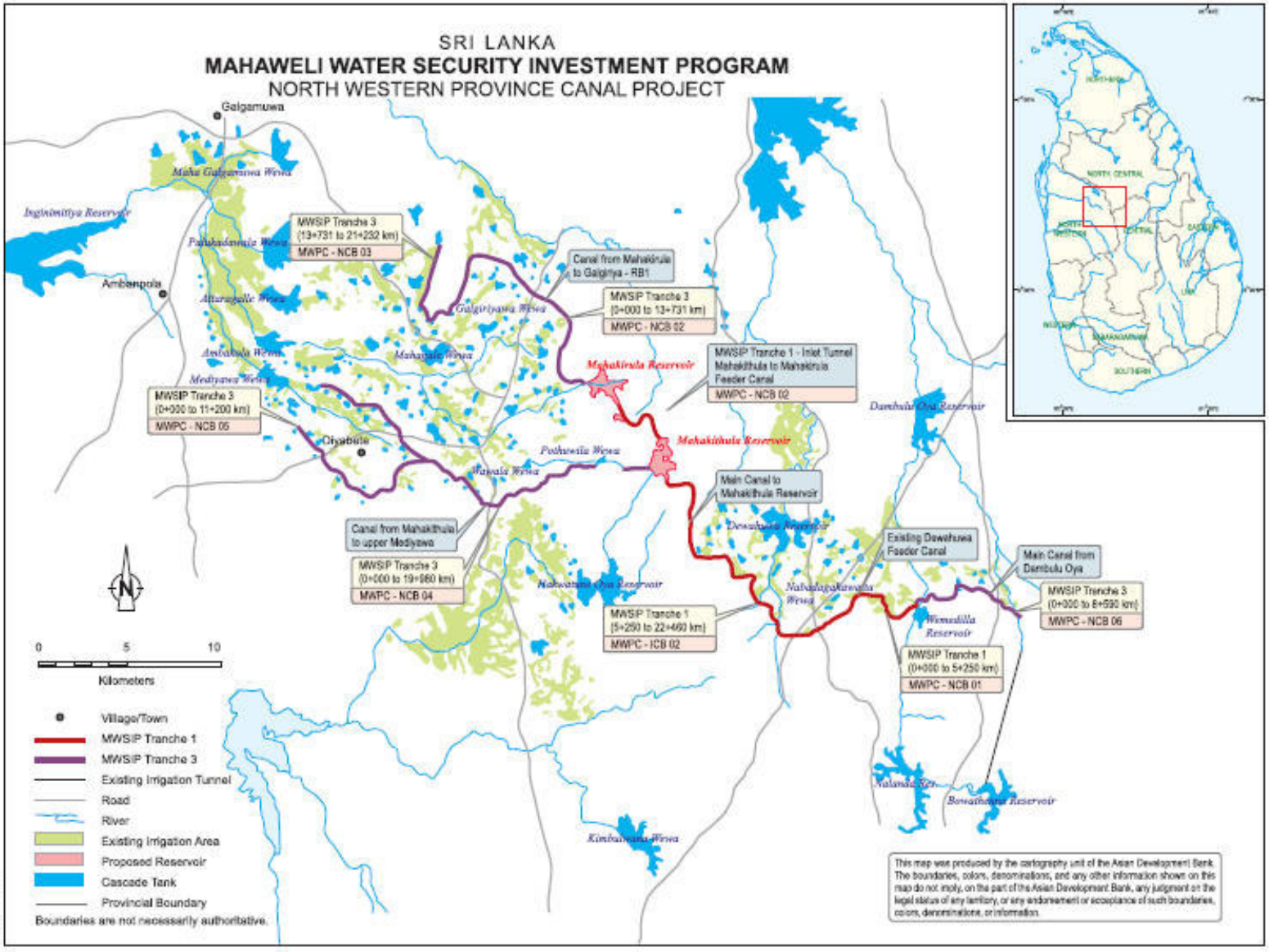


Figure 4: Map of NWPCP



II. IMPLEMENTATION PLANS

11. The tentative schedule for the investment program was to initiate tendering and award of contracts in Q1/Q2 2015 via advance contracting and retroactive financing. The actual commencement of first works packages was in Q4/2016. The MFF is designed for a 10-year implementation period. The government has expressed its desire to complete critical sub-projects of the investment program by 2020. Progress will depend on the expeditious implementation of civil works, disbursement rates, and timely submissions of periodic financing requests under the MFF.

A. Tranche 1 Readiness Activities

Indicative Activities	Responsible Agency	2014	2015							
		Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Advance contracting actions										
– Surveys and detailed designs completed for all packages	EA	x	x	x	x					
– Finalization of NCB and ICB bidding documents for advance action packages	EA	x	x	x	x	x	x	x		
– Approval of EIAs and IEE and initiate implementation of resettlement plan	EA, ADB						x			
Contract award and mobilization of contractors and PMDSC										
– Evaluation of expressions of interest	ADB	x								
– Issue of request for proposals	ADB				x					
– Submission of proposals and evaluation	ADB				x	x	x			
– Contract negotiations and award	EA							x		
– Mobilization and implementation	EA, PMDSC								x	x
Establish program implementation arrangements	EA	x	x	x	x	x	x	x	x	
ADB Board approval	ADB							x		

Loan signing	ADB, MOFP, EA								x	
Government legal opinion provided	MOFP, EA								x	
Government budget inclusion	MOFP, EA		x							
Loan effectiveness	EA, MOFP, ADB									x

ADB = Asian Development Bank, EA = executing agency, EIA = environmental impact assessment, ICB = international competitive bidding, IEE = initial environmental examination, MOFP = Ministry of Finances and Planning, NCB = national competitive bidding, PMDSC = Program Management, Design and Supervision Consultant.

B. Tranche 2 Readiness Activities

Indicative Activities	Responsible Agency	2017								2018	
		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Advance contracting actions											
– Finalization of ICB bidding documents for advance action packages	EA	x	x	x							
– First contract award	EA								x		
– Approval of EIA Addendum and implementation of resettlement plan	EA, ADB	x	x	x	x	x	x	x	x		
ADB Management approval	ADB								x		
Loan signing	ADB, MNPE, EA									x	
Government legal opinion provided	MNPE, EA									x	x
Government budget inclusion	MNPE, EA		x								
Loan effectiveness	EA, MNPE, ADB										x

ADB = Asian Development Bank, EA = executing agency, EIA = environmental impact assessment, ICB = international competitive bidding, MNPE = Ministry of National Policies and Economic Affairs.

C. Overall Project Implementation Plan

12. The implementation schedule for the investment program is in Attachment 1.

III. INVESTMENT PROGRAM MANAGEMENT ARRANGEMENTS

A. Project Implementation Organizations – Roles and Responsibilities

Project implementation organizations	Management Roles and Responsibilities
Central Bank of Sri Lanka	– Setup and management investment program advance account.
Program Steering Committee (PSC)	– Chaired by Secretary, Ministry of Mahaweli Development and Environment (MMDE), and members are shown in Attachment 2. The PSC will be responsible for: o Overseeing and monitoring implementation of the investment program, as well as overall program funding o Convening at least quarterly meetings to support implementation of the investment program. The meetings will discuss overall status and implementation issues, and when and as necessary, invite other participants from government and non-government organizations to support coordination and implementation of the investment program o Facilitating inter-ministerial coordination o Ensuring coordination among government agencies o Monitoring implementation progress of the investment program including its safeguard and development objectives o Rectifying issues that may be hindering implementation progress of the investment program o Providing guidance to the executing agency
Ministry of Mahaweli Development and Environment (MMDE)	– MMDE is the executing agency for the investment program. To implement the investment program, MMDE will establish a Program Management Unit (PMU) under which there will be three Project Implementation Units (PIUs) as described below. MMDE's implementing department is the Mahaweli Authority of Sri Lanka (MASL) and it will second staff to the PMU and UECP PIU. After completion and commissioning of the UECP, MASL will take over its management, operation and maintenance.
Executing Agency (EA)	– As the EA, MMDE will be responsible for: o Execution of the entire investment program o Providing overall coordination of all project activities o Leading inter-agency coordination o Providing policy guidance, strategic direction, and oversight o Ensuring adequacy of overall investment program financing o Establishing the PMU and PIUs and ensuring staffing positions are continuously filled with appropriately qualified and experienced officers and support staff

Project implementation organizations	Management Roles and Responsibilities
	○ Securing annual budgetary allocations proposed by the PMU ○ Ensuring cabinet approval of contract packages ○ Preparing and submitting to ADB: (i) periodic financing requests for all tranches: (ii) quarterly progress reports; (iii) quarterly disbursement projections; and (iv) updated implementation plans, etc. ○ Monitoring and ensuring compliance of loan covenants and environmental and social safeguards, and facilitate the implementation of corrective actions ○ Establishing and chairing the PSC. ○ Manage investment program's advance sub-accounts.
Department of Irrigation (DOI)	– DOI, under the Ministry of Irrigation and Water Resources Management (MIWRM), will second staff to the PMU and PIUs for MLBCRP and NWPCP. – After completion and commissioning of the MLBCRP and NWPCP, DOI will take their management, operation and maintenance.
Mahaweli Authority of Sri Lanka (MASL)	- MASL, under MMDE, will second staff to the PMU and PIU for UECP. - After completion and commissioning of the UECP, MASL will take its management, operation and maintenance.
Program Management Unit (PMU)	– The PMU will be accommodated within MMDE offices in Colombo. – The PMU will be led by either a Special Grade Engineer or Senior Engineer of Class 1 from MMDE who will be responsible for overall implementation management of the investment program. – The PMU will be responsible for: ○ Preparation of implementation plans and annual budgets ○ Overseeing the overall implementation of the program and each of its tranches ○ Liaising and corresponding with ADB on all issues relating to the investment program and each project ○ Coordinating with other government agencies to resolve any interdepartmental issues, and other aid agencies for implementation of non-physical activities as necessary ○ Approving all planning, design and contract documents associated with the investment program ○ Overall management of the Program Management, Design and Supervision Consultant (PMDSC) ○ Recruiting and managing the ISEWP and SIWRM consultant services packages ○ Acting as the "Employer" for all civil works packages ○ Overseeing and managing the procurement of services, works and goods by the respective PIUs ○ Monitoring the activities of the project implementation units (PIUs) and advising as necessary

Project implementation organizations	Management Roles and Responsibilities
	○ Maintaining investment program accounts and comprehensive loan financial records, and submitting consolidated quarterly reports ○ Establishing and maintaining a project performance monitoring and evaluation system (PPMES) at each subproject level, as well as a project and investment program levels ○ Monitoring physical and non-physical investment activities under each project; obtaining necessary data for establishing baselines, maintaining and updating the PPMES ○ preparing and submitting: (i) reports to the PSC and MMDE for consideration and approval; (ii) periodic progress reports on each investment activities; (iii) periodic financing requests (through the Ministry of Finance and Mass Media) for ADB's consideration; (iv) audit reports; and (v) reports mandated under the loan and project agreements ○ Preparing and submitting withdrawal applications to ADB ○ Reviewing, approving and transferring of PIUs' request for payments ○ Preparing media information and implementing the investment program's communications plan ○ Updating and monitoring of the satisfactory implementation of resettlement plans, environment management plans (EMPs), and any correction action plans including resettlement plan for additional facilities such as access roads and camps, consistent with safeguards requirements and ADB's Safeguards Policy Statement (2009), and submitting updated safeguards and monitoring reports for review and disclosure.
MLBRC, UEC and NWPC Project Implementation Units (PIUs)	– Under the PMU, MMDE will establish separate PIUs for the MLBRC, UEC and NWPC investment projects with staff seconded from MMDE, DOI, MASL, and new recruits. The MLBRC and NWPC PIUs will be led by Class 2 officers from DOI, while the UEC PIU will be led by a Class 2 officer from MASL. – The PIUs will be accommodated within DOI and MASL offices within the project areas. – The PIUs will be responsible for: ○ Preparing, reviewing and approving services, works and goods packages ○ Leading implementation of the investment projects by: (i) procuring and evaluating services, works and goods under each investment project; (ii) obtaining all necessary government approval and right-of-way clearances from other state departments and private land owners as necessary; (iii) implementing the Environment Management Plans and Resettlement Plans in compliance with ADB's policies; (iv) monitoring the implementation of social dimensions of the project including adherence to the labor law and core labor

Project implementation organizations	Management Roles and Responsibilities
	standards; and (v) managing contracts awarded under the investment projects o publishing and formally disclosing the project cutoff date to the affected people and communities upon finalization of Detail Measurement Survey (DMS) for updating the required Resettlement Plans o Preparing and submitting to the PMU monthly safeguards progress reports, with complaint-grievances status included, and implementation of labor law and core labor standard for the preparation of biannual safeguards monitoring reports o acting as focal point, with support from the PMU, for the implementation of Grievance and Redress Mechanism and complaint resolutions o Managing the PMDSC at the investment project level o Preparing work and procurement plans, budgets, monitoring plans, and accounts o Submission of request for payments to PMU for prior approval o Undertaking day-to-day project and safeguards management o Coordination with the field staff of concerned line departments o Coordination with Project Management Committees, Farmer Organizations, and respective Project Managers of the beneficiary irrigation systems. o Implementing safeguards actions following the relevant plans o Preparing program progress reports and safeguards monitoring reports o Maintaining project accounts and financial records
Project Advisory Committee (PAC)	– The PAC will comprise of senior technical staff from MMDE, MIWRM, MASL, DOI, and other government agencies as required. It will: o Provide advice on Phase 2 investments o provide strategic feedback to the PSC about the quality of construction, safeguards planning and implementation, and any design or construction issues requiring special attention o assist the PMU and PIUs in identifying future issues and providing impartial and technically competent opinions o meet as and when required but at least quarterly
Program Management, Design and Supervision Consultant (PMDSC)	– Finalizing the detailed engineering designs, cost estimates and bid documents for all work, goods and services packages under the investment program – Preparing due diligence reports (technical, economic, financial, safeguards) and draft ADB board documents for possible financing of Phase 2 – Providing overall investment program management and administration support on reporting, financial management, and monitoring and evaluation

Project implementation organizations	Management Roles and Responsibilities
	– Supporting the PMU and PIUs with establishing and maintaining the PPMES – Undertaking any necessary additional surveys and investigations to support designs and implementation – Serving as the "Engineer" and representing MMDE in the construction contracts – Supporting commissioning and operation of the investments, including preparing management, operation and maintenance manuals – Preparing a Strategic Environment Assessment (SEA)
Independent Environmental Safeguard Monitoring Specialist	– Undertake periodic reviews (at minimum biannually) of the three construction Projects under the MWSIP to ensure compliance with ADB's and Government of Sri Lanka's environment safeguard requirements. The Terms of Reference of the independent monitor are included as Attachment 7.
ADB	– Monitoring and reviewing overall implementation of the investment program in consultation with the EA including: the project implementation schedule; actions required in terms of environmental impacts and RPs as applicable; timeliness of budgetary allocations and counterpart funding; project expenditures; progress with procurement and disbursement; statement of expenditure when applicable; compliance with particular loan covenants; and the likelihood of attaining the investment program's immediate development objectives. – Undertaking periodic review and supervision of the implementation of the investment program through regular loan review missions, midterm and final review missions. – Recruiting the PMDSC under Tranche 1.

B. Key Persons Involved in Implementation

Executing Agency	
Ministry of Mahaweli Development and Environment	Anura Dissanayake Secretary Ministry of Mahaweli Development and Environment Telephone: +94 (0) 11 2676844 Email address: sec@mahaweli.gov.lk Office address: No. 500, T B Jayah Mawatha, Colombo 10, Sri Lanka
	C. H. Devendra Additional Secretary-Water Resource Planning (Acting) Ministry of Mahaweli Development and Environment Telephone: +94 (0) 11 2614395 Email address: chandanideeven@yahoo.com Office address: No. 500, T B Jayah Mawatha, Colombo 10, Sri Lanka
	K.R. Neil Bandara Program Director, MWSIP Telephone: +94 (0) 11 2675 811 Email address: pdadbproject@gmail.com Office address: No. 493/1/1, T.B. Jayah Mawatha, Colombo 10, Sri Lanka
ADB	
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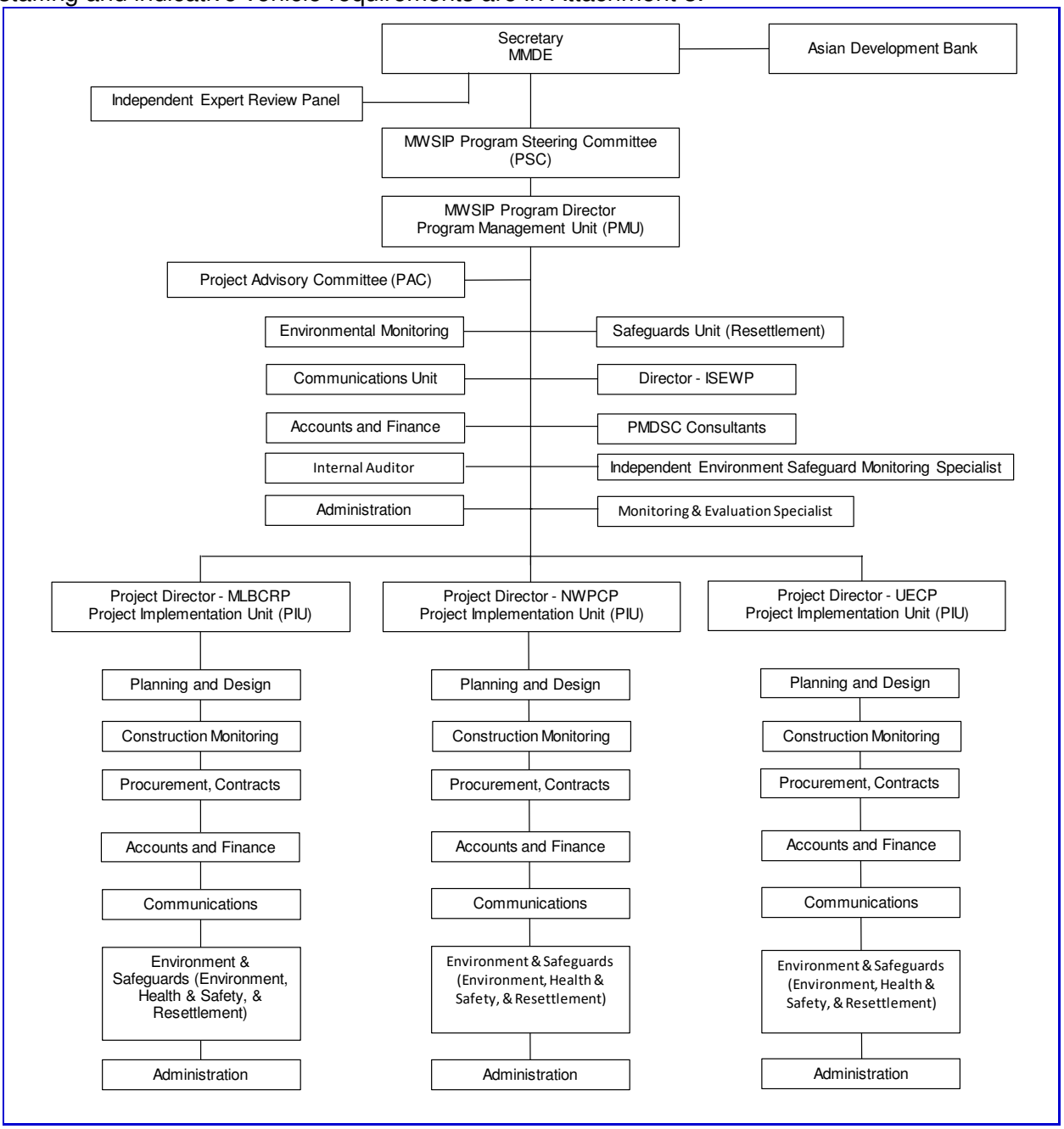
	Manjula Amerasinghe Project Management Specialist, SLRM Telephone: +94 (0) 11 4455 455 Email address: nmamerasinghe@adb.org

C. Project Organization Structure

13. The following organogram shows the reporting lines and essential internal structures of key organizations involved in implementation of the investment program. The PMU and PIU staffing and indicative vehicle requirements are in Attachment 3.



IV. COSTS AND FINANCING

14. The cost of the investment program at approval is estimated at $675 million (Table 1). The government has requested a multitranche financing facility (MFF) in an amount up to $453 million equivalent from ADB's ordinary capital resources (OCR) to help finance part of the investment program. The MFF will consist of 3 tranches, subject to the government's submission of related periodic financing requests, execution of the related loan and project agreements for each tranche, and fulfilment of terms and conditions and undertakings set forth in the framework financing agreement. Approval for the second tranche is scheduled in 2017 and approval for the third tranche is scheduled in 2018.

15. The MFF will provide regular and concessional loans from ADB's OCR up to the aggregate MFF amount. Any allocation for concessional loans will be subject to (i) the availability of such resources; (ii) Sri Lanka's access to such resources pursuant to ADB's Graduation Policy and the requirements of donors to the resources; and (iii) the availability of such resources to Sri Lanka given ADB's policy on performance-based allocation of such resources.

Table 1: Investment Program

Item	Amount [a] ($ million)			
	Investment Program	**Tranche 1**	**Tranche 2**	**Tranche 3**
A. Base Cost [b]				
1. New and improved water conveyance and storage infrastructure constructed	465	116	203	146
2. Systems for improving water resources management and productivity developed	4	2	-	2
3. Multi-disciplinary investment program management operational	53	31	22	0
Subtotal (A)	**522**	**149**	**225**	**148**
B. Contingencies [c]	**120**	**32**	**2**	**86**
C. Financing Charges during Implementation [d]	**33**	**9**	**16**	**8**
Total (A+B+C)	**675**	**190**	**242**	**243**

[a] Includes taxes and duties to be financed from government resources ($68 million for the investment program) as cash contributions. Amounts for the third tranche are indicative.
[b] In mid-2014 prices.
[c] Physical contingencies computed at 10% for civil works and equipment. Price contingencies computed at 0.3%-1.4% on foreign exchange costs and 6.0% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.
[d] Includes interest and commitment charges. Interest during construction for ADB regular loan has been computed at the 5-year US dollar fixed swap rate plus a spread of 0.5% and a maturity-based premium of 0.1%. Commitment charges for an ADB regular loans are 0.15% per year to be charged on the undisbursed loan amount. Interest during implementation for the ADB concessional loan has been computed at an interest rate of 2% per year.
Source: Asian Development Bank estimates.

1. Investment Program and Financing Plan for Tranche 1

16. Tranche 1 of the MFF will finance the following: (i) Stage 1 of the UECP comprising construction of the first 6.2 km of open canals and associated structures of UECP; (ii) Stage 1 of NWPCP comprising construction of two new dams and two new reservoirs at Mahakithula and Mahkirula, 27 km of conveyance channels between the Wemedilla tank and the new Mahakithula and Mahkirula Reservoirs including three new tunnels with a total length of 2,090 meters; (iii) all of MLBCRP; (iv) Stage 1 of PMDSC; and (v) ISEWP.

17. Tranche 1 will be financed, in part, from a regular loan ($76 million) and a concessional loan ($74 million). The OCR loan will have a 26-year term, including a grace period of 5 years, an annual interest rate determined in accordance with ADB's London interbank offered rate-based lending facility,[8] a commitment charge of 0.15% per year, and such other terms and conditions set forth in the loan agreement. The concessional loan will have a 25-year term, including a grace period of 5 years, an interest rate of 2.0% per annum, and such other terms and conditions set forth in the loan agreement. The remainder of the cost of Tranche 1 will be funded by the government ($40 million). The financing plan for the investment program and Tranche 1 is in Table 2.

Table 2: Investment Program and Financing Plan for Tranche 1

Source	Investment Program		Tranche 1	
	Amount ($ million)	**Share** (%)	**Amount** ($ million)	**Share** (%)
Asian Development Bank				
Ordinary capital resources (loan)	262	39	76	40
Special Funds resources (loan)	191	28	74	39
Cofinancing	114	17	-	-
Government of Sri Lanka	108	16	40	21
Total	**675**	**100**	**190**	**100**

Source: Asian Development Bank estimates.

[8] The interest includes a maturity premium of 10 basis points. This is based on the above loan terms and the government's choice of repayment option and dates.

A. Detailed Cost Estimates by Expenditure Category for Tranche 1

Item		Amount ($ million)			
		Foreign Exchange	Local Currency	Total Cost	% of Total Base Cost
A.	**Investment Costs**				
	1. Civil works	38.39	69.11	107.50	72.24
	2. Mechanical and electrical equipment	2.83	1.13	3.97	2.67
	3. Environment and social mitigation	-	4.98	4.98	3.35
	4. Consulting services				
	a. Project management	9.73	12.37	22.09	14.85
	b. Other consulting services	0.77	1.86	2.64	1.77
	Subtotal (A)	**51.72**	**89.45**	**141.17**	**94.87**
B.	**Recurrent Costs**				
	1. Incremental PMU and PIU salaries[a]	-	5.38	5.38	3.62
	2. Strategic communication plan	-	0.85	0.85	0.57
	3. Training	-	0.86	0.86	0.58
	4. Equipment operation and maintenance	-	0.55	0.55	0.37
	Subtotal (B)	**-**	**7.63**	**7.63**	**5.13**
	Total Base Cost	**51.72**	**97.08**	**148.80**	**100.00**
C.	**Contingencies**				
	1. Physical	5.59	8.02	13.61	9.15
	2. Price	1.61	17.42	19.03	12.79
	Subtotal (C)	**7.19**	**25.44**	**32.64**	**21.93**
D.	**Financing Charges During Implementation**				
	1. Interest during implementation	8.26	-	8.26	5.55
	2. Commitment charges	0.30	-	0.30	0.20
	Subtotal (D)	**8.56**	**-**	**8.56**	**5.75**
	Total Project Cost (A+B+C+D)[b]	**67.48**	**122.52**	**190.00**	**127.68**

[a] Per government management services circular no.33 and subsequent circulars.

[b] Any incidental expenditures relating to bank charges, local transport, freight and insurance are eligible for ADB financing.

Source: Asian Development Bank estimates.

B. Allocation and Withdrawal of Loan Proceeds for Tranche 1

Allocation and Withdrawal of ADB Regular Loan Proceeds				
		Amount Allocated $		Percentage and Basis for Withdrawal from the Loan Account
Number	Item	Category	%	
1	Civil Works	54,540,000	51	percent of total expenditure claimed
2	Mechanical and electrical equipment	2,090,000	53	percent of total expenditure claimed
3	Incremental PMU and PIU salaries	450,000	8	percent of total expenditure claimed
4	Strategic communication plan	500,000	59	percent of total expenditure claimed*
5	Training	450,000	53	percent of total expenditure claimed
6	Unallocated	17,970,000		
	Total	**76,000,000**		

*Exclusive of taxes and duties imposed within the territory of the borrower

Allocation and Withdrawal of ADB Concessional Loan Proceeds				
		Amount Allocated $		Percentage and Basis for Withdrawal from the Loan Account
Number	Item	Category	%	
1	Civil Works	37,800,000	35	percent of total expenditure claimed
2	Mechanical and electrical equipment	1,450,000	37	percent of total expenditure claimed
3	Consulting services	21,330,000	86	percent of total expenditure claimed
4	Incremental PMU and PIU salaries	310,000	6	percent of total expenditure claimed
5	Strategic communication plan	350,000	41	percent of total expenditure claimed*
6	Training	310,000	37	percent of total expenditure claimed
7	Unallocated	12,450,000		
	Total	**74,000,000**		

*Exclusive of taxes and duties imposed within the territory of the borrower

C. Detailed Cost Estimates by Financier for Tranche 1 ($ million)

Item		Total	ADB (Regular Loan)		ADB (Concessional) Loan		Government [a]			
		Amount	Amount	%	Amount	%	Costs	Taxes and duties [b]	Total	%
A.	**Investment Costs**									
1.	Civil works	107.50	54.54	51	37.80	35	3.63	11.52	15.15	14
2.	Mechanical and electrical equipment	3.97	2.09	53	1.45	37	-	0.43	0.43	11
3.	Environment and social mitigation [c]	4.98	-	-	-	-	4.98	-	4.98	100
4.	Consulting services									
	a. Project management	22.09	-	-	19.72	89	-	2.37	2.37	11
	b. Other consulting services	2.64	-	-	1.60	61	0.75	0.28	1.04	39
	Subtotal (A)	**141.17**	**56.64**	**40**	**60.58**	**43**	**9.37**	**14.59**	**23.96**	**17**
B.	**Recurrent Costs**									
1.	Incremental PMU and PIU salaries	5.38	0.45	8	0.31	6	4.61	-	4.61	86
2.	Strategic communication plan [d]	0.85	0.50	59	0.35	41	-	-	-	-
3.	Training	0.86	0.45	53	0.31	37	-	0.09	0.09	11
4.	Equipment operation and maintenance	0.55	-	-	-	-	0.51	0.04	0.55	100
	Subtotal (B)	**7.63**	**1.40**	**18**	**0.97**	**13**	**5.12**	**0.13**	**5.25**	**69**
	Total Base Cost	**148.80**	**58.04**	**39**	**61.55**	**41**			**29.21**	**20**
C.	**Contingencies**									
1.	Physical	13.61	7.82	57	5.42	40	0.36	-	0.36	3
2.	Price	19.03	10.14	53	7.02	37	1.87	-	1.87	10
	Subtotal (C)	**32.64**	**17.96**	**55**	**12.45**	**38**	**2.23**	**-**	**2.23**	**7**
D.	**Financing Charges During Implementation**									
1.	Interest during implementation	8.26	-	-	-	-	8.26	-	8.26	100
2.	Commitment charges	0.30	-	-	-	-	0.30	-	0.30	100
	Subtotal (D)	**8.56**	**-**	**-**	**-**	**-**	**8.56**	**-**	**8.56**	**100**
	Total Project Cost (A+B+C+D)	**190.00**	**76.00**	**40**	**74.00**	**39**	**25.28**	**14.72**	**40.00**	**21**

Source: Asian Development Bank estimates.

[a] Audit cost is included as part of the government cost.

[b] Cash contributions

[c] Resettlement implementation and environment management.

[d] Implementing the investment program's Strategic Communications Plan and its related components and activities.

D. Detailed Cost Estimates by Component for Tranche 1

Item	Cost	1. Water conveyance infrastructure constructed or rehabilitated		2. Systems for SIWRM and ISEWP developed		3. Multi-disciplinary investment program management operational	
		$million	%	$million	%	%	$million
A. Investment Costs							
1. Civil works	107.50	107.50	100	-	-	-	-
2. Mechanical and electrical equipment	3.97	3.97	100	-	-	-	-
3. Environment and social mitigation	4.98	4.98	100	-	-	-	-
4. Consulting services							
a. Project management	22.09	-	-	-	-	22.09	100
b. Other consulting services	2.64	-	-	2.20	83	0.44	17
Subtotal (A)	**141.17**	**116.45**	**82**	**2.20**	**2**	**22.53**	**16**
B. Recurrent Costs							
1. Incremental PMU and PIU salaries	5.38	-	-	-	-	5.38	100
2. Strategic communication plan	0.85					0.85	100
3. Training	0.86	-	-	-	-	0.86	100
4. Equipment operation and maintenance	0.55	-	-	-	-	0.55	100
Subtotal (B)	**7.63**	**-**	**-**	**-**	**-**	**7.63**	**100**
Total Base Cost	**148.80**	**116.45**	**78**	**2.20**	**2**	**30.16**	**20**
C. Contingencies							
1. Physical	13.61	13.61	100	-	-	-	-
2. Price	19.03	14.38	76	0.30	2	4.34	23
Subtotal (C)	**32.64**	**27.99**	**86**	**0.30**	**1**	**4.34**	**13**
D. Financing Charges During Implementation							
1. Interest during implementation	8.26	6.46	78	0.12	1	1.67	20
2. Commitment charges	0.30	0.24	78	0.00	1	0.06	20
Subtotal (D)	**8.56**	**6.70**	**78**	**0.13**	**1**	**1.74**	**20**
Total Project Cost (A+B+C+D)	**190.00**	**151.13**	**80**	**2.63**	**1**	**36.24**	**19**

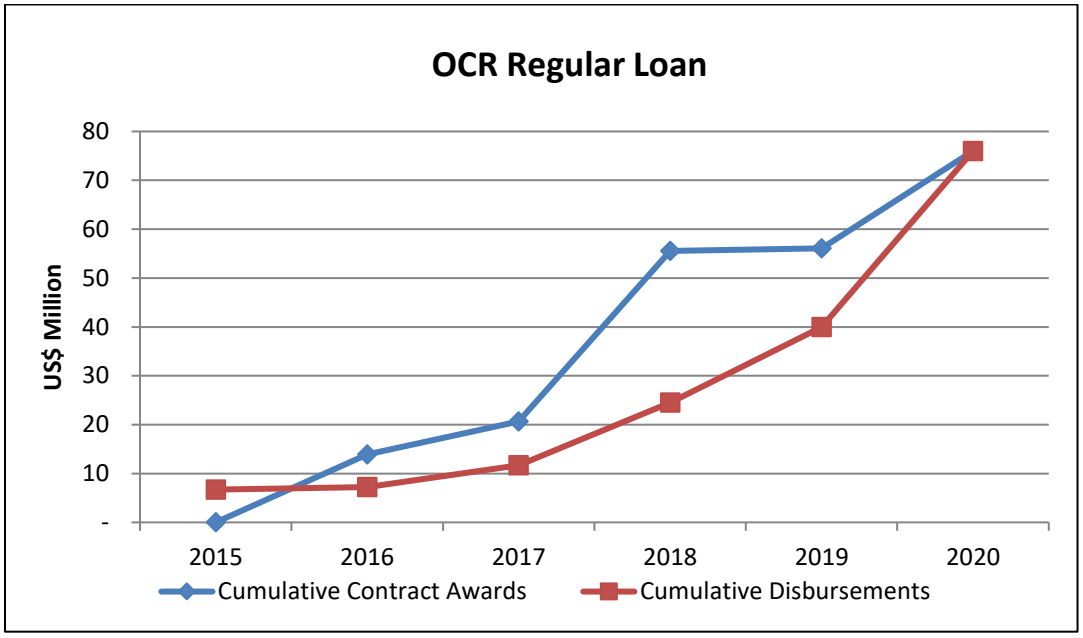
Source: Asian Development Bank estimates.

E. Detailed Cost Estimates by Year for Tranche 1

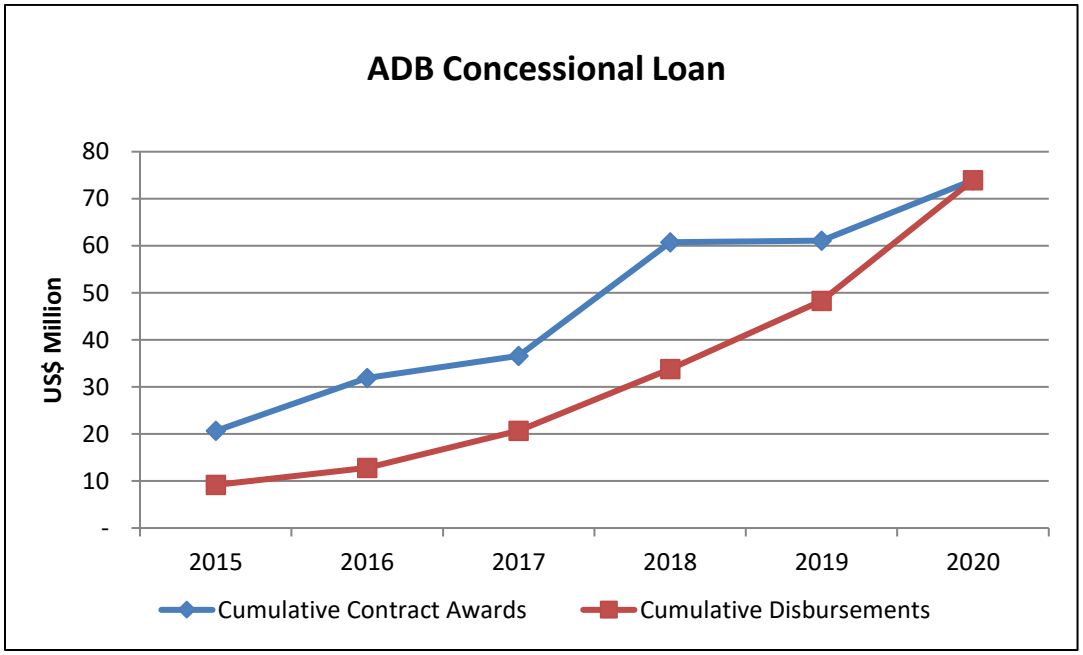
Item	($ million)					
	Total	**2015**	**2016**	**2017**	**2018**	**2019**
A. Investment Costs						
1. Civil works	107.50	4.16	29.91	33.76	32.83	6.85
2. Mechanical and electrical equipment	3.97	1.27	2.09	-	-	0.60
3. Environment and social mitigation	4.98	4.33	0.17	0.16	0.16	0.15
4. Consulting services						
a. Project management	22.09	2.42	4.66	4.48	4.31	6.22
b. Other consulting services	2.64	0.10	0.67	1.19	0.61	0.08
Subtotal (A)	**141.17**	**12.28**	**37.50**	**39.59**	**37.90**	**13.90**
B. Recurrent Costs						
1. Incremental PMU and PIU salaries	5.38	1.18	1.12	1.07	1.03	0.98
2. Strategic communication plan	0.85	0.19	0.18	0.17	0.16	0.15
3. Training	0.86	0.19	0.18	0.17	0.16	0.16
4. Equipment operation and maintenance	0.55	0.12	0.11	0.11	0.10	0.10
Subtotal (B)	**7.63**	**1.67**	**1.59**	**1.52**	**1.46**	**1.39**
Total Base Cost	**148.80**	**13.95**	**39.09**	**41.11**	**39.36**	**15.30**
C. Contingencies						
1. Physical	13.61	0.49	4.01	4.12	4.34	0.67
2. Price	19.03	0.57	2.99	5.17	6.94	3.36
Subtotal (C)	**32.64**	**1.06**	**6.99**	**9.28**	**11.28**	**4.02**
D. Financing Charges During Implementation						
1. Interest during implementation	8.26	0.09	0.63	1.60	2.62	3.32
2. Commitment charges	0.30	0.11	0.09	0.06	0.03	0.01
Subtotal (D)	**8.56**	**0.20**	**0.73**	**1.66**	**2.65**	**3.33**
Total Project Cost (A+B+C+D)	**190.00**	**15.21**	**46.81**	**52.05**	**53.28**	**22.65**
%Total Project Cost	100.00	8.00	24.64	27.40	28.04	11.92

Source: Asian Development Bank estimates.

F. Contract and Disbursement S-curves for Tranche 1



Source: Asian Development Bank estimates.
Note: 2015 disbursement is mainly attributed to the initial advance to the advance account.



Source: Asian Development Bank estimates.
Note: 2015 disbursement is mainly attributed to the initial advance to the advance account and advance payment to project management, design and supervision consultants.

2. Financing Plan for Tranche 2

18. Tranche 2 will finance (i) the partial construction of a 28 km of tunnel, using tunnel boring machine and drill and blast construction methods;[9] (ii) the partial construction of about 8.8 km of new tunnels and channel using drill and blast construction method;[10] (iii) cost increases incurred under the first tranche;[11] and (iv) project management recurring costs.

19. The following key assumptions underpin Tranche 2 cost estimates and financing plan:
    (i) Exchange rate: SLRs153.17 = $1.00 (as of 08 November 2017)
    (ii) Price contingencies based on expected cumulative inflation over the implementation period are shown in Table 3.

Table 3: Escalation Rates for Price Contingency Calculation

Item	2017	2018	2019	2020	2021	2022 and after
Foreign rate of price inflation	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
Domestic rate of price inflation	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%

Sources: Asian Development Bank estimates based on MUV Index (foreign rate of price inflation) and Asian Development Outlook 2017 (domestic rate of price inflation)

20. The government has requested (i) a regular loan of $179 million from ADB's ordinary capital resources, and (ii) a concessional loan of $31 million from ordinary capital resources to help finance the project. The regular loan will have a 20-year term, including a grace period of 5 years, an annual interest rate determined in accordance with ADB's London interbank offered rate -based lending facility, a commitment charge of 0.15% per year (the interest and other charges during construction to be capitalized in the loan), and such other terms and conditions set forth in the draft loan agreement. The concessional loan will have a 25-year term, including a grace period of 5 years, an interest rate of 2.0% per annum during the grace period and thereafter, and such other terms and conditions set forth in the draft loan agreement. The financing plan is in Table 4.

[9] A works package (UEC-ICB-2A) for the 28 km tunnel will be awarded under Tranche 2 with a cost estimate of $314 million. It will be financed under Tranche 2 ($138.5 million) and Tranche 3 ($175.5 million).

[10] A works package (UEC-ICB-2B) for the 8.8 km tunnels and canals will be awarded under Tranche 2 with a cost estimate of $49 million. It will be financed under Tranche 2 ($30 million) and Tranche 3 ($19 million).

[11] A works package (NWPC-ICB-1) for construction of 2 new reservoirs and adjoining 500 m tunnel will be awarded under Tranche 1 with a cost estimate of $67 million. It will be tentatively financed under Tranche 1 ($20 million), Tranche 2 ($30 million) and Tranche 3 ($17 million).

Table 4: Financing Plan for Tranche 2

Source	Tranche 2	
	Amount ($ million)	**Share** (%)
Asian Development Bank	210.00	87
Ordinary capital resources (regular loan)	179.00	74
Ordinary capital resources (concessional loan)	31.00	13
Government of Sri Lanka	32.00	13
Total	**242.00**	**100**

Source: Asian Development Bank estimates.

A. Detailed Cost Estimates by Expenditure Category for Tranche 2

Item			**Amount** ($ million)			
			Foreign Exchange	**Local Currency**	**Total Cost**	**% of Total Base Cost**
A.	**Investment Costs**					
	1.	Civil works	67.68	130.79	198.47	89.97
		a. UEC-ICB-2A	47.22	91.25	138.47	62.77
		b. UEC-ICB-2B	10.23	19.77	30.00	13.60
		c. NWPC-ICB-1	10.23	19.77	30.00	13.60
	2.	Environment mitigation	-	0.82	0.82	0.37
	3.	Social mitigation	-	0.38	0.38	0.17
	4.	Consulting services				
		a. PMDSC	3.50	3.50	7.00	3.17
		Subtotal (A)	**71.18**	**135.49**	**206.67**	**93.68**
B.	**Recurrent Costs**					
	1.	PMU and PIU Operation Costs [a]	-	7.00	7.00	3.17
	2.	Equipment operation and maintenance	-	6.93	6.93	3.14
		Subtotal (B)	**-**	**13.93**	**13.93**	**6.32**
		Total Base Cost (A + B)	**71.18**	**149.42**	**220.60**	**100.00**
C.	**Contingencies**					
	1.	Physical	-	-	-	-
	2.	Price	-	1.89	1.89	0.85
		Subtotal (C)	**-**	**1.89**	**1.89**	**0.85**
D.	**Interest and Commitment Charges**					
	1.	Interest during implementation	19.11	-	19.11	8.66
	2.	Commitment charges	0.40	-	0.40	0.18
		Subtotal (D)	**19.51**	**-**	**19.51**	**8.85**
		Total Project Cost (A+B+C+D) [b]	**90.69**	**151.31**	**242.00**	**109.70**

[a] PMU and PIU Operation Costs includes (i) salaries for PMU and PIU staff as presented within the FAM (including overtime and other due staff payments required to support investment program activities); (ii) Technical Review Committee and Technical Evaluation Committee costs; (iii) office establishment costs including all furniture, equipment, stationary and other ancillary items required to support PMU and PIU; (iv) advertising costs related to eligible recruitment and procurement activities; (v) all operation and maintenance costs related to PMU and PIU offices; and (vi) all operation and maintenance costs related to PMU and PIU vehicles to support investment program activities. Reimbursement procedures may be used for PMU and PIU salaries.

[b] Any incidental expenditures relating to bank charges, local transport, freight and insurance are eligible for ADB financing.

Source: Asian Development Bank estimates.

B. Allocation and Withdrawal of Loan Proceeds for Tranche 2

21. The use of the ADB concessional loan will be prioritized vis-à-vis the use of the ADB regular loan for the UEC-ICB-2A and UEC-ICB-2B packages.

Allocation and Withdrawal of ADB Regular Loan Proceeds				
Number	Item	Amount Allocated $		Percentage and Basis for Withdrawal from the Loan Account
		Category	%	
1	Civil Works			
1a	UEC-ICB-2A	114,890,000	85	percent of total expenditure claimed
1c	NWPC-ICB-1	25,580,000	85	percent of total expenditure claimed
2	Environment Mitigation	820,000	100	percent of total expenditure claimed
3	Consulting Services (PMDSC)	5,970,000	85	percent of total expenditure claimed
4	PMU and PIU Operation Costs [a]	7,000,000	100	percent of total expenditure claimed
5	Equipment operation maintenance	5,660,000	81	percent of total expenditure claimed
6	Interest and Commitment Charges	17,240,000	100	percent of total amounts due
	Unallocated	1,840,000		
	Total	**179,000,000**		

[a] PMU and PIU Operation Costs includes (i) salaries for PMU and PIU staff as presented within the FAM (including overtime and other due staff payments required to support investment program activities); (ii) Technical Review Committee and Technical Evaluation Committee costs; (iii) office establishment costs including all furniture, equipment, stationary and other ancillary items required to support PMU and PIU; (iv) advertising costs related to eligible recruitment and procurement activities; (v) all operation and maintenance costs related to PMU and PIU offices; and (vi) all operation and maintenance costs related to PMU and PIU vehicles to support investment program activities. Reimbursement procedures may be used for PMU and PIU salaries.

Allocation and Withdrawal of ADB Concessional Loan Proceeds				
Number	Item	Amount Allocated $		Percentage and Basis for Withdrawal from the Loan Account
		Category	%	
1	Civil Works			
1a	UEC-ICB-2A	3,157,000	85	percent of total expenditure claimed
1b	UEC-ICB-2B	25,575,000	85	percent of total expenditure claimed
2	Interest Charges	2,268,000	100	percent of total amounts due
	Total	**31,000,000**		

C. Detailed Cost Estimates by Financier for Tranche 2 ($ million)

Item	Total	ADB Regular Loan		ADB Concessional Loan		Government [a]			
	Amount	Amount	%	Amount	%	Costs	Taxes & duties [b]	Total	%
A. Investment Costs									
1. Civil works									
1a. UEC-ICB-2A	138.47	114.89	83	3.16	2	-	20.42	20.42	15
1b. UEC-ICB-2B	30.00	-	-	25.57	85	-	4.42	4.42	15
1c. NWPC-ICB-1	30.00	25.58	85	-	-	-	4.42	4.42	15
2. Environment mitigation	0.82	0.82	100	-	-	-	-	-	-
3. Social mitigation	0.38	-	-	-	-	0.38	-	0.38	100
4. Consulting services									
4a. PMDSC	7.00	5.97	85	-	-	-	1.03	1.03	15
Subtotal (A)	**206.67**	**147.26**	**71**	**28.73**	**14**	**0.38**	**30.30**	**30.68**	**15**
B. Recurrent Costs									
1. PMU and PIU Operation Costs [c]	7.00	7.00	100	-	-	-	-	-	-
2. Equipment operation and maintenance	6.93	5.66	82	-	-	-	1.28	1.28	18
Subtotal (B)	**13.93**	**12.66**	**91**	**-**	**-**	**-**	**1.28**	**1.28**	**9**
C. Contingencies									
1. Physical	-	-	-	-	-	-	-	-	-
2. Price	1.89	1.84	98	-	-	0.04	-	0.04	-
Subtotal (C)	**1.89**	**1.84**	**98**	**-**	**-**	**0.04**	**-**	**0.04**	**-**
D. Interest and Commitment Charges									
1. Interest during implementation	19.11	16.84	88	2.27	12	-	-	-	-
2. Commitment charges	0.40	0.40	100	-	-	-	-	-	-
Subtotal (D)	**19.51**	**17.24**	**88**	**2.27**	**12**	**-**	**-**	**-**	**-**
Total Project Cost (A+B+C+D)	**242.00**	**179.00**	**74**	**31.00**	**13**	**0.42**	**31.58**	**32.00**	**13**

[a] Audit cost is included as part of the government cost.
[b] Cash contributions
[c] PMU and PIU Operation Costs includes (i) salaries for PMU and PIU staff as presented within the FAM (including overtime and other due staff payments required to support investment program activities); (ii) Technical Review Committee and Technical Evaluation Committee costs; (iii) office establishment costs including all furniture, equipment, stationary and other ancillary items required to support PMU and PIU; (iv) advertising costs related to eligible recruitment and procurement activities; (v) all operation and maintenance costs related to PMU and PIU offices; and (vi) all operation and maintenance costs related to PMU and PIU vehicles to support investment program activities. Reimbursement procedures may be used for PMU and PIU salaries.

Source: Asian Development Bank.

D. Detailed Cost Estimates by Component for Tranche 2

Item	Cost	1. Water conveyance infrastructure constructed or rehabilitated		2. Multi-disciplinary investment program management operational	
		$million	%	$million	%
A. Investment Costs					
1. Civil works	198.47	198.47	100	-	-
1a. UEC-ICB-2A	138.47	138.47	70	-	-
1b. UEC-ICB-2B	30.00	30.00	15	-	-
1c. NWPC-ICB-1	30.00	30.00	15	-	-
2. Environment mitigation	0.82	-	-	0.82	100
3. Social mitigation	0.38	-	-	0.38	100
4. Consulting services					
4a. PMDSC	7.00	-	-	7.00	100
Subtotal (A)	**206.67**	**198.47**	**96**	**8.20**	**4**
B. Recurrent Costs					
1. PMU and PIU Operation Costs[a]	7.00	-	-	7.00	100
2. Equipment operation and maintenance	6.93	-	-	6.93	100
Subtotal (B)	**13.93**	**-**	**-**	**13.93**	**100**
Total Base Cost (A + B)	**220.60**	**198.47**	**90**	**22.13**	**10**
C. Contingencies					
1. Physical	-	-	-	-	-
2. Price	1.89	-	-	1.89	100
Subtotal (C)	**1.89**	**-**	**-**	**1.89**	**100**
D. Interest and Commitment Charges					
1. Interest during implementation	19.11	17.19	90	1.92	10
2. Commitment charges	0.40	0.36	90	0.04	10
Subtotal (D)	**19.51**	**17.55**	**90**	**1.96**	**10**
Total Project Cost (A+B+C+D)	**242.00**	**216.02**	**89**	**25.98**	**11**

[a] PMU and PIU Operation Costs includes (i) salaries for PMU and PIU staff as presented within the FAM (including overtime and other due staff payments required to support investment program activities); (ii) Technical Review Committee and Technical Evaluation Committee costs; (iii) office establishment costs including all furniture, equipment, stationary and other ancillary items required to support PMU and PIU; (iv) advertising costs related to eligible recruitment and procurement activities; (v) all operation and maintenance costs related to PMU and PIU offices; and (vi) all operation and maintenance costs related to PMU and PIU vehicles to support investment program activities. Reimbursement procedures may be used for PMU and PIU salaries.

Source: Asian Development Bank estimates.

E. Detailed Cost Estimates by Year for Tranche 2

Item		($ million)					
		Total	**2018**	**2019**	**2020**	**2021**	**2022**
A.	**Investment Costs**						
	1. Civil works						
	1a. UEC-ICB-2A	138.47	63.46	58.23	16.79	-	-
	1b. UEC-ICB-2B	30.00	11.54	13.06	5.41	-	-
	1c. NWPC-ICB-1	30.00	7.72	22.28	-	-	-
	2. Environment mitigation	0.82	0.22	0.21	0.20	0.19	-
	3. Social mitigation	0.38	0.38	-	-	-	-
	4. Consulting services						
	4a. PMDSC	7.00	2.22	1.79	1.79	1.20	-
	Subtotal (A)	**206.67**	**85.53**	**95.56**	**24.18**	**1.39**	**-**
B.	**Recurrent Costs**						
	1. PMU and PIU Operation Costs[a]	7.00	1.87	1.79	1.71	1.64	-
	2. Equipment operation and maintenance	6.93	-	-	2.85	4.08	-
	Subtotal (B)	**13.93**	**1.87**	**1.79**	**4.56**	**5.72**	**-**
	Total Base Cost	**220.60**	**87.40**	**97.35**	**28.74**	**7.11**	**-**
C.	**Contingencies**						
	1. Physical	-	-	-	-	-	-
	2. Price	1.89	0.07	0.04	0.63	1.15	-
	Subtotal (C)	**1.89**	**0.07**	**0.04**	**0.63**	**1.15**	**-**
D.	**Interest and Commitment Charges**						
	1. Interest during implementation	19.11	0.97	3.06	4.56	5.11	5.41
	2. Commitment charges	0.40	0.22	0.12	0.04	0.02	0.00
	Subtotal (D)	**19.51**	1.19	3.18	4.61	5.13	5.41
	Total Project Cost (A+B+C+D)	**242.00**	**88.66**	**100.56**	**33.98**	**13.39**	**5.41**
	%Total Project Cost	100	36.64	41.56	14.04	5.53	2.24

[a] PMU and PIU Operation Costs includes (i) salaries for PMU and PIU staff as presented within the FAM (including overtime and other due staff payments required to support investment program activities); (ii) Technical Review Committee and Technical Evaluation Committee costs; (iii) office establishment costs including all furniture, equipment, stationary and other ancillary items required to support PMU and PIU; (iv) advertising costs related to eligible recruitment and procurement activities; (v) all operation and maintenance costs related to PMU and PIU offices; and (vi) all operation and maintenance costs related to PMU and PIU vehicles to support investment program activities. Reimbursement procedures may be used for PMU and PIU salaries.

Source: Asian Development Bank estimates.

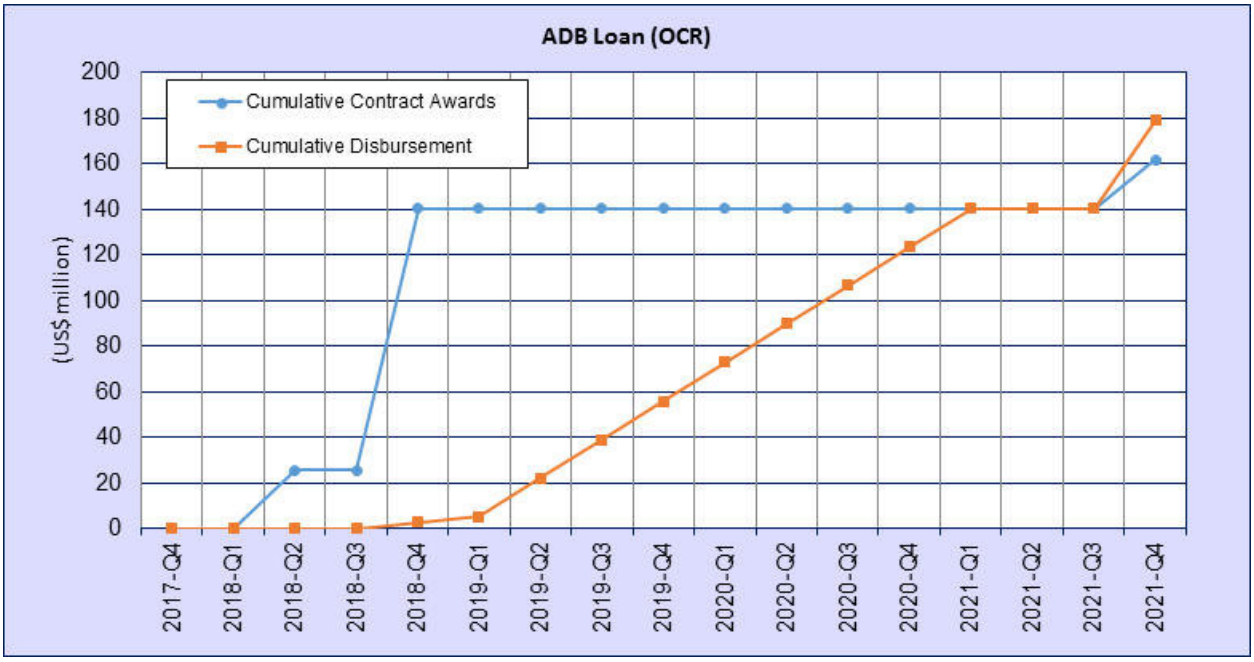
F. Contract and Disbursement S-curves for Tranche 2

ADB Loan (OCR): Contract Awards

	Q1	Q2	Q3	Q4	Total
2018	-	25.58	-	114.89	140.47
2019	-	-	-	-	-
2020	-	-	-	-	-
2021	-	-	-	21.29	21.29
Total	-	**25.58**	**-**	**136.18**	**161.78**

ADB Loan (OCR): Disbursements

	Q1	Q2	Q3	Q4	Total
2018	-	-	-	2.55	2.55
2019	2.56	16.92	16.92	16.92	53.32
2020	16.92	16.92	16.92	16.92	67.68
2021	16.92	-	-	38.53	55.45
Total	**36.40**	**33.84**	**33.84**	**74.92**	**179.00**

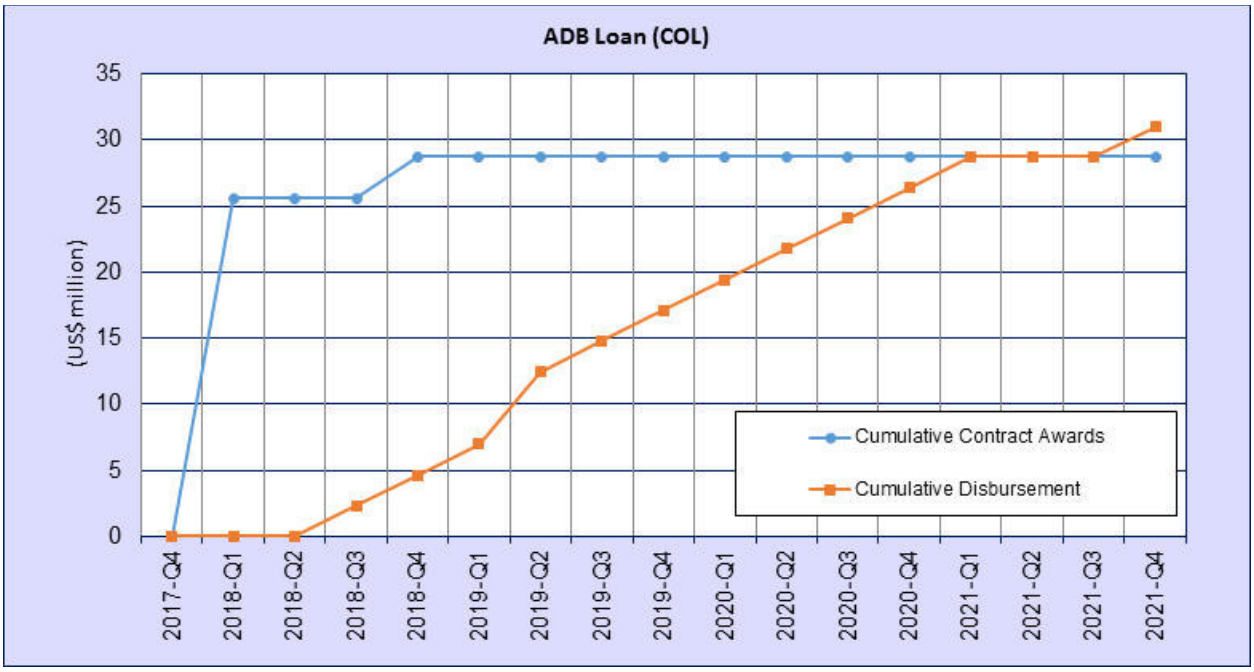


ADB Loan (COL): Contract Awards

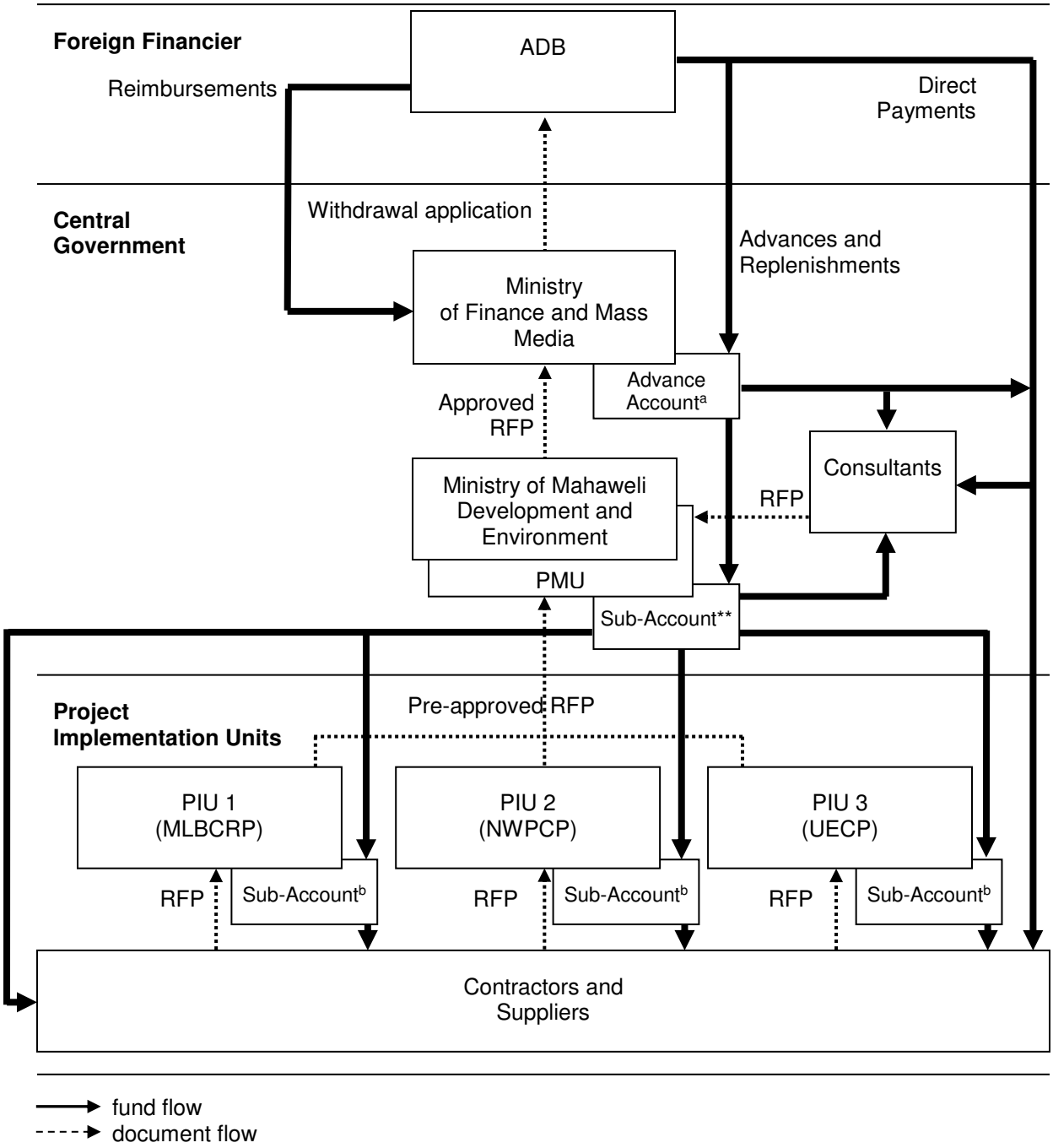
	Q1	Q2	Q3	Q4	Total
2018	25.57	-	-	3.16	28.73
2019	-	-	-	-	-
2020	-	-	-	-	-
2021	-	-	-	-	-
Total	**25.57**	**-**	**-**	**3.16**	**28.73**

ADB Loan (COL): Disbursements

	Q1	Q2	Q3	Q4	Total
2018	-	-	2.31	2.32	4.63
2019	2.32	5.48	2.32	2.33	12.45
2020	2.33	2.33	2.33	2.33	9.32
2021	2.33	-	-	2.27	4.60
Total	**6.98**	**7.81**	**6.96**	**9.25**	**31.00**



3. Investment Program Fund Flow Diagram



RFP = request for payment

[a] US$ account in Central Bank of Sri Lanka

[b] SLRe sub-accounts in state-owned bank under MMDE. The PIU sub-accounts will be established and used only with ADB's prior approval.

V. FINANCIAL MANAGEMENT

A. Financial Management Assessment

22. A financial management assessment of MMDE,[12] DOI and MASL was initially undertaken in 2014 in accordance with ADB's Guidelines for the Financial Management and Analysis of Projects (2005) and Financial Due Diligence: a Methodology Note (2009).[13] This included an assessment of the financial management capacity of MMDE, DOI and MASL including fund-flow arrangements, staffing, accounting and financial reporting systems, financial information systems, internal controls, and internal and external auditing arrangements.

23. The financial management assessment was updated in April 2017. It was undertaken with the purpose of ensuring that MMDE, MASL and DOI are maintaining and developing their institutional and financial management capacities to implement the investment program successfully and effectively operate the facilities built by the investment program. It was also conducted in terms of fund-flow arrangements, staffing, accounting and financial reporting systems, financial information systems and internal controls, as well as internal and external auditing arrangements.

24. MMDE is the executing agency. Staff from the DOI and MASL are seconded to MMDE to fill PMU and PIUs positions as required for the duration of the investment program. MMDE is structured to guide the PMU and PIUs by exercising supervision and progress control over the overall programs and individual projects and tranches. MMDE has extensive experience in executing large foreign funded projects and is also currently managing an ongoing portfolio of foreign and government funded development projects.

25. MASL operates under MMDE as a semi-autonomous institution. The activities of MASL form the cornerstone of the MDP, which include regulating and harnessing the waters of Mahaweli River for power generation, drinking, land settlement and food production, thereby providing employment. Prior to the investment program MASL had completed an array of large hydro and water resource development initiatives and its experience serves well in implementing the investment program. MMDE, together with MASL, has a budget allocation of over $440 million for 2016. The total budget allocation approved for MMDE and MASL for 2016-2019 is $1,350 million, which reflects the combined financial strength of the two organizations and their scale of technical and administrative expertise. MASL operates and maintains large scale irrigation schemes within the Mahaweli System.

26. Previously DOI was under the same ministry as MASL however in January 2015 it was placed under the separate Ministry of Irrigation and Water Resources Management. DOI implements the policies and programs of the Ministry, as the principal government organization responsible for the regulation and control of inland waters. DOI is responsible for operating and maintaining large scale irrigation schemes in and outside the Mahaweli System. However, DOI has always functioned as an independent department with separate budget accounts. It has been playing a key role in the irrigation sector of the country for over 100 years with responsibility for some of the nation's main irrigation systems. DOI is well staffed with the reporting and organizational structures in place to implement the investment program. DOI's 2016 budget was estimated to be around $110 million. The total budget allocation approved for DOI for 2016-2019

[12] The assessment was of the Ministry of Irrigation and Water Resources Management which changed its name to MMDE in January 2015.
[13] The detailed financial management assessment is a supplementary linked document and is available on request.

is $400 million, which reflects the strength of the organization and its scale of technical and administrative expertise. DOI also has considerable experience in implementing major irrigation systems and schemes funded both locally as well as by development partners.

27. Therefore, MMDE with the support of MASL and DOI, has sufficient financial management capacity and expertise to execute and implement this investment program however the following improvements were recommended at the start of the investment program:

(i) A financing management manual be prepared for the investment program and training is provided to MMDE, PMU and PIU staff. This is recommended since MMDE has not implemented ADB-funded projects for more than 10 years. The manual was prepared and training has been initiated under Tranche 1 and will continue for the duration of the investment program, as required.

(ii) A firm commitment from Treasury to prioritize funding for the investment program to ensure timely fund disbursements. This is necessary to avoid re-prioritized projects during the fiscal year resulting in non-disbursements and delays. No delays in financing have been experienced under Tranche 1. For Tranche 2, the government has requested ADB loan financing of all investment and recurrent costs.

(iii) MMDE to include complete financial statements of the investment program to Treasury for their appropriation account, including a balance sheet, profit and loss account, and a cash flow statement. Audited project financial statements for 2015 and 2016 have been submitted to ADB.

(iv) MMDE should routinely update its Corporate Plan through extensive participation of staff in the form of workshops to improve monitoring and physical and financial progress of project against targets. Physical and financial performance indicators are being monitored on a monthly basis.

(v) MMDE should update their project implementation monitoring key performance indicators (KPIs) to track physical progress with financial disbursements of projects and programs. This will enable effective decision-making, planning and allocation of resources and funds. The PMDSC is tasked with preparing a monitoring and evaluation system, and supporting the PMU/PIUs with overall monitoring of the investment program. This action is being undertaken by the investment program and throughout MMDE.

28. Accounts of MMDE, MASL and DOI are prepared in accordance with Sri Lankan Accounting and Auditing Standards and the financial year corresponds with the normal calendar year ending on 31 December. These institutions maintain their accounts under a modified cash basis of accounting. Under this modified cash accounting, capital expenditures for fixed assets are accounted at cost, but depreciation is not provided in the accounts, while its expenditure and income are recorded on a cash basis. Traditionally fixed assets managed and operated by the Government agencies are the Government's assets and they are not depreciated.

29. MMDE, MASL and DOI prepare comprehensive Appropriation Accounts with detailed notes on an annual basis. The Appropriation Account records actual recurrent expenditures (divided into operational and development activities) and capital expenditure (also divided into the same activities) with comparison to the budget. A variation analysis is also provided along with explanations to provide justifications for both over and under expenditure. A statement of claims under foreign-funded projects is included as a separate note in the Appropriation Account. This is a very useful statement, which provides details of payments and claims relating to foreign-funded projects. It is recommended that these institutions maintain a separate note and a statement of payments and claims relating to the investment program. The structure of the

Appropriation Account notes has the flexibility to introduce such additional notes. This is being practiced by MMDE only.

30. MMDE, MASL and DOI's accounting systems use a common platform called Computerized Integrated Government Accounting System (CIGAS), which is employed by most government institutions reporting to the Treasury. CIGAS has been the core accounting system and functions well. It is an on-line fully integrated system that has established direct links with any regional offices of the institutions. In addition to the Appropriation Account, the CIGAS system generates and uploads monthly reports to the Treasury. The Treasury is currently reviewing the existing system and is likely to augment the system across its Ministries and Departments. It is recommended that for the investment program the system introduces separate modules to monitor and report foreign financed projects in more detail.

31. The overall financial management risk is rated as 'low'.[14] There are no high-risk areas and overall MMDE's financial management arrangements are considered adequate. Financial management risks will be considered and updated throughout the life of the investment program along with appropriate risk mitigation measures.

B. Disbursement

32. The loan proceeds will be disbursed in accordance with ADB's Loan Disbursement Handbook (2017, as amended from time to time),[15] and detailed arrangements agreed upon between the government and ADB. Online training for project staff on disbursement policies and procedures is available.[16] PMU and PIU staff are encouraged to avail of this training to help ensure efficient disbursement and fiduciary control. The Borrower shall submit to ADB the original withdrawal applications covering the finances of ADB. ADB will review submitted withdrawal applications and pay its share of financing.

33. ADB's disbursement procedures (direct payment, commitment, reimbursement, and/or advance fund) will be used for withdrawal of project funds. Reimbursement procedures may be used for PMU and PIU salaries. Reimbursement and advance fund (liquidation or replenishment) procedures may be utilized for other recurrent costs (strategic communication plan and training). Withdrawal applications will be authorized by MMDE and sent directly to ADB. One advance account in US dollar will be established per funding source at the Central Bank of Sri Lanka. Sub-accounts will be established and used only with ADB's prior approval. Similar fund flow arrangements may continue for subsequent tranches.

34. The advance account and sub-accounts will be established, managed, replenished and liquidated in accordance with the ADB's Loan Disbursement Handbook (2017, as amended from time to time). The advance and sub-accounts are to be used exclusively for ADB's share of eligible expenditures. MMDE who established the sub-accounts in its name is accountable and responsible for proper use of advances to the advance account including advances to the sub-accounts.

35. The total outstanding advance to the advance account should not exceed the estimate of ADB's share of expenditures to be paid through the advance account for the forthcoming 6

[14] Updated Financial Management Assessment, including an updated financial risk management assessment, is annexed to the Periodic Financing Request Report for Tranche 2.

[15] The handbook is available electronically from the ADB website (Available at: https://www.adb.org/sites/default/files/institutional-document/33606/adb-loan-disbursement-handbook-2017.pdf).

[16] Available at: http://wpqr4.adb.org/disbursement_elearning

months. MMDE may request for initial and additional advances to the advance account based on an Estimate of Expenditure Sheet[17] setting out the estimated expenditures to be financed through the account for the forthcoming 6 months. Supporting documents should be submitted to ADB or retained by the borrower in accordance with ADB's Loan Disbursement Handbook (2017, as amended from time to time) when liquidating or replenishing the advance account.

36. The statement of expenditures (SOE)[18] procedure will be used for reimbursement and liquidation and replenishment of the advance account. Supporting documents and records for the expenditures claimed under the SOE should be maintained and made readily available for review by ADB's disbursement and review missions, upon ADB's request for submission of supporting documents on a sampling basis, and for independent audit.

37. MMDE will be responsible for (i) preparing disbursement projections; (ii) requesting budgetary allocations for foreign aid allocation and counterpart funds; (iii) collecting supporting documents; and (iv) preparing and sending withdrawal applications to ADB in accordance with ADB's Loan Disbursement Handbook (2017, as amended from time to time). Each PIU should submit relevant supporting documents and periodic expenditure statements to PMU. The PMU should consolidate PIU expenses when preparing withdrawal applications.

38. Before submission of the first withdrawal application, MMDE should submit to ADB sufficient evidence of the authority of the person(s) who will sign the withdrawal applications on behalf of the borrower, together with the authenticated specimen signatures of each authorized person. The minimum value per withdrawal application is US$100,000 equivalent. Individual payments below this amount should be paid: (i) by MMDE and subsequently claimed to ADB through reimbursement; or (ii) from the advance account, unless otherwise accepted by ADB. The borrower should ensure sufficient category and contract balances before requesting disbursements. Use of ADB's Client Portal for Disbursements (CPD)[19] system is encouraged for submission of withdrawal applications to ADB.

C. Accounting

39. MMDE will (i) maintain, or cause to be maintained, separate books and records by funding source for all expenditures incurred on the investment program; and (ii) prepare program financial statements in accordance with the government's accounting laws and regulations, which are consistent with international accounting principles and practices. Program financial statements shall include at the minimum, a statement of receipts and payments with accompanying notes and schedules. These shall be prepared to ensure maximum alignment to international accounting standards. Financial statements for individual tranches may be consolidated with a separate table prepared for each loan.

D. Auditing and Public Disclosure

40. MMDE will cause the detailed consolidated investment program financial statements to be audited in accordance with International Standards on Auditing and with the government's audit regulations by an independent auditor acceptable to ADB. The audited project financial

[17] Available in Appendix 8A of the *Loan Disbursement Handbook*
[18] SOE forms are available in Appendix 7B of ADB's *Loan Disbursement Handbook* (2017, as amended from time to time).
[19] The CPD facilitates online submission of WA to ADB, resulting in faster disbursement. The forms to be completed by the Borrower are available online at https://www.adb.org/documents/client-portal-disbursements-guide.

statements together with the auditor's opinion will be submitted in the English language to ADB within 6 months of the end of the fiscal year by MMDE.

41. The audit report for the investment program's financial statements will include a management letter and auditor's opinions, which cover (i) whether the investment program's financial statements present an accurate and fair view or are presented fairly, in all material respects, in accordance with the applicable financial reporting standards; (ii) whether the proceeds of the loans were used only for the purposes of the investment program; and (iii) whether the borrower or executing agency was in compliance with the financial covenants contained in the legal agreements (where applicable); (iv) use of the advance fund procedure; and (v) the use of the statement of expenditure procedure certifying to the eligibility of those expenditures claimed under SOE procedures, and proper use of the SOE and advance fund procedures in accordance with ADB's Loan Disbursement Handbook (2017, as amended from time to time) and the project documents.

42. Compliance with financial reporting and auditing requirements will be monitored by review missions and during normal program supervision, and followed up regularly with all concerned, including the external auditor.

43. The government and MMDE have been made aware of ADB's approach to delayed submission, and the requirements for satisfactory and acceptable quality of the audited project financial statements.[20] ADB reserves the right to require a change in the auditor (in a manner consistent with the constitution of the borrower), or for additional support to be provided to the auditor, if the audits required are not conducted in a manner satisfactory to ADB, or if the audits are substantially delayed. ADB reserves the right to verify the program's financial accounts to confirm that the share of ADB's financing is used in accordance with ADB's policies and procedures.

44. Public disclosure of the audited project financial statements, including the auditor's opinion on the project financial statements, will be guided by ADB's Public Communications Policy 2011.[21] After review, ADB will disclose the audited project financial statements and the opinion of the auditors on the project financial statements no later than 14 days of ADB's confirmation of their acceptability by posting them on ADB's website. The management letter, additional auditor's opinions, and audited entity financial statements will not be disclosed. [22]

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[20] ADB's approach and procedures regarding delayed submission of audited project financial statements:

(i) When audited project financial statements are not received by the due date, ADB will write to the executing agency advising that (a) the audit documents are overdue; and (b) if they are not received within the next 6 months, requests for new contract awards and disbursement such as new replenishment of advance accounts, processing of new reimbursement, and issuance of new commitment letters will not be processed.

(ii) When audited project financial statements are not received within 6 months after the due date, ADB will withhold processing of requests for new contract awards and disbursement such as new replenishment of advance accounts, processing of new reimbursement, and issuance of new commitment letters. ADB will (a) inform the executing agency of ADB's actions; and (b) advise that the loan may be suspended if the audit documents are not received within the next 6 months.

(iii) When audited project financial statements are not received within 12 months after the due date, ADB may suspend the loan.

[21] Public Communications Policy: http://www.adb.org/documents/pcp-2011?ref=site/disclosure/publications.

[22] This type of information would generally fall under public communications policy exceptions to disclosure. ADB. 2011. *Public Communications Policy*. Paragraph 97(iv) and/or 97(v).

VI. PROCUREMENT AND CONSULTING SERVICES

1. Tranche 1 Procurement and Consulting Services

45. A procurement capacity assessment for the investment program was initially prepared in 2014 in accordance with ADB's "Guide on Assessing Procurement Risks and Determining Project Procurement Classification."[23] MMDE has substantial experience in implementing large-scale development projects in the sector. However, when the investment program was processed it is classified as Category A with a concurrent procurement risk classified as "Substantial" because, at that time, MMDE had not been exposed to ADB-financed projects and the level and type of funding that is envisaged under the investment program. The ensuing risk mitigation / management measures have been identified and following mitigation measures were recommended:

(i) The government to strengthen its overall procurement fiduciary, monitoring and capacity development efforts;
(ii) Government to explore the possibilities of increasing procurement approval thresholds procedurally for program procurement, until it makes blanket changes;
(iii) MMDE, MASL and DOI to disseminate opportunities that will be available in the irrigation sector to the construction industry, especially to those who are strong in road construction, in a broad, transparent manner, to stimulate interest of capable contractors who have hitherto not participated in such work;
(iv) While ADB's general Sri Lanka NCB/ICB thresholds will remain the same for the sector, to keep NCB packages below $ 7.5 million threshold for Tranche 1 of the MFF, given the present irrigation sector contractor capacity. To be reviewed during Tranche 2 processing;
(v) MMDE, MASL and DOI to establish a mechanism for handling proper complaints;
(vi) MMDE, MASL and DOI to improve systems for collecting procurement data for monitoring, analysis and feedback. The unit rates used for contract estimates need to be periodically updated; and
(vii) MMDE to conduct hands-on procurement and contract management training to relevant project staff and take measures to retain them.

46. Procurement under the investment program essentially comprises: (i) recruitment of international consulting firms to assist the PMU/PIUs with program management, design and construction supervision, and undertaking the ISEWP and SIWRM consultancy packages; (ii) civil works for the new construction of new conveyance and water delivery infrastructure and rehabilitation of existing canal infrastructure; and (iii) procurement of goods viz. software, project vehicles, office furniture, etc.

47. A consulting firm for the PMDSC services was recruited for implementation assistance to PMU and PIUs. MMDE requested ADB to select the PMDSC to expedite their recruitment, and the EA thereafter negotiated and executed the contract with the selected consultancy firm. Goods such as office furniture and equipment, vehicles etc., are locally available and will be procured through shopping. All transport costs related to all Goods packages are included in the cost estimates. Procurement activities will be carried out with prior review by ADB, unless otherwise stated in the Procurement Plan in Attachment 4.

[23] ADB. 2014. *Guide on Assessing Procurement Risks and Determining Project Procurement Classification*. Manila

A. Advance Contracting and Retroactive Financing

48. To expedite program implementation, the government requested and ADB approved the use of advance contracting actions for the procurement and consulting service (Table 4). All advance contracting and retroactive financing was undertaken in conformity with ADB's *Procurement Guidelines* (February 2015, as amended from time to time)[24] and ADB's *Guidelines on the Use of Consultants* (2013, as amended from time to time).[25] The issuance of invitations to bid under advance contracting and retroactive financing were subject to ADB approval. The borrower and the MMDE were advised that approval of advance contracting and retroactive financing does not commit ADB to finance the investment program.

49. Advance contracting included tendering and bid evaluation for civil works packages, recruitment of the PMDSC consultant services, and shopping for goods.

Table 4: Tranche 1 Advance Contracting

Name	Description	Type
MLBCRP Package 1 – heightening the Minipe Anicut crest level, including water control and measurement facilities	Civil works	ICB
UECP Package 1 – new canal construction for the first 6+226 km of the project	Civil works	ICB
NWPCP Package 1 – new Mahakithula Wewa and Mahakirula Reservoirs, a link canal/tunnel, and associated facilities	Civil works	ICB
PMDSC	Consultant	QCBS
Office equipment and vehicles		Shopping goods
Field office upgrading		Forced account

ICB = international competitive bidding, MLBCRP = Minipe Left Bank Canal Rehabilitation Project, NCB = national competitive bidding, NWPCP = North Western Province Canal Project, PMDSC = program management, design and supervision consultants, UECP = Upper Elahera Canal Project

50. Under each tranche, ADB may, subject to its policies and procedures, allow on request (a) advance contracting of civil works, equipment and materials, and consulting services and (b) retroactive financing of eligible expenditures incurred for consulting services and procurement of goods, services and civil works, project management, and project administration up to 20% of proposed individual loan, incurred prior to loan effectiveness but not earlier than 12 months before the date of signing of the related legal agreement. This applies to items in Table 4.

B. Procurement of Goods, Works and Consulting Services

51. All procurement of goods and works will be undertaken in accordance with ADB's *Procurement Guidelines* (2015, as amended from time to time). ADB and the government will review the public procurement laws of the central and provincial governments to ensure consistency with ADB's *Procurement Guidelines* as and when necessary.

52. An 18-month procurement plan indicating threshold and review procedures, goods, works, and consulting service contract packages and national competitive bidding guidelines is in Section C.

[24] Available at: http://www.adb.org/Documents/Guidelines/Procurement/Guidelines-Procurement.pdf
[25] Available at: http://www.adb.org/Documents/Guidelines/Consulting/Guidelines-Consultants.pdf

53. All consultants will be recruited per ADB's *Guidelines on the Use of Consultants* (2013, as amended from time to time).[26] The terms of reference for all consulting services are detailed in Section D.

54. To facilitate program management and implementation, an international firm, as PMDSC was recruited and mobilized in December 2015. The PMDSC also assumes the role of the "Engineer" and is supervising respective civil works and provides on-the-job training to counterpart staff from the MMDE, and/or provincial and local agencies. The consulting firm was engaged using the quality- and cost-based selection (QCBS) method with a weighting of 90% technical and 10% financial as the nature of the assignment requires priority consideration for quality including designing and supervising the construction of specialized dams and tunnels.

C. Procurement Plan

55. The Tranche 1 procurement plan is in Attachment 4.

D. Consultant's Terms of Reference

56. The PMDSC will support the PMU for five years under Tranche 1 and the contract was signed for the same period. The PMDSC will be responsible for assisting the PMU to: (i) finalize designs for all packages and the bid documents of the remaining contract packages to be awarded under Project 1, and all contract packages of Project 2 and Project 3; (ii) procure, mobilize, and manage the contractors for Project 1, Project 2 and Project 3; (iii) recruit, mobilize, and manage the consultant for the ISEWP consulting services package; (iv) finalize the terms of reference, recruitment and management of a consulting firm to undertake the SIWRM consulting services package; (v) manage and supervise all civil works contracts and act as the "Engineer"; (vi) prepare Phase 2 investments and necessary ADB financing documents; (vii) provide technical and management advice, as required; (viii) manage and administer the investment program; and (ix) prepare draft periodic financing requests for subsequent tranches, and routine reporting requirements of ADB. The PMDSC will also assist MMDE with preparations, logistics and reporting for missions fielded by ADB and other cofinanciers, as necessary, throughout the investment program. Detailed terms of reference are in Attachment 5.

57. The "improving system efficiencies and water productivity" (ISEWP) consulting services package will seek to increase water availability to all areas within the NCPCP project area through investigating current water management and application practices, and identifying areas for improvements. The objective is to maximize overall systems efficiencies and productivity of water within the planned, expanded Mahaweli System being financed by this investment program and under Phase 2. The investment program will construct the main conveyance system which supplies water to existing reservoirs that supply the cascade irrigation systems. The cascade systems comprise major and minor tanks supplying distribution and tertiary canal systems which are largely operated by Provincial Councils and Farmer Organizations (FOs). The systems are characterized by predominately paddy rice cultivation, gross water application rates of approximately 30,000 m^3/ha per annum and distribution efficiencies in the order of 50%. This package will consider how water is managed within these cascade systems. It will study and identify options for improvement of the system's infrastructure and management. The approach will be based on benchmarking (water management, yields and local water management institutions) of 'typical systems' within the NWPCP and MLBCRP areas, analysis of current and

[26] Checklists for actions required to contract consultants by method available in e-Handbook on Project Implementation at: http://www.adb.org/documents/handbooks/project-implementation/

future performance (with future changes in water availability) and formulation of options for improvements to infrastructure, and the system's management, operation and maintenance. The study will also: (i) review past and ongoing efforts to improve system water use efficiencies and productivity of water, and apply the lessons learned to the study's recommendations; (ii) consider what commercial support and extension programs are required to encourage farmers to adopt water-saving practices (for example precise irrigation) and crop diversification; (iii) prepare detailed designs of recommended structural interventions for the NWPC project area that will be included within the NWPC Project - Stage 2; (iv) prepare guidelines for up-scaling recommendations to the national level; and (v) recommend capacity development programs for government staff and FOs. Detailed terms of reference are in Attachment 6. The PMDSC will assist MMDE with finalizing the TOR, recruiting, and managing the ISEWP consultants.

58. The "strengthening of integrated water resources management" consulting services package seeks to promote integrated water resources management (IWRM) principles both within the investment program area and nationally, including recommending and supporting strengthening of water resources management and irrigation sector policies, legislation and institutions. This will be achieved through the review of current policy and legal frameworks, benchmarking of key water sector institutions, and formulation of recommendations and guidelines for improvements to institutionalize IWRM. This activity will also support: (i) updating of current water resources management master plans to include the completed MDP incorporating analysis of climate change impacts and water management practices for dry periods; (ii) possible crop diversification and impacts to scheme designs and management; (iii) assessment of the water demands of, and management of, other major water users including the environment; (iv) design, development and implementation of an IWRM decision support system; and (v) updating and modernizing the Water Management Secretariat under the MASL. The PMDSC will assist MMDE with preparing the TOR.

59. MMDE in concurrence with ADB will recruit and engage a panel of individual experts with qualifications, experience and terms of reference acceptable to ADB, to review, analyze and advise on the detailed engineering designs, contract documents, and implementation of the dam and tunnel components or other experts as required for the investment program and its projects. MMDE will also recruit an Independent Environmental Monitoring Specialist. Draft TOR for these specialists is in Attachment 7.

2. Tranche 2 Procurement and Consulting Services

60. The procurement capacity assessment for the investment program was updated in 2017 in consideration of experience gained during Tranche 1 implementation. MMDE is now gaining experience with the level and type of funding that is envisaged under the investment program through the packages tendered and awarded to date during Tranche 1. To mitigate the risks identified during the procurement assessment carried out for Tranche 1, the following measures are being taken:

(i) MMDE is strengthening its overall procurement capacity through exposure of its officers to training courses and through experience being gained in the award of Tranche 1 construction packages.

(ii) Opportunities in the irrigation sector are being disseminated to the construction industry, including to those strong in road construction, to stimulate interest of capable contractors who have hitherto not participated in such work.

(iii) NCB packages have been kept below the $7.5 million threshold for Tranche 1 of the MFF, given the present irrigation sector contractor capacity. The individual value of works packages to be financed under Tranche 2 exceed $50 million.

(iv) MMDE, MASL and DOI need to establish a mechanism to handle proper complaints. A complaint management system is functioning under the requirements of the National Procurement Commission.
(v) MMDE, MASL and DOI need to improve systems for collecting procurement data for monitoring, analysis and feedback. A Management Information System has been prepared during the first 18 months of the Program and experience is being gained in its use and presentation of the results derived from it. The unit rates used for contract estimates need to be periodically updated.
(vi) MMDE should continue with hands-on procurement and contract management training to relevant project staff and take measures to retain them.

61. Procurement under Tranche 2 essentially comprises: (i) civil works for the construction of new conveyance infrastructure; and (ii) PMU/PIU recurring costs. These are detailed in the Tranche 2 procurement plan in Attachment 8.

62. Goods such as office furniture and equipment, vehicles etc., are locally available and will be procured through shopping. All transport costs related to all Goods packages are included in the cost estimates. Procurement activities will be carried out with prior review by ADB, unless otherwise stated in the Procurement Plan.

A. Advance Contracting and Retroactive Financing

63. To expedite program implementation, the government has requested to apply advance contracting actions for the procurement of works and consulting services. All advance contracting and retroactive financing will be undertaken in conformity with ADB's *Procurement Guidelines* (April 2015, as amended from time to time).[27] The issuance of invitations to bid under advance contracting and retroactive financing will be subject to ADB approval. The borrower and the MMDE have been advised that approval of advance contracting and retroactive financing does not commit ADB to finance the investment program.

64. Advance contracting includes tendering and bid evaluation for civil works packages, an addendum to the PMDSC consultant services package that was awarded under Tranche 1, and shopping for goods. Table 5 shows the status of advance contracting under Tranche 2.

Table 5: Tranche 2 Advance Actions

Activity	Responsible	Due date	Comment
Works package UEC-ICB-2A			
Submission bid document to ADB	PMU	11 Jun 2017	8 Nov 2017
Advertise Bid Notice	PMU	27 Jun 2017	
Receipt of bids	PMU	25 Oct 2017	
Technical bid evaluation report submission to ADB	PMU	24 Nov 2017	
Price bid evaluation report submission to ADB	PMU	9 Jan 2018	
Issue of contract acceptance letter / award	PMU	21 Apr 2018	
Commencement date	PMU	19 May 2018	

[27] Available at: http://www.adb.org/Documents/Guidelines/Procurement/Guidelines-Procurement.pdf

Activity	Responsible	Due date	Comment
Works package UEC-ICB-2B			
Submission bid document to ADB	PMU	12 Mar 2017	Actual
Advertise Bid Notice	PMU	27 Mar 2017	Actual
Receipt of bids	PMU	7 Jun 2017	Actual
Technical bid evaluation report submission to ADB	PMU	30 Aug 2017	Actual
Price bid evaluation report submission to ADB	PMU	26 Aug 2017	22 Nov 2017
Issue of contract acceptance letter / award	PMU	6 Dec 2017	
Commencement date	PMU	3 Jan 2018	

ADB = Asian Development Bank, ICB = international competitive bidding, UECP = Upper Elahera Canal Project

65. Under each tranche, ADB may, subject to its policies and procedures, allow on request (a) advance contracting of civil works, equipment and materials, and consulting services and (b) retroactive financing of eligible expenditures incurred for consulting services and procurement of goods, services and civil works, project management, and project administration up to 20% of proposed individual loan, incurred prior to loan effectiveness but not earlier than 12 months before the date of signing of the related legal agreement. This applies to items in Table 5.

B. Procurement of Goods, Works and Consulting Services

66. All procurement of goods and works will be undertaken in accordance with ADB's *Procurement Guidelines* (2015, as amended from time to time). ADB and the government will review the public procurement laws of the central and provincial governments to ensure consistency with ADB's Procurement Guidelines as and when necessary.

67. An 18-month procurement plan indicating threshold and review procedures, goods, works, and consulting service contract packages and national competitive bidding guidelines is in Section C.

68. Tranche 2 will also finance additional inputs to the PMDSC contract that was awarded under Tranche 1. The additional inputs are contract management, construction supervision and commissioning for the Tranche 2 works packages until their completion. This will be addressed through a contract amendment to the PMDSC's existing contract.

C. Procurement Plan

69. The Tranche 2 procurement plan is in Attachment 8.

VII. SAFEGUARDS

A. Key Safeguards Documents and Responsibilities

70. Pursuant to ADB's Safeguard Policy Statement (SPS, 2009) ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the SPS.

71. The investment program will have three projects implemented time-sliced across three tranches. Implementation of all three projects will be initiated under Tranche 1. Therefore, all three projects have been categorized and assessments prepared prior to ADB Board approval. The following safeguards documents were prepared for the investment program as per ADB's SPS and the government rules:

(i) Environmental Impact Assessment: Upper Elahera Canal Project
(ii) Environmental Impact Assessment: North Western Province Canal Project
(iii) Initial Environmental Examination: Minipe Left Bank Canal Rehabilitation Project
(iv) Environmental Assessment and Review Framework
(v) Resettlement Implementation Plan: North Western Province Canal Project
(vi) Resettlement Framework

72. The environmental assessment and review framework (EARF) and the resettlement framework (RF) serve to guide safeguard assessments and the preparation of relevant safeguards documents in all three projects. The safeguard frameworks cover project specific information and requirements in accordance with ADB's SPS: (i) the general anticipated impacts of the projects to be financed under the investment program on the environment, involuntary resettlement, and indigenous peoples; (ii) the safeguard criteria that are to be used in selecting projects; (iii) the requirements and procedure that will be followed for screening and categorization, impact assessments, development of management plans, public consultation and information disclosure (including the 120-day disclosure rule, for the environmental impact assessments), and monitoring and reporting; (iv) the institutional arrangements (including budget and capacity requirements) and the government's and ADB's responsibilities and authorities for the preparation, review and clearance of safeguard documents. Given that all environmental assessments and resettlement plans required for the entire investment program will be finalized prior to approval of the MFF, these frameworks also provide guidance to the EA on process to be followed if the approved documents need to be revised or updated later due to any changes in design or scope.

73. The government through MMDE will ensure that all safeguards requirements prescribed in the EARF and RF are complied with during the processing and implementation of the program. Pursuant to ADB's SPS, ADB will not finance investments that do not comply with the SPS and national laws. All institutions under the investment program will ensure that their investments comply with applicable national laws and regulations, and will apply the prohibited investment activities list to sub-projects financed by ADB.

74. A safeguards cell will be established in the PMU. The safeguards cell will be responsible to oversee overall monitoring and verification of environment and resettlement activities of the investment program. Two counterpart personnel with relevant experience will be assigned to the safeguards cell which will have responsibility for ensuring compliance of the safeguards requirements including (i) environment and (ii) resettlement including gender. While MMDE will be responsible for overall coordination, planning, and financing of resettlement program, the

implementation of resettlement implementation plans and supervision of the implementation of the environment management plans (EMPs) is the responsibility of PMU.

75. No indigenous peoples issues are foreseen to be addressed during the investment program implementation. Tranche 1 is categorized as C for the indigenous peoples safeguard. There are no indigenous peoples as defined by ADB's SPS in any of the areas of the three projects under the Investment Program. As the remaining tranches would also be categorized as C, an Indigenous Peoples Planning Framework has not been prepared.

B. Environment

76. Since the MFF is designed as a time-slice investment, and all three projects are to be initiated in Tranche 1, environmental assessments of the three sub-projects have been prepared prior to ADB's Board approval. Each project has been categorized as per ADB's SPS to determine the level of assessment required.

77. MLBCRP is classified as Category "B" according to ADB's SPS. An IEE was prepared for MLBCRP and includes an EMP that describes mitigation measures to be adopted during design, construction and operation. The EMP is a plan for mitigating all anticipated environment impacts during project construction and operation. Specific mitigation measures with details on location, time and responsible agency for implementation are given in the EMP.

78. Both NWPCP and UECP are classified as Category 'A' for environment in accordance with ADB's SPS as they traverse through forest reserves. An EIA was prepared for each project. A range of mitigation measures have been proposed to avoid or minimize negative impacts, and to achieve effective offsets for any residual impacts. Impacts on physical resources, human settlements and land use, biodiversity and natural resources, community health and safety, and occupational safety and archaeological/historical resources have been identified. The long-term impacts of the proposed projects under the investment program on physical archaeological, historical and physical cultural resources, socio-economic aspects, are not significant. A large proportion of adverse impacts are confined to the construction phases and they can be minimized and mitigated with appropriate and timely interventions, with adequate supervision and monitoring by the project proponent and other stakeholders.

79. The category of the tranche is determined by the most environmentally sensitive component. Therefore, Tranche 1 which comprises all three projects is classified as Category A. Tranche 2 includes only the UECP and will be Categorized A. Tranche 3 includes NWPCP and UECP and will be also be Category A. Therefore, all three tranches under the investment program will be categorized as A for environment. The EIAs for NWPCP and UECP will be disclosed on ADB's website 120 days prior to Board approval of the investment program.

80. The Program Director, supported by the PMU's Environment Specialist, will be responsible for overseeing and managing the implementation of environmental safeguards in the entire investment program. The PIU Project Directors, supported by PIU Environment Officers, will assume primary responsibility for the environmental assessment as well as implementation of EMPs for their respective projects. The duties of the PIU Environment Officers will include: (i) oversight of construction contractors for monitoring and implementing mitigation measures; (ii) preparing and implementing environment policy guidelines and environmental good practices; (iii) liaising with the environmental agencies and seeking their help to solve the environment-related issues of project implementation; (iv) providing awareness training on environmental and social

issues related to the program and; (v) preparation of environmental monitoring reports every 6 months for EIAs and once a year for IEEs (as required by ADB).

81. The PMU and PIU Environmental Officers will also be supported by the PMDSC's Environmental Specialists. The PMDSC will support the PMU and PIUs to: (i) update the environmental assessments including EMP based on detailed designs; (ii) ensure EMPs are included in bidding documents and civil works contracts; (iii) provide oversight on environmental management aspects of the project and ensure EMPs are implemented by the contractors; (iv) facilitate and ensure contractors comply with all government rules and regulations regarding permits as well as any other relevant approvals required for works; (v) supervise and provide guidance to the contractors to properly carry out implementation of the EMPs; (vi) review, monitor and evaluate the effectiveness with which the EMPs are implemented, and recommend necessary corrective actions to be taken as necessary; (vii) consolidate periodic environmental monitoring reports to be submitted to ADB on a semi-annual basis; (viii) ensure timely disclosure of final environmental assessments in locations and forms accessible to the public; (ix) take corrective actions when necessary to ensure no environmental impacts; (x) conduct ongoing consultation with the community during implementation of the project; and (xi) establish a grievance redress mechanism and ensure it is operated satisfactorily. In addition, the two consultants will train the PMU and PIU environmental officers on environmental monitoring and reporting.

82. In Q2/2017, PMU approved in principle the recruitment through the PMDSC of two Environmental Monitoring Specialists, to provide effective monitoring of compliance of construction activities by frequent inspections, verifications and on-site evaluations related to EMPs/CEMPs with tasks including: (i) approve and follow up the Contractor's schedule on environmental management (weekly/daily basis) to ensure the Contractor's preparation for the respective mitigatory measures; (ii) monitor construction activities ensuring that the Contractor has a capable environmental staff at site and the requirements in Contracts and proper construction practices are being followed in accordance with the relevant EMP/CEMP; (iii) conduct frequent inspections, verifications, and monitoring as required to maintain and improve the effectiveness of Contractor's EMPs according to the monitoring formats prepared by the Consultant's national Environmental Specialist; (iv) regularly liaise with the PIU, Resident Engineer (RE) and construction team to ensure that the environmental safeguard compliance in place; (v) recommend corrective action for any environmental non-compliance incidents on the construction sites; (vi) coordinate and follow up the timely data collection, and reporting activities related to the periodical environmental monitoring of surface water, air quality and noise and vibration, suspended sediment levels followed by baseline data collection carried out by a qualified institution subcontracted through the Consultant; (vii) follow up with the Contractor for updating environmental issue logs at the site and updating display chart on the worksite environmental, health and safety management; (viii) compile a regular report highlighting any non-compliance issues as well as good compliance with the CEMP; (ix) provide follow-up and guidance to the Contractor for their self-environmental monitoring and reporting activities; (x) liaise with Contractor to obtain the regular monitoring reports on time; (xi) assist the Consultant in the preparation and review of the progress reports and monitoring reports, and ensure that these reports meet environmental requirements; (xii) assist PMDSC to update evaluation and monitoring systems with respect to environmental safeguard aspects; (xiii) assist the Consultant to arrange required training, capacity building programs where necessary identified through the regular monitoring and liaise with national and provincial agencies; and (xiv) support the Health and Safety Officer with regular monitoring of health and safety aspects.

C. Involuntary Resettlement

83. The NWPCP and UECP will have involuntary resettlement impacts on project affected peoples (PAPs). The first tranche of the investment program is categorized B for involuntary resettlement impacts, based on identified involuntary resettlement impacts of the separate projects: the NWPCP is category B, and due diligence for MLBCRP was undertaken and found that encroachers along the Minipe Left Bank Canal agreed to voluntary not use the canal reservation areas during the construction works for rehabilitation the canal during project implementation. A Resettlement Framework (RF) for the investment program and a Resettlement Implementation Plan (RIP) for the NWPCP under the first tranche were prepared. The RIPs were also prepared for the entire NWPCP as part of preparation of Tranche 1. For Tranche 2, that has been categorized as "B" in accordance to ADB SPS 2009, the RIP has been prepared for the UEC-ICB-2A package which involves acquisition of small portion of land from 15 farmers that will be used for widening the access road to carry construction materials and equipment to the project site. The due diligence report has also been prepared for the UEC-ICB-2B package that will require temporary acquisition of 8 plots of paddy field that will be used for temporary working areas. The due diligence report also covers information on the status of land provided by the Moragahakanda project, which is not financed under this investment program.

84. A socioeconomic survey was conducted to identify the nature and significance of potential project impacts on potential PAPs. A resettlement census was conducted as part of preparation of the RIP. It covered the PAPs' assets and main sources of livelihood affected, and their socioeconomic status. The gender-disaggregated socioeconomic data have been used to determine if special actions are needed by poor and vulnerable households, especially female-headed households, to overcome their socioeconomic marginality and disarticulation.

85. The RIPs address land acquisition, compensation, resettlement assistance, and physical relocation requirements. The RIPs will be implemented in close consultation with the stakeholders, particularly with PAPs through focus group discussions and stakeholder consultation meetings. Women's participation will be ensured by involving them in public consultations at various stages of project preparation and implementation, and by arrangements which would enhance their ability to attend such meetings.

86. The EA will ensure that no physical/or economic displacement of affected households will occur until: (i) compensation at full replacement cost has been paid to each displaced person for project components or sections that are ready to be constructed; (ii) other entitlements listed in the resettlement plan are provided to PAPs; (iii) a comprehensive income and livelihood rehabilitation program, supported by adequate budget, is in place to help displaced persons, improve, or at least restore, their incomes and livelihoods; and (iv) civil works implementation for MLBCRP will be scheduled in such a way to minimize the risk of disruption on the existing irrigation systems. In case additional land will be required for access roads and other facilities to support the projects, MMDE must ensure that a RIP in accordance with the RF will be prepared, and submitted to ADB.

87. In accordance with IR principles listed in the RF, all PAPs will be entitled to a combination of compensation packages and resettlement assistance per the nature of ownership/user/occupier rights and interests on lost assets and the degree of project impacts on socio-economic conditions and vulnerability of PAPs. A RF with compensation matrix have been prepared and agreed with the government, consistent with ADB's policy for sector projects, to address any impact, should it occur.

88. The PMU has established a Resettlement Unit or Cell with full-time specialists who assist with the formulation of RIPs and updated RIPs and RF as required, resettlement due diligence reports, monitoring implementation of RIPs, and preparing monitoring reports. The specialists' key activities include, but are not limited to: (i) screening of proposed projects and their supporting facilities for potential resettlement impacts and risks;(ii) reviewing and providing project alternatives to avoid or minimize resettlement impacts; (iii) assessing social impacts of the project; (iv) formulating appropriate approach and conducting public consultations and resettlement information disclosure; (v) formulating or update RIPs and preparing RIPs for other project support facilities such as access roads and camps, if required, with support of resettlement consultants; and (vi) taking the role as the PMU contact person in implementing GRM and monitoring of their effectiveness. All RIPs are reviewed and approved by ADB prior to the award of any contracts. The RIPs will be updated by the Resettlement Specialist (RS) in consultation with AP's, line agencies and NGOs.

89. The PMU/PIU monitors the RIPs' implementation to determine whether resettlement goals have been achieved and livelihood and living standards have been restored, and to recommend how to further improve implementation. Resettlement issues are coordinated by the PMU, which ensures that all subprojects comply with involuntary resettlement safeguards. For this, each project will elaborate specific, relevant and detailed monitoring indicators. The PMU/PIU prepares half-yearly monitoring reports to submit to EA and ADB. The reports focus on whether resettlement activities have complied with IR safeguard principles and loan covenants of the project. The report also documents consultations conducted with PAPs and summaries of issues identified and actions taken to resolve them. It also provides a summary of grievances or complaints lodged by PAPs and actions taken to redress them and the specific activities conducted to restore and improve income sources and livelihoods of PAPs.

D. Grievance Redress Mechanism

90. A Grievance Redress Mechanism (GRM) has been established at the project level to resolve disputes and grievances relating to land acquisition, relocation and implementation of the RIPs, and environment-related grievances and complaints. The GRM comprises of four levels of grievance redress committees (GRCs): (i) Grama Niladari Level; (ii) Project Implementation Unit (PIU) level; (iii) Divisional Secretary level; and (iv) executing agency (PMU)/ministry level. The GRC at the Grama Niladari level includes Grama Niladhari (Chair) village level government officers (Samurdhi, Agrarian Service or DOI), village level priest (Buddhist, Hindu, Christian, Islam), community-based organization leaders, project representatives (environment and resettlement officers), two representatives from the contractor and consultant, and any other officers if required based on the issue. If the issue is not resolved at this level, it will be forwarded to the second-tier committee at the PIU level. The GRC PIU level will comprise of the PIU Project Director (Chair) and officers from project-related line agencies (Social, Samurdhi), Secretary (Pradeshiya Sabha), Grama Niladari of relevant Grama Niladari Division, four members of community-based organization or representatives of PAPs and two representatives from the contractor and consultant. If the solution cannot be determined at this level, then the complaints will be passed on to the GRC at Divisional Secretary level. At this stage, the grievance is considered by representatives of Divisional Secretary (Chair) and project-related government agencies such as Land Registration Officer, Inland Revenue Officer, Forest Department, Wild Life Department, Samurdhi Officer, Surveyor, Grama Niladari, and PIU staff (Environment and Resettlement Officer), four PAPs and two representatives from contractor and consultant. In case Divisional Secretary cannot solve the complaint then the complaint is brought to the Executing Agency GRC. This level includes Secretary to the Ministry or nominated representative (Chair), Divisional Secretary, Resettlement Specialist, Environment Specialist, Project Director for respective

project, four members of community-based organization or representatives of PAPs, two representatives from contractor and consultant. This is the final level of the GRM system.

91. The GRCs are ex-gratia, legal, semi-structured bodies empowered to make decisions on disputes resolution during the implementation of RIPs or environment related concerns. The fundamental objective of formation of a GRC is to resolve disputes at the grass-roots level to avoid lengthy and costly judicial process. The GRC will not deal with matters pending in the court of law. Also, it has no jurisdiction over the rate of compensation.

92. Grievances from the affected people on social and environmental issues during program implementation will be addressed mainly through the existing local administrative system. Depending on the nature and significance of the grievances or complaints, grievances will be addressed at one of the four levels identified above. All attempts will be made to resolve grievances at the project level, where complaints will be directly received and addressed by the contractor, PMDSC or PIU representative on site. Grievances which are simple but still cannot be addressed at the grass roots level will be addressed at the Grama Niladhari level. More complex grievances which cannot be addressed at the Grama Niladhari level will be addressed at the Divisional Secretariat level.

VIII. GENDER AND SOCIAL DIMENSIONS

93. The investment program activities for Tranches 1 and 2 will be limited to constructing and rehabilitating major water storage and conveyance infrastructure. Hence, there are no negative gender impacts leading to women's loss of traditional land rights or employment opportunities. In fact, the project will provide an opportunity for women to participate in the construction stage, and in the long run, will secure access to domestic water supply that will reduce their traditional burden of fetching water from far away and thereby reduce household chores. Therefore, Trances 1 and 2 are classified as "no gender elements." Nonetheless it is expected, that Tranche 3 may have "some gender elements" since there may be some modernization of distribution systems.

94. MMDE will ensure that the investment program monitors the social impacts throughout the implementation financed by the loan, in consultation with local governments, local communities and civil society organizations. In this respect, the PMU and PIU will take the following actions:

(i) Conduct awareness program for contractors, sub-contractors on gender, core labor standards (CLS), and other social concerns such as communicable diseases and other social risk to ensure that:

   a. Women and men should be given equal opportunities to work in the project, and women and men will also opt equal payment, and treatment;
   b. Contractors/sub-contractors will provide a basic service requirement for women and men such as toilet, and other necessary facilities;
   c. All workers will be treated in accordance to the CLS such as no child will be employed, the right of workers on health and safety, as well as the right of workers to be part of labor union are guarantee, no forced labor in whatever form involve in their activities;
   d. Contractors and subcontractors should provide appropriate camps with all necessary basic facilities for their workers; and
   e. Contractors and subcontractors should take responsibility to ensure that their workers would not be contributing in any spread of communicable diseases

(HIV), using drug and alcohol, and minimize any potential conflict with local communities.

(ii) Conduct awareness program for local communities to encourage participation of women and men in project activities both in pay activities such as working with contractors or suppliers, and unpaid activities (volunteer) in monitoring any impact associates with project activities to the local communities;

(iii) Ensure that contractors and subcontractors have an emergency plan that involves local communities, in occurrence of unexpected accident associated with the project; and

(iv) Ensure that the monthly progress reports from contractors include detailed information on workers employed for the project during the reported period. The data should be disaggregated per sex and age. The progress reports should also ensure: (i) compliance with all applicable labor laws; (ii) use their best efforts to employ women and local people, including disadvantaged people, living in the vicinity of the projects financed under the loan; (iii) information is disseminated at worksites on health and safety for those employed during construction; (iv) equal pay to men and women is maintained for work of equal type; (v) safe working conditions are provided along with separate, culturally appropriate facilities for male and female workers; and (vi) abstinence from child labor. The investment program is classified as 'general intervention' as it supports poverty reduction indirectly, and gender is classified as 'no gender elements.'

IX. PERFORMANCE MONITORING, EVALUATION, REPORTING AND COMMUNICATION

A. Investment Program Design and Monitoring Framework

95. The design and monitoring framework (DMF) for the investment program, Tranche 1 and Tranche 2 are in Attachments 9-11, respectively.

B. Monitoring

96. **Project performance monitoring.** During the investment program implementation, monitoring will be carried out for: (i) periodic progress reporting; (ii) safeguard monitoring; (iii) benefit monitoring and evaluation; and (iv) financial management monitoring. The design and monitoring frameworks will be the basis for monitoring progress.

97. With guidance from MMDE, the PMU and PMDSC will prepare separate progress reports for the investment program and submit to ADB with copies to Department of Project Management and Monitoring on a quarterly basis within 15 days from the end of each quarter. The reports will provide a narrative description of progress made during the period, changes in the implementation schedule, problems or difficulties encountered, performance of the program management and implementation consultants, and the work to be carried out in the next period. The progress reports will also include a summary financial account for the program, consisting of expenditures for the year to date and total expenditure to date. Performance will be evaluated based on indicators and targets stipulated in the design and monitoring framework.

98. The PMU through the project performance management evaluation system (PPMES), will rigorously monitor the overall performance of each project under the investment program. The

PMU will establish a PPMES within 6 months from investment program commencement and collect and update baseline data for performance monitoring. The PMDSC's Monitoring and Evaluation Specialist will establish the system, with ongoing support to the PMU from the national consultant. The system will be tailored to program-specific requirements and prepared in consultation MMDE and specialists within the PMU. The key indicators and targets, assumptions, and risks outlined at the impact, outcome, and output levels in the investment program's design and monitoring framework will be the primary data required for analysis. In addition, a database of key benchmark indicators will be established by the PMU and become a part of the program monitoring system and be routinely updated and monitored at least twice a year and in greater detail immediately prior to midterm review and project completion. These will be reported through the MMDE's quarterly progress reports and after each ADB review mission. These quarterly reports will provide information to regularly update ADB's PPR system.[28] During Tranche 1 a Management Information System (MIS) and project performance management evaluation system (PPMES) have been established and are being used in regular reporting for the investment program.

99. **Compliance monitoring**. The status of compliance with loan covenants, including policy, legal, financial, economic, environmental, and others, will be monitored and reported by the PMU and PIUs through the quarterly progress reports, which will be consolidated and submitted by the PMU to ADB. The results will be reviewed in detail during ADB's review missions. In particular, the status of the implementation of safeguard measures described in EMPs and RIPs, as well as implementation of measures described in the SPRSS, will be monitored and reported by PIUs in quarterly progress reports for each sub-project.

100. The main aim will be for the PMU to ensure the investment program is implemented with due concern for quality and specifically to ensure that any issues are adequately addressed to the requirements of MMDE and ADB.

101. **Safeguards monitoring** will be performed by the Safeguards Unit of the PMU and PIUs and PMDSC consultants, and the results will be included in the quarterly progress reports. In addition, the PMU will submit, biannual (for UECP and NWCP) and annual (for MLBRCP) environmental monitoring reports, and (ii) semi-annual resettlement monitoring report for UECP and NWCP. Such monitoring should adhere to the requirements in the EMPs of the EIAs and IEE, and RIPs. This will include (i) environmental quality monitoring of water and soil quality parameters (as referred to in the EIAs and IEE), and (ii) potential resettlement impacts such as compensation for loss of income.

102. Implementation of the EMPs will be monitored internally by the PMU and PIUs, and the PMDSC. For environment safeguards, monitoring of EMP implementation will be carried out during the preconstruction, construction and operation and maintenance stages of the investment program. Based on the EMPs, monitoring checklists will be prepared for each of these stages. Records of these completed checklists must be systematically maintained with the PIUs or PMU office. Satisfactory due diligence reports will be prepared and submitted to ADB before approval of the next tranche.

103. For resettlement, internal monitoring will be carried out by the PMU and PIUs with the support from the PMDSC. If land donation is required, an independent monitor will be engaged to verify the land donation process. Annual monitoring reports will be submitted to MMDE and ADB.

[28] ADB's project performance reporting system is available at: http://www.adb.org/Documents/Slideshows/PPMS/default.asp?p=evaltool

Annual monitoring reports will be disclosed on the ADB website. Satisfactory due diligence reports will be prepared and submitted to ADB before approval of the next tranche.

C. Evaluation

104. Within 24 months of loan effectiveness, ADB will undertake a mid-term review in consultation with the relevant government departments to identify problems and constraints encountered and suggest measures to address them, including appropriateness of scope, design, implementation arrangements, schedule of activities and compliance with safeguard and other covenants.

D. Reporting

105. MMDE will provide ADB with: (i) quarterly progress reports in a format consistent with ADB's project performance reporting system; (ii) consolidated annual reports including: (a) progress achieved by output as measured through the indicator's performance targets including contract awards and disbursements, (b) key implementation issues and solutions; (c) updated procurement plan, and (d) updated implementation plan for next 12 months with quarterly contract awards and disbursements projections; (iii) environmental and social monitoring reports; (iv) a project completion report to ADB within 6 months of physical completion of each tranche MMDE will submit;[29] and (v) a MFF completion report within 6 months of physical completion of the MFF. MMDE will also make available, as required, the audit reports as mentioned in Section V.

E. Stakeholder Communication Strategy (SCS)

106. A comprehensive stakeholder analysis and strategic communications plan (SCP) has been prepared for the investment program.[30] This was developed based on a thorough stakeholder analysis and consultations during project preparation. Specifically, the strategy emphasizes two main objectives: (i) establishing and maintaining two-way information flow for stakeholders to exchange relevant and timely information and feedback; and (ii) supporting effective communication by building the communication capacity of the PMU and PIUs. The updated SCS is in Attachment 12.

107. Implementation of the SCP will engage and inform relevant investment program stakeholders and sectors with timely, accurate, and comprehensive information. Such information sharing will help to build consensus, be responsive to stakeholder concerns, and ensure continuous stakeholder support throughout the investment program. Public notification of project milestones and safeguards, as well as progress towards these milestones and the measures taken to impose safeguards, will be posted on both the investment program's and ADB's websites. They are also being displayed prominently in hard copy in the PIU offices.

108. The SCP identifies the information needs of each stakeholder group including PAPs, civil society, collaborating government agencies government officers, and the media. Activities are proposed for each stakeholder group to ensure that information regarding the investment program is easily accessible and timely presented in ways that are appropriate for each stakeholder. Emphasis is on project information such as scope, general progress status, project benefits and

[29] Project completion report format is available at: http://www.adb.org/Consulting/consultants-toolkits/PCR-Public-Sector-Landscape.rar

[30] Link reference to the SCP.

impacts, mitigating measures, results of monitoring activities, invitation for bids, consultant recruitment notices, and mechanisms for feedback. Feedback mechanisms will include contact points for questions and concerns and details for the grievance redress mechanisms. Given the lengthy time frame of the investment program and the high expectations among some sectors of the public, there is also an emphasis on expectation management through transparent timelines and information about likely project benefits.

109. Key communication channels to be used include: (i) community level interpersonal channels such as consultations and outreach to farmer organizations and other community leaders through established local coordinating meetings; (ii) use of posters, brochures, fact sheets and local media to disseminate project information in affected communities; (iii) national-level media outreach; (iv) consultative meetings for stakeholders including NGOs; (v) consultative meetings and capacity building with government officers to enable them to better engage with affected communities and the media; and (vi) internal communications to facilitate accuracy and consistency of information sharing.

110. The PMU includes a Communications Officer position who will lead the delivery of the SCS for the investment program. Each PIU will also include a Communication's Officer who will support delivery of communication activities in specific project areas.

111. Training activities will be used to enable other project staff in the PMU and PIUs serve as project communicators both with the public (with emphasis on PAPs and beneficiaries) as well as with the media. Trainings will also be organized to equip government officers at the division, district and village levels to serve as sources of information for community members.

X. ANTICORRUPTION POLICY

112. ADB reserves the right to investigate, directly or through its agents, any violations of the Anticorruption Policy relating to the investment program.[31] All contracts financed by ADB shall include provisions specifying the right of ADB to audit and examine the records and accounts of the executing agency and all contractors, suppliers, consultants and other service providers. Individuals/entities on ADB's anticorruption debarment list are ineligible to participate in ADB-financed activity and may not be awarded any contracts under the investment program.[32]

113. To support these efforts, relevant provisions are included in the loan agreement and the bidding documents for the investment program. Risks associated with program management, including procurement and disbursement, will be mitigated by (i) providing consulting inputs to advise and assist in the procurement of goods and services; (ii) requiring that civil work contracts include a condition that contractors adhere to ADB"s Anticorruption Policy (1998, amended, from time to time); (iii) the PMU and PIUs periodically inspecting the contractors fund withdrawals and settlements; and (iv) reporting on project activities and implementation on the website to foster transparency and timely awarding of contracts.

114. The government will ensure that (i) MMDE conducts periodic monitoring inspections on all contractors' activities related to fund withdrawals and settlements, and (ii) all contracts financed by ADB in connection with the investment program include provisions specifying the right of ADB to audit and examine the records and accounts of MMDE and all contractors, suppliers, consultants and other service providers as they relate to the investment program.

[31] Available at: http://www.adb.org/Documents/Policies/Anticorruption-Integrity/Policies-Strategies.pdf
[32] ADB's Integrity Office web site is available at: http://www.adb.org/integrity/unit.asp

115. A grievance redress mechanism will be established throughout the investment program. A grievance redress mechanism will be put in place at the PMU to receive and resolve complaints, as well as to act upon stakeholders' reports of irregularities on project related matters, including grievances concerning land donation procedures. MMDE will widely publicize the existence of this mechanism to ensure that stakeholders are aware that a venue is available to address concerns or grievances relating to fraud, corruption, abuse, and any other aspects of program implementation.

XI. ACCOUNTABILITY MECHANISM

116. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make a good faith effort to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.[33]

XII. RECORD OF FAM CHANGES

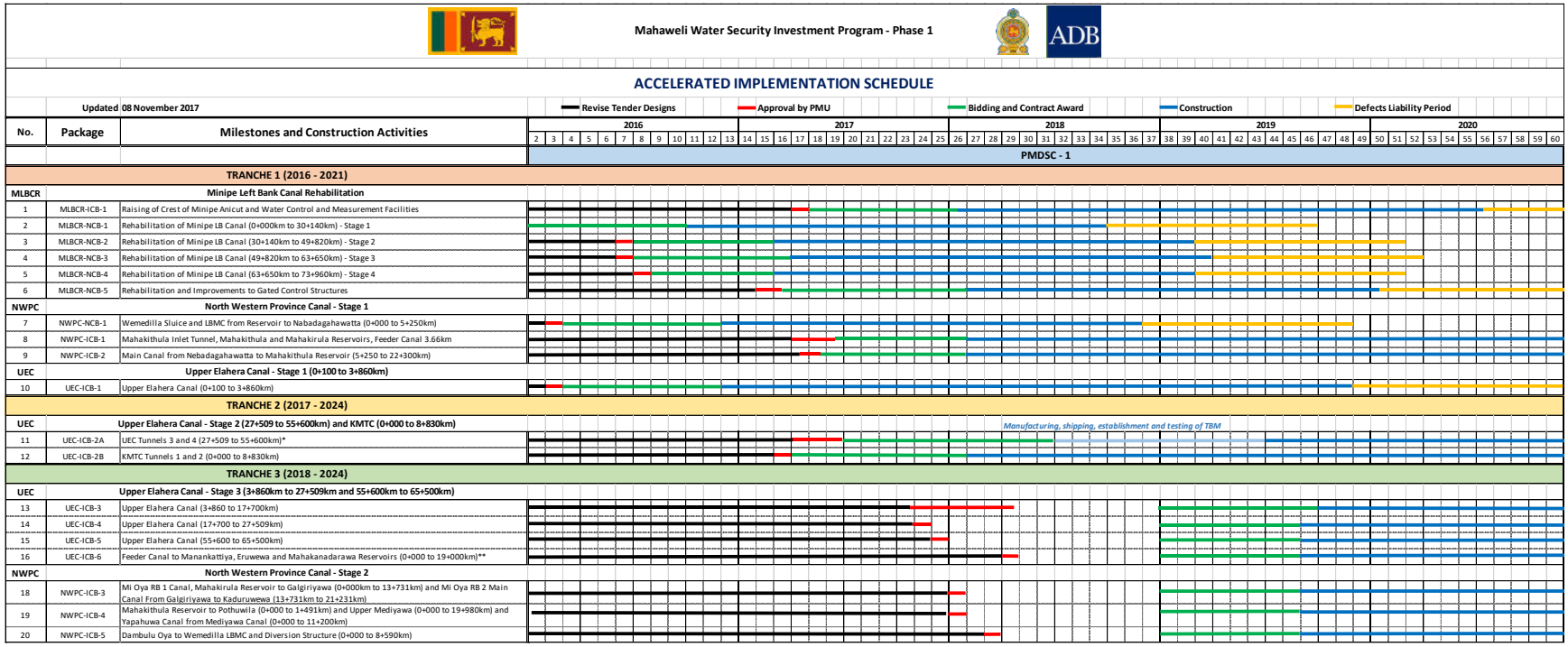
117. All revisions and updates during implementation will be retained in this Section to provide a chronological history of changes to implementation arrangements recorded in the FAM.

Date	Original	Revised	Remarks
20 July 2017		Proposed updates in the main text and attachments to include specific information on Tranche 2	
27 July 2016	EA's address (page 15) and Project Organization Structure (page 16)	Page 14: No. 493/1/1, T.B.Jayah Mawatha, Colombo 10 Left side under MWSIP Program Director, delete "Administration" and include "Procurement".	Based on comments sent by PMU on 11 July 2016.
	Consultants' Terms of Reference (page 32)	Minor revision to para. 55 (page 41)	
	Attachment 3: PMU & PIU Staffing Requirements (pages 48-49)	Updated PMU and PIU positions (pages 60-62)	
	Grievance Redress Mechanism (pages 37-38)	Edits to para. 89 (pages 49-50)	
	Attachment 5: Procurement Plan Version 1	Project Closing Date corrected to "30 June 2020" from "31 December 2019". NCB Annex updated.	

[33] For further information see: http://www.adb.org/Accountability-Mechanism/default.asp.

Date	Original	Revised	Remarks
	(8 July 2016)		
9 June 2016	Fund Flow Diagram (page 25)	Additional fund flow: (i) from imprest account directly to contractors and suppliers; and (ii) from PMU sub-account directly to contractors and suppliers (page 33)	Updated based on discussions between SLRM disbursement unit, SAOD-PR Financial Management Specialist, and CTLA-LGD.
	Disbursement procedures (para. 23, Section V [Financial Management], page 27)	Sub-accounts will be established and used only with ADB's prior approval (para. 32, page 36)	
	Contract and Disbursement S-curves for Tranche 1 (page 24)		Updated based on adjustments made to the baseline projections dated 26 April 2016.
	Attachment 1: Implementation Schedule (page 45)	Accelerated Implementation Program (page 46)	Based on Attachment 4 of the Feb 2016 Inception Mission Aide Memoire.
	Attachment 3: PMU & PIU Staffing Requirements (pages 48-49)	Updated PMU and PIU positions (pages 49-52)	Based on information provided by PMU on 25 March 2016.
	Attachment 5: Procurement Plan Version 0 (26 June 2015)	Attachment 5: Procurement Plan Version 1 (8 July 2016) Main changes include: (i) updating projected contract advertisement dates to reflect the updated implementation plan; (ii) changing the type of proposal for the ISEWP consulting services package from "full technical proposal" to "simplified technical proposal"; (iii) removing environmental surveys packages since these are 100% financed from government funds; (iv) correcting the procurement method for utility shifting and deposit works from "Shopping" to "Force Account"; and (v) increasing the amount for 'field office works' from $140,000 to $300,000 to ensure appropriate field offices are available for the PIU and PMDSC staff to use.	These changes were discussed during the Feb 2016 Inception Mission.
	Attachment 7: TOR for ISEWP consultants	Finalized terms of reference based on comments provided under Submission 1 have been incorporated (pages 118-131)	

Attachment 1: Implementation Schedule



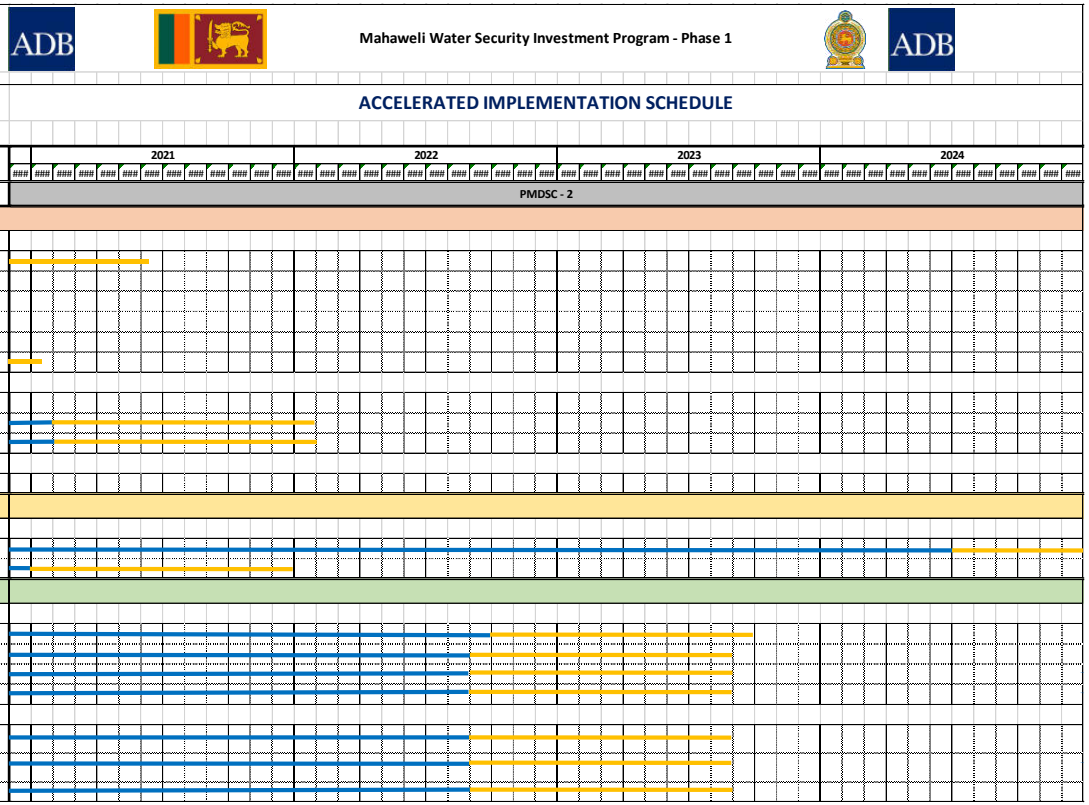
No.	Package	Milestones and Construction Activities
		TRANCHE 1 (2016 - 2021)
MLBCR		**Minipe Left Bank Canal Rehabilitation**
1	MLBCR-ICB-1	Raising of Crest of Minipe Anicut and Water Control and Measurement Facilities
2	MLBCR-NCB-1	Rehabilitation of Minipe LB Canal (0+000km to 30+140km) - Stage 1
3	MLBCR-NCB-2	Rehabilitation of Minipe LB Canal (30+140km to 49+820km) - Stage 2
4	MLBCR-NCB-3	Rehabilitation of Minipe LB Canal (49+820km to 63+650km) - Stage 3
5	MLBCR-NCB-4	Rehabilitation of Minipe LB Canal (63+650km to 73+960km) - Stage 4
6	MLBCR-NCB-5	Rehabilitation and Improvements to Gated Control Structures
NWPC		**North Western Province Canal - Stage 1**
7	NWPC-NCB-1	Wemedilla Sluice and LBMC from Reservoir to Nabadagahawatta (0+000 to 5+250km)
8	NWPC-ICB-1	Mahakithula Inlet Tunnel, Mahakithula and Mahakirula Reservoirs, Feeder Canal 3.66km
9	NWPC-ICB-2	Main Canal from Nebadagahawatta to Mahakithula Reservoir (5+250 to 22+300km)
UEC		**Upper Elahera Canal - Stage 1 (0+100 to 3+860km)**
10	UEC-ICB-1	Upper Elahera Canal (0+100 to 3+860km)
		TRANCHE 2 (2017 - 2024)
UEC		**Upper Elahera Canal - Stage 2 (27+509 to 55+600km) and KMTC (0+000 to 8+830km)**
11	UEC-ICB-2A	UEC Tunnels 3 and 4 (27+509 to 55+600km)*
12	UEC-ICB-2B	KMTC Tunnels 1 and 2 (0+000 to 8+830km)
		TRANCHE 3 (2018 - 2024)
UEC		**Upper Elahera Canal - Stage 3 (3+860km to 27+509km and 55+600km to 65+500km)**
13	UEC-ICB-3	Upper Elahera Canal (3+860 to 17+700km)
14	UEC-ICB-4	Upper Elahera Canal (17+700 to 27+509km)
15	UEC-ICB-5	Upper Elahera Canal (55+600 to 65+500km)
16	UEC-ICB-6	Feeder Canal to Manankattiya, Eruwewa and Mahakanadarawa Reservoirs (0+000 to 19+000km)**
NWPC		**North Western Province Canal - Stage 2**
18	NWPC-ICB-3	Mi Oya RB 1 Canal, Mahakirula Reservoir to Galgiriyawa (0+000km to 13+731km) and Mi Oya RB 2 Main Canal From Galgiriyawa to Kaduruwewa (13+731km to 21+231km)
19	NWPC-ICB-4	Mahakithula Reservoir to Pothuwila (0+000 to 1+491km) and Upper Mediyawa (0+000 to 19+980km) and Yapahuwa Canal from Mediyawa Canal (0+000 to 11+200km)
20	NWPC-ICB-5	Dambulu Oya to Wemedilla LBMC and Diversion Structure (0+000 to 8+590km)

Mahaweli Water Security Investment Program - Phase 1

ACCELERATED IMPLEMENTATION SCHEDULE

Updated 08 November 2017

No.	Package	Milestones and Construction Activities
		TRANCHE 1 (2016 - 2021)
MLBCR		**Minipe Left Bank Canal Rehabilitation**
1	MLBCR-ICB-1	Raising of Crest of Minipe Anicut and Water Control and Measurement Facilities
2	MLBCR-NCB-1	Rehabilitation of Minipe LB Canal (0+000km to 30+140km) - Stage 1
3	MLBCR-NCB-2	Rehabilitation of Minipe LB Canal (30+140km to 49+820km) - Stage 2
4	MLBCR-NCB-3	Rehabilitation of Minipe LB Canal (49+820km to 63+650km) - Stage 3
5	MLBCR-NCB-4	Rehabilitation of Minipe LB Canal (63+650km to 73+960km) - Stage 4
6	MLBCR-NCB-5	Rehabilitation and Improvements to Gated Control Structures
NWPC		**North Western Province Canal - Stage 1**
7	NWPC-NCB-1	Wemedilla Sluice and LBMC from Reservoir to Nabadagahawatta (0+000 to 5+250km)
8	NWPC-ICB-1	Mahakithula Inlet Tunnel, Mahakithula and Mahakirula Reservoirs, Feeder Canal 3.66km
9	NWPC-ICB-2	Main Canal from Nebadagahawatta to Mahakithula Reservoir (5+250 to 22+300km)
UEC		**Upper Elahera Canal - Stage 1 (0+100 to 3+860km)**
10	UEC-ICB-1	Upper Elahera Canal (0+100 to 3+860km)
		TRANCHE 2 (2017 - 2024)
UEC		**Upper Elahera Canal - Stage 2 (27+509 to 55+600km) and KMTC (0+000 to 8+830km)**
11	UEC-ICB-2A	UEC Tunnels 3 and 4 (27+509 to 55+600km)*
12	UEC-ICB-2B	KMTC Tunnels 1 and 2 (0+000 to 8+830km)
		TRANCHE 3 (2018 - 2024)
UEC		**Upper Elahera Canal - Stage 3 (3+860km to 27+509km and 55+600km to 65+500km)**
13	UEC-ICB-3	Upper Elahera Canal (3+860 to 17+700km)
14	UEC-ICB-4	Upper Elahera Canal (17+700 to 27+509km)
15	UEC-ICB-5	Upper Elahera Canal (55+600 to 65+500km)
16	UEC-ICB-6	Feeder Canal to Manankattiya, Eruwewa and Mahakanadarawa Reservoirs (0+000 to 19+000km)**
NWPC		**North Western Province Canal - Stage 2**
18	NWPC-ICB-3	Mi Oya RB 1 Canal, Mahakirula Reservoir to Galgiriyawa (0+000km to 13+731km) and Mi Oya RB 2 Main Canal From Galgiriyawa to Kaduruwewa (13+731km to 21+231km)
19	NWPC-ICB-4	Mahakithula Reservoir to Pothuwila (0+000 to 1+491km) and Upper Mediyawa (0+000 to 19+980km) and Yapahuwa Canal from Mediyawa Canal (0+000 to 11+200km)
20	NWPC-ICB-5	Dambulu Oya to Wemedilla LBMC and Diversion Structure (0+000 to 8+590km)



Attachment 2: Members of Program Steering Committee

The Program Steering Committee will comprise the following positions, subject to appropriate changes during the implementation period:

Position, Organization

1. Secretary, Ministry of Mahaweli Development and Environment
2. Secretary, Ministry of Irrigation and Water Resources Management
3. Secretary, Ministry of Lands and Parliamentary Reforms
4. Secretary, Ministry of Power and Renewable Energy
5. Secretary, Ministry of Tourism Development and Christian Religious Affairs
6. Chief Secretary, North Central Province
7. Chief Secretary, North Western Province
8. Chief Secretary, Central Province
9. Director General, Department of Irrigation
10. Director General, Mahaweli Authority of Sri Lanka
11. Director General, Department of Agriculture
12. Director General - External Resources, External Resources Department
13. Director General, Department of National Budget
14. Director General, Department of National Planning
15. Director General, Department of Treasury Operations
16. Director General, Department of Project Management and Monitoring
17. Director General, Central Environment Authority
18. Director General, Archeological Department
19. Director General, Agrarian Services Department
20. Surveyor General, Department of Survey
21. Director General – Wildlife, Department of Wildlife Conservation
22. Conservator General of Forest, Department of Forest Conservation
23. Land Commissioner General, Land Commissioner General's Department
24. Chief Valuer, Department of Valuation
25. District Secretary / Government Agent – Anuradhapura
26. District Secretary / Government Agent – Polonnaruwa
27. District Secretary / Government Agent – Kurunegala
28. District Secretary / Government Agent – Matale
29. District Secretary / Government Agent – Kandy
30. Director of Irrigation, Anuradhapura
31. Director of Irrigation, Polonnaruwa
32. Director of Irrigation, Kurunegala
33. Director of Irrigation, Kandy
34. Program Director, Mahaweli Water Security Investment Program
35. Project Director (UEC PIU), Mahaweli Water Security Investment Program
36. Project Director (NWPC PIU), Mahaweli Water Security Investment Program
37. Project Director (MLBCR PIU), Mahaweli Water Security Investment Program
38. Team Leader (PDMSC), Mahaweli Water Security Investment Program

Attachment 3: Program Management Unit and Project Implementation Unit Staffing Requirements

A. Program Management Unit

Serial No	Category	Approved Cadre by ADB		
		Level	Cadre No	FT/PT
1	Program Director	PS1	1	FT
2	Deputy Program Director	PS2	1	FT
3	Director - ISEWP	PS2	1	FT
4-6	Project Managers - ISEWP	PS3	3	PT
7-11	Independent Consultants	PS3	5	FT
12	Senior Engineer – Contract Management	PS3	1	FT
13-16	Senior Engineers	PS3	4	FT
17	Procurement Specialist	PS3	1	FT
18	Environment Specialist	PS3	1	FT
19	Resettlement Specialist	PS3	1	FT
20	Finance Manager	PS3	1	FT
21	Senior Mechanical Engineer	PS3	1	PT
22	M&E Specialist	PS3	1	PT
23-31	Civil / Irrigation Engineers	PS4	8	FT
32-33	Earth Resource Engineers	PS4	2	FT
34-41	Engineers (From ID, MASL)*	PS4	9	FT or PT
42	Communications Specialist	PS4	1	FT
43-44	Accountants	PS4	2	FT
45	Internal Auditor	PS4	1	FT
46	Engineer – Contract Management	PS4	1	FT
47	Training Coordinator	PS4	1	FT
48	Policy Planning Specialist (Irrigation)	PS5	1	PT
49	Human Recourses Officer	PS5	1	FT
50	ICT Officer	PS5	1	FT
51	Senior Documentation Officer	PS5	1	FT
52	Senior Procurement Officer	PS5	1	FT
53	Senior Technical Officer	PS5	1	FT
54	Project Secretary	PS6	1	FT
55-57	Project Coordinators		3	FT
58-75	Management Assistants/Documentation Assistants/Accounts Assistants	Supporting Staff (as per Section 3.2.3)	18	FT
76-82	Drivers		7	FT
83-87	Office Aid/Peon		5	FT
	Total		**87**	

FT = full time, PT = part time, *If not available from ID & MASL direct recruitment is proposed.

B. Upper Elahera Canal Project

Serial No	Category	Approved Cadre by ADB		
		Level	Cadre No	FT/PT
	Main Office			
1	Project Director	PS2	1	FT
2	Deputy Project Director (KMTC)	PS3	1	FT
3	Senior Engineer	PS3	1	FT

Serial No	Category	Approved Cadre by ADB		
		Level	Cadre No	FT/PT
4-7	Civil Engineers	PS4	4	FT
8-9	Earth Resource Engineers	PS4	2	FT
10	Senior Resettlement Officer	PS5	1	FT
11	Senior Draftsman	PS5	1	FT
12-16	Senior Technical Officers	PS5	5	FT
17	Senior Environment Officer	PS5	1	FT
18	Senior Acquisition Officer	PS5	1	FT
19	Senior Communications Officer	PS5	1	FT
20-29	Management Assistants	Supporting Staff (as per section 3.2.3)	10	FT
30-35	Driver		6	FT
36-38	Office Aid/Peon		3	FT
	KMTC Office			
39	Senior Engineer – Tunneling	PS3	1	FT
40	Earth Resource Engineer	PS4	1	FT
41	Civil Engineer	PS4	1	FT
42	Senior Environment Officer	PS5	1	FT
43-44	Senior Technical Officers	PS5	2	FT
45	Management Assistant	Supporting Staff (as per section 3.2.3)	1	FT
46-47	Office Aid/Peon		2	FT
48-49	Driver		2	FT
	UEC-ICB-2A Office			
50	Deputy Project Director	PS3	1	FT
51	Senior Engineer – Tunneling	PS3	1	FT
52-53	Earth Resource Engineers	PS4	2	FT
54-55	Civil Engineers	PS4	2	FT
56	Senior Environment Officer	PS5	1	FT
57-60	Senior Technical Officers	PS5	4	FT
61-62	Management Assistants	Supporting Staff (as per section 3.2.3)	2	FT
63-64	Office Aid/Peon		2	FT
65-68	Driver		4	FT
	Total		**68**	

FT = full time, PT = part time

*** As ADB instructed, PIUs accounts were closed however PIU Accountant will support PMU Accountant.

C. **North-Western Province Canal Project**

Serial No	Category	Approved Cadre by ADB		
		Level	Cadre No	FT/PT
1	Project Director	PS2	1	FT
2	Deputy Project Director	PS3	1	FT
3-6	Civil Engineers	PS4	4	PT/FT
7-9	Civil Engineers	PS4	3	FT
10	Earth Resource Engineer	PS4	1	FT
11	Senior Draftsman	PS5	1	FT
12-19	Senior Technical Officer	PS5	8	FT/PT
20	Senior Environment Officer	PS5	1	FT
21	Senior Resettlement Officer	PS5	1	FT

Serial No	Category	Approved Cadre by ADB		
		Level	Cadre No	FT/PT
22	Senior Communications Officer	PS5	1	FT
23	Senior Acquisition Officer	PS5	1	FT
24-33	Management Assistants	Supporting Staff (as per section 3.2.3)	10	FT
34-39	Driver		6	FT
40-42	Office Aid/Peon		3	FT
	Total		**42**	

FT = full time, PT = part time

D. Minipe Left-Bank Canal Rehabilitation Project

Serial No	Category	Approved Cadre by ADB		
		Level	Cadre No	FT/PT
1	Project Director	PS2	1	FT
2	Deputy Project Director	PS3	1	FT
3	Senior Engineer	PS3	1	FT
4	Mechanical Engineer	PS4	1	FT
5	Civil Engineers (Part-Time)	PS4	1	PT
6-9	Civil Engineers	PS4	4	FT
10	Senior Draftsman	PS5	1	FT
11-14	Senior Technical Officers (Part-Time)	PS5	4	PT
15-18	Senior Technical Officers	PS5	4	FT
19	Senior Environment Officer	PS5	1	FT
20	Senior Communications Officer	PS5	1	FT
21-29	Management Assistants	Supporting Staff (as per section 3.2.3)	9	FT
30-33	Drivers		4	FT
34-36	Office Aid/Peon		3	FT
	Total		**36**	

FT = full time, PT = part time

Indicative vehicle requirements:

1. Jeeps 02 Nos
2. Double cabs 38 Nos
3. Mini Bus 02 Nos
4. Bus 01 Nos

Attachment 4: Procurement Plan for Tranche 1

Basic Data

Project Name: Mahaweli Water Security Investment Program - Tranche 1	
Project Number: 47381-002	**Approval Number:** 3267/3268
Country: Sri Lanka	**Executing Agency**: Ministry of Mahaweli Development & Environment
Project Procurement Classification: Category A **Project Procurement Risk:** Substantial	**Implementing Agency**: N/A
Project Financing Amount: US$ 190,000,000 **ADB Financing:** US$ 150,000,000 **Cofinancing (ADB Administered):** **Non-ADB Financing:** US$ 40,000,000	**Project Closing Date:** 30 June 2020
Date of First Procurement Plan: 26 June 2015	**Date of this Procurement Plan**: 23 November 2017

A. Methods, Thresholds, Review and 18-Month Procurement Plan

1. Procurement and Consulting Methods and Thresholds

Except as the Asian Development Bank (ADB) may otherwise agree, the following process thresholds shall apply to procurement of goods and works.

Procurement of Goods and Works		
Method	**Threshold**	**Comments**
International Competitive Bidding for Goods	US$ 2,000,000 and Above	Threshold applies to all unless propriety items are required from overseas (e.g. MLBCR Goods ICB-01).
National Competitive Bidding for Goods	Between US$ 100,001 and US$ 1,999,999	
Shopping for Goods	Up to US$ 100,000	
International Competitive Bidding for Works	US$ 7,500,000 and Above	Except MLBCR-ICB-01
National Competitive Bidding for Works	Between US$ 100,001 and US$ 7,499,999	Except MLBCR-ICB-01
Shopping for Works	Up to US$ 100,000	
Community Participation in Procurement for Works	Up to US$ 20,000	Simple civil works contracts costing less than $20,000 each may be directly awarded to project area community groups / civil society organizations as a community works contract using existing government rates. ADB PAI 5.10 for community participation is followed.
Force Account for Works	Up to US$ 650,000	Includes works and goods. Total amount for entire Tranche 1 is $650,000 (this amount includes all contract packages under Tranche 1). Existing government rates shall be used. Utility shifting, field office works, and other works by government-owned entities (for activities which cannot be done by competitive contracting such as shifting power and telephone poles, realigning water/drainage pipes, road restoration, cables, cutting trees etc.)

Consulting Services	
Method	**Comments**
Consultant's Qualification Selection for Consulting Firm	
Least-Cost Selection for Consulting Firm	
Quality- and Cost-Based Selection for Consulting Firm	

Quality-Based Selection for Consulting Firm	
Individual Consultants Selection for Individual Consultant	

2. Goods and Works Contracts Estimated to Cost $1 Million or More

The following table lists goods and works contracts for which the procurement activity is either ongoing or expected to commence within the next 18 months.

Package Number	**General Description**	**Estimated Value**	**Procurement Method**	**Review** (Prior/ Post)	**Bidding Procedure**	**Advertisement Date** (quarter/year)	**Comments**
MLBCR-ICB-01	Heightening of Minipe Anicut including water control facilities for Left-Bank and Right-Bank canals	12,310,000.00	ICB	Prior	1S2E	Q2 / 2017	Prequalification of Bidders: N Domestic Preference Applicable: N Advance Contracting: Y Bidding Document: Large Works
MLBCR-NCB-05	Rehabilitation & Electrification of Radial Gated Structures at 8 Locations and Improvements to Cross Regulator Structures of Minipe Left-Bank Canal	1,810,000.00	NCB	Prior	1S2E	Q1 / 2017	Prequalification of Bidders: N Domestic Preference Applicable: N Bidding Document: Small Works
NWPC-ICB-01	Construction of Mahakithula Inlet Tunnel, Mahakithula & Mahakirula Reservoirs, Feeder Canal from Mahakithula to Mahakirula Reservoir	66,770,000.00	ICB	Prior	1S2E	Q2 / 2017	Prequalification of Bidders: N Domestic Preference Applicable: N Advance Contracting: Y Bidding Document: Large Works
NWPC-ICB-02	Construction of Main Canal from Nebadagahawatta to Mahakithula Reservoir Inlet Tunnel (5+250 km to 22+300 km)	53,840,000.00	ICB	Prior	1S2E	Q2 / 2017	Prequalification of Bidders: N Domestic Preference Applicable: N Advance Contracting: N Bidding Document: Large Works

Various lots-1	Office furniture, IT equipment and software	1,360,000.00	SHOPPING	Prior		Q2 / 2014	Advance Contracting: N

3. Consulting Services Contracts Estimated to Cost $100,000 or More

The following table lists consulting services contracts for which the recruitment activity is either ongoing or expected to commence within the next 18 months.

Package Number	General Description	Estimated Value	Recruitment Method	Review (Prior/ Post)	Advertisement Date (quarter/year)	Type of Proposal	Comments
CS-2	Improving System Efficiencies and Water Productivity consultants	3,400,000.00	QBS	Prior	Q2 / 2016	STP	Assignment: International Quality-Cost Ratio: 90:10 Advance Contracting: N Comments: As per FAM.
CS-3	Expert panel and other specialist assistance as required	1,500,000.00	ICS	Prior	Q3 / 2015		Assignment: International Expertise: TBD Advance Contracting: N Comments: As per FAM. International and national consultants.

4. Goods and Works Contracts Estimated to Cost Less than $1 Million and Consulting Services Contracts Less than $100,000 (Smaller Value Contracts)

The following table lists smaller-value goods, works and consulting services contracts for which the activity is either ongoing or expected to commence within the next 18 months.

Goods and Works								
Package Number	**General Description**	**Estimated Value**	**Number of Contracts**	**Procurement Method**	**Review** (Prior/ Post)	**Bidding Procedure**	**Advertisement Date** (quarter/year)	**Comments**
MLBCR Goods-01	Supplying of operation and maintenance materials	660,000.00	1	NCB	Prior	1S1E	Q3 / 2016	Prequalification of Bidders: N

								Domestic Preference Applicable: N Advanced Contracting: N Bidding Document: Goods
Various lots-2	Utility shifting and deposit works by government-owned entities	450,000.00	1	FA	Post		Q4 / 2016	Advanced Contracting: N
Various lots-3	Community works contracts	180,000.00	1	CPP	Prior		Q2 / 2016	Advanced Contracting: N Comments: Many contracts, each contract not exceeding $20,000. Prior review for first contract. Direct contracting.
Various lots-4	Field office works	300,000.00	5	SHOPPING	Post		Q4 / 2016	Advanced Contracting: Y
Various lots-5	Vehicles	2,300,000.00	multiple	NCB	Post		Q1 / 2016	

Consulting Services								
Package Number	**General Description**	**Estimated Value**	**Number of Contracts**	**Recruitment Method**	**Review** (Prior/ Post)	**Advertisement Date** (quarter/year)	**Type of Proposal**	**Comments**
None								

A. Indicative List of Packages Required Under the Project

The following table provides an indicative list of goods, works and consulting services contracts over the life of the project, other than those mentioned in previous sections (i.e., those expected beyond the current period).

Goods and Works							
Package Number	**General Description**	**Estimated Value**	**Estimated Number of**	**Procurement Method**	**Review** (Prior/Post)	**Bidding Procedure**	**Comments**
None							

Consulting Services							
Package Number	**General Description**	**Estimated Value (cumulative)**	**Estimated Number of Contracts**	**Recruitment Method**	**Review** (Prior/Post)	**Type of Proposal**	**Comments**
None							

B. List of Awarded and On-going, and Completed Contracts

The following tables list the awarded and on-going contracts, and completed contracts.

1. Awarded and Ongoing Contracts

Goods and Works							
Package Number	**General Description**	**Estimated Value**	**Awarded Contract Value**	**Procurement Method**	**Advertisement Date** (quarter/year)	**Date of ADB Approval of Contract Award**	**Comments**
UEC-ICB-01	Construction of Upper Elahera Canal From 0+100 Km to 6+226 Km	24,740,000.00	24,853,518.90	ICB	Q1 / 2016	22-SEP-16	
MLBCR-NCB-01	Rehabilitation of Minipe LB Canal from 0+000 km to 30+140 km - stage 1	2,670,000.00	2,713,783.09	NCB	Q4 / 2015	07-SEP-16	
MLBCR-NCB-02	Rehabilitation of Minipe LB Canal from 30+140 km to 49+820 km - stage 2	1,320,000.00	1,928,470.73	NCB	Q3 / 2016	03-FEB-17	
MLBCR-NCB-03	Rehabilitation of Minipe LB Canal from 49+820 km to 63+650 km - stage 3	5,230,000.00	4,659,263.00	NCB	Q3 / 2016	02-FEB-17	
MLBCR-NCB-04	Rehabilitation of Minipe LB Canal from 63+650 to 73+960 km - stage 4	2,440,000.00	1,388,000.42	NCB	Q3 / 2016	03-FEB-17	
NWPC-NCB-01	Wemedilla LBMC from 0+000 Km to 5+250 Km & new Sluice and tail canal	5,550,000.00	6,150,311.22	NCB	Q1 / 2016	20-SEP-16	
Various lots-5	Vehicles	680,000.00	1,141,253.82	NCB	Q1 / 2016	10-JUN-16	

Consulting Services							
Package Number	**General Description**	**Estimated Value**	**Awarded Contract Value**	**Recruitment Method**	**Advertisement Date** (quarter/year)	**Date of ADB Approval of Contract Award**	**Comments**
CS-1	Program Design, Management and Supervision Consultants	22,630,000.00	20,783,510.88	QCBS	Q4 / 2014	27-OCT-15	

C. National Competitive Bidding

A. Regulation and Reference Documents

1. The procedures to be followed for national competitive bidding shall conform to the provisions of ADB's Procurement Guidelines (2015).

B. Procurement Procedures

1. Eligibility

2. The eligibility of bidders shall be as defined under Section I of ADB's Procurement Guidelines (2015, as am ended from time to time) (the "Guidelines); accordingly, no bidder or potential bidder should be declared ineligible for reasons other than those provided in Section I of the Guidelines.

2. Sanctioning

3. National sanction lists or blacklists may be applied only with prior approval of ADB.

3. Prequalification

4. Prequalification is discouraged for NCB. When used, particularly for works contracts, an individual prequalification exercise is acceptable for each contract as is the use of a registration system (or approved standing list) of contractors based on criteria such as experience, financial capacity, and technical capacity. Foreign bidders from eligible countries must, however, be allowed to register and to bid without unreasonable cost or additional requirements.

4. Advertising

5. The posting of NCB specific notices for contracts valued at less than $1 million on ADB's website is not required but is highly recommended.

5. Preferences

6. The following shall be observed:

(i) No preference of any kind shall be given to domestic bidders or for domestically manufactured goods.

(ii) Foreign suppliers and contractors from ADB member countries shall be allowed to bid, without registration, licensing, and other government authorizations, leaving compliance with these requirements for after award and before signing of contract.

6. Participation by Government-Owned Enterprises

7. Government-owned enterprises in the Democratic Socialist Republic of Sri Lanka shall be eligible to participate only if they can establish that they are legally and financially autonomous, operate under commercial law, and are not a dependent agency of the procuring entity, or the Project Executing Agency or Implementing Agency.

7. Rejection of Bids and Rebidding

8. Bids shall not be subjected to a test for unrealistic rates. No lowest evaluated and substantially responsive b id shall be rejected on the basis of comparison to rates, including but not limited to market, historical, or agency established rates, without prior approval of ADB.

9. Bids shall not be rejected and new bids solicited without the ADB's prior concurrence.

8. Price Negotiations

10. Price negotiation shall be allowed only where the price offered by the lowest evaluated and substantially responsive bidder substantially exceeds costs estimates. Approval of ADB is required prior to any negotiation of prices.

C. Bidding Documents

9. Acceptable Bidding Documents

11. Procuring entities shall use standard bidding documents acceptable to ADB for the Procurement of Goods, Works and Consulting Services, based ideally on the standard bidding documents issued by ADB.

10. Bid Security

12. Where required, bid security shall be in the form of a certified check, a letter of credit or a bank guarantee from a reputable bank.

11. ADB Policy Clauses

13. A provision shall be included in all NCB works and goods contracts financed by ADB requiring suppliers and contractors to permit ADB to inspect their accounts and records and other documents relating to the bid submission and the performance of the contract, and to have them audited by auditors appointed by ADB.

14. A provision shall be included in all bidding documents for NCB works and goods contracts financed by ADB stating that the Borrower shall reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for the contract in question.

15. A provision shall be included in all bidding documents for NCB works and goods contracts financed by ADB stating that ADB will declare a firm or individual ineligible, either indefinitely or for a stated period, to be awarded a contract financed by ADB, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices or any integrity violation in competing for, or in executing, ADB-financed contract.

Attachment 5: Terms of Reference for Program Management, Design and Supervision Consultant

A. Background

1. These terms of reference (TOR) outline the scope of works, deliverables and work program for the Program Management, Design, and Supervision Consultant (PMDSC). The PMDSC will be responsible for assisting the Government of Sri Lanka with implementing the Mahaweli Water Security Investment Program (the "investment program"). The investment program will assist the government in completing outstanding water conveyance investments under the Mahaweli Development Program (MDP). Implementation of MDP began in 1970 and its completion is a key priority of the government. The investment program will support the objectives of MDP to maximize the productivity of Mahaweli River Basin (MRB) water resources by transferring available water to Sri Lanka's northern and northwestern dry zone areas for irrigation, drinking and commercial purposes. This will accelerate local and national economic growth.

2. At the national level, Sri Lanka has abundant access to water resources with about 50,000 million cubic meters (MCM) of annual runoff and an annual per capita endowment (ACE) of 2,500 cubic meters (m^3), well above the 1,700 m^3 threshold defining water stress. However, there are significant spatial and temporal variations; the northern dry zone river basins contribute only about 11% of the country's total runoff volume and only during the December to February period. This amounts to a local ACE of 1,200 m^3 indicating severe water stress which is compounded by regular droughts. Consequently, agricultural productivity in this region lags behind other wetter regions in Sri Lanka with 25% to 30% lower paddy yields and cropping intensities. This stress also impacts water availability for drinking and commercial users. This causes significant constraints for social and economic development which may be exacerbated in the future by anticipated population growth and climate change.

3. Historically, Sri Lanka has addressed these constraints by constructing many small cascade systems of reservoirs and transfer canals. In the 1960s, under MDP, the government decided to augment water within these systems with available water resources in the MRB using large transfer canals and reservoirs. The MRB is Sri Lanka's largest river basin, comprising 18% of Sri Lanka's area and providing 21% of the country's overall runoff. Over time, the government has revised MDP accounting for socioeconomic changes and national development priorities. The government's current priorities and investment roadmap are described in the Public Investment Strategy[1] for the irrigation and water resources sector. These focus on ensuring availability of adequate water quantities for irrigation; improving management, productivity and usage efficiency of water to meet rising demands; and minimizing spatial variations in water availability through implementing trans-basin diversions to divert available water to dry zone areas. The updated MDP will address the government's sector priorities by constructing the North Central Province Canal Program (NCPCP), an outstanding investment component of MDP. NCPCP will be implemented in two sequential phases: Phase 1 will transfer water from MRB to existing reservoirs in the Central, North Central and North Western Provinces; and Phase 2 will extend the transfer of MRB water from the North Central Province reservoirs to existing reservoirs in the Northern Province, and may eventually augment drinking water supplies to Jaffna and Kilinochchi.

[1] Government of Sri Lanka. Ministry of Finance and Planning. 2013. *Mahinda Chintana Public Investment Strategy, 2014-2016.* Colombo.

B. The Investment Program

4. The investment program will implement NCPCP Phase 1 using the Asian Development Bank's (ADB's) multitranche financing facility (MFF) modality, loaned to the government in three tranches. The number of tranches and projects, especially those after Tranche 1 are indicative and are subject to change. Phase 1 comprises three main individual investment projects. These will be constructed in stages under each tranche of the investment program. The three projects are:

(i) The Upper Elahera Canal Project (UECP) comprises two main components. The first component is the 9 km Kalu Ganga-Moragahakanda Transfer Canal [KMTC] (including about 8 km of tunnels) that will convey up to 771 MCM of water annually between Kalu Ganga and Moragahakanda Reservoirs, both of which are currently under construction. The second component is the 65.5 km Upper Elahera Canal (UEC) that will annually convey up to 974 MCM northwards from Moragahakanda Reservoir to the existing Huruluwewa Reservoir, and a further 16.7 km of canals to supply the existing Manankattiya, Eruwewa and Mahakanadarawa Reservoirs; these existing reservoirs supply existing irrigation and water supply schemes. The project is divided into three stages: (a) stage 1 will construct the first 6.2 km of UEC's open canals and associated structures; (b) stage 2 will construct the Kalu Ganga-Moragahakanda Transfer Canal and a 28 km tunnel of the UEC; and (c) stage 3 will construct the remaining 50 km of open and cut-cover canal sections, and four tunnels with lengths ranging from 70 m to 1.7 km.

(ii) The North Western Province Canal Project (NWPCP) will construct 96 km of new and upgraded canals, including a new 940 m tunnel and two new 25 m tall earth gravity dams impounding the planned Mahakithula and Mahakirula Reservoirs to annually withdraw 130 MCM from Dambulu Oya River and the existing Nalanda Reservoir (via the existing Wemedilla Reservoir) to command new and existing irrigation and water supply reservoirs located throughout North Western Province. The project is divided into two stages: (a) stage 1 will construct two new dams impounding the new Mahakithula and Mahkirula Reservoirs, the 26.7 km of open canals between the Wemedilla tank and the new Mahakithula and Mahakirula Reservoirs, and the tunnel; and (b) stage 2 will construct the remaining open canal sections and associated structures.

(iii) Minipe Left Bank Canal Rehabilitation Project (MLBCRP), located downstream of the Mahaweli Hydro Power Complex on the Mahaweli River, will: (a) add upstream storage by heightening the headwork's weir by 3.5 m to regulate generation inflows; (b) construct new automatic downstream-controlled intake gates to the left bank canal; (c) construct new emergency spill weirs to both left and right bank canals; and (d) rehabilitate the 74 km Minipe Left Bank Canal, including regulator and spill structures, to improve conveyance and reliability of service to existing farmers.

5. The investment program will address other key sector priorities through two consulting packages: (i) improving system efficiencies and water productivity (ISEWP) will be under Tranche 1; and (ii) in Tranche 3 strengthening integrated water resources management (SIWRM) consulting package will be undertaken. Further information on these packages is provided in the following sections. The investment program will be implemented over ten years and its tentative structure is shown in Table 1.

Table 1: Investment Program Structure and Implementation Schedule

Project	Subproject	Schedule
Civil Works		
Project 1 (Tranche 1)	UECP Stage 1 NWPCP Stage 1 MLBCRP	Q3 2015 – Q4 2019
Project 2 (Tranche 2)	UECP Stage 2 KMTCP Stage 1	Q1 2017 – Q4 2024
Project 3 (Tranche 3)	UECP Stage 3 NWPCP Stage 2 KMTCP Stage 2	Q1 2018 – Q4 2024
Consulting Services		
PMDSC	Stage 1 (Tranche 1) Stage 2 (Tranche 3)	Q3 2015 – Q2 2020 Q3 2020 – Q4 2024
ISEWP		Q3 2015 – Q3 2017
SIWRM		Q1 2019 – Q4 2020

ISEWP = improving system efficiencies and water productivity, KMTCP = Kalu Ganga-Moragahakanda Transfer Canal Project, MLBCRP = Minipe Left Bank Canal Rehabilitation Project, NWPCP = North Western Province Canal Project, PMDSC = program management, design and supervision consultant, SIWRM = strengthening integrated water resources management, UECP = Upper Elehera Canal Project
Source: Asian Development Bank

6. The investment program will raise paddy production in 32,800 ha of existing command area by increasing cropping intensities from 130% to 180% and yields from about 3 ton/ha to 6 ton/ha. Additional benefits will arise from increased drainage return flows within the existing cascade systems that downstream communities will use. Once NCPCP Phase 2 is completed, the irrigated area commanded by the investment program will increase to 103,400 ha. Cropping intensities, yields and command areas may be further increased through water use efficiency initiatives identified under the ISEWP package, which will also encourage diversification into less water consuming and higher value crops. The NCPCP will also annually convey 92 MCM for non-agricultural users under Phase 1 and a further 70 MCM to the North Province under Phase 2. There will also be hydropower benefits through construction of three new hydropower projects (HPPs) in Phase 2, and optimization of hydropower generation for peak period generation throughout the existing and planned HPPs in the Mahaweli System.

C. Project 1 Investment

7. The first tranche of the investment program will finance Project 1 which will comprise packages for civil works, goods, and consulting services. Indicatively, these will be implemented from Q3 2015 to Q4 2019 and the main works packages are shown in Table 2 along with their status of preparation. Implementation of these packages may possibly start in 2015. The PMDSC will be responsible for reviewing the detailed designs of the advanced packages, recommending improvements where necessary, finalizing the detailed engineering designs for all packages, and finalizing the bidding documents for all non-advance packages.

Table 2: Project 1's Indicative Civil Works Packages

Package	Description	Status
Upper Elahera Canal Project		
UEC-ICB-01	Construction of the UEC from 0+000 km to 6+200 km including sections of open canal, cut-cover canal, an aqueduct, and heightening of level crossings	Advanced

North Western Canal Project		
NWPC-NCB-01	Construction of the LBMC and associated sluices from the Wemedilla Reservoir from 0+145 to 5+250	
NWPC-ICB-01	Construction of the LBMC from Nebadagahawatta to Mahakitulawewa from 5+250 km to 22+500 km	
NWPC-ICB-02	Construction of: (a) the Mahakithula and Mahakirula Reservoirs with all appurtenance structures; (b) the 4 km link canal between the reservoirs; and (c) the 940 m tunnel linking the LMBC to Mahakithula Reservoir	Advanced
Minipe Left Bank Canal Rehabilitation Project		
MLBCR-ICB-01	Heightening the Minipe Anicut using a piano-key style weir, and construction of new intake structure for the left bank canal and upstream emergency overflow weirs for both left bank and right bank canals	Advanced
MLBCR-NCB-01 to 04	Four packages for rehabilitation of the 74 km left bank canal	
MLBCR-NCB-05	Electro-mechanical components of radial gate structures, provision of trash racks for syphons and repairs to Hasalaka Wewa radial gated spillway	

Note: "Advanced" means the detailed engineering designs are near completion, tender documents have been prepared, and the tendering process is underway.
ICB = International Competitive Bidding, LBMC = left bank main canal, MLBCR = Minipe Left Bank Canal Rehabilitation, NCB = National Competitive Bidding, NWPC = North West Province Canal, UEC = Upper Elahera Canal

8. The other main packages included in Project 1 are the: (i) consulting packages for the PMDSC and ISEWP; (ii) training and capacity development of government officers and departments; and (iii) vehicles and office equipment for assisting the government in implementing the investment program.

9. **Improving System Efficiencies and Water Productivity (ISEWP).** This consulting services package will seek to increase water availability to all areas within the NCPCP project area through investigating current water management and application practices, and identifying areas for improvements. The objective is to maximize overall systems efficiencies and productivity of water within the planned, expanded Mahaweli System being financed by this investment program and under Phase 2. The investment program will construct the main conveyance system which supplies water to existing reservoirs that supply the cascade irrigation systems. The cascade systems comprise major and minor tanks supplying distribution and tertiary canal systems which are largely operated by Provincial Councils and Farmer Organizations (FOs). The systems are characterized by predominately paddy rice cultivation, gross water application rates of approximately 30,000 m^3/ha per annum, and distribution efficiencies in the order of 50%. This package will consider how water is managed within these cascade systems. It will study pilot areas and identify options for improvement of the system's infrastructure and management. The approach will be based on benchmarking (water management, yields and local water management institutions) of the pilot areas, analysis of current and future performance (with future changes in water availability), and formulation of options for improvements to infrastructure, management, operation and maintenance. The study will also: (i) review past and ongoing efforts to improve system water use efficiencies and productivity of water, and apply the lessons learned to the study's recommendations; (ii) consider what commercial support and extension programs are required to encourage farmers to adopt water-saving practices (e.g. precise irrigation) and crop diversification; (iii) prepare detailed designs of recommended structural interventions for the project area that will be included in Tranche 3; (iv) prepare guidelines for up-scaling recommendations to the national level; and (v) recommend capacity development programs for government staff and FOs. The draft terms of reference (TOR) and budget estimate for the ISEWP

consulting package have been prepared. The PMDSC will assist the executing agency with finalizing the TOR, recruiting, and managing the ISEWP consultants.

D. Project 2 and Project 3 Investments

10. The remaining civil works will be implemented in Project 2 from Q1 2017 to Q4 2023 and Project 3 from Q1 2018 to Q4 2024. Project 2 will comprise only the tunneling works of UECP–Stage 2. Project 3 will comprise all remaining stages of the investment projects including: NWPCP–Stage 2, and UECP–Stage 3. Feasibility-level designs for these civil works packages are currently being prepared. It will also include the consulting services package for SIWRM which is explained below.

11. **Strengthening of Integrated Water Resources Management (SIWRM).** This consulting services package seeks to promote the strengthening of IWRM principles both within the investment program area and nationally, including recommending and supporting strengthening of water resources management and irrigation sector policies, legislation and institutions. This will be achieved through the review of current policy and legal frameworks, benchmarking of key water sector institutions, and formulation of recommendations and guidelines for improvements to institutionalize IWRM. This activity will also support: (i) updating of current water resources management master plans to include the completed MDP incorporating analysis of climate change impacts and water management practices for dry periods; (ii) possible crop diversification and impacts to scheme designs and management; (iii) assessment of the water demands of, and management of, other major water users including the environment; (iv) design, development and implementation of an IWRM decision support system; and (v) updating and modernizing the Water Management Secretariat under the Mahaweli Authority of Sri Lanka (MASL).

E. NCPCP Phase 2

12. The full benefits of the investment program will only be achieved once Phase 2 is also implemented. Phase 2 will allow transfer of additional excess water (up to 555 MCM/annum) from the Mahaweli River to the Moragahakanda Reservoir. From there, it will be conveyed via the UEC to the planned North Central Province Canal (NCPC). The NCPC will convey 640 MCM/annum to command about 87,000 ha of cascade systems in the North Central Province, and will terminate at the Chemadu kulam Reservoir. From there, about 100 MCM/annum will flow via natural drainage channels to the existing Iranamadu Reservoir for local irrigation and drinking users. Two route options are to be reviewed by the PMDSC before selecting the preferred route and then preparing the associated investments to feasibility level:

(i) Option 1 will transfer water from the Randenigala Reservoir to the Kalu Ganga Reservoir via the planned Randenigala – Kalu Ganga Transfer Canal (RKTC) that will comprise a 40 km long series of open canals and tunnels. This includes two new reservoirs located along the RKTC route at the Hasalaka and Heenganga Rivers. The Hasalaka Reservoir will have a 70 m tall RCC dam and 28MW HPP, and the Heenganga Reservoir will have a 80 m tall dam and 5.5MW HPP. Other associated infrastructure is also included such as access roads and power transmission lines, etc.

(ii) Option 2 will transfer water from Polgolla Barrage to the Moragahakanda Reservoir via a new tunnel and enlarged tailrace canal to the Bowatenna Reservoir. This option also includes the heightening of the Kothmale Reservoir by 25 m to increase system storage. The existing facilities at the Polgolla Barrage and Bowatenna Reservoir will also require upgrading to manage the increase in flows.

13. Phase 2 investments will also comprise:

(i) Lower Uma Oya Project comprising a 75 m tall roller-compacted concrete (RCC) dam, a 6km tunnel to Randenigala Reservoir, a 10MW HPP, and other associated infrastructures such as access roads, power transmission lines, etc.; and

(ii) NCPCP which is an 80km open canal that will convey water from the UEC to Chemmadu kulam in the Northern Province. This will also include off-takes and feeder channels to nearby major tanks, other control structures, and outlets to the downstream reservoirs.

14. Construction of Phase 2 is not financed under this investment program. However, the PMDSC will be responsible for (i) assessing the two route options; (ii) recommending the preferred option; (iii) undertaking a detailed feasibility assessment of the preferred option; and (iv) preparing all necessary documents for ADB Board consideration for possible future financing.

F. Implementation Arrangements

15. The executing agency for the investment program is the Ministry of Mahaweli Development and Environment (MMDE) under which a Program Management Unit (PMU) has been established to implement this investment program. The PMU is led by the Program Director (PD). Under the Program Director are three Project Implementation Units (PIUs), each led by Project Directors, one for each investment project. The PMU will oversee the ISEWP and SIWRM consulting packages. A Program Steering Committee (PSC) will be established to provide overall coordination of the investment program and facilitate interministerial coordination. The PSC will be chaired by the Secretary, MMDE, and the Program Director will be the PSC's secretary; all concerned ministries and agencies will be represented.

16. The PMDSC will assist the PMU and its other advisory sections comprising: (i) a committee that will comprise inter-government department staff who will review designs and documents, and advise as necessary; (ii) an environment and resettlement Safeguards Monitoring and Evaluation Section (SMES) that will monitor, evaluate and report on required safeguard activities; (iii) an Accounts and Finance Section that will be responsible for effective account management; (iv) a Communications Section who will lead communication activities; and (v) a Procurement Section that will be responsible for obtaining approvals and issuing bid documents, managing bidding processes until package award, and contract management including contract variations playing the role of the "Employer" during implementation. The PMDSC will furnish PMU and its advisory sections with the relevant project-related information. On the advice of the PMU, the PMDSC will correct, revise, update, and improve its services and outputs comprise this consulting assignment.

17. At the completion of the investment program, the investments will be managed by either the Department of Irrigation (DOI) or MASL.

G. Purpose of Consulting Services

18. The PMDSC will initially support the PMU for five years and the contract will be signed for the same period. While the PMDSC will be financed from Tranche 1, it will support all necessary activities under the subsequent tranches during the five-year period. The PMDSC will be

responsible for assisting the PMU to: (i) finalize designs for all packages and the bid documents of the remaining contract packages to be awarded under Project 1, and all contract packages of Project 2 and Project 3; (ii) procure, mobilize, and supervise all contractors for Projects (tranches) 1 to 3; (iii) recruit, mobilize, and manage the consultant for the ISEWP consulting services package; (iv) finalize the TOR, and recruit and manage a consulting firm to undertake the SIWRM consulting services package; (v) manage and supervise all civil works contracts and act as the "Engineer"; (vi) prepare Phase 2 investments and necessary ADB financing documents; (vii) provide technical and management advice, as required; (viii) manage and administer the investment program; and (ix) prepare draft periodic financing requests for subsequent tranches, and routine reporting requirements of ADB. The PMDSC will also assist MMDE with preparations, logistics and reporting for missions fielded by ADB and other cofinanciers, as necessary, throughout the investment program.

H. Scope of Services

19. The PMDSC has a number of main tasks which are explained in the following paragraphs. In general however, the PMDSC is responsible for ensuring effective and timely implementation of all the investment program's outputs to the highest standards.

20. **Task 1 – Program Management.** The PMDSC will assist with the overall investment program coordination and management through the relevant agencies at national, provincial and local levels. The PMDSC will work closely with the PMU and PIUs to ensure the effective and timely delivery of the project outputs. The PMDSC will maintain liaison with MMDE through PMU and PIU, and with ADB. Other main activities related to program management will include, but not be limited to:

(i) Working with PMU and PIUs to identify project management needs, planning, strategies and schedules for execution;

(ii) The design and establishment of a project performance management evaluation system (PPMES) that will allow PMU to (a) monitor and evaluate implementation of the project; (b) identify performance constraints; and (c) formulate and implement practical measures to address shortcomings. Annual performance evaluations will be carried out based on assessment of the projects. It should include secure financial management and accounting reporting, and be accessible to the PMU and ADB.

(iii) Preparing a Quality Assurance Plan (QAP) that will assist the PMDSC, PMU and PIUs with overall quality assurance. Essential elements of quality assurance for the investment program shall be controlled by the engineer to ensure quality products are provided in a cost-efficient and timely manner. It will encompass all aspects of the investment program, including control of contractors and sub-contractors, in-process inspections, receiving inspections, production and special process controls, functional testings, control of nonconformities, drawing control, corrective actions, configuration controls, quality assurance records, audits, shipping inspections, and other quality specifications and requirements to meet the needs of the investment program. contractors' quality assurance operations shall be subject to the engineer's verification at any time.

(iv) Facilitating the initial establishment of the PSC and thereafter, regular meetings. Preparing briefing materials on progress and issues, and providing general support to the PSC to effectively guide the investment program's implementation;

(v) Maintaining regular communications with all stakeholders to ensure implementation of the investment program and planning for Phase 2 investments so that it follows a participative and integrated planning and management approach;

(vi) Ensuring the actual implementation schedule reflects the design of the investment program and intended implementation schedule. Note that, the government's objective is to expedite completion of the UECP. The PMDSC shall identify the critical paths of investment program activities; critical activities include the planning, detailed design, tendering, award and implementation timing and sequence of packages; consider opportunities for expediting the implementation schedule, particularly for UECP; and recommend improvements wherever possible.

(vii) Preparing a Risk Management Plan (RMP) in coordination with the PMU, PIUs and contractors. The RMP will consider: (a) risk identification: determining risks may affect the investment program, and documenting the characteristics of each; (b) risk quantification: evaluating risks and risk interactions to assess the range of possible outcomes; (c) risk response: defining enhancement steps for opportunities and responses to threats; and (d) risk response control: responding to changes in risk over the course of the investment program. RMP will assist with proactively identifying potential risks and opportunities and advising and assisting the PMU and PIUs, to take timely actions to enhance project performance and mitigate any adverse constraints;

(viii) Advising and assisting the PMU and PIUs on establishing and maintaining the most appropriate and effective organizational, fiscal, implementation and management arrangements to ensure successful project implementation;

(ix) Establishing an appropriate project performance monitoring, evaluation and reporting systems that keeps project stakeholders suitably informed of project progress and impact, and assist PMU and PIUs to operate, maintain and update the system;

(x) Establishing and maintaining appropriate fiscal management and monitoring systems and assist PMU and PIUs in fiscal management and monitoring project expenditures and disbursements;

(xi) Advising and assisting the PMU and PIUs, and funding agencies in the efficient coordination of the various packages. Ensure that the PMU and PIUs will be well assisted by its services such that all project activities and particularly construction contracts are implemented in a timely and cost effective manner and maintain the highest standards;

(xii) Assisting and advising the PMU and PIUs to enhance human resources management to provide capacity development;

(xiii) Assisting with general project administration, performance and monitoring, and preparation of project reports;

(xiv) Assisting MMDE and ADB prepare the additional financing and necessary project documents for the second and third tranches of the investment program;

(xv) Ensuring timely mobilization and fielding of PMDSC staff, and when necessary, quick replacement of staff following government and ADB requirements;

(xvi) Finalizing the TOR for the ISEWP consultant and supporting the PMU and PIUs by providing guidance to the ISEWP consultant, reviewing their outputs, and recommending improvements, whenever necessary;

(xvii) Finalizing the TOR for the SIWRM consulting package, and assisting PMU with recruiting the consulting firm;

(xviii) Assisting the PMU to tender, evaluate and award contracts;

(xix) Assisting the PMU with planning and implementing any other activity related to design, construction and commissioning the investments, for example and not limited to: (a) planning and establishment of contractor camps with access, utilities etc.; (b) supervising and ensuring compliance of health and safety requirements; and (c) supervising and ensuring compliance of environmental and social safeguard measures, etc.;

(xx) Preparing a Project Completion Report (PCR) for Project 1 in a manner satisfactory to the PMU and ADB, including major project events, performance of contractors, operation of Project 1, actual and price inflated (to completion year) project cost (foreign and local costs separately) by implementation year, and labor employed by skilled/unskilled and foreign/local categories in person-years. The PCR shall also cover, among other items: (a) the relative successes (problems) in the implementation of each package; (b) an assessment of the impact of the project on the economy and social aspects of the beneficiary areas; (c) "as-built" drawings; and (d) detailed description of all the works by items of technical and non-technical matters;
(xxi) Updating investment program documents as required; and,
(xxii) Supporting visiting missions from ADB and cofinanciers.

21. **Task 2 – Design Review, Detailed Designs and Preparing Contract Documents.** The PMDSC will be responsible for reviewing and finalizing the detailed engineering designs for 'Advanced' packages in Project 1, and conducting detailed engineering designs for all remaining packages under the investment program. Among other activities, this includes: (i) undertaking any necessary additional surveys and laboratory tests (geological, hydraulic, etc.); (ii) preparing detailed engineering design drawings and accurate cost estimates; (iii) providing criteria for evaluation and selection procedures; and (iv) preparing the specifications, bid documents, and construction schedules. The contract packages will comprise of civil works, goods and consulting services. Works will include construction of open and covered canals (both lined and unlined), tunnels, dams, aqueducts, gate structures, electro-mechanical equipment installation, hydraulic steel structures, and all other ancillary and supporting structures, e.g. access roads, cross drainage channels, fences and access gates, etc.

22. Included within the investment program is about 38 km of tunnels. These will be constructed using tunnel boring machines (TBMs) and drill-and-blast methods. The PMDSC will prepare their detailed engineering designs and contract packages, including providing advice on the contracting modality for procurement of these work packages that will ensure construction quality to the highest standards, expeditious implementation schedules, cost-competitive bids, and minimal risks. As part of these duties, the PMDSC will: (i) review available information and designs; (ii) advise on and then undertake additional necessary surveys, geotechnical investigations, and laboratory tests; (iii) advise on the best procurement procedures and modality; (iv) advise on the construction and contract risks and appropriate mitigation measures; (v) recommend the preferred equipment and construction methods; (vi) advise and accordingly plan as necessary on any other matters related to construction of the tunnels, for example: (a) procurement and mobilization of the equipment to site; (b) auxiliary and ancillary plant requirements; (c) access requirements (including a review of current access routes) and any widening or strengthening of bridges, etc.; (d) contractor's staffing requirements and their living arrangements; (e) associated ancillary works such as staging areas, portals, adits, mixing plants, segment lining factories and storage, and power transmission; (f) environmental impact and management considerations; (g) interfacing considerations with other associated contracts; (h) health and safety considerations; (i) insurance; (j) construction logistics; (k) security; and (l) in-situ stress monitoring. Similarly, the PMDSC will provide similar expert advice and improvements as necessary, to the designs, and construction and procurement methods, for dams, aqueducts, cut-cover canal sections, and open canal sections being constructed under the investment program.

23. For packages which are already being tendered or have been awarded, the PMDSC will review the designs, specifications, and final design reports previously prepared and satisfy themselves the extent to which the works was defined. Following this review, the PMDSC will

prepare a “Tender Design Review Report” which will include, but not be limited to, the following discussion: (i) extent to which the drawings and designs may be insufficient for construction; (ii) identify any additional drawings required and provide schedule of such drawings required; (iii) scope of further surveys, tests, and detailed design calculations; and (iv) identify any implications to the prices and risk profiles of the contracts. Following review and approval by the PMU, the PMDSC undertake the necessary improvements to the surveys, tests, calculations, detailed designs, drawings, etc. and advise the PMU on how the contracts will be improved or varied, if necessary.

24. **Task 3 – Contract Management, Construction Supervision, Commissioning and Operation.** The PMDSC will assist MMDE with overall contract management and administration, construction supervision, and quality control. This includes assisting and advising the PMU and PIUs with smooth execution of all works under the investment program for its timely and successful completion without having cost overruns. This applies to supervising all goods, works, surveys, field studies, investigations, trainings, and consulting services packages under the investment program. The PMDSC shall be responsible for documenting all the design drawings, reports, as–built drawings,[2] and construction monitoring and quality certificates. The PMDSC shall develop an appropriate documentation plan for this purpose. Based on the documentation plan, the PMDSC shall also carry out the actual documentation and filing of the design drawings, reports, any events, as built drawings and quality monitoring certificates.

25. The PMDSC shall act in the capacity of “the Engineer” and represent the Client in the construction contracts. Accordingly, the PMDSC shall have full responsibility and authority for the professional quality and sufficiency of the supervision with respect to progress, quality of materials and work, measurements of quantities, costs, and legal aspects related to the contract. As “the Engineer”, the PMDSC will ensure timely progress of the works, initiate laboratory as well as in-situ tests as necessary, enforce specified materials, workmanship requirements and construction methods, and control the overall quality of construction. This includes the assessment of programs, materials, labor, construction methods, and monitoring compliance with specified construction methods. The PMDSC will carry out acceptance tests of equipment in the factory and on-site, including installation and commissioning. It also comprises supervision of contractor’s programs, rates of progress, performance testing, compliance with specifications and drawings, and health, safety and environmental requirements. In case of anticipated cost overruns, the PMDSC shall immediately inform the client and suggest mitigation measures wherever possible. Supervision shall be carried out on all sites where works are underway. Prior approval of the Employer is to be obtained by the PMDSC for taking any action under a civil works contract designating the consultant as “Engineer”, for which action, pursuant to such civil works contract, the written approval of the Client as “Employer” is required. Other specific activities will include, but are not limited to:

(i) Establishing a data transfer system for all documents and drawings;
(ii) Assisting the PMU and PIUs with bid evaluation and contract negotiations, as necessary;
(iii) Undertaking day-to-day construction supervision and monitoring, collection and checking of documentation, quality control, application of quality assurance procedures, checking the adequacy of contractor’s designs, drawings, and method statements, and preparation of progress and other reports;
(iv) Carrying out regular inspections, including sample testing where required, of all materials and workmanship to ensure compliance with the design specifications;

[2] To be supplied by the contractors. This must be included within the scope of the employers requirements for each tender document

(v) Surveying each of the constructed components to evaluate physical and financial progress of each item;
(vi) Maintaining a photographic and written record of all construction activities and progress;
(vii) Assisting with the design of concrete mixes for concrete segments and shotcrete as per technical specifications;
(viii) Conducting site investigations of construction materials and geotechnical investigations including laboratory testing and analyze investigation results;
(ix) Assessing the quantities of spoil materials and the capacity of the spoil areas, and help identify additional spoil areas, if necessary, within the vicinity of the project area;
(x) Monitoring the construction works and laboratories for quality assurance;
(xi) Ensuring that works are being implemented as per the contract specifications;
(xii) Providing sound and timely advice to resolve problems that arise during construction;
(xiii) Holding regular site meetings with contractors and preparing minutes of such meetings (based on agreed standardized format), and proactively managing the execution of agreed actions;
(xiv) Instructing the contractors to submit corrective measures or revised programs, as necessary, to keep pace with the anticipated progress and construction standards, and inform the PMU and PIUs on measures adopted;
(xv) Providing designs services for works during construction in order to completely and efficiently respond to meet changing site and ground conditions as construction work progresses. Issuance of instructions and additional or modified drawings and specifications to the contractors which may be necessary for the execution of the works and remedying of any defects, and inform the PMU and PIUs accordingly;
(xvi) Issuing interim payment certificates after final measurements for consideration to PMU and the PIUs;
(xvii) Examining contractor's claims on justification and quantities; deciding on claims that fall within the authority of the Engineer; making recommendations for the claims to be considered by PMU and the PIUs;
(xviii) Examining the need for contract variations; deciding on contract variations with the delegated authority of the Engineer, and for all other variations make recommendations to the PMU and the PIUs;
(xix) Monitoring compliance of environmental management plans (EMPs) by the contractors. This will include: (a) monitoring the contractor performance on meeting provisions of tender documents and approved EMP; (b) monitoring the effectiveness of the mitigation measures; and (c) instructing the contractors on needed actions and corrective measures to comply with the EMP;
(xx) Monitoring compliance of health and safety plans for all activities related to implementation of the investment program;
(xxi) Monitoring the preparation and timely submission of as-built drawings as well as final reports by contractors;
(xxii) Preparing partial, substantial and final completion certificates for consideration by PMU and the PIUs; and
(xxiii) Preparing regular progress reports highlighting the current progress, problems encountered, tests conducted, adopted corrective measures and estimate of likely completion time.

26. During the defect liability period for each package, the PMDSC will carry out the following functions: (i) monitoring the functional as well as structural performance of the investments and report to the PMU; (ii) preparation of the inventory of the defects/damages rectification/repair works, if any, to be done by the contractors as per the provisions of their contracts; (iii) evaluation

of the design, drawing and construction methodology for rectification/repair works proposed by the contractors and make recommendations to the PMU and PIUs; (iv) supervision and checking of the quality of the defect/damage rectification/repair works; and (v) assisting the PMU and PIUs with contract management and finance related issues related to the individual works contracts. The PMDSC will also assist PMU, MASL and DOI with commissioning and operation phases. It will involve building capacity within MASL and DOI to manage the project facilities. Commissioning covers initial operation to identify and rectify any construction faults prior to the contractor's official handover of completed systems to MASL and DOI. Commissioning will be progressive over the final year of individual project implementation. The PMDSC will identify specific facilities needed, expertise and staffing requirements, and prepare detailed management, operation and maintenance (MOM) procedures, including those relating to minimizing social and environmental impacts of all infrastructure developed under the investment program. This will be supported by preparation of comprehensive MOM manuals for each Project. The MOM procedures should be developed in consultation with all stakeholders.

27. **Task 4 – Capacity Development and Training Implementation.** The PMDSC will provide support for a broad program of institutional development as well as informal and formal training of key stakeholders. The PMDSC will undertake a Training Needs Assessment (TNA) of the MMDE, MASL and DOI to identify gaps and opportunities for raising their capacity in support of the investment program and implementation of Phase 2, including aspects of tunnel and dam design, procurement, contract management, construction supervision, water management, and management, operation and maintenance of the NCPCP. Upon approval of the TNA from the PMU and ADB, the PMDSC will assist MMDE with developing and implementing the training program, including programming, scheduling and managing logistics of the training, institutional development and awareness programs. Training programs will be financed by the investment program under a separate budget.

28. **Task 5 – Communications.** The PMDSC will support MMDE and PMU with managing communications during implementation of the investment program and preparation of Phase 2. This includes regularly updating the existing strategic communications program and supporting its effective implementation. It also includes establishing and operating a central grievance redress mechanism within the PMU to respond to stakeholder enquiries. Main activities will be, among other activities:

(i) Assisting and advising MMDE to develop and manage an effective public relations plan and to implement such developed plan;
(ii) Assisting MMDE in establishing a proactive informative campaign and dialogue with supporting and opposing stakeholders;
(iii) Promoting the benefits of the investment program and disseminating information to the project affected people, associated project stakeholders, general public and nongovernment organizations (NGOs) on how well social and environmental aspects are taken care of, how proper compensation is made to the affected people, what additional support the project provides to the people in investment program's beneficiary areas, and what benefits are attributed to the poor community;
(iv) Proactively organizing public relations events;
(v) Assisting MMDE with developing and maintaining an investment program website to disseminate information and implementation progress, and also provide a feedback and communication system for stakeholders and general public; and
(vi) Preparing a photographic and video diary of the construction works throughout the entire duration of the investment program. This should show construction activities, progress, and interviews with MMDE, PMDSC specialists, contractors, government staff, and stakeholders. It will be prepared to a high professional standard.

29. **Task 6 – Preparing a Strategic Environment Assessment (SEA).** For the NCPCP, the PMDSC will prepare the SEA taking into account the NCPCP and other ongoing and planned investments in the Mahaweli river basin, expanded Mahaweli System, and northern dry zone region (mainly comprised of North Central, Northern, North Western and Eastern Provinces, and parts of Central Province). The PMDSC will undertake a desk study of available literature that will include among others: (i) the SEA prepared for the Northern Province by the Central Environment Agency and the Disaster Management Centre; (ii) the two SEAs prepared for the Mahaweli System and for National Level Water Resources Planning which were both prepared for MMDE's Dam Safety and Water Resources Planning Project; (iii) the environmental impact assessments (EIAs) and initial environmental examination (IEE) reports prepared for this investment program; and (iv) any other relevant studies and stakeholder consultations. If necessary, the PMDSC will initiate additional surveys and consultations. The SEA will include, among other items:

(i) The main objectives of the planned NCPCP and ultimate completion of the MDP, and assess linkages to any other relevant ongoing and planned developments or programs in the NCPCP's and MDP's beneficiary areas. The SEA will broadly consider the cumulative impacts of these combined programs.
(ii) The relevant aspects of the current state of the environment and its likely evolution in absence of the investment program.
(iii) Socio-environmental characteristics of the area to be affected by completion of the NCPCP and MPD.
(iv) Any significant environmental issues relevant to the NCPCP, or any areas of particular environmental importance within the area.
(v) Likely impacts on the environment, including biodiversity, land use, hydrology, flora and fauna, climatic factors, land use soil, cultural and archaeological heritage, population, human health, water quality, etc.
(vi) Recommended initiatives that will prevent, reduce, and if possible, offset any significant impacts. These should include a scope of the initiatives, preliminary designs, and estimates for the implementation and recurring costs.

30. **Task 7 – Preparation of Phase 2.** The PMDSC will assess the route options for transferring water from the Mahaweli River to Moragahakanda Reservoir. The assessment will be based on: (i) consultations with all stakeholders (government, nongovernment, upstream and downstream users, etc.); (ii) detailed daily, monthly, and seasonal water balance assessments of the MDP and NCPCP based on the modeling of long-term observation records and anticipated climate change; (iii) current and planned water management practices; (iv) impacts on hydropower generation; (v) environmental, social and resettlement safeguards; and (vi) technical and economic feasibility. Once the preferred route is selected, the PMDSC will: (a) undertake all necessary surveys, geological investigations and laboratory as well as in-situ testing;[3] (b) prepare feasibility designs and cost estimates; (c) undertake necessary institutional, financial, procurement, environmental and social safeguard assessments; (d) assess the economic benefits and viability; and (e) prepare the feasibility and financing documents that meet both the government's and ADB's approval requirements. This includes preparing necessary ADB documents for: (i) using a project design advance to finance the detailed engineering design of Phase 2; and (ii) Board consideration for possible financing.

31. **Implementation Schedule.** The investment program is for ten years, however the government seeks to expedite its completion as soon as possible, particularly for the UECP and

[3] The PMDSC will be responsible for: (i) preparing the terms of reference and subcontract documents for these surveys and laboratory tests; (ii) procuring the services and studies following ADB's requirements; (iii) supervising and monitoring the subcontracts; and (iv) ensuring all subcontract outputs meet required expectations.

preparation of Phase 2 investments. The PMDSC should recommend in their proposal, viable options for achieving these goals.

I. Consulting Services

32. The Project Management, Design and Supervision Consultancy (PMDSC) will be for a period of five years.[4] Recruitment will be undertaken in accordance with ADB's *Guidelines on the Use of Consultants* (2013, as amended from time to time).[5] Firms will be recruited using quality- and cost-based selection (QCBS) method with a 90:10 quality-to-cost ratio. This ratio is justified as the priorities for the PMDSC are high-quality outputs including designing and supervising the construction of specialized dams and tunnel investments. A full technical proposal is required.

33. The PMDSC must have extensive experience with planning, designing and supervising the construction of large scale civil engineering works comprising tunnels (using both TBMs and drill and blast methods), dams and canals; experience with preparing hydropower projects is also necessary. The PMDSC must also have extensive experience in preparing contract documents, supervising construction works, and administering contracts under the International Federation of Consulting Engineers (FIDIC) Conditions of Contract for Construction for Building and Engineering Works designed by the Employer.[6]

34. The PMDSC will be engaged under a time-based contract with a lump-sum component, reimbursable component, and contingency for the time-based component. The time-based component applies to Tasks 1, 3, 4, 5 and 7. The lump-sum component applies for Tasks 2 and 6. Payment for the time-based component will be made upon submission of Monthly Progress Reports by the PMDSC which include detailed time-sheets for the individual specialists and summary of activities undertaken; the content of the Monthly Progress Reports will be agreed during the inception period of the assignment. Payment for the lump-sum component will be based on the schedule shown in Table 8. Tables 3 to 5 provide a list of key and non-key specialists to undertake all seven tasks of the PMDSC's scope of work, along with minimum inputs for the time-based components.

35. **Time-Based component.** The total minimum inputs for international key experts will be 244 person-months (pm), for national key experts will be 689 pm, and for the national non-key experts will be indicatively 1,628 pm. The cost of non-key experts must be included in the financial proposal. However, their CVs are not required in the technical proposal since they will not form part of the technical evaluation. CVs for non-key experts will be evaluated during contract negotiations with the highest-ranked firm and they will be accepted on a pass or fail basis.[7]

36. **Lump-Sum component:** CV's for the key experts shown in Table 5 must be included in the technical proposal and they will be evaluated. Preferably, only one expert is to be nominated for positions common to more than one task (time-based and lump-sum). In the technical proposal, the firm should also include a list of proposed additional non-key positions (international and national), provide justification for their inclusion, and include the CV's for proposed experts for each of the positions.[8] The proposed additional non-key positions and CV's of the additional

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[4] The PMSDC contract may be extended for subsequent tranches of the investment program, at the request of the executing agency or the government, subject to satisfactory performance of the team.
[5] Available at: http://www.adb.org/Documents/Guidelines/Consulting/Guidelines-Consultants.pdf.
[6] Multilateral Development Bank Harmonized Edition, June 2010.
[7] Non-key experts should be budgeted under the remuneration section of the time-based financial proposal.
[8] If selected, and unless there are significant mitigating circumstances, nominated additional non-key experts must join the PMDSC to undertake the role.

non-key experts will be evaluated during contract negotiations and will be accepted on a pass or fail basis.[9] For the purpose of preparing the lump-sum financial proposal, it is assumed that the services of both key and additional non-key experts will be undertaken within the project offices in Sri Lanka. During contract negotiations the PMDSC may propose alternative arrangements for the work locations for the additional non-key experts, which, subject to assessment and approval of the PMU and ADB, will provide services of an equivalent or better quality. Associated cost savings will be reflected in the agreed lump-sum contract amount.

Table 3: Summary of Key Experts and Inputs for Time-Based Tasks

Position	Person-Months	
	International	National
Team Leader and Chief Design Engineer*	44	-
Deputy Team Leader and Program Management Specialist	-	55
Monitoring and Evaluation Specialist	-	12
Procurement and Contracts Specialists	15	50
Environment Specialists*	9	30
Social and Resettlement Safeguards Specialists	6	14
Sociologist	-	6
Communications Specialists	6	34
Institutional Strengthening Specialists	6	12
Financial Management Specialists	4	8
Chief Design Engineer (Tunnels)*	4	-
Senior Design Engineers (Dams and Tunnels)*	18	30
Senior Design Engineers (Canals)*	-	28
Rock Mechanics Engineers*	10	40
Senior Structural Engineers*	6	22
Senior Engineering Geologists*	10	24
Senior Mechanical Engineer (TBM)*	12	-
Mechanical Engineers (Gates and Hydropower)*	1	2
Senior Electrical Engineers (TBM)*	2	6
Senior Electrical Engineers (Gates and Hydropower)*	2	2
Hydraulic Structures Engineers*	2	4
Water Resources and Irrigation Planning Specialists*	6	10
Modeling Specialists	10	20
Agriculture Specialist	-	6
Economists	4	10
Chief Resident Engineer	55	-
Senior Construction Engineer	-	55
Resident Engineers (3 persons)	-	150
Tunnel Construction Engineers	12	50
Dam Engineer*	-	9
Total	**244**	**689**

TBM = tunnel boring machine.
* These experts are also included in Table 5 as key experts for lump-sum tasks. Preferably, only one expert is to be nominated for each position.

Table 4: Indicative Summary of Non-Key Experts for Time-Based Tasks

Position	Person-Months	
	International	National
Concrete Engineers (3 persons)*	-	90
Senior Surveyors (3 persons)*	-	90
Quantity Surveyors (3 persons)*	-	90
Health and Safety Officer*	-	50

[9] Additional non-key experts for the lumpsum component should be budgeted under the lumpsum financial proposal.

Senior Draftsperson*	-	50
Assistant Design Engineers (8 persons)	-	192
Engineer Assistants (Construction Supervision) (12 persons)	-	600
Assistant Mechanical and Electrical Engineers (4 persons)	-	92
Survey Assistants (6 persons)	-	270
Draftspersons (4 persons)	-	104
Total		**1,628**

* For guidance, the tasks for these specialists are shown in Section K.

Table 5: Summary of Key Experts for Lump-Sum Tasks

Position	CV Required*	
	International	National
Chief Design Engineer	Yes	
Environment Specialists	Yes	Yes
Chief Design Engineer (Tunnels)	Yes	
Senior Design Engineers (Dams and Tunnels)	Yes	Yes
Senior Design Engineers (Canals)	Yes	Yes
Rock Mechanics Engineers	Yes	Yes
Senior Structural Engineers	Yes	Yes
Senior Engineering Geologist		Yes
Senior Mechanical Engineer (TBM)	Yes	
Mechanical Engineers (Gates and Hydropower)	Yes	Yes
Senior Electrical Engineers (TBM)	Yes	Yes
Senior Electrical Engineers (Gates and Hydropower)	Yes	Yes
Water Resources and Irrigation Planning Specialists	Yes	Yes
Hydraulic Structures Engineers	Yes	Yes
Dam Engineer		Yes

* Only provide CV's for experts not proposed for positions in Table 3.

J. Individual Terms of Reference for Key Experts (time-based component)

37. **Team Leader and Chief Design Engineer: International (minimum 44 pm for time-based tasks)**. The expert must be an experienced civil engineer, preferably with a Master's degree and about 15 years of work experience out of which about 10 years should be related to project management of large construction projects similar to the investment program that include multiple concurrent works activities and construction of tunnels in soil and rock, earth and concrete dams, large canals, and large gated hydraulic structures. The expert should have demonstrated experience of leading design and implementation teams, and working in complex projects in similar geographical and topographical settings. The expert should be competent in planning, design, contract management, quality assurance and quality control, safety, compliance with safeguards, etc. pertaining to construction of similar projects. The expert must have excellent verbal and written communication skills in English. The expert will have prior experience of leading similar projects in countries with similar geographic conditions. The expert will be responsible leading and contributing to all tasks and for undertaking the following activities, among others:

(i) Setting-up an effective organizational structure for the PMDSC. Preparing and implementing all administrative systems and procedures needed to ensure the effective design and supervision of the contract works in accordance with the scope of works with acceptable international standards;

(ii) Being responsible for overall direction of the PMDSC team, coordination of inputs, and management of individual specialists;

(iii) Being responsible for the overall management of the planning, design and engineering team and their activities. Providing expert advice as required. Review and ensure

outputs are complete, well prepared using consistent formats, and their content are prepared to the highest standard;

(iv) Having overall responsibility for the timely delivery and quality of all outputs, including those listed in Table 6, in formats that are acceptable to the government and ADB;

(v) Managing the relationships with the government, PMU, PIUs, ADB, and all other stakeholders;

(vi) Carrying out a comprehensive review of the feasibility studies and detailed designs done to-date and draw attention to changes which may have become necessary since their preparation;

(vii) Advising on construction and contracting methods, and performing a comparative analysis of options, benefits, risks, mobilization, and implementation schedules;

(viii) Assisting the PMU and PIUs to prepare invitation for tender; preparing bid evaluation criteria, initially evaluating and providing advice to the PMU on alternative proposals, and elaborating on recommendations with a ranking of all contractors concluding with a suggestion of the technically and economically qualified bidder;

(ix) Identifying important technical and managerial issues which affect progress, safety, quality and compliance with safeguards;

(x) Reviewing the construction schedule of the tunneling methods and recommending the most optimal solutions, and reviewing the dam designs with the construction schedule;

(xi) Reviewing mobilization of the contractor's resources (experience of the personnel, equipment, machines, quality and quantity of materials, funds, etc.) and recommending additional resources to be mobilized;

(xii) Guiding, coordinating and supporting program activities and providing overall guidance and direction and ensure that the PMDSC works in harmony with other ongoing and planned programs;

(xiii) Advising the Program Director in coordinating the planning, management, monitoring and reporting of all project activities including supporting the development and implementation of progress monitoring systems;

(xiv) Advising the Program Director in planning, and coordinating inputs particularly for physical interventions under Tranches 2 and 3. Oversee selection, field investigations, feasibility studies and detailed designs of Phase 2 investments;

(xv) Planning and coordinating project designs and other requirements for subsequent tranches of the investment program in accordance with ADB's requirements. These should all be based on relevant international and regional experiences and best practices;

(xvi) Supporting PMU and PIUs with packaging contracts and finalizing tender documents;

(xvii) Coordinating with and assisting PMU on any relevant activities for river basin planning in relation to the investment program and Phase 2;

(xviii) Supporting visiting missions from ADB and cofinanciers; and

(xix) Supporting PMU with preparing periodic financing requests for subsequent tranches.

38. **Deputy Team Leader and Program Management Specialist: National (55 pm).** This expert will support the Team Leader with overall management duties of the team, help lead the design process, and liaise with the main government and project stakeholders. Preferably, the specialist will have a Master's in Civil Engineering or Agricultural Sciences, with 15 years of experience in preparing and implementing large irrigation and water resources projects, preferably with dams and canals; and previously co-led international donor-funded development projects. The main activities of the specialist will be, among others:

(i) Support the Team Leader in managing the overall assignment and be responsible for the national consultants' outputs;

(ii) Collect and compile all relevant studies including designs, drawings, survey information and data for all projects under Tranches 2 and 3 and Phase 2;
(iii) Maintain proper filing and reporting systems. Coordinate with the PMU and PIUs on management information system (MIS) procedures, website information, and records maintenance;
(iv) Support development of an MIS for the investment program that addresses among other things, individual and overall contract implementation schedules and budgets (planned and actual), project operational performance, operation and maintenance, safeguards and human resource development. Update the MIS at least monthly to support reporting requirements and for PMU, PIU, ADB and general public knowledge;
(v) Develop and deliver training materials on technical aspects including the MIS;
(vi) Review role of and interrelationship among important stakeholders and suggest ways to improve liaison, cooperation and coordination among them to achieve improved pace and quality of implementation;
(vii) Support the timely submission of all deliverables;
(viii) Support the necessary approval processes of deliverables;
(ix) Work closely with the Team Leader to guide the management and coordination with the government, and other stakeholders including the facilitation of regular management dialogue between the PMU, PIUs, other associated agencies and stakeholders at central and project levels;
(x) Support the establishment and guide the activities of the PMU, PIUs, the PSC, and other proposed institutional arrangements, as necessary; and
(xi) Support the PMU and PIUs in the liaising, coordinating and supervising of the contractors and other consultancies, and panel of experts hired by PMU.

39. **Monitoring and Evaluation Specialist: National (12 pm).** The specialist will have a civil engineering degree and preferably with 10 years of experience on monitoring and evaluation (M&E) of large-scale water resources infrastructure projects, preferably with tunnels and dams. The specialist will work closely with the Team Leader and PMU to ensure that proper systems are established, the investment program is implemented in accordance with the program design and monitoring framework (DMF), and that issues arising are quickly identified and brought to the attention of the government and ADB for prompt resolution. Other activities will include, but not limited to:

(i) Carrying out a review of the project preparation documents with regard to project M&E and drawing attention to changes which may have become necessary since their preparation;
(ii) Support the Team Leader and PMU in ensuring that the project is implemented in accordance with the investment program's and project's DMF and that issues arising are quickly identified and resolved;
(iii) Set up M&E frameworks and the PPMES for overall project activities. The PPMES will include a participatory baseline survey to be conducted within the first year of the Project with follow-up surveys to evaluate any changes. Surveys will target direct and indirect stakeholders and beneficiaries. Monitoring and evaluation of pro-poor effects of the project will also be integrated into the PPMES;
(iv) Prepare evaluation criteria for each activity, and role and tasks of the agencies;
(v) Work with government experts and other specialists in the team to develop: (a) indicators that are objective, obvious and effective; (b) databases for effective data collection and management; (c) methods for evaluation and analysis; and (d) procedures for audit and control;
(vi) Prepare the necessary guidelines for M&E consistent with project documents (report and recommendation of the President, the Loan Agreement, facility administration

manual [FAM], environmental assessment and review framework [EARF], IEE/EIAs and EMP, resettlement framework [RF] and resettlement implementation plans [RIPs], summary poverty reduction and social strategy [SPRSS], etc.), ADB's requirements, and regulations of the government;

(vii) Set up standards, contents and schedules for assistance to the PMU and PIUs for M&E to ensure the project components are implemented as scheduled and outputs are as specified in the Loan Agreement;
(viii) Prepare M&E and PPMES manuals for monitoring and assessment and ensure that relevant agencies comply with these manuals;
(ix) Develop a community participation process within the M&E systems;
(x) Collect necessary data, monitor and routinely evaluate project implementation results and impacts as part of the MIS;
(xi) Support the team in the preparation and organization of training and workshop programs on data management and using M&E for the PMU, stakeholders, and other government staff;
(xii) Prepare standardized reporting formats and templates; and
(xiii) Assist the Deputy Team Leader to take over managing and updating the M&E, MIS and PPMES.

40. **Procurement and Contracts Specialists: International (15 pm) and National (50 pm).** The experts, preferably with a degree in Civil Engineering or equivalent and with 8 years of experience on similar development projects in countries with similar geographic conditions. The experts should have demonstrated profound knowledge of contract management, international contracts for construction works (i.e. FIDIC), and experience with procurement processes for externally-financed projects, mainly those funded by ADB or World Bank. The experts will have considerable experience in preparing bid documents, evaluation of bids, negotiations, etc., and should be well informed on major pitfalls related to large-scale contracting and construction issues. The experts will have extensive experience in assessing claims of contractors with respect to the specifications, plans, and conditions of contracts under FIDIC guidelines. The expert's main activities include, but are not limited to:

(i) Reviewing the procurement plan and contract packages in the FAM with regard to procurement and financial management and draw attention to changes which may have become necessary since their preparation;
(ii) Assisting the PMU and PIUs with procurement of Tranche 1 outstanding contracts, review their progress, recommend adjustments, and identify lessons learnt that can be applied to procurement of all other remaining packages in the investment program;
(iii) Preparing detailed procurement plans for Tranches 2 and 3 incorporating the procurement requirements for all necessary goods, works, consulting services packages, etc.;
(iv) Annually updating the Procurement Plans according to actual implementation schedule and agreed changes, accounting for content, schedule, resources, contract awards and disbursement;
(v) Advising on procurement strategies in accordance with the government's and ADB's Procurement Guidelines (2013, as amended from time to time);
(vi) Preparing a Program Procurement Handbook in accordance with ADB's procurement policies and guidelines and government regulations. The handbook should include guidelines for effective implementation of the investment program including, but not limited to, providing guidance on bid notification and bid submission, bid evaluation and contract award, contract supervision, and payments;

(vii) Undertaking a capacity assessment of the PMU and PIUs to assess what supplementary personnel and resources are required to ensure satisfactory implementation of the investment program;
(viii) Guiding, supporting and monitoring the PMU and PIUs in procurement and financial management in accordance with the Program Procurement Handbook;
(ix) Work with the engineers in finalizing cost estimates, tender documents, and bill of quantities (BOQ); preparing procurement documents for all remaining packages to be contracted under the investment program and also the advance packages for Phase 2, in accordance with ADB's *Guidelines on the Use of Consultants* and ADB's Procurement Guidelines;
(x) Advising on the timelines for procurement and developing strategies to ensure the optimum phasing of the start-up of the various packages;
(xi) Assisting the PMU and PIUs with reviewing contents of packages and the procurement plan and updating as necessary of tender documents in accordance with ADB policy and government regulations (including forms of payment, audit procedures, disbursement and preparation of reports related to financing activities);
(xii) Assisting the PMU and PIUs to prepare and review necessary procurement notices;
(xiii) Assisting the PMU and PIUs with advance procurement and recruitment where necessary. This applies to packages under the investment program and advance packages under Phase 2 should it proceed during the time of this consulting package;
(xiv) Preparing standard criteria and checklists for evaluation of the tenders and assist the PMU and PIUs in preparation of the bid evaluation reports and assist them in reviewing the selection process of bidders;
(xv) Supporting the PMU and PIUs with all procurement activities for national competitive bidding (NCB), international competitive bidding (ICB), shopping for goods and works, community works contracts, use of force accounts, and selection of consultants according to the ADB's guidelines and government regulations;
(xvi) Assisting the PMU and PIUs with contract negotiations, preparation of contracts and contract awards;
(xvii) Maintaining complete and updated files on all contractual issues including submittals, securities, insurance, and related documents;
(xviii) Supporting specific actions for integrity, ease of fund flow, and transparency;
(xix) Examining consultant and contractor claims and support the construction supervision specialists, PMU and PIUs with determination of need for contract variations, etc.;
(xx) Coordinating with the M&E Specialist in setting up a monitoring system on procurement and contracts for the whole program from central to local level in a unified framework in accordance with the monitoring framework and project design;
(xxi) Supporting the Team Leader, PMU and PIUs in ensuring that the project is implemented in accordance with the FAM to ensure that management and operation mechanisms will be effective, obvious and sustainable, and that issues arising are quickly identified and resolved;
(xxii) Assisting the project implementation officers of the PMU and PIUs in preparing and delivering on-the-job training programs related to procurement, contracts, financial management and disbursements;
(xxiii) Updating, monitoring and evaluating the payment and disbursement of all packages in the project and identifying the causes of existing problems, delays and propose remedial measures;
(xxiv) Assisting the PMU and PIUs in preparing monthly reports for procurement and contract awards, contract management and performance of each contract package;

(xxv) Providing advice as required helping resolve contractual matters. Advising on and mediating disputes, as necessary, between the contractors and PMU, should they arise; and

(xxvi) Supporting preparation of Phase 2 by: (a) updating the Procurement Capacity Assessment of MMDE, MASL, DOI, and national contractors; (b) preparing the procurement plans for the Phase 2 investments; and (c) advising on procurement arrangements and formats of the bid documents, taking into consideration lessons learned during implementation of this investment program.

(xxvii) The national expert will support the international expert, resident engineers and team leader.

41. **Environment Specialists: International (minimum 9 pm for time-based tasks) and National (minimum 30 pm for time-based tasks).** Preferably, the specialists will have a Master's degree in environmental sciences, environmental engineering, or similar. For the international specialist, 10 years of experience undertaking similar assignments, preferably in countries with similar geographic conditions is an advantage. The national specialist, preferably with 8 years of experience, should have worked on two or more assignments financed by ADB or other multilateral agencies. The specialists will be responsible for three main tasks: (i) preparing the SEA; (ii) updating the environmental assessments and EMPs, and ensure their effective implementation by the contractors; and (iii) preparing the necessary environmental assessments for the Phase 2 investments that will be included in the overall feasibility and preparation of Phase 2. In summary, the tasks of the specialists will be, among other activities:

(i) Preparing the SEA;

(ii) Updating the EIAs and IEE, and the respective EMPs based on final detailed designs;

(iii) Training and building capacity of PMU and PIU staff on environmental management, supervision, reporting, and monitoring of implementation of EMPs;

(iv) Orienting contractors on implementation of the EMPs;

(v) Reviewing the environmental method statements provided by contractors and guide them on any revisions required;

(vi) Monitoring implementation of the EMP and recommending any corrective actions on any unforeseen environmental impacts;

(vii) Taking the lead in preparing environmental monitoring reports for PMU, ADB and Central Environmental Authority (CEA); and

(viii) Preparing separate EIAs for: (i) the North Central Province Canal Project; and (ii) the Lower Uma Oya Project combined with the Randenigala-Kalu Ganga Transfer Canal Project. The EIAs will meet the requirements of both ADB's Safeguard Policy Statement (2009) and that of government's CEA. They will in general cover: (a) a description of the projects including alternatives considered; (b) policies, legal and administrative frameworks relevant to the projects and environmental assessments, (c) descriptions of the existing environment which will include the physical, biological, and socioeconomic conditions of the study areas; (d) anticipated environmental impacts and mitigation measures which will include the positive and negative, direct, indirect, and cumulative impacts to the physical, biological and socioeconomic environments, and the physical cultural resources in the area of influence and associated mitigation measures; (e) descriptions of the information disclosures, consultation and participation plans; (f) descriptions of the grievance redress mechanisms; and (g) environmental management plans which will identify the mitigation and monitoring requirements including the implementation arrangements and associated costs. To support preparation of the EIAs, the Environment Specialists may need support from the other PMDSC specialists (engineers, geologists, water resources specialist, etc.) and additional national specialists such as ecologists,

agronomist, sociologist, and archeologist. The Environment Specialists will prepare TORs and budgets for the additional roles, for approval by the PMU.

42. **Social and Resettlement Safeguards Specialists: International (6 pm) and National (14 pm).** Preferably, the specialists will have a degree in social sciences with 10 years of experience undertaking similar assignments, preferably financed by ADB or other multilateral agencies. The specialists will assist the PMU with implementing the resettlement activities for the investment program, and help prepare the appropriate safeguard documents for Phase 2 investments. Other main activities of the specialists will include, but are not limited to:

(i) Updating the approved RF of the investment program, as necessary;
(ii) Updating resettlement plans for Tranches 2 and 3, as necessary;
(iii) Designing, commissioning, and supervising the implementation of appropriate socioeconomic surveys for Tranches 2 and 3 and Phase 2 investments; and provide all necessary inputs for the preparing the associated social and resettlement activities including the social impact assessments, safeguard planning documents such as RIPs, SPRSS, and gender action plans;
(iv) Proposing practical and implementable options for improving resettlement implementation. Draw lessons to be learned from comparable projects and propose practical and implementable options for improvement in resettlement implementation;
(v) Preparing MMDE's capacity assessment and involuntary resettlement training programs if gaps are identified;
(vi) Assisting PMU in: (a) identifying affected persons and the impact of the project on them; (b) making a detailed inventory of assets; (c) making swift payments of compensation and the provision of other resettlement assistance, along with other relevant agencies; and (d) keeping detailed records of progress on resettlement implementation;
(vii) Providing or organizing training programs or other forms of support for income restoration and improvement; and
(viii) Planning and implementing consultations with affected persons in accordance with the consultation plan.

43. **Sociologist: National (6 pm).** The specialist will have a post-graduate degree in sociology or equivalent, preferably with 10 years of experience in planning development projects in the water resources management or irrigation sector. The main tasks of the specialist will be supporting the investment program and preparing Phase 2. Other main activities will include, but not limited to:

(i) Collecting information and undertaking surveys to support the following studies;
(ii) Assessing the social dimensions and dynamics within the completed Mahaweli System for every system area and disaggregated for social dimensions such as, but not limited to: age, gender, income, employment, ethnicity, and religion;
(iii) Assessing how the above dynamics affects water management now and possibly in the future taking to consideration planned investments under Phase 1 and 2;
(iv) Contributing to the planning and design of investments under Phase 1 and 2;
(v) Supporting the Communications Specialists in preparing and implementing communication activities; and
(vi) Supporting the Social and Resettlement Safeguards Specialists with undertaking their activities.

44. **Communications Specialists: International (6 pm) and National (34 pm).** Preferably, the specialist will have Master's degree in communication or equivalent with 10 years of successful experience in planning and implementing communication plans for development

projects, preferably in the water resources sector. The tasks of the specialists will be supporting the investment program and preparation of Phase 2. Other main activities will include, but not limited to:

(i) Reviewing, updating, and improving the investment program's communications strategy and plan;
(ii) Identifying Media, NGOs or other communications agencies that can efficiently support and implement the investment program's communication plan;
(iii) Preparing the project communications campaigns and communications materials;
(iv) Supervising the design and development of the investment program's website;
(v) Preparing a video and photographic diary on the implementation of the investment program;
(vi) Training the PMU communication specialists; and,
(vii) Preparing a communications plan for Phase 2.

45. **Institutional Strengthening Specialists: International (6 pm) and National (12 pm).** Preferably, the specialists will have 10 years of experience in institutional strengthening and capacity development in water resources and irrigation projects. The specialists should have a Master's degree or equivalent in civil engineering, water resources management, institutional strengthening, or financial management. Experience in Sri Lanka, or other countries with similar geographic conditions, is preferred for the international expert. Responsibilities will include, among others:

(i) Prepare a training needs assessment and design a training program to strengthen the staff of the PMU and PIUs, and from other relevant agencies, in matters related to the investment program;
(i) Provide advice and guidance on the implementation of the training program which may include short- and long-term courses, national and international courses, and study tours;
(ii) Assist the PMU and PIU's with implementing the training program by providing logistical support;
(iii) Prepare institutional and staff long-term development plans for MMDE that will support long-term management of the entire MDP and NCPCP;
(iv) Review policies, laws, regulations, agreements, frameworks and mechanisms currently being used to govern the management of water resources in Sri Lanka and that enable interagency coordination for its development and management. Advising on strengths, weaknesses and opportunities to improve these under the investment program and subsequent Phase 2;
(v) Review the current institutional arrangements within MMDE, MASL and DOI, and advise strengths, weaknesses and opportunities to improve these agencies under the investment program and subsequent Phase 2; and
(vi) With the Water Resources and Irrigation Planning Specialist, update and finalize the TOR for the SIWRM consulting package. Support the PMU with their recruitment, and assist the PMU with monitoring and advising on the outputs of the SIWRM consultant.

46. **Financial Management Specialists: International (4 pm) and National (8 pm).** Preferably, the specialists will have an advanced degree in accounting or finance or equivalent and 10 years of experience in undertaking financial analysis, preferably in multilaterally-financed projects or in the public and private sector. The main activities of the specialists will be, among others:

(i) Support the PMU in establishing and using proper project financial management and accounting systems to support financial management of the investment program and adopting the financial management improvement proposed in the FAM;

(ii) Support preparation of the Phase 2 investments by: (a) updating the Financial Management Assessment of MMDE, MASL and DOI; (b) preparing the financial evaluation and analysis of the Phase 2 investments which will include both non-income generating components (irrigation and bulk water supply) and income generating components (hydropower). The formats of these assessments will follow ADB requirements.
(iii) Prepare and revise the project cost estimates, financial monitoring and financial analysis;
(iv) Prepare a Financial Management Handbook for the investment program and provide training to the PMU and PIUs as necessary on the handbook, project accounting and ADB procedures for disbursements;
(v) Assist the PMU in setting up the overall financial management, i.e., disbursement of funds, review of withdrawal applications, monitoring of project and counterpart funds, etc.;
(vi) Assist the PMU in implementing improvement measures recommended by the PPTA financial management assessment, and update the FAM accordingly;
(vii) Assist PMU staff in the preparation of project accounts in a format suitable for both ADB and national requirements;
(viii) Assist PMU staff in developing a system of internal control to ensure accurate and reliable financial information; and
(ix) Assist the Team Leader and Deputy Team Leader in timely preparation of reports.

47. **Chief Design Engineer (Tunnels): International (minimum 4 pm for time-based tasks).** Preferably, the expert will have a Master's degree in civil engineering, with specialization in all kinds of tunneling works in soil and rock. The expert should have demonstrated experience of more than 12 years working in complex projects in similar geographical and topographical settings. The expert should be competent in planning, design, cost estimate, tendering, contract management and controlling, quality assurance and quality control, safety compliance and construction of tunnels, shafts and/or caverns as well as risk management. The expert has to review and comment on alternative proposals. The expert must have profound knowledge about electronic data processing and software like AutoCAD, etc., and must have excellent verbal and written communication skills in English and ideally will have prior experience of leading similar projects. The activities will include, but are not limited to:

(i) Studying the alignments of mechanized (TBM) and conventional (drill and blast) tunnels in soil and rock, and find optimum solutions for either structure to fit the program time and cost constraints;
(ii) Preparing tender drawings for all tunnels including the respective cost estimates, and construction schedules;
(iii) Elaborating on the best suited cross section of the conventional tunnels, and determining the minimum longitudinal distance between face heading and bench blasting in the tunnels;
(iv) Checking the rock mass parameters for a stability assessment of portals and tunnel portions with low rock cover in collaboration with the Rock Mechanics Engineer;
(v) Selecting the locations of the temporary tunnel portals in close cooperation with the Engineering Geologist;
(vi) Designing the tunnel between temporary and final portal as cut-and-cover sections;
(vii) Elaborating on the excavation classes on the basis of rock mass rating (RMR) together with the Rock Mechanics Engineer and Engineering Geologist; assigning each excavation class the advance rate and the respective excavation diameter;
(viii) Determining the pay-line for the excavation in collaboration with the Engineering Geologist and Rock Mechanics Engineer;

(ix) Designing the support classes by means of RMR and excavation classes in cooperation with the Rock Mechanics Engineer; elaborating on the best suited support system for TBM, i.e. segmental lining or reinforced shotcrete with rock bolts;
(x) Designing permanent support for all underground excavations and being responsible for reviewing and approving the contractor's temporary support proposals;
(xi) Develop a dewatering system in detail for the entire length of each of the tunnels including the portals, select the capacity of the pumps and determine the size of the retaining basin(s);
(xii) Developing the optimal requirements of important equipment for critical activities of TBM, drilling and blasting; permanent support works (e.g., lining, shotcrete, etc.) headworks; etc.;
(xiii) Advising on construction methods;
(xiv) Providing overall management of the tender design review, detailed designs and preparation of "for construction" drawings for the tunnels;
(xv) Advising on contractual issues and the use of land for the start-up installation and for dump of tunnel muck;
(xvi) Updating the schedules for mobilization, implementation, construction, and commissioning;
(xvii) Evaluating the total cost of each tunnel based on the geotechnical findings and the selected TBM, independently from the existing available estimates;
(xviii) Advising on additional tests or investigations, if deemed necessary; and
(xix) Supporting preparation of Phase 2 investments.

48. **Senior Design Engineers (Dams and Tunnels): International (minimum 18 pm for time-based tasks) and National (minimum 30 pm for time-based tasks).** The experts must be civil engineers, preferably with a Bachelor's degree and about 10 years of work experience out of which about 7 years should be related to design and construction of dams with hydropower facilities and tunnel projects preferably in countries with similar geographic and climatic conditions. Experience with planning and design of earth gravity dams and roller-compacted concrete (RCC) dams is required. The international expert must have ample experience with dams and TBMs, and excellent verbal and written communication skills in English. The experts will review and finalize the designs of the dams that will be constructed under the investment program (Phase 1). The experts will also plan and prepare feasibility designs, cost estimates, draft specifications for the dams and tunnels to be constructed under Phase 2, along with preparing the TOR for their detailed engineering design. The following activities apply to both this investment program and preparing Phase 2. They will include, but are not limited to:

(i) Supporting the Chief Design Engineers with the design works including preparing the detailed engineering designs, cost estimates, construction schedules and tender documents;
(ii) Reviewing of the updated seismic hazard analyses;
(iii) Reviewing and commenting on the available designs and construction details for two dams, one saddle dam of NWPC; assess the costs and elaborate tender documents with the construction schedule;
(iv) Checking the height of the freeboard and the size of the rip-rap with the Water Resources and Irrigation Planning Specialists;
(v) Working with the Engineering Geologists to establish the criteria for dam foundation in general and in particular the foundation of the clay core, treatment measures and the availability of suitable local dam construction materials in close vicinity and selecting the appropriate material parameters to be applied in the dam analysis/design;

(vi) Working closely with the Engineering Geologists, deciding on locations of borrow areas for construction materials from the reservoirs based on the results from the site geotechnical drilling/testing and investigation programs;
(vii) Designing the spillways and associated appurtenances in close cooperation with the Water Resources and Irrigation Planning Specialists, Modeling Specialists and Hydraulic Structures Engineers; to ensure the dams safely pass design flood events, outflows are easily managed, erosion on the embankments is prevented in case of spilling, and providing gated bottom outlets to release the water into the canals and pass sediments;
(viii) Firming-up the dam layouts and details including the foundation treatments, embankment zoning, seepage control measures, toe drainage, rip-rap protection of the embankment dam and slopes in the reservoir;
(ix) Carrying out dam stability analysis with the soil parameters gained from laboratory tests;
(x) Designing a monitoring system for the dams as part of a permanent monitoring and safety system;
(xi) Preparing BOQs, cost estimates, and construction schedule;
(xii) Providing overall management of the tender design review, detailed engineering designs, and preparation of “for construction” drawings for the dams and canals;
(xiii) Elaborating on a comprehensive list of machines and equipment; specifying details of TBM as well as drill-and–blast technology;
(xiv) Reviewing requirement of important equipment for critical activities of TBM, drilling and blasting, temporary and permanent support works (e.g., shotcrete, rock bolts, steel arches, etc.), and for the tunnel sections in cut-and-cover; assessing the contractor’s approach to dam construction, borrow areas and sealing measures; reviewing mobilization, quality and quantity of the contractor’s equipment and suggesting additional equipment for the optimized construction;
(xv) Checking the quality and quantity of construction materials in the borrow areas for the dam sites; in case the necessity arises develop an investigation program for the proof of suitable and sufficient core, filter, embankment and rip-rap material;
(xvi) Investigating and commenting on the quality and quantity of the tunnel muck to be used as rip-rap and/or as concrete aggregates as well as evaluate haulage and storage cost; arrange the construction schedules of dams and tunnels to fit the muck for immediate use;
(xvii) Selecting temporary storage areas for the different types of construction materials preferably in the reservoir; optimize the excavation and the filling of the embankment in order to reduce the number and size of the storage facilities;
(xviii) Checking the stability of the slopes in the reservoir against erosion by wave action or rapid drawdown;
(xix) Being responsible for the design of permanent support for all underground excavations and responsible for reviewing and approving the contractor’s temporary support proposals;
(xx) Providing continuous representation during the construction of the tunnels and dams.
(xxi) Monitoring the tunnel support progress and selection of supports based on actual site conditions. Advising the other specialists on progress status and obtaining assistance when needed;
(xxii) Monitoring and reporting on the works including soil excavation, shotcreting, rock-bolting, etc.;
(xxiii) Reviewing and reporting on any contractor initiated proposals for design modifications;
(xxiv) Checking working drawings for conformity with approved designs;
(xxv) Participating in the preparation of reports, certification of progress payments, etc.;

(xxvi) Monitoring the construction works from the point of view of conformity with the quality, works measurement, record keeping, contract interfaces and progress; issuing field instructions as necessary to ensure that the contractor remedies the defects; and monitoring the remedial actions;
(xxvii) Ensuring that safety and environmental measures are strictly followed by the contractors. Coordinating with site staff and report accordingly;
(xxviii) Supervising and monitoring the advance rates, and providing weekly progress reports of the tunneling works;
(xxix) Reviewing works to confirm that the quality of the performed works is according to contractual specifications;
(xxx) Maintaining accurate records on measurement of the quantity of different items of the works;
(xxxi) Participating in the checking and verification of payment certificates;
(xxxii) Contributing to the preparation of progress reports; and
(xxxiii) Providing training to the PMU, PIU and other national staff on matters relating to dam and tunnel construction, to include safety, quality assurance and control, risk management, selection of materials and supports, monitoring performance, etc.

49. **Senior Design Engineers (Canals): International (no time-based tasks) and National (minimum 28 pm for time-based tasks).** The experts must be civil or irrigation engineers, preferably with a Bachelor's degree and about 7 years of work experience out of which about 5 years should be related to design and construction of new and rehabilitated large-scale canals, preferably in countries with similar geographic and climatic conditions. The activities will include, but are not limited to:

(i) Reviewing the alignment and the design of headworks, canals, aqueducts, level crossings, regulators, and the feeder structures at the dams;
(ii) Checking the hydraulics and the capacity of the canals and improving the design of all structures if deemed necessary;
(iii) Elaborating on and proposing as necessary model tests or any other investigations for the benefit of the structures;
(iv) Advising on lining materials and types that will best suit the canals;
(v) With the Hydraulic Structures Engineer, advising on cross drainage and flow control structures;
(vi) Advising on construction methods including methods and equipment required for lining of the canals;
(vii) Preparing detailed engineering designs, cost estimates and tender documents;
(viii) Estimating the requirement of contractor's resources (personnel, equipment, machines, materials, funds, etc.) and recommending additional resources to be mobilized to complete the canals and appurtenant structures within the contract periods;
(ix) Providing continuous representation during the construction of the tunnels and dams;
(x) Support the health and safety engineer at each of the construction sites; and
(xi) Support preparation of Phase 2 investments.

50. **Rock Mechanics Engineers: International (minimum 10 pm for time-based tasks) and National (minimum 40 pm for time-based tasks).** Preferably, the experts shall have a Master's degree in civil engineering, specializing in rock mechanics and about 12 years of work experience out of which 8 years should be related to the design and construction of underground structures, e.g. galleries, tunnels, shafts, caverns in countries with similar geographic conditions and similar tropical climate. The experts shall be familiar with the various types of rock and their

parameters and also with the technologies of conventional and mechanized tunneling works, the respective machinery, the auxiliary equipment and the varieties of construction materials. They should be competent in tunnel planning, design and construction. The experts shall have excellent verbal and written communication skills in English. The experts will assess the stability of all tunnels in close collaboration with the Engineering Geologist followed by stability analyses for each rock class in order to define the respective support measures. They will also define the sections for convergence measurements, obtain the records and evaluate the deformations over the time. Other main activities include, but are not limited to:

(i) Examining the tunneling methods (TBM, drill and blast) and recommend appropriate tunneling method to fit the program time and cost constraints;
(ii) Undertaking prime responsibility for supplementary field investigations (if necessary), design, tender drawings, BOQ and cost estimates for the tunnel components;
(iii) Analyzing the use of explosives in tunnel excavation and suggest mechanism to rationalize and optimize the use of explosives;
(iv) Analyzing the issue of compatibility of drilling and shotcrete equipment with the tunnel cross section and suggest the most optimal solutions for drilling and shotcrete;
(v) Developing the optimal requirement of important equipment for critical activities of TBM, drill and blast; permanent support works (e.g., shotcrete); headworks; etc.;
(vi) Estimating requirement of contractor's resources (personnel, equipment, machines, materials, funds, etc.) and recommend additional resources to be mobilized to complete tunnels within contract periods;
(vii) Reviewing the alignment and design of the tunnels in relation to the type of rock and the thickness of the burden; comment on the geological documentation; and recommend design and construction methods as necessary;
(viii) Reviewing the available investigation results on their reliability, completeness and representativeness, and recommend and oversee additional laboratory and/or in-situ tests, if deemed necessary;
(ix) Reviewing the hazards for all tunnels with regard to low or insufficient rock cover, deep-seated tropical weathering, and karstification; comment on countermeasures and recommend and oversee additional investigations, if necessary; elaborate cost estimates, supervise and evaluate the findings; and improve the heading works accordingly;
(x) Assessing the likelihood or presence of primary stress in tunnels with high rock cover of 100m to 370m (RKTC, KMTC, UEC); if positive, recommend in-situ tests for execution; supervise the tests and evaluate the recorded results. If the primary stress exceeds a tolerable limit, inform the PIU, PMU, contractor, and the manufacturer of the TBM accordingly;
(xi) Recommending sections for convergence measurements in all tunnels and evaluate the deformations on a graph and comment;
(xii) Providing continuous representation during the construction of the tunnels and dams.
(xiii) Checking the contractor's equipment, all machines and respective personnel and recommend additional resources;
(xiv) Checking the contractor's support materials on quality and quantity; perform acceptance tests for anchors, rockbolts, shotcrete, etc.;
(xv) Inspecting the supporting works and organize performance tests on a regular basis;
(xvi) Review and comment on the contractor's blasting schedule with regard to the prevailing rock strength; supervise the blasting results and comment as necessary; and
(xvii) Checking the dewatering facilities in the tunnels and advise for improvement of the water load; initiate regular monitoring of the yield. Inform PIU and PMU about potential water loss by leakage from the tunnel.

51. **Senior Structural Engineers: International (minimum 6 pm for time-based tasks) and National (minimum 22 pm for time-based tasks).** The experts shall be civil engineers, preferably with a Master's degree in structural engineering. They must have about 12 years of work experience out of which 8 years should be related to the design and construction of sluices, weirs, aqueducts, canals, dams and underground structures in countries with similar geographic conditions and with similar climate. The experts shall have excellent verbal and written communication skills in English. The activities will include, but are not limited to:

(i) Reviewing and advising on, and undertaking if necessary, the stability calculations for all structures to be constructed under the investment program and planned in Phase 2;
(ii) With the other design engineers for the canals, aqueducts, dams and tunnels, finding the most economical solution for each structure;
(iii) Designing and computing the details for the reinforcement of the segmental lining in TBM tunnels, all hydraulic structures, and all associated civil structures, as necessary;
(iv) Supporting as necessary the Engineering Geologists and the Tunnel Construction Engineers for designing the cut-and-cover section of the canals;
(v) Providing continuous representation during the construction of the tunnels, dams, aqueducts and other major civil structures;
(vi) Checking the contractor's fabrication and shop drawings, including structural design, as and when needed;
(vii) Reviewing modifications to the structural design as a result of changes in ground and other conditions;
(viii) Regularly reviewing the structural engineering aspects of the works and report accordingly; and
(ix) Reviewing and reporting on any contractor initiated proposals for modification of the structural designs.

52. **Senior Engineering Geologists: International (minimum 10 pm for time-based tasks) and National (minimum 24 pm for time-based tasks).** The experts will have degrees in geology or engineering geology, preferably with 12 years of experience in design and construction of dams, tunnels and other similar civil structures related to this investment program. Experience shall include planning, implementing and analyzing the results of geotechnical drilling/testing investigations for dams, tunnels, and aqueducts. They will be familiar with geological documentation, sealing works, monitoring and evaluation of piezometer or deformation readings. Preferably, the international expert will have experience of working in countries with similar geographic conditions. Preferably, the national expert will have experience of working on similar projects, either in Sri Lanka or abroad. The experts shall have excellent verbal and written communication skills in English. The experts will be responsible for planning the investigation program, supervision of its execution and evaluation the findings. They will also support preparation of Phase 2. As such, their responsibilities will be to lead and execute all of the activities related to geology. They will be responsible for, among other activities:

(i) Managing and control of the in-situ investigations;
(ii) Logging of drill holes and trenches to international best practice standards;
(iii) Inspecting, photographing and ensuring proper storage of drilled cores;
(iv) Selecting drilled core samples to undergo laboratory testing;
(v) Supervising in-situ testing;
(vi) Evaluating and commenting on the results of laboratory and in-situ tests;
(vii) Deciding when the required maximum drilling depth has been reached;
(viii) Mapping rock outcrops with tectonic logging of discontinuity planes;

(ix) Evaluating all findings and establishing geological sections for each structure with the results of tectonic logging and permeability testing;
(x) Carrying out geological and geotechnical mapping and analysis;
(xi) Incorporating the results of geophysical exploration into the geological sections;
(xii) Drawing conclusions and writing a final report about the geotechnical conditions;
(xiii) Advising on proper support and lining methods as well as drainage and seepage issues, and applicable management options;
(xiv) Evaluating and commenting on contractor's tender documents with respect to geotechnical aspects, i.e. foundation levels, dewatering, quality and quantity of construction materials, slope stability, sealing works, advance rates, and support in tunnels;
(xv) Commenting on contractor's personnel and equipment;
(xvi) Assisting the Tunnel Construction Engineers in the design of permanent ground support and review of contractor's temporary support proposals;
(xvii) Recording rock and soil conditions as the work progresses;
(xviii) Inspecting the probing and exploratory drilling works. Advising on the need for and scope of grouting works;
(xix) Monitoring all instrumentation and permeability testing activities, and reviewing the results and the degree of structural dilation, as required;
(xx) Regularly review the geological and geotechnical conditions at the sites; and
(xxi) Supporting the preparation of Phase 2 investments by planning, managing and advising on the results of all necessary borehole investigations, in-situ and laboratory tests, for the planned dams, tunnels and other major civil structures.

53. **Senior Mechanical Engineer (TBM): International (minimum 12 pm for time-based tasks).** The expert will have a Master's degree in mechanical engineering, preferably with 10 years of experience with the construction or performance of different types of TBMs for soil and rock. The expert shall be familiar with the technology in general, and the hydraulic functions of cutter heads and other auxiliary systems in particular. The expert must be able to assess the drillability of the rock based on the specific parameters gained from the site and from the laboratory. The expert will cooperate with the Chief Design Engineer and Rock Mechanics Engineer to select the most appropriate and economic TBM for all tunnel works. The expert should also advise the pre-qualification criteria for the selection of experienced contractors, if necessary. The expert will review and finalize the designs of the tunnels that will be constructed under the investment program (Phase 1) and will also support preparation of the Phase 2 investments including supporting preparation of feasibility designs, cost estimates, draft specifications for the tunnels to be constructed under Phase 2, along with preparing the TOR for undertaking the detailed engineering designs. Other main activities are, but not limited to:

(i) Reviewing the geological conditions along the tunnel alignments and the tunneling concept for TBM drive of KMTC and UEC tunnels;
(ii) Advising the PMU and PIU on the preferred type of TBMs, their procurement and mobilization, the costs of machines and backup/support systems, as well as possible modalities of financing;
(iii) Performing acceptance tests in the course of construction of the TBMs, in the assembly as well commissioning phase;
(iv) Commenting on the staffing and equipment of the contractor's TBMs; and
(v) Assisting the contractor to overcome technical problems with the TBM and/or backup system.

54. **Mechanical Engineers (Gates and Hydropower): International (minimum 1 pm for time-based tasks) and National (minimum 2 pm for time-based tasks).** Preferably, the experts

will have a degree in mechanical or electrical engineering and 10 years of experience in designing and implementing similar projects. The experts should be competent in planning, design, cost estimate, tendering, contract management and controlling, quality assurance and quality control, safety compliance and construction. The experts must have profound knowledge of data processing and software like AutoCAD, etc. as well as excellent verbal and written communication skills in English. The main activities of the experts will include, but not limited to:

(i) Preparing the assessment, planning, detailed engineering designs, BOQs, cost estimates and tender documents for the mechanical and electrical aspects of all three projects under the investment program, and advising on the requirements and associated costs for investments under Phase 2;
(ii) Coordinate with the state electricity supplier to keep them informed and engage support for the proposed extensions of the electrical distribution system to energize tunneling equipment, gates etc. Prepare the associated detailed engineering designs, BOQ, engineering cost estimates, specifications, and contract documents;
(iii) Liaise with and support PIUs with the electrification work;
(iv) Assessing the requirements for gate rehabilitation and modernization, where necessary;
(v) Supporting preparation of MOM manuals for all mechanical items installed or that are associated with the investment program; and
(vi) The national specialist will support the international specialist.

55. **Senior Electrical Engineers (TBM): International (minimum 2 pm for time-based tasks) and National (minimum 6 pm for time-based tasks).** Preferably, the experts will have a degree in electrical engineering and 10 years of experience in design, construction and implementing TBMs on job sites preferably in similar countries with similar climate. The experts must be familiar with the capacity and infrastructural measures for the external power supply as well as the power distribution within the construction site. The main activities of the experts are, but not limited to:

(i) Reviewing the existing plans and designs, recommending improvements, and assessing or updating the cost estimates;
(ii) Assisting the PMU and PIU with the supply of required power to the TBM sites;
(iii) Checking the existing capacities of transmission lines and substations, and where necessary recommending improvements and extensions along with preparing designs, quantities and cost estimates;
(iv) Carrying out acceptance tests with the manufacturer;
(v) Checking the construction and power distribution on the various sites in cooperation with the health and safety engineer;
(vi) Advising on all matters relating to the tunnel and site lighting, air handling, ventilation, dewatering, etc. Reviewing submittals and processing accordingly;
(vii) Providing support to preparing Phase 2 investments, as necessary; and
(viii) The national specialist will support the international specialist.

56. **Senior Electrical Engineers (Gates and Hydropower): International (minimum 2 pm for time-based tasks) and National (minimum 2 pm for time-based tasks).** Preferably, the experts will have a degree in electrical engineering and 10 years of experience in design, construction and implementing of HPPs and power transmission, preferably in similar countries with similar climate. The experts must be familiar with the planning, cost estimate, tendering, contract management and controlling, quality assurance and quality control, safety compliance and construction. The experts must have profound knowledge of data processing and software like AutoCAD, etc. as well as excellent verbal and written communication skills in English. The experts will support the designs of electrified gates and systems under this investment program,

and the preparation of Phase 2 investments which include three new HPPs. The main activities of the engineers will include but are not limited to:

(i) Reviewing the existing power transmission systems within vicinity of the planned electrified gates and HPPs and advising on optimum connection points, and what new infrastructure will be required;
(ii) Preparing the feasibility designs for power generators, control systems, switchyards, substations, power transmission lines, preparing cost estimates and draft specifications;
(iii) Preparing the TOR for undertaking detail engineering designs;
(iv) Prepare the designs, specifications and bidding documents for the electrical gates and systems under the investment program; and
(v) The national specialist will support the international specialist.

57. **Hydraulic Structures Engineers: International (minimum 2 pm for time-based tasks) and National (minimum 4 pm for time-based tasks).** Preferably, the experts will have a Degree in civil engineering, or an equivalent qualification, with 10 years of design and implementation experience, preferably on large water projects within geographically similar regions. The experts will have profound knowledge of hydraulics and experience of designing major hydraulic structures. The experts will support the Water Resources and Irrigation Planning Specialist and Design Engineer and lead preparation of the detailed engineering designs for all hydraulic structures in the investment program, and those planned under Phase 2. Activities will include, but are not limited to:

(i) Working with the Water Resources and Irrigation Planning Specialists to prepare a Hydraulic Structures Design Manual that incorporates international best practices and standards for canal design, the hydraulic design of gates and measurement facilities. The manual will be specific for the needs of the investment program and Phase 2 investments.
(ii) Support the other PMDSC design experts with improving designs of all hydraulic structures to ensure they are easily manageable, minimize head losses, convey the required design flows, pass the design sediment loads, are low maintenance, and are safe. This applies to the dams, spillways, regulators, outlets, transitions, cross drainage structures and all other flow control structures.
(iii) Support the team with preparing feasibility studies, detailed engineering designs, cost estimates, specifications, and the TOR for Phase 2 consultants; and
(iv) The national specialist will support the international specialist.

58. **Water Resources and Irrigation Planning Specialists: International (minimum 6 pm for time-based tasks) and National (minimum 10 pm for time-based tasks).** Preferably, the experts will have a Master's degree in civil or water resources engineering or similar subject, and have 12 years of experience in hydrological analyses, water resources planning, and planning, designing and management of irrigation schemes, preferably in geographically similarly regions. The experts should also have experience with assessing and incorporating anticipated climate change impacts into their analyses and designs. The experts' activities will include, among others tasks:

(i) Reviewing the available water balances for the investment program and Phase 2 investments, and update them as necessary taking into account any new additional information or planning decisions made that may affect the analysis. This applies to updated flow records, changes in climate change projections, changes in existing and planned cropping patterns, changes in projected population and socioeconomic scenarios, and changes in development scenarios and associated water demands and management requirements;

(ii) Supporting the design teams with providing design flow information where needed;
(iii) Supporting preparation of Phase 2 investments, as necessary;
(iv) Supporting the M&E Specialist to assess the outcome and impact of the investment program;
(v) Supporting the PMU and PIUs with advising the ISEWP consultant by providing guidance, reviewing their outputs, and recommending improvements whenever necessary;
(vi) Review current and planned flow monitoring and control systems for the ultimate developed Mahaweli System and recommend improvements as necessary for implementation of a comprehensive SCADA system. This includes recommending locations for flow monitoring and mechanized gates, communication and operating systems, etc. Prepare a TOR and specifications for recommended system;
(vii) Prepare reservoir management operating guidelines including planning and preparing the detailed engineering designs of flow and reservoir monitoring system;
(viii) With the ISEWP consultant, incorporating the recommendations into the design of Tranche 3 and Phase 2 investments. This includes guiding the other PMDSC experts to prepare detailed engineering designs, cost estimates and updating bidding documents as necessary;
(ix) Supporting preparation of the MOM manuals for each Project;
(x) With the Modeling Specialist and ISEWP consultant, reviewing current models and water management monitoring and control systems used in Sri Lanka and particularly within the Mahaweli System then providing advice on improvements to the models and systems, including equipment and software. Prepare detailed TOR and/or specifications, cost estimate, and tender documents for the improvements which will be implemented by the SIWRM consulting package; and
(xi) The national specialist will support the international specialist.

59. **Modeling Specialists: International (minimum 10 pm for time-based tasks) and National (minimum 20 pm for time-based tasks).** Preferably, the specialists should have 10 years of experience in planning, developing, implementing, and using hydrologic, hydraulic, and river basin models. The specialists should have a Master's degree or equivalent in civil engineering or water resources. The specialists will support the Water Resources and Irrigation Planning Specialist by reviewing and updating the existing water balance models for the Mahaweli System and provide design flow data. Other main responsibilities will include, but are not limited to:

(i) Developing a detailed and calibrated hydraulic model of the main conveyance systems of the fully developed Mahaweli System that will support planning, design, and management of the entire system. It should include accurate representation of all features including gates, weirs, reservoirs, and main outlets to the cascade systems. The model should extend down to the head regulators of secondary canals within each system;
(ii) Developing a detailed and calibrated rainfall-runoff model of the complete Mahaweli System that can accurately model spatially and temporally variable rainfall and crop water requirements. The model should provide upstream and downstream boundary conditions to the hydraulic model. Ideally the two models would be linked, however they should also operate as standalone models;
(iii) Operating the above models for various time-steps ranging from hourly to monthly time-series. The results of these models will be used to finalize the designs of Phase 1 investments and for selecting and finalizing the Phase 2 investments. The models will also be used by MMDE and other stakeholders for routine water management.

(iv) Training to MMDE and other stakeholders on how to update and operate the models, including preparing detailed operating manuals.
(v) Assisting MMDE and other stakeholders to use the models for water management for at least 1 year to ensure effective handover of the tools.
(vi) Developing dam break models of the planned reservoirs for the investment program and Phase 2 using appropriate software, and assess the risk of dam break on downstream river channels, flood plans, infrastructure and communities. Liaise with the Dam Engineer and Hydraulic Structures Engineers to develop mitigation measures;
(vii) Use the models to support other PMDSC specialists undertake their work, as necessary; and,
(viii) Prepare user manuals for the models and provide training to MMDE, MASL, and PMU staff in operating and updating the models.

60. **Agriculture Specialist: National (6 pm).** The specialist must have a background in Agronomy or related field/discipline and a Master of Science in Agro-economics or related field/discipline. Preferably, the specialist must have twelve years of experience in agro-economics/agronomy with two or more successful agriculture development projects. The specialist should have experience in the development of irrigated agriculture projects, economic value chains and market-based crop production analysis. The specialist should have experience working in multidisciplinary teams. The specialist's main responsibilities will include, but are not limited to:

(i) Providing detailed assessment of current farming practices in Mahaweli System areas (including those that will come under the command of the Mahaweli System after Phase 2) and recommending opportunities for improving on-field water management and crop diversification;
(ii) Assessing the constraints and opportunities for farmers to grow higher value crops during the Yala season including risks, markets, etc.;
(iii) Supporting the PMDSC with finalizing the ISEWP TOR; and,
(iv) Supporting other team members in preparing the water balances for the investment program and Phase 2 investments.

61. **Economists: International (4 pm) and National (10 pm).** Prefarably, the economists will have a Master's degree in economics with 12 years of experience in undertaking economic appraisals in the water resources and agricultural sector, preferably with experience of working in similar geographical regions, with relevant ADB or other multilateral development bank (MDB) project experience. An understanding of econometrics and economic surplus analysis is important, as well as experience in impact evaluation, drinking water and hydropower valuation. Activities for the specialists include, but are not limited to:

(i) Preparing detailed cost tables and investment plan for Tranches 2 and 3, and Phase 2;
(ii) Collection of appropriate available survey data from the government or other institutions, for example "cost of cultivation" survey or other regular data collection, and undertaking either cross-sectional analysis with control for selection/placement bias (e.g. Propensity Score Matching, endogenous switching regression, etc.) or panel analysis using fixed effects models. The methodology of the analysis will be agreed with PMU and ADB prior to initiating the analyses;
(iii) Using collected data in an econometric analysis that effectively isolates the effect of irrigation development from covariates, including factors conditioning program placement and farmer participation, so as to rigorously predict the effects of irrigation expansion on cropping intensity, yields and variable production costs (methods may

include Propensity Score Matching, endogenous switching regressions, instrumental variables or other control function approaches);
(iv) Analysing the current and future farm budgets;
(v) Reviewing project agricultural, water supply and hydropower benefits, and undertake economic appraisals for Tranches 2 and 3, and Phase 2 projects, including estimated cash flows and economic internal rate of returns, in accordance with ADB's *Guidelines for the Economic Analysis of Projects* (1997);
(vi) Identifying the economic and financial risks associated with the projects and carry out sensitivity and risk analyses;
(vii) With the support of the Social Specialists, identifying the beneficiaries and undertaking a distribution analysis of project benefits and a poverty impact analysis of the projects consistent with ADB guidelines; and
(viii) The national specialist will support the international specialist.

62. **Chief Resident Engineer (CRE): International (55 pm); Senior Construction Engineer (SCE) and Resident Engineers (REs): 4 National (SCE: 55pm and REs total 150 pm).** The experts must be civil engineers, preferably with a Bachelor's degree and about 15 years of work experience out of which about 10 years should be related to project management of mega-projects that include tunnels in soil and rock, dams, and large canals. The experts should have demonstrated experience of working in complex projects in similar geographical and topographical settings. The experts should be competent in contract management, quality assurance and quality control, safety, compliance with safeguards, risk management, project controlling, claim management, etc., pertaining to construction of similar projects considering the requirements of National Sanctuaries in Sri Lanka. The experts must have profound knowledge of data processing and software like PRIMAVERA as well as excellent verbal and written communication skills in English. The international expert will have prior experience of leading similar projects within similar geographic regions. The national experts will have worked on similar scale projects in Sri Lanka, or abroad. The experts will be responsible for undertaking the following activities, among others:
(i) The CRE will have overall responsibility for supervising and monitoring construction activities and leadership of the construction supervision team and contractors.
(ii) The SCE will support the CRE and REs as required and coordinate with the design team, PMU, PIUs, key stakeholders, and affected people.
(iii) The RE's will assist the CRE and SCR.
(iv) Managing and supervising contractors in the role of the owner's Engineer;
(v) Undertaking daily construction supervision and monitoring of quality control;
(vi) Checking of materials for quality and quantity and ensure they meet specifications;
(vii) Issuing interim payment certificates;
(viii) Supporting the Procurement and Contracts Specialist with examining contractor claims and providing advice to the PMU and PIUs as necessary;
(ix) Examining the needs for contract variations;
(x) Monitoring compliance with environment management plans;
(xi) Monitoring preparation of as-built drawings;
(xii) Preparing partial, substantial and final completion certificates;
(xiii) Supervising and monitoring of the local consultants and contractors; and
(xiv) Training of PIU and PMU staff.

63. **Tunnel Construction Engineers: International (12 pm) and National (50 pm).** The experts must have a Bachelor's degree in civil engineering, preferably with 12 years of work experience out of which 8 years should be related to construction of tunnel projects. They should have demonstrated experience of working in complex tunnel projects in soil and rock, and in

similar geographical and topographical settings, and using similar construction methods (TBMs and conventional drill-and-blast). They should be competent in work planning, tunnel construction supervision, cost and time control, contract management, quality assurance and quality control, safety control, compliance with safeguards, risk assessment, etc. pertaining to the construction of different types of tunnels. They must have excellent verbal and written communication skills in English. Their activities will be, but not limited to:

(i) Identifying the important technical and managerial issues in construction of tunnels which are affecting the progress, safety, quality and compliance with safeguards;
(ii) Carrying out a quick time-motion analysis and recommend the most optimal solutions to reduce the blasting cycle time and to ensure efficient utilization of resources;
(iii) Analyzing the use of explosives in tunnel excavation and suggest mechanism to rationalize and optimize the use of explosives;
(iv) Developing the optimal requirement of important equipment for critical activities of drilling and blasting; permanent support works (e.g. reinforced shotcrete, rock bolts, steel arches, etc.); headworks; comparing mobilization of the contractor's equipment with expected levels and suggesting additional equipment for the optimized construction in the given circumstances;
(v) Examining the preparedness of the contractor for the tunnel headworks and suggest ways to expedite the activities with quality;
(vi) Reviewing the mobilization of the contractor's resources (personnel, equipment, machines, materials, funds, etc.) and recommending additional resources to be mobilized to complete the tunnels according to the implementation schedules and to the required specifications;
(vii) Having regular meetings with the contractor, the Engineer and the PIUs to operationalize all recommendations in an efficient and effective manner; and
(viii) The national specialist will support the international specialist.

64. **Dam Engineer: National (minimum 9 pm for time-based tasks).** The expert must be a civil engineer, preferably with a Master's degree and a specialization in soil mechanics and dam design. The expert must present about 12 years of work experience out of which 8 years should be related to the design and construction of zoned rock- or earth-fill dams in countries with similar geographic conditions or at least in countries with similar tropical climate. The expert should be competent in planning, design, cost estimate, tendering, contract management and controlling, quality assurance and quality control, safety compliance and construction. The expert must have profound knowledge of data processing and software like AutoCAD, etc. as well as excellent verbal and written communication skills in English. The expert must also be familiar with the various types of construction materials, their parameters, occurrence and exploitability as well as their treatment on the site, mode of compaction and monitoring of their behavior before and after impounding. The main activities of the expert are:

(i) Supporting the Chief and Senior Design Engineers, as necessary;
(ii) Reviewing the available dam designs, stability and seismic hazard analyses, and comment on the various types of construction materials. If necessary, undertake additional stability analyses and improve the design for technical and/or financial reasons;
(iii) Working with the Engineering Geologist, establish the need for dam foundation treatment measures and the availability of suitable local dam construction materials and select the appropriate material parameters to be applied in the analysis and design of the dams;
(iv) Establishing a mass balance for construction materials to be exploited from borrow areas or quarries with regard to the quantities required for construction. Search for sufficient materials for each type and make sure that at least 150% of the required

material is exploitable. Recommend and supervise laboratory and in-situ compaction tests for both core and embankment materials, and determine the density at optimum water content for each fill material;

(v) Designing the filters according to the filter criteria and make sure that the contractor provides ample quantities;

(vi) Investigating the necessity of placing geotextiles and select the proper type of fabric to fit the purpose;

(vii) Firming-up the dam layouts and details including the abutment and foundation treatments, embankment design and zoning, seepage control measures, etc.;

(viii) Working with the Hydraulic Structures Engineer on the engineering of the diversion facilities, water outlet works, spillways and associated appurtenances;

(ix) Preparing the detailed engineering designs, BOQs, cost estimates, construction schedule, and tender documents;

(x) Checking the contractor's equipment, machines and personnel and recommend additional resources as needed;

(xi) Checking the contractor's screening plant on proper grain size gradations and high efficiency, as well as sufficient storage facilities;

(xii) Ensuring that the contractor keeps the core material at optimum moisture content before and during filling and compacting;

(xiii) Checking the obtained densities after compaction in regular intervals and guiding the contractor to correct their process, if the specified criteria are not obtained; and

(xiv) Recommending and supervising the installation of settlement gauges and other monitoring devices for the safety of the dam; collect the readings in regular intervals and evaluate them for stability reasons.

K. Indicative Terms of Reference for Some Non-Key Experts (time-based component)

65. **Concrete Engineers: 3 Nationals (Total 90 pm).** Preferably, the experts must have a Bachelor's degree in civil engineering and a specialization in concrete technology with 10 years of work experience, of which about 5 years should be related to construction of canals, dams and tunnels. The experts should be competent in mix designs for shotcrete, concrete, mortar and grouting works as specified in the tender documents on the basis of international standards. This includes quality assurance and safety control in compliance with safeguards. They should have demonstrated experience of working in projects in similar geographical and topographical settings. Specific activities for the experts include, but are not limited to:

(i) Checking the contractor's laboratory facilities for storing, curing and testing concrete, shotcrete, mortar and grout samples;

(ii) Investigating different types of cement and select the most suited for each purpose i.e. structural concrete, lining concrete, shotcrete, and grout;

(iii) Inspecting the quality and efficiency of the screening and batching plants including the cooling facilities;

(iv) Taking samples of aggregates and instructing the contractor to investigate their alkali silica reaction;

(v) Elaborating on design mixes for concrete with plasticizer, shotcrete with accelerator, mortar and grout with plasticizer and filler;

(vi) Performing acceptance tests for each of the mixes and selecting the ones best suited for the respective purposes;

(vii) Checking the early strength of the shotcrete from test panels on regular basis;

(viii) Undertaking regular and intermittent sampling of concrete, mortar and various grout mixes to perform laboratory tests as part of the quality control;

(ix) Drilling cores of shotcrete from tunnel walls to check its thickness and test the strength in the laboratory for quality control;
(x) Inspecting each concreting stage; checking the slump of each batch, the temperatures of the concrete, and the efficiency of the vibrators;
(xi) Commenting on the skill and professionalism of the contractor's personnel;
(xii) Checking daily reports and test results from the laboratory; and
(xiii) Examining and commenting on contractor claims.

66. **Senior Surveyors: 3 Nationals (Total 90 pm).** The experts will be qualified, licensed surveyors, preferably with 10 years of experience, of which 5 years should be on setting out and monitoring construction projects, including canals and dams. The experts will review contractors' survey controls and quality assurance program including benchmarks, survey control points, laser equipment use and calibrations procedure, and will periodically review the field verification program. Other main activities will include, but are not limited to:

(i) Checking the setting out of all works, confirming control points are accurate and not disturbed throughout the construction works;
(ii) Ensuring all alignments are in accordance with the approved plans;
(iii) Ensuring that the surveying process and equipment used conform to the specifications. Maintain records of calibration and equipment used;
(iv) Checking all survey data from excavations and embankments, verify results and records and ensure they are within the specified permissible error ranges;
(v) Verifying the survey equipment calibration process; and
(vi) Participating in the measurement of the completed works and review of as-built drawings.

67. **Quantity Surveyors: 3 Nationals (Total 90 pm).** The experts will be qualified, licensed surveyors, preferably with 10 years of experience, of which 5 years should be in performing the role of quantity surveyor on major construction projects. The experts will manage all costs relating to building and civil engineering projects, from the initial calculations to the final figures, while seeking to minimize costs, enhance value for money, and achieve the required standards and quality. Amongst other tasks assigned by the CRE, the experts will support preparation of BOQs and cost estimates; provide advice on contract claims; maintain cost control on all civil works packages; support preparation of progress reports; valuing completed works and supporting with payment arrangements; etc.

68. **Health and Safety Officer: National (50 pm).** Preferably, the officer will have a Bachelor's degree in engineering or similar, and 5 years of experience, preferably with assignments financed by ADB or other donor agencies. The main activities of the officer will be, among other tasks:

(i) Preparing a health and safety manual for the investment plan that includes guidelines, requirements, procedures and protocols, etc. that will guide and support safe practices on all construction sites, camps, officers and transport routes. Updating the manual from time-to-time to account for the changing needs of the works, and to incorporate lessons learned during implementation;
(ii) Providing regular training based on manual to the other PMDSC experts, PMU, PIUs, and contractors;
(iii) Assisting the PMU and PIU with monitoring and enforcing health and safety requirements by undertaking regular and intermittent inspections of all construction sites, camps, offices to ensure health and safety rules, regulations, procedures and measures are being correctly implemented;

(iv) Liaising regularly with the contractor's health and safety experts to ensure complete understanding and concurrence of all obligations;
(v) Maintaining monthly health and safety reports that document incidences on the construction sites and related to the investment program. The reports should describe the incidents and recommend measures to prevent them from occurring again. These should be used to update the manual;
(vi) Supporting the CRE with issuing temporary stop-work notices if safety requirements are not met, and providing advice on necessary corrective measures;
(vii) Reviewing and improve the contractors' program to safeguard healthy conditions on the site for all staff, visitors and all abutting owners;
(viii) Inspecting the working conditions of all laborers on site, in particular in deep pits and in the tunnel; checking the guidelines of a safe construction site with e.g. protected scaffolds, safe and new tools, provision of proper overalls, safety equipment like shoes, gloves, goggles, ear protection, safety belts, warning vest, etc., inspecting the lighting conditions in the tunnel, controlling the speed of all vehicles and the correct loading of trucks on the site and in particular in the tunnels;
(ix) Checking the design and inspecting the construction of bunkers for the storage of explosives and detonators in close cooperation with the national authorities of Sri Lanka; develop a safe system for transport of explosives and detonators to the site as well as collection of non-used material and return to the bunkers;
(x) Inspecting the health conditions of the food, kitchens and kitchen staff, clean-up facilities, latrines, and living quarters, in regular and intermittent intervals and ensuring adequate hygiene and sanitary conditions are maintained; and
(xi) Providing regular training and advice on minimizing the risk of exposure to communicable and infectious diseases.

69. **Senior Draftsperson: National (50 pm).** The expert will have an appropriate diploma or certificate qualification in drafting, and preferably with 15 years of practical drafting experience, of which 5 years will have been leading a team of draftspersons. The expert must have profound knowledge and experience of data processing and using drafting software such as AutoCAD. The expert will be responsible for the overall quality and delivery of drawings prepared by the PMDSC. The main activities, among others, will be:

(i) Establishing a secure and backed-up database system for managing all documents, drawings and software used by the PMDSC;
(ii) Establishing a comprehensive indexed drawing and document numbering system;
(iii) Establishing templates, protocols, and drawing standards that are to be used for all drawings and presentations;
(iv) Leading the drafting team and coordinate their work with the other PMDSC specialists on drawing related matters; and
(v) Reviewing and maintaining quality assurance on all drawings prior to release to contractors, PMU, PIUs, and others; and
(vi) Providing training as necessary to the drafting team and other relevant staff members of PMU and PIUs.

L. Office Support Staff and Logistical Arrangements

70. PMDSC shall provide the entire administrative, technical professionals, and support staff needed to carry out their services. An adequate number of suitability skilled office support staff will be required to meet the needs of the Colombo and field offices, and all associated logistics of the consulting assignment. Suggested positions, qualifications, and number of staff in each position are shown in Table 6. However, the positions and actual numbers at the discretion of the

PMDSC and will cost them accordingly as out-of-pocket, fixed-rate expenses in their time-based financial proposal. The PMDSC is not required to submit CVs for supporting staff as part of their technical proposal since they will not be evaluated as part of the expert team.

Table 6: Indicative Office Support Staff

Position	Indicative No.	Qualification/Experience	Activities
Office Manager	1	Preferably, 10 years of good office management experience preferably with an international company for international development projects	Office management, team logistics, support for field trips, preparation of workshops, etc.
Accountant	1	Degree in accounting, or equivalent with 5 years book keeping experience. Preferably will have similar experience working on ADB projects.	Maintaining project financial statements and submission of invoices and payment requests to the PMU according to government and ADB's standards.
Assistant Office Manager / Secretary	4	Good English and national languages and computing skills (with appropriate certificate)	Office support, data entry, preparing letters, organizing printing. There will be one position in each office at Colombo and field.
Computer Operators / Office Assistants	8	Good English and national languages, computing skills (with appropriate certificate)	Support the Office Manager, Secretary and Accountant. There will be one position in each office at Colombo and field.
Office Caretaker / Messenger / Guard	8	Good English and national languages and previous experience	Maintaining the office, carrying messages, and other minor tasks. There will be one position in each office at Colombo and field.
Drivers	12	Good English, and national languages, driver's license, with 10 years of driving experience, an advantage	Driving within Colombo, in the project areas, and between offices

71. Other out-of-pocket expenses the PMDSC will be responsible for include: (i) all other necessary facilities and logistic support for its staff including living accommodation and per diems; (ii) international and national travel, and miscellaneous transportation; (iii) day-to-day office communications, utilities and other miscellaneous costs which may be required for carrying out the services as per the requirement of the Contract; and (iv) printing, publishing and transmittal of all reports and deliverables (excluding specific communication outputs related to Task 5 which may be funded under provisional items).

M. Procurement of Additional Studies, Equipment and Training

72. Goods and works for ADB-financed contracts will be procured in accordance with ADB's *Procurement Guidelines* (March 2013, as amended from time to time). Consultants will be recruited in accordance with ADB's *Guidelines on the Use of Consultants* (March 2013, as amended from time to time). Provisional sums have been included in the consultancy agreement for procurement of various requirements that will support the project. The PMDSC will be

responsible for preparing the exact implementation arrangements, TORs, specifications, and detailed cost estimates of the procurement which will be approved by the Program Director before initiating procurement. Procurement procedures will follow ADB's Procurement Guidelines. The tentative scopes of provisional items are summarized in Table 7.

Table 7: Indicative Provisional Items

Item	Description
Vehicles and motorcycles	Up to 12 vehicles may be purchased or leased for national transport needs between project offices, construction sites, and for meetings in Colombo and the project areas. Up to 16 motorcycles may be purchased to support construction supervision activities between the project site offices and construction sites.
Surveys and Studies	Supporting surveys and specific studies including topographic surveys, geotechnical investigations, laboratory tests, flow monitoring, and resettlement and socioeconomic surveys.
Office Equipment	Procurement of office equipment including computers, printers, photocopiers, GPS power inverter, etc. for central and field offices using the shopping procurement method.[10]
Meetings, workshops and training	For routine meetings, workshops and training sessions convened by the PMDSC.
Communication Materials	Publishing of communication materials and media including the video diary of the investment program and development and hosting of the website.

N. Work Plan and Reporting

73. **Deliverables.** The list of main deliverables by PMDSC is summarized in Table 8. Unless otherwise agreed, all deliverables are to be submitted as drafts for review and comment by the PMU and ADB, and thereafter amended and submitted as final versions. Other occasional deliverables maybe required from time to time on an informal basis. The number of printed copies of each report is also shown in Table 8. In addition, electronic copies will be provided for each document and the PMDSC will maintain an electronic safe backup of all contract related documentation. The PMDSC will be responsible for maintaining the official record of all correspondence relating to the works and consulting services packages under the investment program.

[10] All PMDSC key and non-key experts are responsible for providing their own computers or be supplied by the PMDSC firm. This provisional item is only for providing computers for the office support staff and providing general office IT equipment.

Table 8: List of Main Deliverables, Payment Schedule for Lump-Sum Component, and Indicative Number of Reports

No.	Item	Description	Due Time [a]	% of the Lump-Sum component [b]	Number of copies for PMU	Number of copies for ADB [c]
Task 1 – Program Management						
1.1	Inception Report	The inception report will: (i) confirm, elaborate on, and adjust as necessary the consultant's approach, methodology and work plan based on information received during the inception phase; (ii) provide a detailed plan of the consultant's activities and confirmation and adjustment to the tasks of each expert with further elaboration as required; (iii) provide an updated procurement plan and detailed implementation plan for the project's activities; (iv) discuss any issues identified during the inception phase; (v) outline the planned implementation of the provisional items with scopes and costs; and (vi) the contents of the PPMES and the MIS. This inception report will be for Tasks 1 to 5. Tasks 6 and 7 will have separate inception reports (see below).	2nd month	-	4	2
1.2	Updated TOR and RFP for ISEWP Consultants	Update and finalize the TOR for the ISEWP consultant and prepare other "request for proposal" documents necessary to meet ADB requirements.	3rd month	-	2	2
1.3	MEM, QAP and RMP	The MEM will set out how the investment program will be monitored and evaluated. This supports preparation of the PPMES. It includes the QAP and RMP, and will be updated routinely as necessary.	4th month, updated routinely	-	4	2
1.4	Procurement Handbook	The Procurement Handbook shall be aligned with ADB and government procurement regulations. It will include program specific guidelines for procurement plan updates, and processes for procuring works, goods and services.	4th month	-	4	2
1.5	Financial Management Handbook	The Financial Management Handbook is to be specific to the investment program and aligned with ADB and government financial management requirements. It will include procedures for project accounting and meeting ADB requirements for disbursements.	4th month	-	4	2

1.6	MIS	The MIS will detail how all information related to the investment program will be structured, managed, and secured. It will include a secure filing system for printed material and a secure and backed up server for electronic material. It will be accessible from all project offices. The MIS will also include the public website for the investment program.	6th month	-	4	2
1.7	PPMES	Design of the PPMES appropriate for the investment program. The content of the PPMES should be discussed in the inception report and agreed with the PMU and ADB prior to developing the system. The system should be flexible to allow routine changes as necessary and it should be accessible from all project offices. A manual will be prepared that shows users how to update and use the system.	6th month	-	4	2
1.8	Mid-term Report (the number of versions of this report will depend on how many mid-term review missions are fielded by ADB)	Scheduled approximately half way through the consultancy period and should be produced prior to the ADB mid-term mission (note that the number and schedule of missions may vary). The contents would include, but not be limited to: (i) summary of the progress including issues, confirmation elaboration and/adjustments to the consultants program; (ii) progress against the loan and the DMF; (iii) updated detailed implementation plan; (iv) status of loan covenants; (v) updated FAM; and (vi) summary and discussion of all specialist aspects of the project including construction, capacity building, social and environmental safeguards, together with conclusions and any recommendations for adjustment. The content of the report will be agreed with the PMU and ADB prior to its preparation.	25th month, however timing and number to be agreed with PMU and ADB	-	4	2
1.9	Final Report	The Final Report will be submitted one month after issue of the Performance Certificate for the last civil works contract or in the 57th month, whichever happens earlier. The Final Report will present a summary of all aspects of project implementation and comparison with the expectations of the loan (or as subsequently adjusted) and of the DMF. The report will summarize and discuss the results of specialist	58th month	-	4	2

		aspects of the project including construction, capacity building, social and environmental safeguards, together with conclusions, recommendations and lessons learned for future projects. The content of the report will be agreed with the PMU and ADB prior to its preparation.				
1.10	Monthly Reports	Concise mainly tabular report with 4-page maximum summarizing monthly progress of the project, implementation status and highlighting any critical issues that require government or ADB support with resolving. On agreement with the PMU and ADB, these may be submitted electronically only.	Monthly, by the 7th day of each following month	-	4	2
1.11	Quarterly Reports	Concise reports giving more details of the project and key issues. For every year, the first two reports will be incremental reports detailing activities, progress and issues during the previous trimester, and planned activities for the next trimester. These reports must present all the findings related to procurement and to monitoring requirements identified in the DMF, including progress on delivering the outputs. The reports will also summarize the results of relevant data collected. The forth report (which will become the Annual Report) will be cumulative for the full year period. The Quarterly Report is to include that month's Monthly Report (no separate monthly report).	Quarterly, by the 15th day of the following month	-	4	2
1.12	Briefing Reports	Special briefing reports as requested by the PMU and/or ADB.	As required	-	4	2
1.13	Draft PFR	Project documents for the subsequent tranches including technical, safeguards, economic, social due diligences based on standard ADB format including the cost estimates and financial management assessment. These are necessary for processing of the second and third tranches of the investment program.	As required	-	2	2
1.14	Environmental Monitoring Reports	Requirements are described in the EARF document. Generally, the reports are to: (i) capture any environmental safeguards issues and their resolution; (ii) the compliance by contractors of EMPs are to be reported; and (iii) a summary of environmental parameters monitoring to be presented.	Submit semiannual monitoring reports as per	-	4	2

			guidance provided in the EARF			
1.15	Resettlement Monitoring and Evaluation Reports	Requirements are described in the RF. Generally, the reports will discuss the quality and progress of resettlement plan implementation, and any issues and remedies suggested to be presented. Status of resettlement including physical progress and financial expenditure to be stated.	Initially submit reports every 3 months for first year and then every 6 months thereafter	-	4	2
1.16	PCR	The contents of the report shall be as agreed between the PMU, PMDSC and ADB. It will focus on the individual tranches and generally it will follow standard ADB format.	Last month of loan closure for each tranche	-	2	2
1.17	Special Reports	The PMDSC will prepare and submit any other report related to the investment program as requested by the PMU and ADB.	As required	-	4	2
Task 2 – Design Review, Detailed Designs and Preparing Contract Documents (Portion of Lump-Sum Amount: 85%)						
2.1	Hydraulic Structures Design Manual	The Hydraulic Structures Design Manual should incorporate international best practices and standards for designing all hydraulic structures specific for the needs of the investment program and Phase 2 investments. The design of all hydraulic structures under the investment program will follow this manual. The Manual may be updated from time to time as required.	3rd month	2.5%	4	2
2.2	Tender Design Review Report	As described in the above text for already tendered Tranche 1 projects.	3rd month	5%	4	2
2.3	SCADA system	TOR and specifications for implementing a SCADA system for the complete Mahaweli System	12th month	5%	2	2
2.4 – 2.6	Detailed Design Reports	Separate reports and drawings will be prepared for each of the three tranches. They will include technical, economic, social, financial, and environmental feasibility analysis;	As required to meet	20%	4	2

		survey results; detailed design calculations and drawings sufficient for construction purposes; detailed cost estimates; and implementation arrangements and schedules. The reports should be structured in a way that they can be merged into single documents for each individual project, for example: a complete report for the UECP Stages 1-3.	implement -ation schedule			
2.7	MOM manuals	For each investment project, a MOM manual will be prepared that includes information from the contractors and suppliers. It will contain sections describing, among others which will be agreed with the PMU: (i) the operation of the system to ensure the desired amount of water is conveyed through the investments as planned and designed; (ii) the operation of the system in the event of anomalies (floods, droughts, power failures, etc.); (iii) routine and infrequent system maintenance; (iv) system trouble shooting; and (v) required O&M staffing and annual expenditures.	48th month	15%	4	2
2.8 -	Tender Documents	To be prepared for all outstanding works and goods packages under the investment program following PMU and ADB procurement requirements and formats.	As required to meet implement -ation schedule	37.5%	4	2
Task 3 – Contract Management, Construction Supervision, Commissioning and Operation						
3.1	Construction Supervision Manual	The Manual will outline the PMDSC's approach to contract management and construction supervision. The format and contents of the Manual will be discussed and agreed with the PMU and ADB however in general it will show the management and reporting structure, team organizations, logistical arrangements, report and certificate templates, etc. It will be updated from time-to-time to suit the needs of the investment program.	2nd month	-	4	2
3.2	Health and Safety Manual	The Health and Safety Manual will include guidelines, requirements, procedures and protocols, etc. that will guide and support safe practices on all construction sites, camps, officers and transport routes. It will be agreed by all contractors and updated every year.	3rd month			
3.3	Shift Reports	To be prepared by the resident engineers for each contract. It shall include, among any other relevant information as	Per Shift	-	4	-

		deemed necessary, the weather conditions, crews and equipment working, works executed and tentative quantities, resource allocation, compliance with approved procedures, and any special or unusual occurrences experienced in each shift.				
3.4	Weekly Reports	To be prepared by the resident engineer for each project. It shall summarize the shift reports highlighting progress during the week, resource allocation, problems or hindrances, any specific problems encountered, action taken and any other matter deemed necessary.	Weekly	-	4	-
3.5	Monthly Progress Reports	The monthly report shall be prepared by the Chief Resident Engineer, within one week of the end of the report period. It shall provide, among other items: (i) progress during the month on a quantitative and cost basis with appropriate graphical presentations comparing progress with program and giving reasons for any discrepancies with proposed remedial measures; (ii) cumulative expenditure record and estimated quantity at completion of each BOQ item, variation order and claim for the construction and equipment contracts; (iii) record of variation orders issued and being prepared; (iv) claims received, under consideration and settled; (v) comments on the quality of the month's work; (vi) a record of climatic conditions, and if appropriate, river flow conditions; (vii) any other matters which are deemed necessary by the PMU, PMDSC and contractors; and (viii) details of non-conformance works, recommendations and actions taken for rectifications.	Monthly	-	4	2
3.6	Annual Progress Reports	Highlighting the main features of the construction activities and other activities under consulting services contracts, in the previous fiscal year. The PMDSC shall prepare and submit the annual report within fifteen days of the end of the Fiscal Year.	Annually	-	4	2
3.7	Health and Safety Reports	Specifically report every health and safety incident (including near misses), provide recommendations for improvements, and document responses of project management (contractors, PMU, PIU and PMDSC) to control and contain them.	Monthly	-	4	-

3.8	Claim Reports	For every claim, individual claim reports will include an analysis of the claim, the Engineer's recommendation as to whether the claim should be accepted, partly accepted, or rejected and the contractor's entitlement under the contract.	Every claim	-	4	-
3.9	Contract Completion Reports	This shall be prepared at the end of each works / goods contract. The report shall incorporate as-built records and drawings, details of construction methodology, concrete quality, hydrological, sedimentation, geological, and geotechnical condition, etc. The report will also include: a record of changes of design criteria or of design with reasons, records of labor used, and progress records for different types of works. The contents of the report shall be as per the standard for this type of the contract and as agreed between the PMU and PMDSC.	Completion of each works contract	-	4	2
3.10	Certificates	These will include the Statement of Completion Certificates, Taking Over Certificates, and Performance Certificates.	As required	-	4	2
3.11	Final Reports	The Final Report will be submitted one month after the issue of the Performance Certificate for each civil works contract. The report will contain details of remedial works carried out by the contractors to rectify defects found during the Defects Liability Period. The report will also contain a summary of Final Statements.	Completion of each works contract's Defects Liability Period	-	4	2
3.12	Technical Review Reports	The PMDSC will prepare and submit review reports on design reports submitted by contractors, such as for the design and assembly of the TBMs, segment lining design and fabrication facilities, conveyor systems and power, etc., gates and other electro-mechanical equipment, etc. The review report shall be submitted within the period mutually agreed between the PMU and PMDSC.	As required	-	4	2
3.13	Special Reports	The PMDSC will prepare and submit any other report related to contract management and construction supervision as requested by the PMU and ADB.	As required	-	4	2
Task 4 – Capacity Development						
4.1	Training Needs Assessment and Training Plan	Institutional review and training needs assessment of MMDE, MASL, DOI, the PMU and PIUs to support their needs for managing both implementation of the investment	6th month,	-	4	2

		program and its subsequent MOM. The plan will provide an agreed detailed training program comprising local, international and on-the-job training. Among other agreed items, it will also present implementation arrangements including training institutions and programs, implementation costs, logistical arrangements.	annual revisions every year			
4.2	Training Completion Report	A report summarizing the individual and institutional achievements and results from implementing the training plan. The report will discuss lessons learned, recommend improvements for future training programs, and recommend additional training for future consideration.	58th month	NA	4	2
Task 5 – Communications						
5.1	Updated Communications Strategy and Plan	Reviewing, improving and routinely updating the investment program's communications strategy and plan.	3rd month, annual revisions every year	-	4	2
5.2	Media publications	As requested by the PMU and ADB. This applies to all forms of media. Drafts must be reviewed and approved by the government and ADB prior to release.	As necessary	-	4	2
5.3	Website	Professional and user friendly website where all project reports, information, photos and video links are available to users. Website to be routinely updated as required.	Operational by 6th month	-	-	-
5.4	Video presentation	Maintain a video diary of the implementation of the investment program. Annually, prepare an edited highlight of physical project progress snippets and capacity building initiatives (workshop, training, consultation, communication etc.) of approximately 1 hour duration with footage of construction activities and interviews with stakeholders, as necessary. The production will be prepared to the highest professional standards.	Annually	-	4	2
Task 6 – Strategic Environmental Assessment (Portion of Lump-Sum Amount: 15%)						
6.1	Inception Report	The SEA inception report will outline the planned work approach.	4th month	2.5%	2	2
6.2	Interim Report	Report presenting the interim findings in preparing the SEA.	8th month	2.5%	2	2
6.3	SEA Final Report	Comprehensive final SEA report covering all requirements as describe in the main text above.	10th month	10%	2	2

Task 7 – Preparing NCPCP Phase 2						
7.1	Inception Report	Report that outlines the scope of Phase 2 investments and describes, amongst others: (i) the PMDSC's methodology for undertaking the task; (ii) planned work and staffing schedule; (iii) planned site investigations, surveys and studies with scope of works and cost estimates; (iv) an indication of the categorization of the investments for environmental, involuntary resettlement, and indigenous peoples; and (v) outline of all reports to be prepared under this task.	4th month		4	2
7.2	Route Selection Report	Report describing the activities undertaken for assessing the routes with recommendation of the preferred route.	8th month		4	2
7.3	Interim Report	Report describing the interim progress for the undertaking this task and preparing the following documents.	16th month		4	2
7.4	Feasibility Design Report for Phase 2	Comprehensive report that describes work undertaken for this task to assess the feasibility of Phase 2 investments. It will comprise, amongst others: (i) the technical evaluation of all features of the Phase 2 investments; (ii) all necessary reports and frameworks for environmental, involuntary resettlement, and indigenous peoples safeguards; (iii) economic and financial assessments; and (iv) updated financial and procurement assessments.	20th month		4	2
7.5	PDA documents	The necessary ADB documents for obtaining government and ADB approval for the PDA which will finance the detailed design of Phase 2 investments prior to its loan approval.	22th month		4	2
7.6	ADB loan documents	This includes draft versions of the Report and Recommendation of the President, and all required linked documents and supplementary appendices.	24nd month		4	2

ADB = Asian Development Bank, BOQ = bill of quantities, DMF = design and monitoring framework, EARF = Environmental Assessment and Review Framework, EMP = environmental management plan, DOI = Department of Irrigation, FAM = facility administration manual, ISEWP = improving system efficiencies and water productivity, MASL = Mahaweli Authority of Sri Lanka, MEM = Monitoring and Evaluation Manual, MIS = Management Information System, MIWRM = Ministry of Irrigation and Water Resources Management MOM = management, operation and maintenance, O&M = operation and maintenance, PCR = project completion report, PDA = Project Design Advance, PFR = periodic financing request, PIU = project implementation unit, PMDSC = program management, design and supervision consultant, PMU = program management unit, PPMES = Program Performance Monitoring and Evaluation System, QAP = Quality Assurance Plan, RF = resettlement framework, RFP = request for proposal, RMP = risk management plan, SEA = strategic environment assessment, TBM = tunnel boring machine, TOR = terms of reference, UECP = Upper Elahera Canal Project.

[a] The due date applies to submission of draft versions for those reports which require both draft and final versions.

[b] Payment will be on approval of final versions.
[c] For the ADB reports, one copy is to be delivered to the ADB Sri Lanka Resident Mission and one copy sent to ADB Headquarters in Manila. At least one more copies should be prepared and sent to each cofinancing partner, as required during the subsequent tranches.

O. Client's Input and Counterpart Personnel

74. The PMU shall provide the PMDSC with all documents, drawings, maps and other contract related documents that are available and at the disposal of the investment program. All the requirements needed to carry out the consulting services, unless otherwise mentioned in these TOR, shall be the responsibility of the PMDSC. While no government staff will be deployed to work under PMDSC, at Colombo and the three PIU locations, adequate PMU and PIU counterpart staff will be in place to work with PMDSC. A complete list of PMU and PIU positions will be available to short-listed firms. All the equipment, goods and materials procured under the consulting services contract are the property of the Project and shall be returned to the government after the completion of the services in good working condition. Furnished and air-conditioned working office spaces will be provided by the PMU in Colombo and at the three project sites. The PMDSC shall take responsibility for office maintenance, consumables and upkeep. The PMDSC will be responsible for providing appropriate living accommodation for the PMDSC staff.

P. Available Data for Proposal Preparation

75. The PMU and ADB have prepared documents and drawings to support the preparation of this investment program. Shortlisted firms may review the reports and all available information, at the PMU office in Colombo with prior appointment. Similarly, shortlisted firms may also download copies of available digital reports and documents of the project which are accessible through: http://www.adb.org/projects/44167-013/main. Further details on the available reports and download website will be provided to the shortlisted firms.

Q. Specific Requests for Proposal Information

76. In addition to the information required by the Request for Proposal, and any other relevant information the firm wishes to submit, the proposals for the PMDSC should also ideally provide the following information:

(i) The lead firm's experience with: (a) implementing design and build contracts where careful management and programing has been required for undertaking design work, contract preparation and bidding, and supervising construction activities; (b) supervising multiple construction packages being implemented concurrently; (c) managing multidisciplinary teams located across multiple offices; (d) assisting the executing agencies with implementing environmental and social measures, including involuntary resettlement, ensuring the safeguard policies/requirements of the government and externally aided agencies are met; and (e) having overall responsibility for project implementation management.

(ii) The firms' experience with supervising the construction of large-scale civil works contracts (i.e. larger than $100 million in capital budget) as the 'Engineer' under FIDIC contracts. The works must have included: (a) large diameter tunneling (i.e. diameter larger than 4 meters) using construction methods of both "shielded tunnel boring machines" and "drill and blast;" (b) construction of earth gravity dams; and (c) construction of large canals including cut-and-cover sections. If the lead firm does not have experience in any particular types of works then there must be a joint venture agreement with the suitably experienced partner firm.

(iii) The firm's experience in preparing detailed engineering designs, cost estimates and contract packages, for: (a) large diameter tunneling (i.e. diameter larger than 4 meters) using construction methods of both "shielded tunnel boring machines" and "drill and blast;" (b) construction of earth gravity dams; and (c) construction of large canals including cut-and-cover sections.

(iv) The firms' or proposed experts' experience in: (a) preparing and implementing environmental and involuntary resettlement plans; (b) preparing and implementing communication plans for similar large scale construction projects; and, (c) preparing strategic environmental assessments in the water resources sector, or similar.

(v) The firms' experience in planning, preparing feasibility assessments, and undertaking ADB project preparatory technical assistance projects (or similar) in the water resources and/or energy (hydropower) sectors. This applies particularly for preparing feasibility designs for planned large diameter tunnels (TBM and "drill and blast"), high dams (roller compacted concrete and similar), hydropower facilities, and large canals. This includes preparing and supervising site investigations, surveys and studies, and preparing ADB loan documents.

(vi) The lead firm's experience of undertaking similar projects with tunnel, dam and canal components in Sri Lanka should be highlighted. However, for the lead and joint-venture partner firms, similar experience in other developing countries (including Africa and Americas) should also be highlighted, along with any other particular experience relevant to the nature of the proposed investment plan in developed countries.

(vii) Practical recommendations for expediting the overall implementation schedule for the investment program, particularly the UEC Project.

(viii) Submission of CVs in Tech-6 of the technical proposal: please ensure they are presented in the same order as the positions listed in Tables 3 and 5.

Attachment 6: Terms of Reference for Improving System Efficiencies and Water Productivity Consultant

I. BACKGROUND

1. The overall goal of the Mahaweli Water Security Investment Program (MWSIP) is to improve water productivity and household income in the agricultural sector in Sri Lanka. The program includes significant investments in water infrastructure for the transfer of water from the south-central 'wet' zone to the northern dry zones, construction of storage reservoirs, construction of major conveyance canals and tunnels, and the rehabilitation of existing irrigation infrastructure to improve water supply to existing irrigation systems (major and minor cascade systems). These systems currently suffer from water shortages, particularly during the Yala season, resulting in low cropping intensities and thereby reducing yields and farm and household food security and incomes.

2. However, the existing irrigation systems are often characterized by high water application rates, which can be symptomatic of low application efficiencies due to high conveyance and operational losses. Water delivery service is sub-optimal. Crop yields are below genetic potential and cropping patterns dominated by relatively low investment, low return crops, particularly paddy. As a result water productivity[1] in terms of yield and returns are well below potential levels.

3. Climate change may also adversely impact on irrigated agriculture in Sri Lanka. Higher temperatures may lead to a reduction in paddy yield, increased irrigation water demand, and changes in the timing and intensity of seasonal rainfall that may further contribute to water shortages. These are potential risks to not only the sector but more specifically to systems within the investment program, and may adversely impact on system and project performance.

4. The investment program represents a significant investment in the sector and as such is a major opportunity to improve production of irrigated agriculture. However, to fully realize the potential for improved agricultural productivity, enhanced food security and poverty reduction, it will be necessary to improve the current performance of irrigation systems and the associated farming systems. To do this there is a need for a better understanding of the current performance constraints and opportunities to improve the productivity and returns within cascade irrigation systems, and how to better optimize returns to the most limiting resource, water. There is also a need to better understand and quantify probable climate change risks and identify suitable risk mitigation adaptation measures.

II. OBJECTIVES

5. These Terms of Reference (ToR) are for the Improving System Efficiencies and Water Productivity (ISEWP) consultancy package under the investment program. The goal of ISEWP is to prepare a strategy for the improvement of cascade irrigation system efficiency[2] and water productivity. The strategy would include measures to improve the efficiency and effectiveness of water delivery service through physical and non-physical improvements (i.e., both infrastructure and operational aspects) and increase farm production and returns (both on- and off-farm measures). An integral part of ISEWP requires that irrigation and agricultural improvements be demonstrated in selected areas as the first step in a scaling-up process of improving the regional

[1] In the context of irrigated agriculture, water productivity is generally defined as the crop yield quantity or value per unit of irrigation water, with units of kg/m^3 or \$/m^3

[2] Irrigation efficiency refers to the ratio of the amount of beneficial consumption (i.e., crop evapotranspiration, ET) to the amount irrigation water diverted, delivered or applied, depending on the specified boundary conditions.

productivity of irrigation water and in demonstrating the long-term viability and sustainability of irrigated agriculture in the face of changing climate.

6.

III. SCOPE OF SERVICES; TASKS AND EXPECTED DELIVERABLES

7. **Overall Scope:** The overall objective of ISEWP is to analyze and demonstrate sustainable increases in irrigation system efficiencies and water productivity (in both yields and returns) that can be readily adopted in systems and farms within the Mahaweli System.

8. **Pilot Demonstrations:** It is proposed to demonstrate these improvements through application in case study irrigation systems and pilot farms. The case study systems include: (i) a minor system within North West Province Canal Project (NWPCP)[3] which is to be selected), (ii) a sub-system within Minipe Left Bank Canal Project (MLBCP)[4], and (iii) the Huruluwewa Irrigation System.[5] Within each of these systems pilot farms will be developed for application of improved irrigation management and increased crop production and diversification. These systems and farms will serve as practical examples of the approach to and results of improving productivity and returns to land and water for dissemination to all stakeholders engaged in irrigated agriculture in the project areas.

9. **Irrigation Systems:** Within the irrigated areas of the investment program the irrigation systems are often a hydrologically interlinked cascade system of major and minor tanks (reservoirs) with associated irrigation command areas, canals and drains. Water sources include both surface water from external transfer and from local rainfall runoff, reuse of drainage water and shallow groundwater sources. While water use is principally for irrigation, it is also of importance to domestic and livestock consumption and for aquaculture, tourism, industry, and energy production.

10. **Farming Systems:** The farming system is predominately small holdings producing paddy to meet household food needs. However with more secure and reliable water supplies, particularly during the Yala season, as well as increased inputs and knowledge there are also opportunities for production of higher value field and vegetable crops to increase returns and improve household security. The project will review the existing farming systems and evaluate opportunities and constraints for farmers to diversify into higher valued crops, including reviewing and recommending improvements to supply and market chains.

11. **The Approach:** The approach is in two inter-related parts; Part 1 – case study irrigation systems, and Part 2 - pilot demonstrations, as outlined below.

12. **Timeframe:** The total study duration is 36 calendar months, inclusive of mobilization, surveys, stakeholder consultations, assessments, intervention design, implementation, monitoring and evaluation, workshops and reporting. The monitoring and evaluation period for both Parts 1 and 2 should be concurrent, and cover four consecutive irrigation seasons.

13. **Part 1 – Case Study Irrigation Systems:** The purpose is to recommend improvements to irrigation system operation to increase water delivery efficiencies, both conveyance and operational efficiencies. As outlined below this will be achieved through assessment of current

[3] An alternative or additional system could be the Huruluwewa System which is also a water short system and the primary target area for the Upper Elahera Canal (UEC) under Phase 1 development.

[4] While the MLBC is a not a typical cascade system it is included in the study as it is part of the current investment program and has significant potential for improved water use efficiency.

[5] System within command of the Huruluwewa Reservoir that will receive water from the UEC

levels of system performance and then the implementation and monitoring and evaluation of recommended changes to system operation.

14. **System Inventory:** (3 months) A GIS-based asset inventory will be established for each system to include the following (at a minimum): physical extent of command and irrigated areas, engineering parameters and condition of the key irrigation infrastructure, past and current cropping patterns and productivity, and survey and data requirements for the assessment phase. The inventory will be implemented in consultation with key stakeholders (Mahaweli Authority of Sri Lanka (MASL), Irrigation Department (ID), Department of Agrarian Development, National Water Supply and Drainage Board (NWSDB), Water Resources Board (WRB), NWP Provincial Irrigation Department, Farmer Organizations, farmers and other relevant agencies, as needed). A GIS Unit will be established at a central location focusing on training by the consultant of ID/MASL field officers in GIS skills during and after the project. Staff envisaged for training in GIS skills are indicated in Annexure 1. Specific activities include: (i) delineation of the system including a base map of the command area, inventory of the principal irrigation infrastructure including tanks, main and distributary canals, main control structures, and drains; (ii) crops and cropping patterns: summary of seasonal crops and cropped areas for the past five years (Yala and Maha seasons) and reported productivity and returns for paddy and other field crops, including any relevant information associated with agronomic and agricultural aspects that strongly links to water use and management; and (iii) water deliveries, including a summary of water deliveries over the past five years (Yala and Maha seasons) per month and season. Promotion of cultivation of other field crops for Yala season and paddy cultivation in Maha season is expected in line with the Food Security and Sustainable Agriculture policy of the Government of Sri Lanka introduced under the National Food Production Programme being implemented under the supervision of Ministry of Agriculture. The consultant will be required to demonstrate understanding of present government policy and of formulating methodologies to increase the cropping intensity of the irrigation sites and improve land and water productivity.

15. **Performance Benchmarking:** (4 months) The preparation of an irrigation system benchmark assessment to determine current level of performance and to identify constraints and opportunities to improving delivery efficiencies. The benchmarking would follow the FAO MASSCOTE / Rapid Appraisal Process (RAP) procedures. In addition, at least 5 years of remote sensing data will be used to establish baseline values. The activity includes: (i) preparation of system water balance, (ii) determination of current levels of productivity and operational performance (i.e., water delivery service), (iii) assessment of institutional adequacy and performance, and (iv) assessment of system efficiencies.

16. **System Operational Plan:** (2.5 months) The preparation of updated operational plans for the selected systems setting out the necessary organization and procedures for improved system operation. This includes: (i) improvements to flow control and measurement at key system nodes, (ii) improvements to the organizational aspects of system operation, and (iii) preparation of updated seasonal operation plans to match with production targets.

17. **Assessment of Opportunities for Growing High Value Crops:** (2.5 months) Studying the existing supply and marketing chains for produce within Sri Lanka and assessing the opportunities and constraints for encouraging farmers to grow higher value crops, particularly during the Yala season.

18. **Monitoring and Evaluation:** (24 months) The purpose of the monitoring and evaluation is to verify the performance of the systems, in terms of delivery efficiencies over four consecutive irrigation seasons. Total productivity of the system depends on the inputs that are to be supplied

during the season at the required times. Therefore it is necessary to monitor inputs on a seasonal basis to express factors affecting high productivity. The activities include:

- Flow monitoring: the measurement of system flows at key nodes to determine distribution within the system and validate existing water records. This may require the installation or upgrading of, measurement and maintenance of flow and water level measurement at key system nodes such as reservoir outlets, and at the headings of main canals and drains, and distributary canals and drains.
- Demand monitoring: the determination of crop water demands based on localized weather information. This may require the installation, calibration, measurement and maintenance of an automated meteorological station.
- Productivity monitoring: the determination of system crop productivity based on interpretation of satellite imagery and associated crop records and field surveys.
- Field surveys: sample area surveys to field-validate irrigation infrastructure and operation and crop types (including updating inventory of assets and assessment of performance status and potential).
- Stakeholder consultations: facilitated discussion group meetings with key stakeholders to identify, analyze and document issues and constraints to system operation and farm productivity. Consultations with stakeholders in agricultural value chains to identify constraints and opportunities.
- Institutional assessment: evaluation of the current systems' institutional capacities and support provided to the farming operations.
- System assessment: preparation of system-level water balance assessments to benchmark levels of performance, efficiency and adequacy, and water productivity.

19. **Part 2 – Pilot Demonstrations:** The purpose is to demonstrate improvements to current farming systems to increase farm productivity and returns to both land and water.

20. **Rationale for Initiating Demonstration Areas.** Short-term financial considerations of individual farmers invariably take priority over long-term strategic water management objectives. Therefore, measures to address water efficiency (conservation) and productivity must be demonstrated to be economically feasible, or at least to incur no financial penalty to the operating farmers. The framework envisaged for demonstration projects in the investment program is to initiate a package of comprehensive water management interventions in a cluster of farms, with managerial assistance from their Farmer Organizations (FOs), and with technical assistance, mainly in the form of international and national consultants working cooperatively with MASL's and ID's field offices / field offices. Some assistance may be taken from DAD, DOA and IMD. This initiative requires capacity building within MASL and ID so that they are adequately resourced and technically grounded to facilitate multi-stage expansion of proven water management innovations following successful completion of the 'demonstration phase'. The goal is to up-scale the recommendations of the project in a step-wise manner ultimately providing measurable system-wide water savings, across the entire Mahaweli System by 2025 at the latest. Selection of specific interventions or the project activities at different levels of the system will be guided by such factors as their overall effectiveness in the quantities of water-saving, ease of implementation and operation, cost effectiveness, contribution to increasing water productivity, benefits to farmers, and minimum detrimental effects on environment, sustainability and national policy directions. This will be achieved through the application of a range of interventions on pilot farms in selected irrigation systems. The specific activities are outlined below.

21. **Pilot Farm Selection:** (2 months) The selection of pilot farms within the selected case study irrigation systems for the purpose of demonstrating improved farming and on-farm irrigation methods and management. It is envisaged that there will be 4 pilot farms/fields in total. Each pilot area will comprise sub-areas on the same supply canal located within head, middle and tail of the survey canal). Each pilot area will be of minimum area 20 ha and comprise a minimum of 5 pilot farms. Specific activities include: (i) stakeholder consultations to present the proposed program, (ii) farm surveys and preparation of detailed farm maps, and (iii) participatory identification of pilot farms/fields. Consultants will be required to select the study areas and pilot demonstration sites jointly with the ID, MASL and ND officers under the guidance of PMU.

22. **Interventions Design:** (4 months) The planning and design of proposed interventions to increase production and returns, and on-farm as well as off-farm water use efficiencies. Interventions have to be conceptualized clearly on structural, planning and management levels. It is envisaged that interventions will include changes to current farming systems such cropping patterns and varieties, advanced irrigation management such as Alternate Wet and Dry (AWD) and Shallow Water Depth (SWD) for paddy, irrigation methods such as pressure irrigation and/or improvement of on-farm canals and the main and secondary canals directly upstream of the pilot areas that will result in improved water management. The method of bulk water allocation system adopted in System "H" will be replicated to improve the water allocation and distribution practices within the scheme[6]. The proposed interventions will be presented to the stakeholders for endorsement prior to implementation. No disturbances to the seasonal plan of the schemes will be permitted while implementing the study and pilot demonstrations.

23. **Implementation Program:** (6 months) The above interventions will be implemented in preparation for the next irrigation season. The timing and during of these is dependent on the nature of the intervention, for example physical works need to be implemented prior to season commencement. The project will identify the proposed implementation mechanisms for provision of physical (on-farm works and inputs) and non-physical (services) works. The project will also provide technical support to all stakeholders with implementing the recommendations during the trial period and with introducing regular maintenance programs, funding arrangements for essential structural improvement works, and on-site training for capacity building of farmers and officers.

24. **Monitoring and Evaluation:** (24 months) The purpose of the monitoring and evaluation is to determine the impacts of the above interventions to increase farm productivity and water use efficiencies. This will be conducted over four consecutive irrigation seasons. The activities per pilot farm includes: (i) measurement of water deliveries (volumetrically) and drainage volumes; (ii) measurement of crop yields (total and marketable); (iii) recording of returns for marketed crop yields; (iv) determination of water productivity and water use efficiencies; and (v) updating of the performance indicators. A performance assessment program is to be introduced with relevant irrigation scheme performance indicators

25. **Dissemination Program:** On completion of the above tasks (Parts 1 and 2) a program for the extension of the field-tested interventions will be prepared, including a detailed program for extension to irrigation systems within the Mahaweli System and further pilot demonstrations and trainings within these systems. This will include detailed descriptions of the physical and non-physical works and services, cost estimates, total production, changes in household income, assessment of value chain potentials, and an implementation schedule. This will be presented in the Final Report.

[6] Gunaratne, B. (2015), *Participated Bulk Water Allocation Concept*, test edition produced for peer review

26. **Schedule:** Parts 1 and 2 of the workplan are synchronized and run concurrently. The program is organized into three phases: Phase 1 (9 months) including mobilization and assessment to implementation of interventions (on both cascade systems and pilot demonstrations); Phase 2 (24 months) including monitoring and evaluation over four consecutive irrigation seasons; and Phase 3 (3 months) including the preparation of project reports and final workshop.

IV. TEAM COMPOSITION AND QUALIFICATION REQUIREMENTS FOR KEY EXPERTS

27. The consulting team will be engaged in accordance with ADB's *Guidelines on the Use of Consultants* (2013) using Quality and Cost-based Selection (QCBS) method, with 90% quality and 10% cost weight ratio. The following staff are to be proposed:

A. Key Staff

28. **Table 1** summarizes the proposed consulting services in person-months inputs. The total input of key specialists is 160 person-months, of which 40 and 120 are international and national, respectively. Consultants are expected to consult and liaise closely with MMDE/ID/PMDSC[7]/local government and other relevant organizations.

Table 1: Proposed Consulting Services

International Specialists	**Person-months**
Key Staff	
Team Leader and Water Resources Management	16
Irrigation Planning and Design Engineer	6
Agriculture Specialist	6
Agricultural Economist	3
Agricultural Marketing Specialist	3
Participatory Irrigation Management Specialist	6
Subtotal	**40**
National Specialists	**Person-months**
Key Staff	
Deputy Team Leader and Agriculture Specialist	27
Water Management Specialist	18
Irrigation Planning and Design Engineer	12
Agriculture Specialist	12
Agricultural Economist	6
Participatory Irrigation Management Specialist	12
Rural Sociologist	4
GIS Specialist	9
Non-Key Staff*	
Surveyors	20
Subtotal	**120**
Total	**160**

*Note: only the CVs of key experts will be scored as part of the technical

[7] Program Management, Design and Supervision Consultant

evaluation of proposals

29. **Team Leader (TL) and Water Resources Management (International 16 PM):** with at least MSc or equivalent in agricultural water resource management and at least 15 years of relevant experience, including the role of team leader in similar programs. The Team Leader is principally responsible for overall program management and liaison with the ADB and Government, and including specific tasks as follows:

(i) Organize the work and supervise the inputs of all consultants

(ii) Manage the relationship with ADB, the government, and other stakeholders

(iii) Recommend specific practical innovations for improvement of water productivity at cascade system and farm levels

(iv) Supervise preparation and implementation of the monitoring and evaluation of Part 1 – Case Irrigation System and Part 2 – Pilot Demonstrations.

(v) Prepare and present the program workshops, and coordinate and liaise with key stakeholders; ADB, MASL, ID, and FOs.

(vi) Timely delivery of the program reports, including: Inception, Interim, Monitoring and Evaluation, and Final.

30. **Deputy Team Leader (DTL) and Agriculture Specialist (National 27 PM):** with at least the equivalent of an MSc in tropical agriculture, and at least 10 years of experience in tropical agriculture and including at least 5 years in the management of agriculture development projects/programs in Sri Lanka. The principal role of the DTL is to support the TL in implementation and reporting on the program, and specifically the implementation of the Pilot Demonstrations (Part 2). In addition specific tasks include:

(i) Liaison with MASL, ID, and key stakeholders at local, district and national levels

(ii) Supervision of the Pilot Demonstrations, and in particular the Farm Selection and Intervention Design elements, and their implementation

(iii) Assisting the TL in preparation of workshops and program reports

31. **Water Management Specialist (National 18 months)** at least an MSc or equivalent in irrigation engineering, irrigation management or agriculture and at least 10 years of relevant experience in agricultural water management. The specialist will engage with farmers and field operations staff in the pilot areas to identify the main constraints to improved water management through the performance assessment techniques; review the requirements and propose strategies for increasing the performance of the systems; and from lessons learned during the pilot interventions, assess how new initiatives for improved water management could be applied to other systems.

32. **Irrigation Planning and Design Engineers (International 6 PM; National 18 PM):** with at least the equivalent of an MSc in irrigation engineering or similar, and at least 10 years relevant experience, including cascade irrigation systems and preferably country experience. The main role of the engineers is the assessment of irrigation components of both Parts 1 and 2, and formulation of irrigation intervention for improvement of irrigation deliveries and infrastructure maintenance. The specific tasks include:

(i) Supervision of the irrigation system inventories

(ii) Supervision of the irrigation system performance benchmarking

(iii) Contributing to the formulation of irrigation interventions at both system and farm levels

(iv) Contributing to the irrigation elements of the monitoring and evaluation program (Parts 1 and 2), including process and method for data acquisition and analysis

(v) Preparation of the relevant irrigation elements of program reporting including workshop and reports

33. **Agriculture Specialists (International 6 PM; National 12 PM)**: with at least the equivalent of an MSc in agriculture, and at least 10 years' experience in tropical agriculture, including paddy and other field and vegetable crops. Experience in programs for improved paddy production, with SRI and AWD and other water conservation techniques is preferable. The role of the specialists is to support the development and implementation of interventions to improve farm crop production and productivity (both yield and returns), with specific tasks including:

(i) In collaboration with the DTL, supervision of the Farm Selection element of Part 2, including stakeholder consultation, farm surveys and mapping

(ii) Identification of appropriate intervention, including alternative cropping regimes and cultivation methods, inputs and harvesting

(iii) Contributing to the preparation and implementation of the monitoring and evaluation for Part 2, including process and methods for data collection and analysis

(iv) Contribution to the program reporting, including workshops and reports

34. **Agricultural Economists (International 3 PM; National 6 PM)**: with at least the equivalent of an MSc in agricultural economics or equivalent and 15 years' relevant experience, particularly in development programs. The role of the agricultural economists is to support and develop those elements of the program related to determination of water productivity, including those within system performance benchmarking and monitoring and evaluation. It is also to contribute to program outputs, including workshops and reports.

35. **Agricultural Marketing Specialist (International 3 PM)**: with at least the equivalent of a MSc in agribusiness, agricultural economics, marketing, business administration or equivalent and 10 years' relevant experience, particularly in development programs. The role of the agricultural marketing specialist is with specific tasks including:

(i) Reinforcing the marketing capacity of the farmers, including the preparation of detailed guidelines for the development of market linkages for selected high value products

(ii) Assisting the FOs in clustering of enterprises to ensure vertical and horizontal linkages among key players in the segments of the value chain;

(iii) Building the capacity of FOs to develop and prepare business plans by providing guidance in the preparation of marketing strategies or marketing plans; and

(iv) Assisting in market promotion and dissemination of relevant market information in support of the identified enterprises.

36. **Participatory Irrigation Management (PIM) Specialists (International 6 PM; National 12 PM)**: with at least the equivalent of an MSc in agricultural and/or irrigation extension and at least 10 years program relevant experience. The PIM specialists are responsible for those program elements related to institutions, both irrigation and agriculture, at local and district levels, and for the assessment and development of institutional reforms to improve water and land productivity.

37. **Rural Sociologist (National 4 PM)**: at least an MSc or equivalent in rural sociology and at least 10 years of relevant experience in rural extension and communications. The main role of the Rural Sociologist is to support program elements related to stakeholder engagement (mainly farmers), communications and contributions to the program workshops and reports.

38. **GIS Specialist (National 9 PM):** at least a degree in a subject relevant to the specialisation and at least 7 years of relevant experience, including expertise in remote sensing and its interpretation. The specialist should be familiar with providing thematic mapping to the highest quality and have good communications skills and a record of successful interaction with a range to specialists from different disciplines. The specialist should also be experienced in knowledge dissemination and coaching GIS beginners.

B. **Non-Key Staff**

39. **Surveyors (National 20 PM):** topographical surveyors with skills in terrestrial survey and mapping. The specialists will provide information at the detail required for the pilot areas to be mapped to scales adequate for the purposes of the study, and make intermittent inputs as required.

V. REPORTING REQUIREMENTS AND TIME SCHEDULE FOR DELIVERABLES

40. **Outputs and Reports:** The study outputs and reports include:

(i) Inception Report: within 1 month of commencement a report presenting an initial assessment of the selected cascade irrigation systems and pilot farm selection, including proposed selection of irrigation system sub-section areas (distributary canal), the locality and extent of pilot demonstration farms, and updated work program.

(ii) Interim Report: within 9 months of commencement presenting: (i) Part 1 findings and recommendations for cascade irrigation systems; system inventories, performance benchmarking, operational plan, value chains, marketing strategies, and alternate crops; and (ii) Part 2 findings and recommendations for the pilot demonstrations including; farm selection, intervention designs and implementation program.

(iii) Monitoring Reports (4): within one month of conclusion of each irrigation season presenting the results and recommendation of the monitoring and evaluation of the cascade irrigation systems and pilot demonstrations.

(iv) Draft Final Report: within 34 months of commencement presenting the study findings and recommendations, along with dissemination program of interventions for improved irrigation system performance and improved farm production and water productivity within the Mahaweli System.

(v) Final Report: within 36 months of commencement and inclusive of responses to ADB and Government of Sri Lanka comments on the Draft Final Report presenting the study findings and recommendations and the proposed dissemination program.

(vi) Workshops including:

a. Stakeholder Workshops: in addition to stakeholder consultations during field surveys, two stakeholder meetings will be conducted, the first prior to the first irrigation season, the purpose of which is to consult with stakeholders on planned interventions for pilot demonstrations, and the second before the third irrigation season presenting the findings of the monitoring and evaluation.
b. Final Workshop: after approximately 34 months at the end of the second irrigation season presenting the results of the monitoring and evaluation of the study and recommendations for the dissemination program. The workshop will seek stakeholder comment and recommendations for the program.

VI. CLIENT'S INPUT AND COUNTERPART PERSONNEL

41. **Services, facilities and property to be made available to the Consultant by the Client:** the client will provide adequate office space at Colombo and respective divisional offices where the studies are planned to be conducted in Sytem "B" and "C" in Mahaweli areas, Minipe LB Canal and within the NWP Canal Project area. Electricity, water and telecommunication expenses are to be borne by the project funds under the local component while all necessary equipment, such as furniture, computers, printers, fax and photocopy machines and scanners are to be supplied by the consultants.

42. **Professional and support counterpart personnel to be assigned by the Client to the Consultant's team**. In addition to the national consultants, the client may arrange counterpart staff, including personnel from the field of irrigated agriculture and from research and development institutes. An indicative list of national, regional and divisional level counterpart staff is shown in Annexure 1. Consultants should not plan to rely on inputs from these staff but be ready to work with and disseminate knowledge to them. A per diem plus a travel allowance are to be paid to counterpart staff who may work with the consultants in order to organize all events with local communities and participate in other activities. Furthermore an allowance is to be paid for each sitting to Technical Review Committee Members who review the deliverables of the consultants. Both of the above payments are to be made from the Provisional Sum set aside with the approval of the Program Director.

VII. CLIENT'S PROVISION OF INPUTS; PROJECT DATA AND REPORTS TO FACILITATE PREPARATION OF PROPOSALS

43. In order to prepare proposals for the project, relevant information and mapping may be collected by the consultant from the ID, IMD, MASL DOA and DAD. Required meteorological data can be obtained from the Meteorological Department and some data from Department of Agriculture and Irrigation Department. National level long term data on production are available in the Department of census and statistics and HKARTI etc. The consultants will be responsible for collection of data from field and ID/MASL offices. Some data may be in text form and some in electronic versions. Consultants may obtain some data from websites but when there is a need to pay for obtaining the data during the studies he costs will be covered by the project funds.

Annexure 1

Counterpart Staff for the Study

Note: Staff to be trained in GIS skills are marked with an asterisk

From the Irrigation Department

At National Level

1. Director of Irrigation (water Management & Training)
2. Director Of Irrigation (Hydrology)
3. Director of Irrigation (Land Use)
4. Chief Engineer (Irrigation Management and Productivity Enhancement)
5. Chief Engineer (Water Management)

At Regional Level

1. Director of Irrigation (Range)
2. Chief Engineer (Range)
3. Institutional Development Officer

At Scheme Level

1. Divisional Irrigation Engineer *
2. Engineering Assistant (0 & M)*
3. Field Assistant (0 & M)

From the Mahaweli Authority of Sri Lanka

At National Level

1. Deputy Director General, Technical Services
2. Director (Downstream Development)
3. Director (Agriculture)
4. Director (Institutional Development) Director, Water Management
5. Director, Headworks

At Regional Level

1. Resident Project Manager (System ...)
2. Deputy Resident Project Manager (Technical)
3. Deputy Resident Project Manager (Agriculture)
4. Engineer-in-Charge, Moragahakanda Dam

At Scheme Level (Block Level)

1. Block Manager
2. Irrigation Engineer*
3. Agriculture Officer*

At Scheme Level (Unit Level)

1. Unit Manager
2. Engineering Assistant
3. Technical Officer
4. Field assistant

Irrigation Management Division

At National Level

1. Monitoring Officer

At Scheme Level

1. Resident project Manager
2. Development Officer

Department of Agriculture

At National Level

1. Addl. Director General (Water Management

At Regional Level

1. Deputy Director (Inter Provincial Agriculture)
2. Agriculture Officer

At Scheme Level

1. Head quarter Agriculture Instructor
2. Agriculture Instructor

Department of Agrarian Services

At National Level

1. Head Water Management Division

At Regional Level

1. Deputy Commissioner
2. Regional Engineer

At Scheme Level

1. Divisional Officer
2. Technical Officer
3. Agriculture Research and Production assistant

Provincial Irrigation Department — North Western Province

At Provincial Level

1. Provincial Director of Irrigation
2. Engineer*

At Scheme level

1. Technical officer*

Potential Sources of Additional Support

1 Rice Research and Development Institute, Bathalagoda Department of Agriculture

2 Mahailluppallama Field Crops Research Institute, Department of Agriculture

3 Hector Kobbekaduwa Agriculture Research Training Institute, Ministry of Agriculture

4 Irrigation Training Institute, Galagamuwa, Irrigation Department

Attachment 7: Terms of Reference for Individual Consultants

Independent Environment Safeguard Monitoring Specialist

1. Objective and Purpose of the Assignment

The Ministry of Mahaweli Development and Environment (MMDE) of Government of Sri Lanka (GoSL) is currently implementing the Mahaweli Water Security Investment Program (MWSIP) with the support of the Asian Development Bank (ADB).

The investment program is being implemented from 2016 to 2024 under three tranches. The first tranche begun in quarter 4 (Q4) 2015 and will continue until Q2 2020. Three construction Projects implemented under the MWSIP are Minipe Anicut Raising & Left Bank Canal Rehabilitation Project, Northwestern Province Canal Project (NWPCP) and Upper Elahera Canal Project (UECP). The construction activities of three Projects began in Q4 2016 and are located in the North Central and North Western Provinces.

The Program Management Unit (PMU) established under the MMDE executes the constructions through three Project Implementation Units (PIU) with assistance from the Program Management Design and supervision Consultant (PMDSC).

For environmental safeguards the investment program is Category A. Hence an independent environment safeguards monitoring specialist is required to review project implementation and ensure compliance with ADB and government environment safeguard requirements.

2. Scope of Work

The independent monitor will undertake periodic reviews (every six months) of three construction Projects to ensure compliance with ADB's and Government of Sri Lanka's environment safeguard requirements.

3. Detailed Tasks and/or Expected Output

The consultant will submit bi-annual monitoring reports to the PMU and ADB. The independent monitor will:

- Conduct periodic site visits to ensure contractor's compliance with the environmental management plan and regulatory standards at all three sub-project sites
- Review the PMU's environment management systems in place and ensure that records are maintained and effective monitoring is undertaken
- Conduct any sampling as required to ensure verification with monitoring records available on site
- Consult key Government Agencies (CEA, DWC etc.) to verify compliance with National safeguard regulations
- Advice PMU of any non-compliance and recommend measures to improve environmental performance
- Assess if the Grievance Redress Mechanism (GRM) is meeting the required objectives and public complaints regarding environmental issues are addressed effectively
- Recommend measures to address any environmental impacts not identified in the EIAs (for NWPCP & UECP)/IEE (for MLBCRP) or EMP
- Ensure the EA and contractors are complying with the CEA's conditions of approval.

4. Minimum Qualification Requirements

The consultant will have at least a Master's degree in environmental science/management or equivalent degree and more than 15 years of experience in preparing environmental impact assessments and implementing environmental management plans, preferably for multilateral development bank financed projects.

5. Deliverables

Independent Bi-annual Environment Monitoring Report for each semester based on the interim submittals through the following milestones;

a) Submission of the "work program" indicating key tasks and deliverables for preparation of "Independent Bi-annual Environment Monitoring Report" together with the "table of content" of the report.

b) Draft of the "Independent Bi-annual Environment Monitoring Report".

c) Final report incorporating the PMU and ADB comments.

6. Schedule and Places of Assignment

Intermittent inputs during Tranche 1 implementation period from Q2 2017 to Q2 2020 (average two months inputs each year). Inputs will be on home office and field office based.

Attachment 8: Procurement Plan for Tranche 2

Basic Data

Project Name: Mahaweli Water Security Investment Program - Tranche 2	
Project Number: 47381-002	**Approval Number:**
Country: Sri Lanka	**Executing Agency**: Ministry of Mahaweli Development & Environment
Project Procurement Classification: Category A	**Implementing Agency**: N/A
Project Procurement Risk: Moderate	
Project Financing Amount: US$ 242,000,000 **ADB Financing:** US$ 210,000,000 **Non-ADB Financing:** US$ 32,000,000	**Project Closing Date:** 31 December 2021
Date of First Procurement Plan: 16 June 2017	**Date of this Procurement Plan**: 23 November 2017

A. Methods, Thresholds, Review and 18-Month Procurement Plan

1. Procurement and Consulting Methods and Thresholds

Except as the Asian Development Bank (ADB) may otherwise agree, the following process thresholds shall apply to procurement of goods and works.

Procurement of Goods and Works		
Method	**Threshold**	**Comments**
International Competitive Bidding for Goods	US$ 2,000,000 and Above	Threshold applies to all unless propriety items are required from overseas.
National Competitive Bidding for Goods	Between US$ 100,001 and US$ 1,999,999	
Shopping for Goods	Up to US$ 100,000	
International Competitive Bidding for Works	US$ 7,500,000 and Above	
National Competitive Bidding for Works	Between US$ 100,001 and US$ 7,499,999	
Shopping for Works	Up to US$ 100,000	
Community Participation in Procurement for Works	Up to US$ 20,000	Simple civil works contracts costing less than $20,000 each may be directly awarded to project area community groups / civil society organizations as a community works contract using existing government rates. ADB PAI 5.10 for community participation is followed.
Force Account for Works	Up to US$ 650,000	Includes works and goods. Total amount for entire Tranche 1 is $650,000 (this amount includes all contract packages under Tranche 1). Existing government rates shall be used. Utility shifting, field office works, and other works by government-owned entities (for activities which cannot be done by competitive contracting such as shifting power and telephone poles, realigning water/drainage pipes, road restoration, cables, cutting trees etc.)

Consulting Services	
Method	**Comments**
Consultant's Qualification Selection for Consulting Firm	
Least-Cost Selection for Consulting Firm	
Quality- and Cost-Based Selection for Consulting Firm	
Quality-Based Selection for Consulting Firm	
Individual Consultants Selection for Individual Consultant	

2. Goods and Works Contracts Estimated to Cost $1 Million or More

The following table lists goods and works contracts for which the procurement activity is either ongoing or expected to commence within the next 18 months.

Package Number	**General Description**	**Estimated Value**	**Procurement Method**	**Review** (Prior/ Post)	**Bidding Procedure**	**Advertisement Date** (quarter/year)	**Comments**
UEC-ICB-02A	Upper Elahera Canal - (27+509 to 55+600 km); Tunneling of UEC Tunnel 3 (TBM) and Tunnel 4 (D&B)	$314 million	ICB	Prior	1S2E	Q1 / 2018	Prequalification of Bidders: N Domestic Preference Applicable: N Advance Contracting: Y Bidding Document: Large Works
UEC-ICB-02B	Upper Elahera Canal: KMTC (0+000 to 8+813 km)	$49 million	ICB	Prior	1S2E	Q1 / 2017	Prequalification of Bidders: N Domestic Preference Applicable: N Advance Contracting: Y Bidding Document: Large Works

Attachment 9: Design and Monitoring Framework for the Investment Program

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Improved agricultural production and sustained economic growth in the North Central Province, Central Province, North Western Province and Eastern Province	By 2030: Annual growth of at least 8% in provincial GDP (baseline: 9.7% weighted average in 2010-2012). Agricultural production increases from SLRs 390 billion in 2012 to SLRs 600 billion (in 2012 prices).	Central Bank of Sri Lanka Annual Report Department of Agriculture and MASL annual reports	**Assumptions** Government completes NCPCP Phase 2 and associated command area improvement, and implements programs to improve productivity of water Government continues to maintain irrigation infrastructure in the investment program's beneficiary command areas
Outcome Secured access to water resources for agricultural and drinking purposes in project areas	By 2024: 974 mcm/year of water available from the Mahaweli System in North Central Province, inclusive of 70 mcm/year of raw water for 358,000 people (baseline = 60 mcm/year with 0 mcm/year for drinking in 2014) 130 mcm/year water available from the Mahaweli System in North Western Province (baseline= 0 mcm) Storage capacity of Minipe Anicut is increased to 1.25 mcm (baseline= 0.18 mcm in 2014) Irrigated area serviced by Mahaweli System increases to 162,000 ha with cropping intensity of 191% (baseline = 146,000ha and 188% in 2014)	For all indicators: MASL and DOI annual reports	**Risks** Climate change impacts on water availability and water demand by crops exceed projections
Outputs 1. New and improved water conveyance and storage infrastructure constructed	By 2024: Kalu Ganga - Moragahakanda Transfer Canal (9 km) and Upper Elahera Canal commissioned (82 km) By 2024: North Western Province Canal (96 km),	For all indicators: MASL and DOI progress reports	**Assumptions** Cofinancing will be secured on time. **Risk**

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
	two new reservoirs, and associated infrastructure commissioned By 2019: Minipe Anicut Heightened by 3.5 m, and Left Bank Canal and associated infrastructure rehabilitated (74 km)		Unexpected ground conditions cause implementation delays
2. Systems for improving water resources management and productivity developed	Recommendations from ISEWP plan implemented during 2019 to 2024 Recommendations from SIWRM plan approved by the government by 2024	MASL and DOI project and investment program progress and completion reports MMDE Annual Reports	
3. Multi-disciplinary investment program management operational	Timely submission of periodic financing requests for subsequent tranches Program outputs delivered on time and within budget	For all indicators: MMDE financial records and progress reports	

Activities with Milestones	Inputs
1. New and improved water conveyance and storage infrastructure constructed 1.1 For tranche 1, finalize detailed designs, and procurement documents, and award first contract of tranche 1 works package in Q4 2015 and last works package by Q1 2017 1.2 Commence works for tranche 1 in Q4 2015 1.3 Tender and award of tranche 2 works package in Q4 2016 1.4 Complete construction of tranche 1 works by Q4 2019 1.5 Tender and award the first works packages for Tranche 3 by Q4 2017 and last works package by Q4 2021. 1.6 Complete construction of tranche 2 works by Q4 2021 1.7 Complete construction of tranche 3 works by Q4 2024 **2. Systems for improving water resources management and productivity developed** 2.1 Award ISEWP consulting package and mobilize consultants by Q3 2016 2.2 Complete ISEWP consulting package by Q2 2018 2.3 Award SIWRM consulting package and mobilize consultants by Q4 2020 2.4 Complete SIWRM consulting package by Q4 2022	**Asian Development Bank: $453 million** **Government: $108 million** **Cofinancing: $114 million to be confirmed**
3. Multi-disciplinary investment program management operational 3.1 Mobilize PMDSC by Q3 2015 3.2 Prepare the detailed designs, cost estimates, and contract documents for Tranche 2 and 3 packages by December 2016 3.3 Finalize the feasibility study for NCPCP Phase 2 and prepare necessary documents for possible funding by Q2 2017 3.4 Finalize documents for consulting services package for SIWRM by Q4 2019 3.5 Prepare necessary reporting documents to the government and ADB (continuous)	

ADB = Asian Development Bank, DOA = Department of Agriculture, DOI = Department of Irrigation, EMP = environment management plan, GDP = gross domestic product, ISEWP = improving system efficiencies and water productivity, km = kilometer, m = meter, MASL = Mahaweli Authority of Sri Lanka, MCM = million cubic meters, MMDE = Ministry of Mahaweli and Environment, NCPCP = North Central Province Canal Program, PFR = periodic financing request, PMDSC = program management, design and supervision consultant, PMU = program management unit, PPTA = project preparatory technical assistance, RP = resettlement plan, SIWRM = strengthening integrated water resources management, SLRs = Sri Lankan rupees.
Source: Asian Development Bank.

Attachment 10: Design and Monitoring Framework for Tranche 1

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Improved agricultural production and sustained economic growth in the North Central, Central North Western and Eastern Provinces	By 2024: Annual growth of at least 8% in provincial GDP (baseline: 9.7% weighted average in 2010-2012). Agricultural production increases from SLRs 390 billion in 2012 to SLRs 600 billion (in 2012 prices).	Central Bank of Sri Lanka Annual Report MMDE and DOA annual reports	**Assumption** Government maintains irrigation infrastructure in the investment program's beneficiary command areas
Outcome Secured access to water resources for agricultural and drinking purposes in project areas	By 2019: 30 MCM/year water available from Mahaweli System to North Western Province (2014 baseline = 0) Storage capacity of Minipe Anicut is increased to 1.25 MCM (2014 baseline = 0.18 MCM)	For all indicators: MASL and DOI annual reports	**Risks** Climate change impacts on water availability and water demand by crops exceed projections
Outputs 1. New and improved water conveyance and storage infrastructure constructed	By 2019: 6.2 km of Upper Elahera Canal constructed Two new reservoirs and 27 km of the North Western Province Canal and associated infrastructure commissioned Minipe Anicut Heightened by 3.5 m, and 74 km of the Left Bank Canal and associated infrastructure rehabilitated	For all indicators: MASL and DOI progress reports	
2. Systems for improving water resources management and productivity developed	Recommendations from ISEWP plan approved by 2018	Project Progress Reports	

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
3. Multi-disciplinary investment program management operational	By 2017: Timely submission of PFRs for Tranches 2 and 3 Tranche 1 outputs delivered on time and within budget NCPCP Phase 2 investments planning documents are approved by MMDE.	For all indicators: MMDE financial records and progress reports	

Activities with Milestones	Inputs
1. New and improved water conveyance and storage infrastructure constructed	**Asian Development Bank: $150 million**
1.1 Finalize detailed designs and procurement documents, and award the first construction contract packages by Q4 2015 and the last construction package by Q1 2017	**Government $40 million**
1.2 Commence works for Tranche 1 in Q4 2015	
1.3 Complete construction of Tranche 1 works by Q4 2019	
2. Systems for improving water resources management and productivity developed	
2.1 Award ISEWP consulting package and mobilize consultants by Q3 2016	
2.2 Complete ISEWP consulting package by Q2 2018	
3. Multi-disciplinary investment program management operational	
3.1 Mobilize PMDSC by Q3 2015	
3.2 PMU prepares necessary reporting documents to the government and ADB (continuous)	
3.3 PMU establishes and operates a Program Performance Monitoring and Evaluation System (continuous)	
3.4 PDMSC supports PMU with preparing the detailed designs, cost estimates, and contract documents for Tranche 2 and 3 packages by December 2016	
3.5 PMDSC supports PMU with finalizing the feasibility study for NCPCP = North Central Province Canal Program Phase 2 and preparing necessary documents for possible funding by Q2 2017	

ADB = Asian Development Bank, DOA = Department of Agriculture, DOI = Department of Irrigation, EMP = environment management plan, GDP = gross domestic product, ISEWP = improving system efficiencies and water productivity, km = kilometer, m = meter, MASL = Mahaweli Authority of Sri Lanka, MCM = million cubic meters, MMDE = Ministry of Mahaweli Development and Environment, NCPCP = North Central Province Canal Program, PFR = periodic financing request, PMDSC = program management, design and supervision consultant, PMU = program management unit, PPTA = project preparatory technical assistance, SIWRM = strengthening integrated water resources management, SLRs = Sri Lankan rupees.

Source: Asian Development Bank

Attachment 11: Design and Monitoring Framework for Tranche 2

<table>
<tr><td colspan="4">Impacts the Project is Aligned with
Agricultural production improved and economic growth sustained in the North Central, Central North Western, and Eastern Provinces of Sri Lanka (program defined)</td></tr>
<tr><th>Results Chain</th><th>Performance Indicators with Targets and Baselines</th><th>Data Sources and Reporting</th><th>Risks</th></tr>
<tr><td>Outcome
New and improved water conveyance and storage infrastructure constructed</td><td>By 2024:
a. Kalu Ganga-Moragahakanda Transfer Canal (9 km) and Upper Elahera Canal (92 km) commissioned (2017 baseline: 0)
b. North Western Province canal, two new reservoirs, and associated infrastructure commissioned (2017 baseline: 0)</td><td>a-b. Project progress reports</td><td>Climate change impacts on water availability exceed projections.</td></tr>
<tr><td>Outputs
1. Completion of new and improved water conveyance and storage infrastructure increased</td><td>By 2021:
1a. Additional 21% of 101 km conveyance channel linking Kalu Ganga and Mahakandara reservoirs constructed (2017 baseline: 0)
1b. Additional 45% of Mahakithula and Mahakirula Reservoirs, and Mahakithula Inlet Tunnel constructed (2017 baseline: 0)</td><td>1a-b. Project progress reports</td><td rowspan="2">Unforeseen ground conditions and extreme weather conditions lead to delays in implementation</td></tr>
<tr><td>2. Multi-disciplinary investment program management operational</td><td>By 2019:
2a. PFR for tranche 3 submitted to ADB (2017 baseline: n.a.)
2b. Tranche 2 outputs delivered on time and within budget (2017 baseline: n.a.)</td><td>2a. PFR documents
2b. MMDE financial records and progress reports</td></tr>
<tr><td colspan="4">Key Activities with Milestones
1. Completion of new and improved water conveyance and storage infrastructure increased
1.1 Award UEC-ICB-2B contract for constructing 8.8 km conveyance channel linking Kalu Ganga and Moragahakanda reservoirs (December 2017)
1.2 Award UEC-ICB-2A contract for constructing 28 km tunnel (October 2018)
2. Multi-disciplinary investment program management operational
2.1 PMU prepares PFR for Tranche 3 to ADB (May 2019)
2.2 PMU prepares necessary reporting documents to the government and ADB (continuous)</td></tr>
</table>

Inputs
ADB: $179 million (regular loan) and $31 million (concessional loan) Government: $32 million
Assumptions for Partner Financing
Not Applicable

ADB = Asian Development Bank; DMF = design and monitoring framework; ICB = international competitive bidding, km = kilometer; MMDE = Ministry of Mahaweli Development and Environment; PFR = periodic financing request, PMU = Program Management Unit, UEC = Upper Elahara Canal,
Note: Output 2 was grandfathered from the facility DMF prepared under the old DMF guidelines.
Source: ADB.

Attachment 12: Communications Strategy Matrix

	Strategic Elements					Work Plan Elements			Evaluation
Communications Objective	**Key Risks**	**Audience/ Stakeholder**	**Current and Desired Behavior**	**Messages/ Information Needs**	**Channels /Activity**	**Timing**	**Responsibility**	**Resource Needs**	**Expected Outcomes**
1. Build a supportive stakeholder base for the project	People directly affected by the project could protest against the project leading to project delays	Project Affected People who will be resettled or compensated in the UEC and NWPCP canal areas (474 households)	Accept resettlement and compensation	Technical details on how they will receive compensation Compensation will follow SL government and ADB guidelines and will be provided in a timely manner. Grievance mechanisms will be in place	Direct through project authorities (MMDE) Face to face	Tranche 1 of project. Re-evaluation prior to each tranche and annual.	PMU with PIU support	Please see Budget in Section VI of main document	Please see M&E framework in Section IV of the main document
		People affected by project construction	Unaware/ Aware of issues and mitigations accept disruptions	Specific to each group and problem when they arise. But in general The project has taken every precaution to ensure that construction is done in a way to have minimal impacts on people. MMDE will share construction timetables and other information about potential impacts	Website <u>Media</u> Lanka Deepa Thinakaran Sunday Observer Hiru Shakti Srya Neth FM City FM Local meetings Local Economic Dev. and Ag. Ext. workers MMDE providing information				
		Downstream water users affected by the	Unaware of the potential impacts/ Aware	Need specific technical information on the impacts	Community meetings and consultations				

	Strategic Elements					Work Plan Elements			Evaluation
Communications Objective	**Key Risks**	**Audience/ Stakeholder**	**Current and Desired Behavior**	**Messages/ Information Needs**	**Channels /Activity**	**Timing**	**Responsibility**	**Resource Needs**	**Expected Outcomes**
		dams (Mahakithula and Mahakirula Reservoirs)	and accept mitigation	Need for continued consultation with the community to ensure their feedback Message Water flow will only be impacted during dam construction and impoundment. Better water management will result from dam construction	Radio Posting printed notices in villages Local officials providing information				
		Divisional Secretaries Elahera Medirigirya Galenbidunuwewa Palugaswewa Dambulla Galewela Polpithigama Mahawa Eheluwewa Abanpola Galgamuwa Naula Minipe Hasalaka Laggala Pallegama Wigamuwa	Minimally aware of project and safeguard related issues/ Aware and supportive	Need specific technical information on impacts and mitigation Messages: The project will manage all environmental and project risks and eventually local areas will see improvements in economic development and water security	Local advertising Briefings Regular updates Project and gov't web sites				
	Politicization of the project and protests by current	Office of the President	Completely aware and strongly supportive	- This projects is a high priority for the government -The project has the potential to bring	Tours Press conference				

	Strategic Elements					Work Plan Elements			Evaluation
Communications Objective	**Key Risks**	**Audience/ Stakeholder**	**Current and Desired Behavior**	**Messages/ Information Needs**	**Channels /Activity**	**Timing**	**Responsibility**	**Resource Needs**	**Expected Outcomes**
	users against water transfers derail project			economic benefits in the North and East which will benefit the entire country. -There will be increased water access in all project areas not just the Northern zones. -MOUs and other provisions have been established to ensure current water rights and availability will not be reduced - All safeguard and other policies have been put in place including special attention to human wildlife conflicts and CKD	and media releases Govern't web sites Briefings Testimony to Parliament Progress reports Media advertising around some issues (e.g. construction, bidding, resettlement, water use issues)				
		Parliamentary committees Parliamentarians from project areas	Awareness varies generally supportive but could use for political purposes/ Aware constantly informed supportive	See above	See above				
		Ministry of Irrigation Water Resources Management (MRWIM)	Completely aware and strongly supportive	See above	See above				

	Strategic Elements					Work Plan Elements			Evaluation
Communications Objective	**Key Risks**	**Audience/ Stakeholder**	**Current and Desired Behavior**	**Messages/ Information Needs**	**Channels /Activity**	**Timing**	**Responsibility**	**Resource Needs**	**Expected Outcomes**
		Ministry of Mahaweli Environment and Development (MMDE)	Somewhat aware but not of details/ Aware and strongly supportive						
		Mahaweli Authority of Sri Lanka (MASL) Divisional Secretaries	Completely aware and strongly supportive Somewhat aware but not of details/ Aware and strongly supportive	See above	See above				
		Current water users in the South affected by water transfers	Unaware/ Aware and local groups along canal route supportive	There will be increased water access in all project areas not just the Northern zones. -MOUs and other provisions have been established to ensure current water rights and availability will not be reduced. - Economic benefits will accrue to people in project areas and the country as a whole. Strong environmental safeguards have been put into place including attention to wildlife and CKD	Media Local Economic Dev. and Ag. Ext. workers Community meetings Gov't briefings Project and Gov't web sites Dramas, concerts, cultural shows where relevant and effective				

	Strategic Elements					Work Plan Elements			Evaluation
Communications Objective	**Key Risks**	**Audience/ Stakeholder**	**Current and Desired Behavior**	**Messages/ Information Needs**	**Channels /Activity**	**Timing**	**Responsibility**	**Resource Needs**	**Expected Outcomes**
		Farmers groups	Unaware/ Aware and local groups along canal route supportive	See above					
		Civil society: NGOs who have attended consultations (e.g, Environmental Foundation LTD,Centre for Environmental Justice, Federation of Environmental Organizations SL, etc).	Generally aware of project and supportive but lack faith safeguards plans will be implemented Could protest and delay project. Specific individual NGOs will have questions about specific aspects of project/Fully aware of project, fully informed throughout	There will be increased water access in all project areas not just the Northern zones. -MOUs and other provisions have been established to ensure current water rights and availability will not be reduced. - Economic benefits will accrue to people in project areas and the country as a whole. -Strong environmental safeguards have been put into place including attention to wildlife and CKD. -Transparent policies in place and CSOs to be involved in monitoring	Direct email Briefings Project tours Project and gov't web sites Brocures and Fact sheets Consultation Progress and monitoring reports				
		NGOs who have not yet participated in consultations (including both wildlife and social development organizations)	Unaware/ Fully aware of project, fully informed throughout	See above	See above. Also, individualized meetings/ outreach to key organizations.				
		Media	Some aware/ Aware able to cover issue with knowledge.	The project has the potential to bring economic benefits in the	Briefings Field trips				

	Strategic Elements					Work Plan Elements			Evaluation
Communications Objective	**Key Risks**	**Audience/ Stakeholder**	**Current and Desired Behavior**	**Messages/ Information Needs**	**Channels /Activity**	**Timing**	**Responsibility**	**Resource Needs**	**Expected Outcomes**
			promote positive outcomes of project	North and East which will benefit the entire country. -MOUs and other provisions have been established to ensure current water rights and availability will not be reduced. -Strong environmental safeguard provisions have been put into place -PAPs are being treated fairly and beyond the current SL requirements -Bidding and awards; project impacts on people; construction progress and problems will all be transparent	Press conference Regular information updates				
	Beneficiaries not aware or supportive of benefits question project and costs expectations high	Office of the President Ministry of Mahaweli Environment and Development (MMDE) Mahaweli Authority of Sri Lanka (MASL) Divisional Secretaries	Fully aware of project and providing strong political and public support for project	- The project has the potential to bring economic benefits in the North and East which will benefit the entire country. -There will be increased water access in all project areas not just the Northern zones. -The project has a long timeframe of at least 10 years and construction be phased so benefits will accrue over this time frame and beyond	Media Parliament meetings Public events Community events in project areas				
		Farmers groups In project area	Aware of project but do not know all benefits/ Fully aware and	There will be increased water access in all project areas zones which will help with better water management; the delivery	Local Economic Dev. and Ag. Ext. workers				

	Strategic Elements					Work Plan Elements			Evaluation
Communications Objective	**Key Risks**	**Audience/ Stakeholder**	**Current and Desired Behavior**	**Messages/ Information Needs**	**Channels /Activity**	**Timing**	**Responsibility**	**Resource Needs**	**Expected Outcomes**
			supportive of project advocating for completion	of quality water; and the potential for strong economic benefits -The project has a long timeframe of at least 10 years and construction be phased so benefits will accrue over this time frame and beyond	MMDE outreach programs Media Community Meetings Dramas, concerts, cultural shows where relevant and effective Brochures and fact sheets				
		<u>Business Community</u> Chambers of Commerce Board of Trade	Aware of project not public advocates/ Fully aware and informed about project believe in outcomes publicly supportive	The project has the potential to bring economic benefits in the North and East. This will not only help boost development and employment but will bring new and better business and service to the area. This development will benefit the entire country -MOUs and other provisions have been established to ensure current water rights and availability will not be reduced. -Strong environmental safeguard provisions have been put into place	Media Specialist trade publications Seminars and conference Internal web sites Briefs to Parliament Brochures and fact sheets Regular consultations timed to project updates				

	Strategic Elements					Work Plan Elements			Evaluation
Communications Objective	**Key Risks**	**Audience/ Stakeholder**	**Current and Desired Behavior**	**Messages/ Information Needs**	**Channels /Activity**	**Timing**	**Responsibility**	**Resource Needs**	**Expected Outcomes**
				- Mitigation for wildlife issues and CKD have been into place -PAPs are being treated fairly and beyond the current SL requirements -The project has a long timeframe of at least 10 years and construction be phased so benefits will accrue over this time frame and beyond	Involve in monitoring process Website Direct through email lists Brochures and fact sheets FAQs on project details, implementation benefits, procedures etc.				
		<u>NGOs</u> NGOs who have attended consultations (e.g, Environmental Foundation LTD,Centre for Environmental Justice, Federation of Environmental Organizations SL, etc).	aware of project and supportive but lack faith safeguards plans will be implemented could protest and delay project/Fully aware of project, fully informed throughout	See above	See above				
		NGOs who have not yet attended consultations	Unaware//Fully aware of project, fully informed throughout	See above	See above				

	Strategic Elements					Work Plan Elements			Evaluation
Communications Objective	**Key Risks**	**Audience/ Stakeholder**	**Current and Desired Behavior**	**Messages/ Information Needs**	**Channels /Activity**	**Timing**	**Responsibility**	**Resource Needs**	**Expected Outcomes**
	Environmental impacts not mitigated leading to political concerns and civil society protests	Mahaweli Authority of Sri Lanka (MASL MMDE	Aware and supportive of project advocates for project	This project has gone beyond the environmental measures required by Sri Lankan law to take proactive steps to enhance stakeholder consultation and to address	Media News Conferences and results Progress reports Consultations Project and Gov't web sites Briefings Field trips				
		Civil Society	Aware and generally supportive of project but skeptical that environmental plans will be mitigated. Some specific NGO concerns about CKD and human wildlife interactions	The project values the feedback from NGOs and encourages NGOs with comments or concerns to contact the Program Director at any time	Direct email Briefings Project tours Project and gov't web sites Brocures and Fact sheets Consultation Progress and monitoring reports				
		Media	Some aware/ Aware able to cover issues of environment		Editorial Board meetings Briefings				

	Strategic Elements					Work Plan Elements			Evaluation
Communications Objective	**Key Risks**	**Audience/ Stakeholder**	**Current and Desired Behavior**	**Messages/ Information Needs**	**Channels /Activity**	**Timing**	**Responsibility**	**Resource Needs**	**Expected Outcomes**
			wildlife and CKD issues with knowledge. promote positive outcomes of project		New releases Media tours				
	CKD	Ministry of Health (MOH) MMDE	Fully aware of CKD issues and promoting project strategies to mitigate including pointing project actions and benefits of more better quality water to North and East	Many factors contribute to CKD and none are part of this project The project has the potential to mitigate some of the factors through the provision better quality water	-Local health workers, doctors, clinics Local Economic Dev. and Ag. Ext. workers MMDE Dramas, concerts, cultural shows where relevant and effective				
		Local communities in project area	Concerned that project might increase incidences of CKD/ Aware of projects impacts and mitigation on issue. Reassured or neutral Fully aware and supportive of project and the wildlife issues act as						

	Strategic Elements					Work Plan Elements			Evaluation
Communications Objective	**Key Risks**	**Audience/ Stakeholder**	**Current and Desired Behavior**	**Messages/ Information Needs**	**Channels /Activity**	**Timing**	**Responsibility**	**Resource Needs**	**Expected Outcomes**
			information sources and advocates						
	Wildlife issues	Civil Society Ministry of Wild Life Resources and Conservation (MWRC) MMDE		Project has taken proactive steps to address the potential human elephant conflicts in the project area including initiatives to develop an action plan with local government agencies and national and international environmental and wildlife organizations. In some cases, forest preserves have been expanded					
		Civil Society Wildlife and Naturalist organizations Local communities in affected areas	Strongly aware of wildlife issues and human interactions/ believe project is doing all it can to mitigate negative human/wildlife interactions	Project has taken proactive steps to address the potential human elephant conflicts in the project area including initiatives to develop an action plan with local government agencies and national and international environmental and wildlife organizations. In some cases, forest preserves have been expanded					

Communication Objectives	Risks	Audiences/ Stakeholders	Current and Desired Behavior	Messages/ Information Needs	Channels/ Activities	Timing	Responsibility	Budget Needs	Expected Outcomes
2. To deliver an effective external communication program that minimizes project risks	Weak EA capacity to implement communications program leads to poor project outcomes	Ministry of Mahaweli Environment and Development (MMDE) ADB project team	Motivated to establish team/ Establishing strong team and monitoring outputs	A strong communication team is essential to project outcomes and reputational risk management	Face to face Internal meetings Establishment of communications officers in PMU and PIU				
	Internal government conflicts driven by poor communication delays project	MMDE Ministry of Finance and Mass Media MWRC MOH Mahaweli Authority of Sri Lanka (MASL) Office of the President Divisional Secretaries	Roles and responsibilities unclear so mixed messages given and information flows weak/ Unified messages given All internal stakeholders fully informed and promoting project	A united message and position on the project will lead to the best outcomes. Information related to the project's implementation must be shared across all government stakeholders	Briefings Internal meetings Web site Progress reports FAQs and talking points Trainings and briefings for spokespersons interfacing with media and/or affected people				
	Insufficient information about projects leads to perceptions of negative impacts on operations and projects	Multilateral and bilateral aid agencies with related projects: World Bank IFAD FAO WHO JICA USAID	Aware of project/ Fully aware of project details and impacts on their operations. Satisfied meets all financial and other safeguards requirements	The project meets all safeguards and financial requirements. Project is conducted in an inclusive and transparent manner and information is freely available. Fully informed about potential impacts on other agencies projects	Briefings Web Sites Progress Reports Field Trips				

		AFD	Supportive of project.						

Attachment 13: Communications Strategy Matrix Evaluation

SCS Strategy Matrices (1-10)

SCS (Appendix A): *Strategy Matrix 1*: Updated MWSIP SCS (Communication Strategy) Planning Matrix 2016

Priority 1: GENERAL PUBLIC: All Sri Lankans are stakeholders and need to understand the Investment Program is "theirs" and that water sharing is a benefit to all.

Objective: All stakeholders will understand that the civil works is in final phase of completion and will assure water reaches everyone. They also understand that civil works planned & in process includes plan assuring social safeguards to persons affected and no negative impacts to the environment.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	MESSAGES CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH:	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING NEEDED:
The mass public-all Sri Lankans	Stakeholders understand the benefit of sharing water equitably, when explained from a holistic view, is linked to Sri Lanka's long range development. They learn that the lengthy period (10 years) required to complete the projects is result of a rigorous process of correct	All Sri Lankans need water and is a gift from God for their livelihood and survival. Conflict has delayed water development for some decades but now we are working together in harmony to complete the job.	Through mass media (R, TV, newspapers, in any circumstance. Orientation meetings, conferences, and training of those who outreach. PIU interactive engagement of stakeholders in conveying info to leaders, PAP's and environmental groups.	Packet 1 primarily (General Overview) but packets 2-6 as may be useful in more specific engagements with target stakeholders identified for other SCS priorities. (See description Proposal for packet 1)	Most important milestone event is to engage all known stakeholders and impacted communities (PAP's) B4 any civil works starts: described further in Work Plans. Synch with construction task, Environment and Social Safeguard agendas in these three project sites:	Described further in Detailed Work Plans 2016 2017-2020 SCS interventions must be in synch with planned activities in key task areas.	Task 5, PMU and PIU at three sites	Budget: See SCS P5 Table: Budget Procure digital equipment for PMU & PIU to record and edit materials Web Site development Special broadcast R & TV air time for PSA/commercial spots Production of documentaries for TV on MWSIP Production of media tool kits/packets Hosting of press	See Update SCS Part VIII Appendix: e) M&E Proposed M&E indicators and choose as may be appropriate. Add: *Monitoring*: Frequency and kind of broadcast and newspaper coverage of MWSIP Extent community groups, NGO's, national and local leaders, PAP's are outreached and frequency of engagement Frequency of "hits" at Web Site (once up and running) and the level of engagement by those accessing. Particularly should there be a blog. *Evaluating*:	Training of PMU, PIU and others who outreach stakeholders to increase interpersonal communication skills, creative use of media, and accessing the mass media, as detailed in updated SCS as a proposal for com training.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	MESSAGES CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH:	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING NEEDED:
	contracting and construction measures and safeguards to environment and PAP's. They will ultimately understand that improving access to water stressed areas in the north is a worthwhile "investment" !	Civil works will proceed for 10 years assuring correct and safe process, with rigorous safeguards in place for PAP's and the environment to avoid negative impacts or compensate for those who lose homes, land or enterprises.	Use of MWSIP web site from info collected by PMU, PIUs of all media. Social media and use of Smart phones A video documentary describing the MWSIP.		MLBCR NWPC UEC			conferences, trainings & exhibits.	Public Opinion surveys about MWSIP-overall program, environmental safeguards and social safety net for PAP's Through relevant periodic surveys, targeted stakeholders are responding more favorably to the civil works of investment program and agree that PAPs and the environment will be/are being protected through the established Safeguards Program. The extent to which web site access by stakeholders result in positive, opposed to negative feedback by those accessing the site; should there be a blog set up in future, this would be a way to further gauge public opinion and expectations for how Task 5 might alter messaging and make some strategy changes, based on feedback.	

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	MESSAGES CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH:	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING NEEDED:
									Web site: with IT assistance, this could be an excellent tool to research stakeholder opinions and concerns for the investment program on many levels of information needs.	

SCS (Appendix A): *Strategy Matrix 2:* Updated MWSIP SCS (Communication Strategy) Planning Matrix 2016

Priority 2: COMMUNICATORS ABOUT INVESTMENT PGM: Those conveying information about Investment program lack uniformity in messaging and often do not have available simple to understand supportive tools.

Objective: Through capacity building facilitated by Task 5 and coordinating with Task 4, everyone communicating with stakeholders about the Investment Program are doing so effectively.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH:	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
Anyone representing investment program from PMU and PIU who engage stakeholders about the investment program in any way.	All investment program staff, through orientation and training, understand the investment program and	Contained in the content for orientation and training to be developed in collaboration with Task 4.	Messages are included in the content for an orientation workshop course in communications for managing all aspects of SCS	Utilize the six media tool kits/packets to be produced for SCS. Other media materials to use as	Training and orientation to occur after web site launched, digital equipment procured	ASAP following hiring of 3 new PIU com staff. Earmark earliest at mid-year. Following production	In collaboration with Task 4, Task 5 will facilitate with PMU and consider contracting outsourced trainers	Locally procured media trainer as facilitated by Task 5 Content-subject matter specialist	Indicators and work performance studies as to how PMU and PIU com staff are performing in their roles and how to provide more capacity building in areas needing improvement	This is a capacity building effort, as linked with task 4.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH:	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
1 PMU and 3 PIU communication officers whose job is to manage and do communications of any kind to stakeholders of the investment program. Any other groups collaborating with investment staff in joint outreach activities with stakeholders	its task team components. All relevant staff who communicate investment program are able to describe the highly technical construction projects and Safeguard Program in simple, easy to understand and visualize, utilizing a wide range of multi-media tools (supplied by Task 5 team) Staff are experiencing positive and satisfying interactions with the various stakeholders as result of their interactions. PIU com staff are proactive in documenting a wide array		implementation.	examples of publication products, videos or Power Point Presentations The web site to access for training on its use.		of Com Tool Kits/Packets Following set up of web site.	depending on the training component.	from relevant task teams who help orient new staff. Venue – conference room to conduct the training at Colombo Digital cameras and PC's for technical training AV Projection equipment PIU's	Success Stories on PMU/PIU com team carrying out their supportive work on all aspects of the investment program.	

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH:	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
	of information using digital cameras and writing simple but informative reports and stories of process and progress impacts. Successful cooperation between PMU and PIU communication staff in uploading text and media for web site, reports on works progress and success stories. Positive engagements with the national and regional mass media in positive coverage of investment program.									

SCS (Appendix A): *Strategy Matrix 3 :* Updated MWSIP SCS (Communication Strategy) Planning Matrix 2016

Priority 3: ADVANCED NOTICE: People in communities to be impacted by civil works are often not informed in advance about plans in time to gain a better understanding and comprehension of the works to be accomplished and how it will affect them, directly or indirectly and what options they have to be compensated if they have to be resettled. Delays in communicating these details to PAPs, can result in anxiety, distrust and lack in confidence in the investment program.

Objective: PAP's aware in advance of construction through timely outreach about the civil works being planned, and when impacted with relocation they understand the process and steps to file a claim or grievance through the Social Safeguards program in place.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE CAN LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
All who are affected by civil works planned and in process. *NOTE: Those in three civil works areas. SCS has already identified these:* *PAP's who will be resettled or compensated in the UEC and NWPCP canal areas.* *Downstream water users affected by dams at Mahakithula and at Mahakirula Reservoir.* *Current water users in the*	As result of being contacted by PIU in advance of the startup of civil works, all persons in communities impacted directly or indirectly by construction understand the rationale for the construction program overall, and say they agree with Social Safeguards program to compensate those who must relocate due	*Details on the Social Safeguards Program and its compensation mechanism. Includes steps to apply for compensation, through whom, timing, and basis of calculating compensation amounts.* *Details on exact sites of construction works (maps).*	PIU com staff and relevant social safeguards staff convey the info on relocation and compensation issues, interacting directly with PAP's and others in attendance. Social Safeguard issues directly or indirectly impacting PAP's conveyed in broadcast radio programs and	(See Proposal for Prod of Media Tools-Packets with details on Social Safeguards conveyed through various print and other formats) Media Packet 1 for general engagement Media Packet 3 specific to "PAP's.	Interventions by PIU com and Social Safety officials in outreaching PAP's need to do so before 1st contact with communities by anyone undertaking initial construction works.	Input Task 5 activities with Tasks 2 and 3, "Accelerated Implementation Schedule" as appearing in subsequent Work Plans for 2016 and 2017-2020.	Task 5 team, PMU and PIU, coordinated with Tasks 2, 3, and Social Safeguards team PMDSC, PMU and PIU.	See this same column in Priority 1 Matrix. Note: *Task 5 team will identify more specific resources that may be required for this priority as Task 5 implementation goes forward.*	In addition to what is described in Priority 1 matrix, some specific indicators for PAPs and Social Safeguards: *Monitoring:* Number, frequency, and issues discussed in meetings called by, or in attendance by PIU and Social Safeguard team in describing to PAP's, the Social Safeguard program. Number and frequency of PAP's contacting PIU in request for info about Social Safeguards program.	Task 5 team, coordinate with Task 4 to train PMU and PIU staff in implementing the SCS. Details in Proposal "A Training and Orientation Course in Implementing the MWSIP SCS.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE CAN LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
South affected by water transfers. OTHERS TO BE IDENTIFIED AS PROGRAM MOVES FORWARD.	to land acquisition. Those PAP's requiring compensation, and/ or relocation understand the Social Safeguards program and the process per the program's Social Safeguards program to be compensated. If dissatisfied with the results, they understand how to process their concerns and grievances via the GRM system.	*Compensation will follow Sri Lanka government and ADB guidelines and be timely.* *Details on the GRM mechanism to appeal decisions on relocation and compensation.*	interviews with relevant PIU officials and PAP's. Published details on Social Safeguards program in newspaper articles written by reporters covering stories specific to these communities. Reports and stories from PIUs uploaded for Web site describing Social Safeguards program.						Identify NGO's, CBO's and local opinion leaders who are in attendance at meetings discussing Social Safeguards, and their level of response to Social Safeguards program and issues concerning resettlement and GRM Process. *Evaluating*: PAP's overall state they understand the Investment program and the reasons that some must relocate to complete necessary civil works to assure equitable distribution of water. PAP's cite their understanding of Social Safeguards program and agree that while it is unfortunate some must relocate; they agree the compensation offered via the program is adequate.	

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE CAN LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
									PAP's who are told they must relocate state they understand the reasons they must move and are supportive that the "sacrifices" they and others in their situation should make is for the benefit of all to receive equitable access to water when all civil works is completed at the end of the program. All PAP's state they understand the process to access the GRM program and can describe the steps to file a claim and grievance, if they were to pursue a course of appeals should they be affected and not agree with outcome of their claim.	

SCS (Appendix A): *Strategy Matrix 4:* Updated MWSIP SCS (Communication Strategy) Planning Matrix 2016

Priority 4: ENVIRONMENT & NATURAL RESOURCES GROUPS: who may or may not be critical of the investment program need to understand the program's environment safeguards in place to be assured forest land and wildlife will be protected from effects of construction.

Objective: NGO's who are supportive or known to be unsupportive of the Investment program become more aware of environmental safeguards and see the program of construction as positive in achieving equitable distribution of water while simultaneously protecting forests and wildlife.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED	LINKED TO PROGRAM M&E & REPORTING/ SPECIAL STORIES	CAPACITY BUILDING:
NGO's focusing on environment and natural resource protection and conservation of forest lands. NGO's who already have attended and participated in investment program meetings and other interactions. NGO's who have never responded or participated in investment program meetings, et al.	Environment & Natural Resources (ENR) groups, who by default, would advocate for ENR safety and be vigorously protected when land is under development, understand agree that robust and sound protection and safeguard measures in place are sufficient to assure them that the investment program planned and ongoing	*Details on the Environment Safeguards Program* *Focus on how the civil works in three project sites will not negatively impact forests nor exacerbate the Human-Elephant conflict*	PIU com staff interacts with ENR NGO's at meetings to discuss ENR safeguard measures. ENR Safeguard issues conveyed in broadcast radio programs and interviews with relevant PIU officials and communities near protected forests and areas known for human –	See Proposal for Prod of Media Tools-Packets with details on Protection Measures for Environment conveyed through various print and other formats) Media Packet 1 for general engagement Media Packet 2 specific to	Interventions by PIU com and Environment Safeguard officer outreach to ENR NGO's and local opinion leaders before 1st contact by a construction task team into communities bordering on, or in close proximity to wildlife and fragile forest lands.	Input Task 5 activities with Tasks 2 and 3, "Accelerated Implementation Schedule"	Task 5 team, PMU and PIU, coordinated with Task 6: SEA Strategy team, PMDSC, PMU and PIU	See this same column in Priority 1 Matrix. Note: *Task 5 team will identify more specific resources that may be required for this priority Task 5 implementation goes forward*	In addition to what is described in Priority 1 matrix, some specific indicators for outreach to ENR NGO's: ***Monitoring***: Number, frequency, and issues discussed in meetings called by, or in attendance by PIU and ENR officers in describing the environment safeguards in place in construction areas.	Task 5 team, coordinate with Task 4 to train PMU and PIU staff in implementing the SCS. Details in Proposal "A Training and Orientation Course in Implementing the MWSIP SCS.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED	LINKED TO PROGRAM M&E & REPORTING/ SPECIAL STORIES	CAPACITY BUILDING:
NGO's know to be in opposition to the investment program as their stance on negative construction impacts on wildlife, forests, and tourism. Sri Lankan public at large who would be supportive of a clean and safe environment as part of cultural heritage.	construction will not be a threat to forest conservation or wildlife. ENR NGO representatives understand the overall program 's goal of channelling water to the north will result in positive development gains for the country as a whole, as expected livelihoods will improve for people currently living in water stressed areas of the North by their increased agriculture productivity. ENR NGO's when engaged by investment program, even those known to be in opposition, are in greater attendance and more	*The sound environmental protection measures the MWSIP has included in its water expansion program has enabled a peaceful close to a long standing conflict. (This could be said from a spiritual angle)*	elephant conflicts. Newsletter (quarterly/bi-annual) Published details on ENR safeguards program in newspaper articles written by reporters covering stories specific to these communities. Web site upload linking with Investment Program ENR Safeguards In Place" (to be established) A TV ad aimed at all Sri Lankans highlighting the beauty and splendour of the land, captured in	"Environmental Protection and Protection Measures"	Periodic return visits to impacted communities and PAPs to maintain positive relations about the investment program and extent PAPs are being serviced through Social Safeguards program.				Number and frequency of ENR NGO's contacting PIU in request for info about the environment safeguards program. Identify NGO's, CBO's and local opinion leaders who are in attendance at meetings discussing ENR concerns and gauge their level of response as pertains to their understanding there are ENR Safeguards in place. ***Evaluating***: Representatives of ENR NGO's state they understand the Investment program and can explain what those safeguards are.	

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED	LINKED TO PROGRAM M&E & REPORTING/ SPECIAL STORIES	CAPACITY BUILDING:
	participatory at meetings and events where these engagements are helping to iron out differences where they may agree to leverage each other for mutual benefit.		moving images of a variety of Sri Lanka's water and other resources. Images include animals in their natural surroundings, with closing images accompanying overall messaging that effectively says the investment program with its safeguards in place, keeps the water flowing to everyone while maintaining a home for all of Sri Lanka's wildlife, as it maintains their pride in culture and national heritage.							

SCS (Appendix A): *Strategy Matrix 5:* Updated MWSIP SCS (Communication Strategy) Planning Matrix 2016

Priority 5: COLLABORATING ORGANIZATIONS IN OUTREACH: As all Sri Lankans value a healthy environment and assured access to water for all uses, all are stakeholders in the investment program; given that scenario, organizations who work on environment and natural resources programs could collaborate jointly in outreach and promotion to maximize impact.

Objective: Officials in relevant line ministries, other ENR projects, and academic-research institutions are collaborating with the investment program, adding value to their respective outreach by sharing information, materials and are jointly conducting outreach when appropriate to maximize positive impacts.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
Identified in more detail SCS Update, pp 10-11. Initial focus on: Environment & Natural Resource NGO's Government Officials national, sub national and village level Div. Secretaries Line Ministries who have ENR/agriculture programs Politicians - Pres Office, MP's	Target groups in this category see the investment program as one they wish to collaborate with as they can strengthen, rather than oppose it. Those organizations that are likewise prioritizing ENR/agriculture/irrigation outreach in their projects see value in leveraging with investment program and are conducting joint outreach on topics of mutual interest. Government leaders, national and local become advocates for equitable water	*Complete list of target groups, needs and messaging appear in Original SCS Part III: Stakeholders, Messaging Approaches and Communication Activities to utilize.*	Presentations by relevant PMU and PIU at conferences, meetings, etc Broadcast radio and TV ads and news coverage about civil works progress and successful problem solving Web site stories, updates, reports and videos that update these stakeholders on progress.	(See Proposal for Prod of Media Tools-Packets with details on Social Safeguards conveyed through various print and other formats) Media Packet 1 for general engagement Media Packet 5 specific to "Interagen	Initial outreach with these stakeholders when these occasions: Info Tool Kits/packets are produced. Web site is developed and operational. 3 PIU Com officers are employed. Mass media representatives fully oriented about investment program	Synchronized with key milestone events described to the left block, but envision as an ongoing level of engagement during the entire program. Feedback from ongoing monitoring and documentation of events and accomplishments by PIU staff will yield material for PMU to craft stories and materials of	Task 5 team (PMDSC, PMU and PIU Com Staff)	See this same column in Priority 1 Matrix. Note: *Task 5 team will identify more specific resources that may be required for this priority as Task 5 implementation goes forward*	In addition to what is described in Priority 1 matrix, some specific indicators for PAP and Social Safeguards: *Monitoring:* Number, frequency, and issues discussed in meetings called by, or in attendance by PIU with these stakeholders. Number, frequency and issues discussed in Press Conferences during mass media engagement.	Task 5 team, coordinate with Task 4 to train PMU and PIU staff in implementing the SCS. Details in Proposal "A Training and Orientation Course in Implementing the MWSIP SCS.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
UNREDD, IWMI Educational Institutions / Universities	access, and speak positively about the investment program plans and achievements as road to economic development.		Feature articles in Sri Lanka newspapers and magazines. PMU and PIU com staff and others who are chosen to be "spokespersons" appear routinely on national TV and radio to talk about the investment program, focusing on how program is addressing PAP's and Environmental Safeguards with good results.	cy Cooperation"	and media access is established.	interest to upload to web site and to engage mass media for reaching this target group.			Number, frequency and topics where PMU, PIU and target stakeholders shared in joint outreach. *Evaluating*: These target stakeholders cite positive engagements with investment program activities and information they receive from various media about progress of investment program doing successful implementation in construction, servicing PAP needs, and maintaining environmental safety. More positive coverage of progress, events and accomplishments of the investment program throughout implementation by the national, regional and community media.	

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
									Universities and research institutes are accessing information about investment program from the web site and are jointly collaborating in sharing information as leverage to all engaged in these partnerships.	

SCS (Appendix A): *Strategy Matrix 6:* Updated MWSIP SCS (Communication Strategy) Planning Matrix 2016

Priority 6: PROGRAM COLLABORATING WITH LOCAL COMMUNITIES: When PIUs collaborate with local NGOs/CBOs and other local respected opinion leaders, PAP's better understand their options for being compensated when affected by construction works. These groups can assist in conveying information about social safeguards program and compensation – grievance process for persons and need to know how the Investment program social safeguards program to be effective in assisting those who need to file claims for compensation.

Objective: PAPs better understand and are successfully accessing social safeguards program services when PIU is working closely with community NGO's and local opinion leaders.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTSING/SPECIAL STORIES	CAPACITY BUILDING:
PIU com and social safeguards staff in each of three project areas NGOs & CBOs at village level who engage PAPs Local Farmer Organizations at these locations. Local Opinion Leaders to include	PIU com and social safeguard staff programmatically linked to do joint outreach with local community groups to PAPs. NGO successfully engaged with PIU in planning & doing joint outreach to PAPs Know the implementation program	*Details on the Social Safeguards Program and its compensation mechanism.*	***Note: As linked with Priority 3 outreach to PAPs, these interventions and support in outreach emphasizes joint engagements by PIU through collaboration with local groups who may have strong credibility with PAPs*** These are already identified in SCS update pp 10-11: Face-to-face	See Proposal for Prod of Media Tools-Packets with details on Social Safeguards conveyed through various print and other formats) Media Packet 1 for general engagement Media Packet 3	Interventions by PIU com and Social Safety officials in outreaching PAP's need to do so before 1st contact with communities by anyone undertaking initial construction works. It is a given that continual engagements and hopeful joint	Input Task 5 activities with Tasks 2 and 3, "Accelerated Implementation Schedule" to assure PAPs and local leaders know of the investment program and social safeguard program prior to any construction works 1st visit to the area.	Task 5 team, PMU and PIU, coordinated with Tasks 2, 3, and Social Safeguards team PMDSC, PMU and PIU	See this same column in Priority 1 Matrix. Note: *Task 5 team will identify more specific resources that may be required for this priority as SCS implementation goes forward*	In addition to what is described in Priority 1 matrix, some specific indicators for PAPs on Social Safeguards program and PIUs engaged with local community groups outreaching to PAPs: *Monitoring:* Number, frequency, and issues discussed in meetings called by, or in attendance by PIU, Social Safeguard team, community groups and PAPs in describing to PAPs, the Social Safeguard program.	**PIU com staff when oriented and trained in investment program and communications will be more effective in outreach to PAPs and community NGOs and opinion leaders** **Greater capacity building when these community groups to include farmer associations and water**

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTSING/SPECIAL STORIES	CAPACITY BUILDING:
religious leaders.	well enough to articulate to PAPs and other groups who likewise may not be fully aware of program from holistic perspective. PIUs and local organizations working jointly are able to maintain harmony and congenial relations in meetings and when servicing the needs of PAPs in resettlement claims – GRM process.		consultation meetings at village or divisional level. Assure involvement of women and youth groups. Relationship building by project staff with village leaders including religious leaders or other opinion leaders so that they can serve as spokespersons or advocates. Dissemination of key messaging to chairmen of Farmer's Organizations (FOs) through Divisional Agricultural Committee Meetings (DACM) and Project Management Committee Meetings (PMCM) organized by	specific to "PAP's. Media Packet 5 specific to "Interagency Cooperation and Liaison"	outreach will occur through proactive collaborations between PIU and local groups on helping PAPs.				Identify NGOs, CBOs and local opinion leaders who are in attendance at meetings discussing Social Safeguards, and their level of response to Social Safeguards program and issues concerning resettlement and GRM Process. *Evaluating*: PAPs overall state they better understand the Investment program and social safeguards when explained In joint outreach by PIU working with local groups and local opinion leaders. PAPs state they believe the investment program, through PIU and joint outreach with local groups, described the civil works and social safeguards clearly and that the information conveyed to them was helpful, even for those who have to relocate.	**user groups are already participating in PIU outreach but welcome to partake in trainings.** **Perhaps add training in conflict resolution-interpersonal communications as chances are there will be need to facilitate some "anger management" when working with PAPs.**

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTSING/SPECIAL STORIES	CAPACITY BUILDING:
			the DOI. Chairmen of FOs will be responsible for disseminating information to their respective FOs. Information Education Communication (IEC) campaign to disseminate project information and results of monitoring reports in formats that are accessible to village level stakeholders. Include: -brochures -posters -radio jingles or announcements; -village level events such as fairs or cultural competitions; - announcements via public address systems; -public notice boards						. .	

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTSING/SPECIAL STORIES	CAPACITY BUILDING:
			and/or hoardings; -fact sheets, etc. Text message and mobile phone outreach for short announcements or updates. Community radio programs as guests to discuss investment program and PAP issues. Newsletter (quarterly-bi-annual)							

SCS (Appendix A): *Strategy Matrix 7:* Updated MWSIP SCS (Communication Strategy) Planning Matrix 2016

Priority 7: INFORMING PAPs ABOUT SAFEGUARDS PROGRAM: PAPs are not fully aware of the grievance and claims filing process to be compensated when losing land, enterprises or their homes. They need to know who to contact and seek assistance in getting more information and help from those NGOs who can advocate on their behalf.

Objective: Persons who are affected in any way become more aware of the Investment program as for why construction/renovations work is important and as a result of outreach from PIU, they know how to proceed with steps to be compensated when they need to resettle and know who can assist them.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS.	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
All who are affected by civil works and need to file for compensation or access GRM. *NOTE: Those in three civil works areas. SCS have already been identified:* *PAPs who will be resettled or compensated in the UEC and NWPCP canal areas (474 households).*	PAPs are fully aware why their community and area around their community was targeted for civil works and the reasons some have to be relocated; they are also aware of steps to file claims for compensation and/or accessing the GRM system.	*Details on the Social Safeguards Program and its compensation, relocation assistance, and GRM mechanism.* *Compensation will follow Sri Lanka government and ADB guidelines and be timely.*	PIU com staff and relevant social safeguards staff present info on relocation and compensation issues, interacting directly with PAPs and others in attendance. Social Safeguard issues directly or indirectly impacting PAPs conveyed in broadcast radio	(See Proposal for Prod of Media Tools-Packets with details on Social Safeguards conveyed through various print and other formats) Media Packet 1 for general engagement Media Packet 3	Interventions by PIU com and Social Safety officials in outreaching PAP's need to do so before 1st contact with communities by anyone undertaking initial construction works.	Input Task 5 activities with Tasks 2 and 3, "Accelerated Implementation Schedule"	Task 5 team, PMU and PIU, coordinated with Tasks 2, 3, and Social Safeguards team PMDSC, PMU and PIU	See this same column in Priority 1 Matrix. Note: *Task 5 team will identify more specific resources that may be required for this priority as Task 5 implementation goes forward.*	In addition to what is described in Priority 1 matrix, some specific indicators for PAP and Social Safeguards is displayed in Priority 3: PAP	Task 5 team, coordinate with Task 4 to train PMU and PIU staff in implementing the SCS. Details in Proposal "A Training and Orientation Course in Implementing the MWSIP SCS. Include section on conflict resolution

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS.	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
			programs and interviews with relevant PIU officials and PAPs. Published details on Social Safeguards program in newspaper articles written by reporters covering stories specific to these communities. Web site upload linking with "Social Safeguards In Place" (to be established).	specific to "PAP's.						

SCS (Appendix A): *Strategy Matrix 8:* Updated MWSIP SCS (Communication Strategy) Planning Matrix 2016

Priority 8: SUPPORT OF POLITICIANS & OFFICIALS: High level officials of government, private sector and other organizations, recognized to influence outcomes of development projects, need to understand the overall benefits of the investment program reach out to their organizations as well, and view it as "theirs". Thus, they open the road to remove potential obstacles.

Objective: More relevant politicians and leaders of large organizations at national and sub national level understand the investment program as being a benefit to their constituents and that their action and support in removing obstacles, "red tape", and vocal support in the mass media will aid in a successful completion of the investment program beneficial to all.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO:	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING NEEDED
Although SCS has identified list of major stakeholders to include high level officials (see SCS, pp 19-22, these persons/groups can be critical to include per the objectives: President's office Cabinet members Cabinet Committees Members of Parliament CEOs of major Sri Lanka based corporations who	Each of these target politicians, government heads, and leaders of large corporations firstly understand why the investment program is critical to achieve fair and equitable distribution of water. By becoming "believers" in the investment program, these groups, through routine	Describe why supporting the investment program will benefit their constituents.	SCS suggests a number of approaches, pp 19-22. For this update, additional approaches: Their attendance at conferences and meetings where critical updates and issues are discussed on the program. Web site updates of information covering all aspects of program	Suggest Media Packet #1 Overview with added information from packets 2-6.	For certain, this is an ongoing series of interventions that, for starters, can firstly rely on the program web site, once launched. Subsequent access to mass media for radio – TV interviews and coverage of events will help posture the investment program in positive	Described further in Detailed Work Plans 2016 2017-2020	Task 5, PMU and PIU at three sites	Budget: See SCS P5 Table: Budget Special broadcast R & TV air time for PSA/commercial spots Production of documentaries for TV on MWSIP Production of media tool kits/packets Hosting of news conferences, trainings & exhibits.	See Update SCS Part VIII Appendix: e) M&E Proposed M&E indicators and choose as may be appropriate. Add: *Monitoring*: Frequency and kind of engagements with high level leaders and officials in any event or situation. Frequency and kind of newspaper or broadcast coverage of investment program engagements with these target groups, national and local. Frequency of "hits" at Web Site (once up	Suggest special workshop or course to investment program leaders how to communicate effectively with politicians to gain their support. (How to Lobby in Your Favor!)

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO:	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING NEEDED
are connected with use of water Directors of main utility companies Directors of private sector associations that may be influential to issues Ministers of government line agencies External relations department of Ministry of Finance and Mass Media /Department of Treasury	outreach and sharing information, would move toward becoming supporters and hopeful advocates for the program and help in raising positive public opinion on the program. Parliamentarian representatives (PM) become fully aware of the investment program through PMU/PIU engagements and when they pass on information to their constituents about investment program, the information would be correct, consistent, and be supported by the PM		implementation accessible to these groups. Video doc-presentation on the program that focuses on milestone engineering achievements of a program of this magnitude, the safeguards for PAPs and the environment, and the long range benefits to the economy. Expanded news coverage by mass media when these target groups are in attendance of, and/or participating in activities on site or in Colombo on investment program issues/events.		light to these target groups. Additional approaches and timings at national and sub national level are included in SCS, pp19-22.				and running) and the level of engagement by those accessing. Particularly should there be a blog. *Evaluating*: Through survey national and sub national politicians, assess their level of knowledge and stand as for supporting the investment program. The nature and outcomes of contact with and level of support/encouragement as may be offered by these target groups on any issue of the program. The extent and level of participation of these target groups at events and functions hosted by the investment program.	

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO:	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING NEEDED
	conveying the information.		Newsletter (quarterly/bi-annual)							

SCS (Appendix A): *Strategy Matrix 9:* Updated MWSIP SCS (Communication Strategy) Planning Matrix 2016

Priority 9: THE MASS MEDIA: For the Investment's communication program to receive positive public opinion the PMU and PIU need to gain the support and positive coverage of the investment program events and accomplishments by the mass media through continual engagement throughout the program.

Objective: Representatives of the mass media are aware of the implementation program and by understanding the benefits to all in equal water distribution when civil works are accomplished in future, will also cover issues surrounding relocation and environmental concerns by conveying information about social safeguards and environmental protection as integral to the investment program's ongoing implementation.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO:	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
See complete list of mass media reps to consider as target groups, SCS pp 22-25 Special emphasis on these groups in	Journalists and news reporters/broadcasters: seek their understanding of the investment program and convince them that program is worth covering from its massive technical	Information to orient all to investment program and specifics for safeguard programs in place.	Conf or seminar to orient mass media reps Routine press release from PMU	Packet #1 primarily (General Overview) but packets 2-6 as may be useful in more specific engagements with	Priority to host conference to orient media to the investment program, and explore ways to	Introductory seminar/conference at Colombo and at regional sites should occur initially before construction starts.	Task 5, PMU and PIU at three sites	Budget: See SCS P5 Table: Budget Special broadcast R & TV air time for PSA/commercial spots	See Update SCS Part VIII Appendix: e) M&E Proposed M&E indicators and choose as may be appropriate. Add: *Monitoring*: Frequency and kind of meetings and	Include in the training proposal for PMU and PIU com staff, a component-lesson on

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO:	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
getting organized: News Directors of national and sub national broadcast radio & TV Regional news reporters who cover stories for local radio and TV. Freelance journalists and their associations Communication directors on other donor funded projects who may have an interest in investment program ADB Sri Lanka mission external outreach director Communication or PR heads of line ministries	achievements in supplying water to all and its program of safeguards to PAPs and environmental protection measures will assure no negative impacts. All groups agree to receive press release and other reports as PMU/PIU's tool to alert them to events, and progress to secure their coverage for news. As is expected positive relations will have been achieved with the mass media through initial and ongoing engagements, when a problem occurs at the civil works sites, news reporters would notify PMU/PIU in advance of doing a story on the occurrence and give "equal time" for MWSIP to respond.		on program activities Web site info that mass media can easily access Their attendance at meetings, seminars and exhibits for coverage. Newsletter (quarterly-bi-annual)	target stakeholders identified for other SCS priorities. (See description Proposal for packet 1)	collaborate in coverage of the program. This could begin with national meeting and then followed up with series of regional meetings at location closest in proximity to three PIU sites. Activities launching and progress milestones on constructions in each 3 project sites.	Press coverage-press releases when new projects begin in 3 areas, at milestone events for sub projects in 3 areas and when completion of projects.		Production of documentaries for TV on MWSIP Production of media tool kits/packets Hosting of news conferences, trainings & exhibits.	conferences hosted with various media groups in orienting media to the program. Frequency and kind of broadcast and newspaper coverage of investment program. *Evaluating*: The extent to which the media, following initial and ongoing engagements, are providing coverage for investment program and if the stories are positive or negative toward the investment program. Public Opinion surveys about MWSIP-overall program, to gain insight to the extent the mass media has influenced attitudes towards the investment program.	accessing national and local mass media.

SCS (Appendix A): *Strategy Matrix 10:* Updated MWSIP SCS (Communication Strategy) Planning Matrix 2016

Priority 10: COORDINATION BETWEEN PMU & PIU: For successful implementation of the Investment program communication strategy ongoing, successful achievements will come about through close coordination of tasks between the PMU and PIU staff.

Objective: According to their TOR's, and as result of capacity building, PMU and PIU communication officers are coordinating their work according to work plans that respond to the SCS.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
Communication Officers of PMU and PIU	With guidance from PMDSC, PMU and PIU communication staff are performing their roles per their individual TORs and managing the work tasks according to the SCS. Key issues: Joint work plans Methods of coordinating their work Maintaining close coordination	The SCS is a guide to access in understanding the logic to do outreach and media access. The PMU and PIU need to coordinate respective work plans as response to PMDSC work plans developed by Task 5 PMDSC consultants.	Work Plan sessions to develop uniform work plans Emails Text messaging with cell phones Documents	All five Media Tool Kit/Packets	Upon hiring the 3 PIU communication staff And, as determined through performance reviews on areas to strengthen skills, ongoing	Assume midyear 2016 Arrange follow on trainings when appropriate.	Task 5 PMDSC	Materials produced special for training, per course design	This needs to be linked with Task 4 as for performance reviews and continual needs for skills enhancement.	Task 5 and Task 4 collaborate in facilitating training of PMU, PIU and others who outreach stakeholders to increase interpersonal communication skills, creative use of media, and accessing the mass media, as detailed in updated SCS as a proposal for com training.

PROFILE OF AFFECTED STAKEHOLDERS & BENEFICIARIES	DESIRED-HOPEFUL OUTCOMES – BEHAVIORS:	WHAT MESSAGES SHOULD BE CONVEYED:	METHODS TO CONVEY INFO-MESSAGES:	INFO PACKETS & TOOLS:	KEY MILESTONE EVENTS WE MUST LINK WITH	WHEN:	WHO: Responsible	RESOURCES NEEDED:	LINKED TO PROGRAM M&E & REPORTING/SPECIAL STORIES	CAPACITY BUILDING:
	of com needs with Safeguard staff on environment and resettlement issues and assuring these activities are monitored and reported on.									

UPDATED CONTRIBUTION TO THE ADB RESULTS FRAMEWORK

No.	Level 2 Results Framework Indicators (Outputs and Outcomes)	Targets	Methods / Comments
1	Land improved through irrigation, drainage, and/or flood management (hectares)	162,000	Additional water supply and improved water delivery will increase cropping intensities and resilience to droughts.

Source: Asian Development Bank.

UPDATED ECONOMIC AND FINANCIAL ASSESSMENT

A. Introduction

1. This summary contains an analysis of the economic costs and benefits of the North Central Province Canal Project (NCPCP).[1] The first phase of the NCPCP, which is being implemented under the Mahaweli Water Security Investment Program, comprises the Minipe Left Bank Canal Rehabilitation Project (MLBCRP), the Northwest Province Canal Project (NWPCP), and the Upper Elahera Canal Project (UECP). These investments will be financed from the proceeds of ADB's proposed multi-tranche financing facility (MFF). The construction of the UECP, which accounts for about two-thirds of the total cost of Phase 1, is needed to implement Phase 2 of the NCPCP. This second phase mainly consists of the construction of the Kalinganuwara Pumping Station, the Lower Uma Oya Dam, the Randenigala-Kaluganga Transfer Complex and the North Central Province Canal. Given that the infrastructure to be financed by the MFF is needed to realize economic benefits that will accrue upon completion of the Phase 2 investments, the economic analysis presented here covers the entire NCPCP instead of the part to be financed under the MFF. This analysis presented in this document is based on that undertaken for the approval of the MFF but applying latest cost estimates and prices.

B. Macroeconomic Assessment

2. Since the end of the civil war in 2009, Sri Lanka has witnessed rapid economic growth. From 2010 to 2015, gross domestic product (GDP) increased by over 6.2% per annum in real terms. The poverty head count dropped from 15.2% in 2006/07 to 6.7% in 2017. From 2009 to 2015, the share of the agricultural sector dropped from 12.0% to 7.5% of real GDP. Nonetheless, the agricultural sector has continued to employ over 27% of the nation's labor force since 2000. Consequently, the agricultural sector is important to Sri Lanka's economy in terms of economic outputs and employment. The sector is especially important in the central and northern provinces, where it accounts for 25% of regional GDP and employs over 50% of the labor force.[2]

C. Demand Analysis

3. At present, over 50% of the population in the NCPCP's beneficiary area is dependent on irrigated agriculture. Cropping intensities in existing cultivated areas are suppressed, mainly because of persistent water shortages. Thus there is a strong demand by farmers for additional irrigation water to increase agriculture production, which currently mostly consists of paddy, and allow the cultivation of higher value-added crops. The NCPCP will also help to improve food security in the area, which is lower than in most other parts of Sri Lanka. Given the limited agricultural production and food insecurity status of the project area, there is a strong local demand for the additional agricultural production to be generated by the project.

D. Rationale

4. The NCPCP will improve deliveries of irrigation water and provide raw water to water utilities and hydropower plants. These are private goods that can, in principle, be delivered to individual customers. However, because farmers are presently exempt from paying irrigation water charges, it is not possible for the private sector to undertake the project on a financially profitable basis. Without some form of public intervention, the market will construct no (or fewer) irrigation water infrastructure than is optimal from a societal point of view. To address this market failure, government intervention is proposed in the form of capital grants and (to the extent required) operation and maintenance (O&M) subsidies.

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1 For details, refer to the supplementary document.

2 *Economic and Social Statistics of Sri Lanka 2016*. Central Bank of Sri Lanka.

E. Project Alternatives

5. The NCPCP is the least-cost option that was identified to achieve the objective of providing water to the project area whilst minimizing adverse impacts on the existing system and the environment. A large number of studies and simulations were undertaken to select the infrastructure that would best achieve this objective. The main reasons for choosing the selected option can be summarized as follows:[3]

(i) shortest transfer route length compared to alternative options studied;
(ii) least environmental damage compared to alternative options studied;
(iii) optimization of infrastructure to be developed under Moragahakanda and Kaluganga Reservoir projects which are currently under construction; and
(iv) enhanced flexibility with regard to regulation of flows.

F. Methodology and Data

6. **Overview.** An economic analysis was prepared for NCPCP in accordance with ADB's *Guidelines for the Economic Analysis of Projects* (2017). The guidelines describe four basic steps to analyzing the economic viability of a project: (i) identify economic costs and benefits; (ii) quantify economic costs and benefits (comparing with-project and without-project situations for each alternative); (iii) value economic costs and benefits; and (iv) compare benefits and costs.

7. **Economic surplus model.** This was used to measure the agriculture benefits of the project. As a result of a project intervention, changes in the quantity of a commodity can result in product price changes, which together leads to changes in economic welfare. Economic surplus comprises two elements: consumers' surplus and producers' surplus. Consumers' surplus is defined as the extra amount a consumer would have been prepared to pay, and is measured as the area below the demand curve and above the price line. The basic premise of consumers' surplus is that at a certain market price there are some consumers who would be willing to pay a higher price to obtain the same quantity, and their welfare is increased by obtaining the product at a lower price. The traditional measure of producers' surplus is the area above the product supply curve and below the price line. This area represents the difference between what a producer actually receives for a sale and the minimum amount he would have been prepared to accept.

8. The standard economic surplus model was used to measure the impact of a rightward shift in commodity supply functions resulting from increased agriculture production from additional irrigation water supplied by the project. This will have consumer and producer effects both within the project area and the rest of Sri Lanka. In the project area, there will be a direct effect on producers through the increase in supply of a commodity. Assuming competitive conditions prevail, this will also have broader implications on the rest of the country through the reduced market price as a result of increased supply. This will impact upon consumers (who gain) and producers (who lose) outside the project from the reduced market price.

9. **Identification and quantification of economic costs and benefits.** The project's incremental economic costs and benefits were identified and (to the extent possible) quantified for the period 2015-2060 (30-year implementation period from completion of NCPCP). All costs and benefits were expressed in mid-2017 economic prices including physical contingencies, but excluding transfer payments. The economic cost-benefit analysis was conducted using a world price numeraire. For internationally traded inputs and outputs, economic prices (at farm gate) were derived from international border prices and adjusted for the cost of transportation, handling, processing and packing. For non-traded inputs and

3 For details, refer to *Pre-Feasibility Study for the Implementation of North Central Province Canal* (MCB, 2012).

outputs, financial prices were obtained from local markets and converted into economic prices using the standard conversion factor (SCF) estimated at an average 0.89. The economic price of farm labor was estimated by applying a shadow wage rate factor of 0.7 to the financial price of this input.

10. **Valuation of economic costs.** The incremental economic costs of the proposed NCPCP comprise the project's incremental investment cost and operations and maintenance (O&M) during the project's economic lifetime. The total economic investment cost of NCPCP was estimated at SLR 251.7 billion (or approximately $1.68 billion). To reflect the benefits that may accrue after the end of the project's economic lifetime in 2060, the residual value of the project was set at 20% of the economic investment cost. The incremental economic O&M cost was estimated at 1.5% per year of the economic investment cost and consists of pumping costs, and cleaning and minor repair costs of project assets. In 2050, hydraulic steel structures and mechanical equipment will need to be replaced. The one-time replacement cost was estimated at 10% of the economic investment cost.

11. **Valuation of economic benefits.** The NCPCP will finance investments in infrastructure that will enable the government to divert water from the Mahaweli River to water-scarce areas in the northern dry-zone region. Upon completion of the proposed investments, the available supply of water is expected to increase by over 1,200 million cubic meters per year.[4] The increase in available water will have quantifiable economic benefits for: (i) increased agricultural production; (ii) increased provision of raw water for domestic, municipal and industrial (DMI) uses; and (iii) increased hydropower generation. In addition, the following benefits were assessed qualitatively: increased food security and increased internal security.

12. **Risk analysis.** A quantitative risk analysis was included to account for uncertainty in key project parameters; (i) phase I capital and O&M costs; (ii) forecast phase II capital costs being considerably higher than cost estimates; (iii) crop yields not achieving forecast gains; (iv) the standard conversion factor; and (v) the annual reduction in without-project crop area due to climate change. A triangular probability distribution was used to represent variability in the random variables, and is specified by minimum, most likely and maximum values. The risk model was simulated for 5,000 iterations and the results are reported in terms of the mean, standard deviation and percentile values. (Para 23).

Table 1: Risk Analysis Triangular Distribution Parameter Values

Parameter	Minimum	Most likely	Maximum
Phase I capital costs scalar	0.95	1.00	1.20
Phase I O&M costs scalar	0.95	1.00	1.20
Phase II capital costs scalar	1.00	1.20	1.40
Paddy yield scalar	0.70	1.00	1.10
Other field crops yield scalar	0.90	1.00	1.10
Sugarcane yield scalar	0.70	1.00	1.10
Standard conversion factor	0.88	0.89	0.92
Climate change annual crop area reduction (%)	0.085	0.099	0.113

13. **Valuation of economic benefits from increased agricultural production.** The primary economic benefit of the NCPCP is increased agricultural production through improved deliveries of irrigation water. More specifically, improved irrigation water supply is expected to result in: (i) an increase in the cropping intensity (CI) on existing cultivated areas; (ii) an increase in paddy yields owing to secured supply of water; and (iii) an increase in the production of high-value crops (such as fruit and vegetables).

4 *Water Balance Study of NCP Canal Project* (MCB, 2012), hereafter also referred to as "the Water Balance Study".

14. The project will increase water deliveries to 232,500 hectares (ha) of irrigable land in Sri Lanka's dry zone ("the Agricultural Benefit Area"). About 214,500 ha is already used to grow crops, mostly paddy, and the remaining 18,000 ha will be cultivated upon completion of Phase 1. Crop areas are expected to decline in some regions due to increased soil moisture deficits associated with temperature rises and reduced rainfall from climate change. Per a recent analysis, air temperatures in the project area will be 1.3ºC to 1.7ºC higher in 2050 than during 1961-1990.[5] The reduction of agricultural production in the "without project" (WOP) scenario due to reduced planting was estimated. It is expected that agricultural production will not decrease owing to climate change in the "with project" (WP) scenario as the newly built irrigation infrastructure will mitigate the adverse climate change impacts by securing the availability of water for agriculture. The risk analysis includes a parameter for the reduced annual crop area, estimated from two simulation options of climate change impacts on agriculture (see footnote 5). A small yield benefit is expected due to the project improving the timing of water supplies to fields. The yield losses for the without-project scenario due to poor distribution are represented as probability distributions in the risk analysis.

15. CIs in existing cultivated areas are currently suppressed due to persistent shortages of irrigation water. Records of the Mahaweli Authority of Sri Lanka (MASL) indicate that CIs are about 50 percent lower in Yala (the dry season, which usually lasts from May to August) than in Maha (the wet season, which starts in September and ends in March). At present, the average CI of the Agricultural Benefit Area is 1.42, meaning that about 331,000 ha (i.e. 1.42 x 232,500 ha) is harvested on an annual basis. Upon completion of the NCPCP in 2031, the CI will increase to 1.86. As a result, and taking into account the impact of climate change, the harvested area will be about 108,000 ha larger, and annual agricultural production over 1.2 million tons higher vis-à-vis the "without project" scenario (Table 2).

16. MASL manages a series of major irrigation schemes that are located in or near the Agricultural Benefit Area, and which already enjoy an adequate supply of irrigation water, notably Systems B, C and H. Actual cropping patterns in these systems were analyzed to define cropping patterns in newly harvested areas in the benefit area. Based on the analysis, the following allocation rules were formulated:

(i) Maha: 100% paddy. It is unusual for farmers in the Agricultural Benefit Area to grow crops other than paddy in Maha, even in well-irrigated areas.

(ii) Yala: 25% paddy, 75% **"other field crops" (OFCs)**. Based on current cropping patterns in Systems B, C and H.[6] About half of the increase in the harvested area for OFCs will be used for banana and maize (24% each), and the remainder for vegetables (14%), green gram (14%), chillies (11%), ground nut (11%) and big onions (2%).

17. In addition, about 6,600 ha in the Kantale area (which are currently fallow) will be allocated to sugarcane to help reduce Sri Lanka's considerable sugar imports. Upon completion of NCPCP, over 63% of the expected increase in the harvested area will be absorbed by paddy, 6% is allocated to sugarcane, and the remaining 30% to OFCs.

5 C. S. De Silva. *Impact of Climate Change on Water Resources and Agriculture in Sri Lanka*. Proceedings of the International Conference on Climate Change Impacts and Adaptations (2013).

6 *Economic Analysis in Financial and Economic Terms of the North Central Province Canal Project of Mahaweli Development Program* (MCB, 2012).

Table 2: Harvested Area and Agricultural Production, 2031

Crop	Harvested Area ('000 ha)			Agricultural Production ('000 tons)		
	WOP	WP	∆Area	WOP	WP	∆Production
Paddy, Maha	199	226	27	1,158	1,328	170
Paddy, Yala	98	135	36	489	682	193
OFCs	34	65	39	236	473	237
Sugarcane	-	7	7	-	643	643
Total	331	433	109	1,884	3,126	1,243

Source: Asian Development Bank (assumed allocation), MASL (other).

18. The economic value of final outputs and agricultural inputs was estimated by converting financial prices into mid-2017 economic prices using conversion factors mentioned in para 9. Paddy yields were assumed to increase by 0.1 ton/ha per year in Maha until the end of Phase I and remain stable thereafter. Assumed paddy yields in Yala and OFC yields are the actual yields realized in Systems B, C and H during 2012-2015. The present value of the economic benefits from increased agricultural production (excluding risk analysis) is estimated at SLRs 195.9 billion (Table 3), or 94.1% of the total present value of the project's quantifiable benefits. This comprises SLRs 85.1 billion from paddy, SLRs 29.2 billion from sugarcane, and SLRs 81.5 billion from OFC. In terms of the welfare effects, consumers in the project area and in the remainder of the country gain SLRs 66.2 billion and SLRs 122.2 billion, respectively; and producers in the project area gained SLRs 124.9 billion, but in the rest of country lost SLRs 117.5 billion (due to lower market prices).

Table 3: Results of Discounted Economic Surplus Analysis
(SLRs billion)

	Paddy	Sugar	OFC	Total
Project area				
Consumer surplus	31.0	15.4	19.8	66.2
Producer surplus	52.8	12.1	60.1	124.9
Total surplus	83.8	27.5	79.9	191.1
Rest of country				
Consumer surplus	54.4	10.3	57.6	122.2
Producer surplus	-53.0	-8.5	-56.0	-117.5
Total surplus	1.4	1.7	1.6	4.8
Total				
Consumer surplus	85.4	25.7	77.4	188.5
Producer surplus	-0.2	3.6	4.1	7.4
Total surplus	85.1	29.2	81.5	195.9

Source: Asian Development Bank.

19. **Valuation of economic benefits from increased provision of raw water for DMI uses.** An important secondary economic benefit of the NCPCP is improved provision of raw water for DMI uses. By 2031, the project will provide 162 million cubic meters of raw water per year to five districts ("the DMI Benefit Area"), which will provide piped water to about 830,000 persons. The quantifiable economic benefits of the NCPCP with respect to raw water are primarily non-incremental, resulting in resource cost savings. They comprise:

(i) **Economic benefits from improved sources of non-piped drinking water supply.** The proposed irrigation canals will provide additional and secure supplies of raw water to areas that are currently water-scarce. This will provide substantial benefits to persons living in the DMI Benefit Area (including those currently without access to piped water) by lowering the cost of obtaining water for domestic uses (easier access to water sources, no need to pay water

vendors) and by lowering health costs (better quality water, more reliable supply of water). This is especially relevant given the high incidence of chronic kidney disease (CKD) in the DMI Benefit Area, which is widely believed to be associated with the absence of safe and clean drinking water supply.

(ii) **Economic benefits from improved sources of piped drinking water supply.** The project will enable the water utilities in the DMI Benefit Area to provide piped water at a lower cost than without the project, mainly because of substantial cost savings on transmission mains, source works and groundwater development. This would not only lower the cost of providing water, but also enable the government to achieve its coverage targets for the project area earlier than would otherwise be the case.

20. **Valuation of economic benefits from increased hydropower generation.** From mid-2018 to 2030, the project will result in an increase in hydropower generation of 18 gigawatt-hour (GWh) per year, and the economic benefits of the increase were estimated at SLRs 451 million per year. From 2031 until the end of the project's lifetime in 2060, the economic benefit is minus SLRs 1,057 million per year, because hydropower generation will drop by 42 GWh per year after commissioning of the NCPCP. The net present value of the hydropower generation is estimated at minus SLRs 2,888 million, or about -0.1% of the total present value of the project's benefits

21. **Economic benefits from increased food security (not quantified).** The economy of the Agricultural Benefit Area is heavily dependent on irrigated agriculture, and droughts therefore adversely affect food security in the area. According to a recent survey undertaken by the World Food Programme, the 2014 Maha drought doubled food insecurity in 15 of Sri Lanka's 26 districts (including all four districts in the Agricultural Benefit Area) and increased the share of households with inadequate diets by 6-18%.[7] The NCPCP would improve food security in the Agricultural Benefit Area and thereby potentially protect at least 70,000 households from malnutrition during a drought event.

22. **Economic benefits from increased internal security (not quantified).** The NCPCP is the capstone of the Mahaweli Development Program (MDP), which was formulated in 1968 with the objective of harnessing the hydropower and irrigation potential of the Mahaweli River. The civil war that ravaged Sri Lanka from the early 1980s until 2009 caused a major delay in the implementation of MDP, and impoverished most of the area that stands to benefit from NCPCP. This observation especially applies to the districts of Anuradhapura and Vavuniya, which were located near the front line of the conflict, and where most of the project's beneficiaries are living. This means that the project will also serve the higher-level goals of restoring prosperity in a formerly conflict-affected area and help prevent the resumption of civil strife in that area.

G. Results

23. The economic net present value (ENPV, discounted at the 9% assumed economic opportunity cost of capital) and the economic internal rate of return (EIRR) were derived from a simulation of the risk analysis model. The mean ENPV was SLRs 52.58 billion (standard deviation SLRs 11.99 billion) and mean EIRR was 12.05% (standard deviation 0.79%), indicating that the NCPCP is economically feasible. The breakdown on the composition of the benefits and costs comprising the NPV are given in Table 4. No sensitivity analysis was undertaken as the key variability in project parameters is accounted for in the risk analysis. The percentiles are plotted in Figure 1, and indicate that the economic viability of the project is a zero probability of being below the economic threshold.

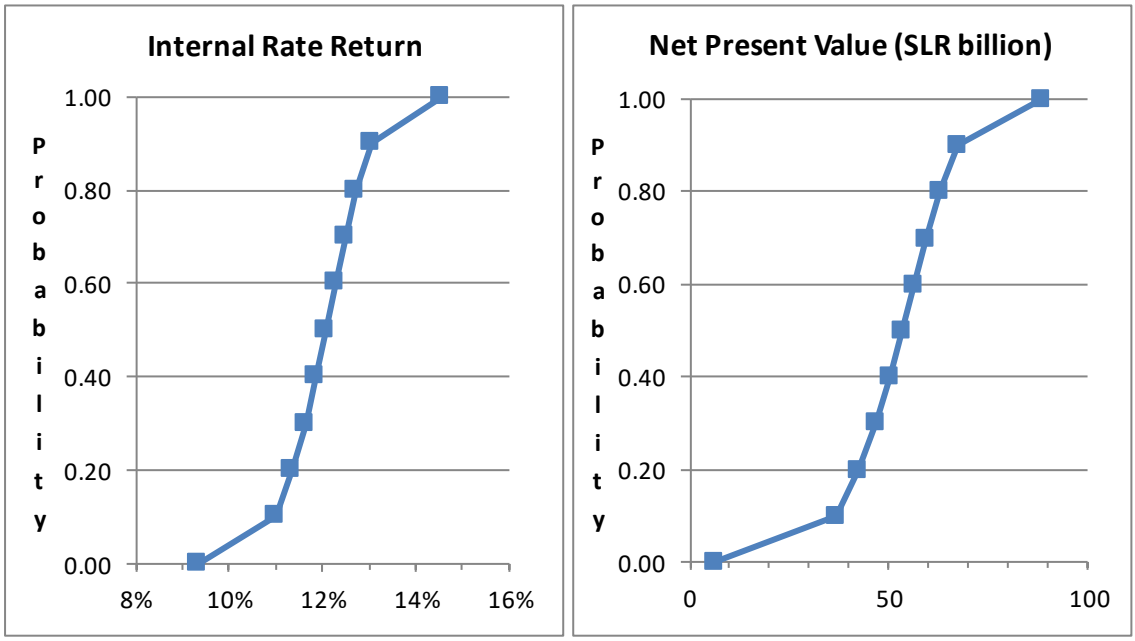
7 *Sri Lanka - Rapid Drought Impact Assessment: Food Security and Livelihoods Affected by Erratic Weather*. World Food Programme. April 2014.

Table 4: Composition of Mean Net Present Value
(SLR billion)

	Agricultural Benefits	Water Supply Benefits	Hydropower Benefits	Total Benefits	Total Costs	Net Present Value
Mean	188.2	12.6	-0.3	200.6	148.0	52.6
Standard Deviation	7.5	0.6	0.0	7.5	8.9	12.0

Source: Asian Development Bank.

Figure 1: Percentiles of EIRR and ENPV



H. Distribution and Poverty Analysis

24. **Distribution of project benefits to stakeholder groups.** Three stakeholder groups were considered: government, agricultural producers and consumers (agriculture and water). These groups were further disaggregated into the project region and the rest of the country. The government will finance the investment and O&M cost of the project. Because the project will not generate incremental revenue (with the exception of a small increase in revenue from hydropower), this stakeholder incurs a substantial net loss. Agricultural consumers and producers in the region will capture most of the net gains (Table 5). The poverty impact ratio of NCPCP is estimated at 31.3%.

Table 5: Distribution of Project Benefits
(SLR billion)

Present Value of:	Govern-ment	Consumers		Producers		TOTAL
		Project area	Rest of SL	Project area	Rest of SL	
Economic benefits						
- Agricultural	-	66.2	122.2	124.9	-117.5	195.9
- Piped water	3.9	7.7	-	-	-	11.6
- Non-piped water	-	1.1	-	-	-	1.1
- Hydropower	-0.3	-	-	-	-	-0.3
Economic costs	-153.9	-	-	-	-	-153.9
Gains and losses	**-150.3**	**75.0**	**122.2**	**124.9**	**-117.5**	**54.4**
Benefits to poor	-10.3	27.4	8.2	50.0	-8.9	66.3
Poverty Impact Ratio[a]						**31.9%**

SL = Sri Lanka
[a] Assumed poverty rates: national 6.9%, rural 7.6%, small farmers 40%.
Sources: ADB estimates, WB (2013), IFAD (2014).

FINANCIAL ANALYSIS

25. **Introduction.** The UECP will be operated and maintained by MASL and the MLBCP and NWPCP will be operated and maintained by the Department of Irrigation (DOI). Per government policy, these projects will not (and were not designed to) generate direct financial revenue that could be used to cover the incremental operations and maintenance costs. Instead, the government will finance these costs from its own sources. This section first presents estimates of the expected O&M costs of the investment program. It then presents estimates of the past and projected budgets of MASL and DOI, and concludes that they are likely to have sufficient financial resources to cover the expected O&M costs.

26. **Incremental O&M costs.** The cost of routine O&M mainly comprises pumping costs, cleaning costs, and minor repairs of project assets; and is estimated at 1.5% per year of the investment cost. In 2050, hydraulic steel structures and mechanical equipment may need to be replaced. The one-time replacement cost of the items is estimated at 10% of the investment cost. From 2015 until 2024, incremental O&M costs are in the order of SLRs 550 million per year. Upon completion of the MFF, these costs will increase substantially, to about SLRs 1.5 billion (all prices are expressed in mid-2016 financial prices). Refer to Table 6 for incremental O&M cost estimates in selected years.

Table 6: Financial Cost of Incremental O&M
(SLR billion, mid-2016 prices)

	2015	2020	2025	2030	2040	2051	2060
Routine O&M cost	0.2	0.6	1.5	1.5	1.5	1.5	1.5
Replacement cost	-	-	-	-	-	27.0	-
Total	0.2	0.6	1.5	1.5	1.5	28.5	1.5

Source: Asian Development Bank estimates.

27. **Government budgets.** In recent years, the combined budget for MMDE and DOI almost tripled when expressed in mid-2017 financial prices, from about SLRs 25.8 billion in 2011 to SLRs 69.1 billion in 2017 (Table 7). The increase was mainly caused by a very substantial increase in capital expenditure, especially for the Uma Oya Diversion Project, the Moragahakanda and Kaluganga Reservoir Projects, and the MWSIP. It was conservatively assumed that budgets will continue to increase with general price inflation. Hence, in mid-

2017 prices, the total budget will increase to SLRs 73.2 billion per year (or approximately $466 million).

Table 7: Financial Cost of Incremental O&M of the Investment Program[a]
(SLR billion, mid-2017 prices)

	2011A	2013A	2014A	2015B	2016A	2017MP	2018MP
Recurrent expenditure	3.9	3.6	2.5	3.7	6.6	6.9	7.3
Capital expenditure	21.9	38.1	22.9	46.9	48.9	62.2	65.9
Total	25.8	41.7	25.8	50.7	55.5	69.1	73.2

[a] A: actual, B: revised budget, E: estimate, MP: MMDE projection
Source: ADB and MMDE (2017) estimates

28. **Incremental O&M cost as a percentage of the MMDE and DOI budget.** ADB does not have a formalized method to assess the financial capacity of an executing or implementing agency to provide the minimum required subsidies for a project. For previously ADB-financed projects, it was assumed that an agency is financially capable to provide the required subsidies if these do not exceed a significant portion of the agency's total budget. Throughout the implementation and operation period of the investment program (2015-2060), the incremental O&M cost of the project will not exceed 2.2% of MMDE's and DOI's total budget (Table 8), except in 2050 (when hydraulic steel structures and mechanical equipment would need to be replaced). Both MMDE and DOI are therefore deemed having sufficient financial capacity to cover the investment program's incremental O&M cost in all years except 2050 (when it may require additional financial support from the government to cover the project's one-time replacement costs).

Table 8: Financial Cost of Incremental O&M of WRDIP as Share of MMDE and DOI's Budget
(%)

	2015	2020	2025	2030	2040	2050	2060
Incremental O&M as % Budget	0.3	0.6	2.2	2.2	2.2	44.2	2.2

Source: Asian Development Bank estimates.

SUMMARY POVERTY REDUCTION AND SOCIAL STRATEGY

Country:	Sri Lanka	Project Title:	Mahaweli Water Security Investment Program: Tranche 2
Lending/Financing Modality:	Multitranche Financing Facility	Department / Division:	South Asia Regional Department Environment, Natural Resources and Agriculture Division

I. POVERTY AND SOCIAL ANALYSIS AND STRATEGY[i]

Poverty targeting: General Intervention

A. Links to the National Poverty Reduction and Inclusive Growth Strategy and Country Partnership Strategy

The investment program uses the time-slicing approach, with individual tranche outputs covering pieces of the overall facility's outputs. Tranche 2 will finance partial construction of conveyance channels under the Upper Elahera Canal Project (UECP) and partial construction of two new reservoirs and channels in the North Western Province Canal Project (NWPCP). Ultimately, the UECP and NWPCP will transfer water to the northern dry zone to increase the cropping intensity of land, provide drinking water, and develop commercial enterprises to improve the living conditions of rural communities and contribute to national and local economic growth. Therefore, the investment program will have a direct positive impact on Sri Lanka's poverty reduction and inclusive growth strategy. The investment program components are aligned with the government's national strategy, 2010–2020, of accelerating economic growth and social welfare to eradicate poverty and improve the environment. The investment program is also aligned with the strategic and sector goals of the Asian Development Bank (ADB) as articulated in ADB's Strategy 2020 and its Midterm Review and the Water Operational Plan, 2011–2020 to reduce the water demand–supply gap in water-scarce areas, foster integrated water resources management, improve water governance and delivery of services, and improve resilience to climate change.[1]

B. Results from the Poverty and Social Analysis during PPTA or Due Diligence

1. Key poverty and social issues. Data shows that 90% of the poor live in the rural areas. Among the population groups, persons living in households headed by 'agricultural, forestry and fishery laborers' are the poorest, followed by those in households headed by 'non-agricultural laborers and similar workers'. The limited availability of irrigation and overall water resources constrains the agricultural and commercial production of the region suppressing social and economic development. The current average monthly household income in the project areas is around SLRs 35,000 which is lower than the average national income (SLRs 45,000/month).

2. Beneficiaries. The project beneficiaries will be but not limited to (i) farmers in the dry zone areas that will receive additional water for irrigation; (ii) the general population in the same areas, who will benefit from (a) surface water for drinking so that the incidence of ground-water related diseases will be reduced, and (b) access to social services in areas where construction is to take place through road improvements; (iii) populations and businesses in towns receiving improved water supplies via the tanks supplied by the investment program; and (iv) persons obtaining employment during the construction stage, this is primarily the group that will be directly benefitted by tranche 2.

3. Impact channels. Development in tranche 2 will only directly provide limited employment/income benefits to local populations, but the investment program will contribute directly to relieving water scarcity, improving food security, and reducing poverty through increased and secure perennial access to water for irrigation by conveying water to parts of the country that are currently short or chronically short of water supplies. The general population in project areas may benefit from (i) availability of surface water for drinking so that the incidence of diseases will be reduced, and (ii) access to social services in areas where construction tunnel will require improvement of access roads.

4. Other social and poverty issues. Although the government has been successful in reducing poverty, disparity between rural and urban areas remains to be a challenging problem in Sri Lanka. More worryingly is the fact that 90% of the poor live in rural areas, with over 80% of Sri Lanka's population still living in rural areas. In addition, with more than 40% of the rural poor being small farmers, their production systems are hampered by fragmented landholding and poor rural infrastructure. To reduce rural poverty, the government has acted to fulfill the need for a better road network to link up the rural areas and provide credit facilities to aid investments of new technology. Aside from the Samurdhi program to assist on the financial aspects, the government has worked in tandem with nongovernment organizations to help ease the situation. For example, the Sarvodaya Economic Empowerment Development Services (SEEDS) program partners with the government to build the economic capacity of the poorest groups within the communities to stimulate an attitude of innovation and entrepreneurship.

5. Design features. The principal objective of the investment program is to increase agricultural production on approximately 162,000 ha of irrigated lands and improve drinking water supplies to households within the Eastern, North Western, Central and North Central Provinces. This will be achieved through investment in the water infrastructure described above, comprising transfer canals, reservoirs and tunnels, and in capacity building

[1] ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila; ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila.

of stakeholders for improved water resource planning and management. Tranche 2 packages include (i) UEC-ICB-2A, for the partial construction of a 28 km tunnel under the UECP between chainages 27+509 and 55+600 km; (ii) UEC-ICB-2B, for the partial construction of the Kalu Ganga – Moragahakanda Transfer Canal (8.8 km) under the UECP; and (iii) NWPC-ICB-1, for partial construction of the Mahakithula and Mahakirula Reservoirs, and Mahakithula Inlet Tunnel.

II. PARTICIPATION AND EMPOWERING THE POOR

1. Participatory approaches and project activities.

The investment program under tranche 2 is dominated by high skilled civil works for mainly underground works and dam construction. However, it does involve series of community participatory consultations during the preparation and will continue throughout the implementation stage. The lesson learned from tranche 1 shows that construction of supporting facilities such as improvement or construction of access road to the construction areas and establishment of crushing plants, will require involvement of the local communities with direct and indirect participation either as construction workers or as supplier of goods and services. Furthermore, the safeguard due diligence study and involuntary land acquisition plan, and updated environmental management plan have been prepared in close consultation with the stakeholders, particularly through stakeholder consultation meetings.

2. Civil society organizations. Relevant nongovernment organizations, community-based organizations including local women organization, and local informal leaders have been consulted through the public consultation/outreach meetings and made aware about the tranche 2. In addition, affected people and informal leaders, who advise and assist persons affected in the civil works areas, are being made aware of the details of the social safeguards program.

3 The following forms of civil society organization participation are envisaged during project implementation, rated as high (H), medium (M), low (L), or not applicable (NA)

☒ Information gathering and sharing (M) ☒Consultation (M) ☒Collaboration (L) ☐ Partnership (NA)

4. Participation plan.

☒ Yes. ☐ No.

Measures to increase public participation have been drawn up in updating the Stakeholder Communication Strategy (SCS). The media and other communication channels, including the program website at www.mwsip.lk are being used to share information, enabling feedback and participation, the building of consensus and community mobilization, and otherwise supporting the project objectives. The website includes a facility for registering grievances, which can also be lodged at PIU and PMU.

III. GENDER AND DEVELOPMENT

Gender mainstreaming category: no gender elements

A. Key issues. Tranche 2 investments are mainly civil works for tunnel and dam construction. There is an opportunity for women to participate in the construction activities. The lesson learned from tranche 1 shows that open advertisement through local newspaper does attract women to participate in implementation of tranche 1 works either in the project implementation unit (PIU) office and, to some extent, as a casual labor. Nonetheless, there were several published reports that daily wages paid to women who engage in casual labor are lower than those paid to men. Surplus labor and social attitudes toward women are reported as factors that influence the payment of lower wages for women.

B. Key actions. The PIU will continue its announcement of any vacancy through the local newspaper and will set up and implement a monitoring mechanism with the contractors so that women will be paid equal wages for work of equal value. Strict implementation of core labor standards, as indicated through the investment program's health and safety manual include the requirement for contractors to provided gender-separated accommodation and sanitation/ablution facilities, and prepare and implement an approved anti-discrimination policy addresses recruitment and workplace conditions. These will be monitored as part of the implementation of the core labor standards.

☐ Gender action plan ☐ Other actions or measures ☒ No action or measure

IV. ADDRESSING SOCIAL SAFEGUARD ISSUES

A. Involuntary Resettlement **Safeguard Category:** ☐ A ☒ B ☐ C ☐ FI

1. Key impacts.

A total of 21 plots of land have been identified as affected by expansion of 1 km road that will be used as access road to the areas for civil work package UEC-ICB-2A. Overall, six are on encroached land and 15 plots on Land Development Ordinance (LDO) permit land in accordance with Sri Lanka's definitions of Land Title; 1655 m^2 (65.7 perches), which is approximately 1.24% of (1.4% encroached lands and 1.5% LDO lands)[2] total land used by affected people and, therefore, impacts classified as marginal; and 63 perennial trees that will be affected by the project. There are 74 total affected peoples.

2. Strategy to address the impacts. Affected households will be compensated for land areas acquired, including for cost of paddy. Trees to be removed will also compensated. A resettlement plan has been prepared, affected peoples have been consulted, and a grievance redress mechanism has been established.

3. Plan or other Actions.

☒ Resettlement plan
☐ Resettlement framework
☐ Environmental and social management system arrangement
☐ No action
☐ Combined resettlement and indigenous peoples plan
☐ Combined resettlement framework and indigenous peoples planning framework
☐ Social impact matrix

[2] Other land title includes Jayabomi title, which is not a part of the affected land, but a part of the total land holdings of the affected persons.

B. Indigenous Peoples **Safeguard Category:** ☐ A ☐ B ☒ C ☐ FI

Key impacts. Within the investment program areas, there are no indigenous or ethnic minorities who display sufficient unique features to classify them as a distinct minority or indigenous group, considered to have a specific social or cultural identity distinct from each other, to be at any disadvantage, but will benefit as, the dominant or mainstream Sri Lankan Society.

Is broad community support triggered? ☐ Yes ☒ No N/A

2. Strategy to address the impacts. NA

3. Plan or other actions.

☐ Indigenous peoples plan
☐ Indigenous peoples planning framework
☐ Environmental and social management system
☐ Social impact matrix
☒ No action
☐ Combined resettlement plan and indigenous peoples plan
☐ Combined resettlement framework and indigenous peoples planning framework
☐ Indigenous peoples plan elements integrated in project with a summary

V. ADDRESSING OTHER SOCIAL RISKS

A. Risks in the Labor Market

1. Relevance of the project for the country's or region's or sector's labor market, indicated as high (H), medium (M), and low or not significant (L).

☒ unemployment (L) ☐ underemployment ☐ retrenchment ☒ core labor standards (H)

1. Labor market impact.

A positive impact from the investment program will be opportunities for local working age populations in employment, that may address some of the unemployment issues existing in the area, especially unskilled and semi-skilled labor. However, health and safety (through the investment program's existing health and safety manual), child labor, gender discrimination issues in labor, will be addressed and monitored

B. Affordability NA – No population in the project area, including the poor, is expected to be worse off than before the investment program.

C. Communicable Diseases and Other Social Risks

1. The impact of the following risks are rated as high (H), medium (M), low (L), or not applicable (NA):

☒ Communicable diseases (M) ☒ Human trafficking (L)
☐ Others (please specify) _____

2. Risks to people in project area.

Although low risk, laborers gaining skills may become the target for human trafficking, as a source, as workers may see it as opportunity for continued employment/ income, while influx of international workers also pose a risk in human trafficking. With the influx of international workers and materials being transported into site, as part of the works packages, there is a risk of increasing the incidences of sexually transmitted diseases, albeit low. The contractor will be required to undertake awareness programs on sexually transmitted diseases for all workers and invite local communities to participate.

VI. MONITORING AND EVALUATION

1. Targets and indicators. The investment program will increase agricultural production on approximately 162,000 ha of irrigated lands and improve drinking water supplies to households within the North Western, Eastern, Central and North Central Provinces. It will deliver approximately 130 MCM per annum of water for irrigation of about 11,500 ha of systems in the North Western Province, and approximately 270 MCM per annum for irrigation of 12,400 ha of systems in North Central Province, as well as the supply of 100 MCM of drinking water. Productivity on about 7,500 ha of irrigated lands in the Minipe System will also be improved. The storage capacity within the systems of the North Western Province will be increased by about 26 MCM through the construction of two new storage reservoirs.

2. Required human resources. The PIUs and Program Management, Design and Supervision Consultant, shall monitor safeguards compliance. Bi-annual ADB review mission will ensure that covenants are being observed.

3. Information in the Facility Administration Manual. Conduct awareness program for contractors and subcontractors on gender, core labor standards (CLS), and other social concerns such as communicable diseases and other social risks**;** local communities encouraging participation of women and men in project activities both in paid and unpaid activities (volunteer) in monitoring any project impacts. Contractors and subcontractors have a health and safety plan and submit monthly progress reports including detailed information on workers employed for the project during the reported period

4. Monitoring tools. A management information system and a program performance monitoring evaluation system have been established. Requirements that provide opportunities for monitoring and reporting performance indicators of relevant to social issues include observance of the environmental management plans, health and safety manual, monitoring reports, resettlement plans, safeguard due diligence reports, quarterly and semiannual resettlement monitoring reports (that include social and human factors and grievance redress mechanism). The quarterly progress reports will include progress in implementation of core labor standards especially on equal payment for men and women, no child labor, and an opportunity for vulnerable

Updated Environment Assessment and Review Framework

Available at: https://www.adb.org/projects/documents/sri-47381-001-eia

Environmental Assessment and Review Framework Update

July 2017

SRI: Mahaweli Water Security Investment Program

Update for Tranche 2

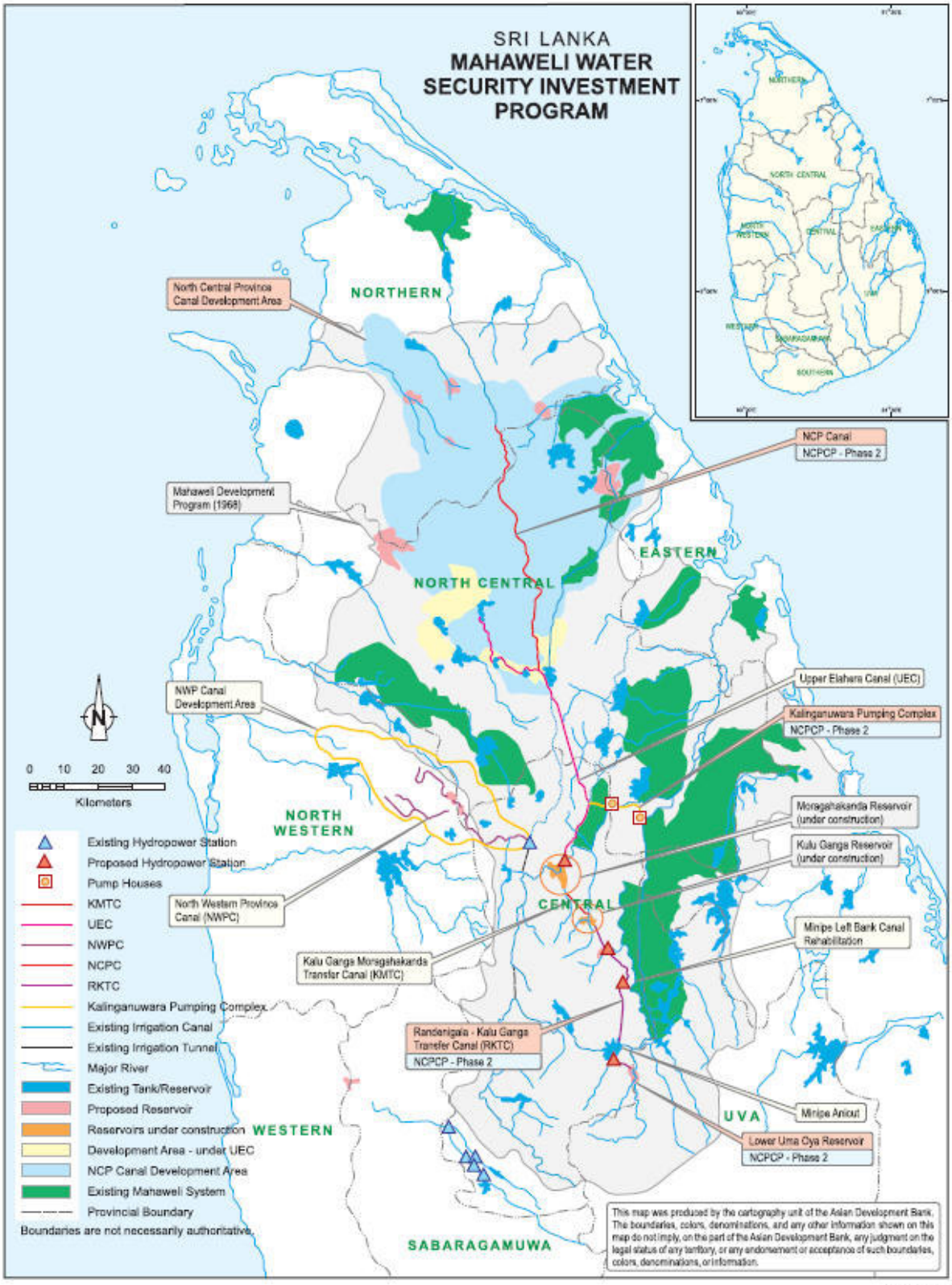
Prepared by Ministry of Mahaweli Development and Environment
Democratic Socialist Republic of Sri Lanka for the Asian Development Bank.

Contents

Annexes

Abbreviations

ADB	Asian Development Bank
CBO	Community-based organization
CC	Construction Contractor
CEA	Central Environmental Authority
CEMP	Contractor Environmental Management Plan
EA	Environmental Assessment
EAR	Environmental Assessment Report
EARF	Environmental Assessment and Review Framework
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
IA	Implementing Agency
IEE	Initial Environmental Examination
IEER	Initial Environmental Examination Report
GNO	Grama Niladhari Officer
GRM	Grievance Redress Mechanism
GRC	Grievance Redress Committee
MI&WRD	Ministry of Irrigation and Water Resources Development
MFF	Multi-tranche Financing Facility
MMDE	Ministry of Mahaweli Development and Environment
MOE&RE	Ministry of Environment and Renewable Energy
NGO	Non-Governmental Organization
NEA	National Environmental Act, 1980
PAA	Project Approving Authority
PAP	Project-affected person
PP	Project Proponent
SPS	Safeguard Policy Statement of ADB (2009)
TOR	Terms of Reference
MWSIP	Mahaweli Water Security Investment Program


SRI LANKA
MAHAWELI WATER SECURITY INVESTMENT PROGRAM
NORTHERN
NORTH CENTRAL
EASTERN
NORTH WESTERN
CENTRAL
WESTERN
UVA
SABARAGAMUWA
North Central Province Canal Development Area
Mahaweli Development Program (1968)
NCP Canal
NCPCP - Phase 2
NWP Canal Development Area
North Western Province Canal (NWPC)
Upper Elahara Canal (UEC)
Kalinganuwara Pumping Complex
NCPCP - Phase 2
Moragahakanda Reservoir (under construction)
Kulu Ganga Reservoir (under construction)
Minipe Left Bank Canal Rehabilitation
Kalu Ganga Moragahakanda Transfer Canal (KMTC)
Randenigala - Kalu Ganga Transfer Canal (RKTC)
NCPCP - Phase 2
Minipe Anicut
Lower Uma Oya Reservoir
NCPCP - Phase 2
N
0 10 20 30 40
Kilometers
Existing Hydropower Station
Proposed Hydropower Station
Pump Houses
KMTC
UEC
NWPC
NCPC
RKTC
Kalinganuwara Pumping Complex
Existing Irrigation Canal
Existing Irrigation Tunnel
Major River
Existing Tank/Reservoir
Proposed Reservoir
Reservoirs under construction
Development Area - under UEC
NCP Canal Development Area
Existing Mahaweli System
Provincial Boundary
Boundaries are not necessarily authoritative.
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Mahaweli Water Security Investment Program

Environmental Assessment and Review Framework

I. INTRODUCTION

1. This Environmental Assessment and Review Framework (EARF) outlines the requirements that the executive agency of the Mahaweli Water Security Investment Program (MWSIP) will comply with in conducting environmental assessments (EAs), and in planning and implementing environmental management plans (EMPs) for projects of the MWSIP. Among these requirements are screening and categorizing potential project environmental impacts and risks; assessment of environmental policy and legal frameworks applicable to the projects; their anticipated environmental impacts and risks; assessment of socioeconomic conditions in the project areas; public consultation and information disclosure arrangements; grievance redress mechanisms; institutional arrangements and their adequacy to ensure environmental soundness and sustainability; monitoring of EMP implementation; adequate budget, and a time schedule. These requirements are found in Sri Lanka's environmental policies, laws, regulations and guidelines, and in the ADB's Safeguard Policy Statement of 2009 (SPS). The Central Environmental Authority (CEA) and ADB will review and approve each environmental assessment report (EAR) prepared according this EARF. An EA can take the form of an Environmental Impact Assessment (EIA), Initial Environmental Examination (IEE), or environmental due diligence/audit.

2. The Ministry of Mahaweli Development and Environment (MMDE) is the executing agency of the MWSIP. It will conduct an EA or a due diligence exercise to formulate an EIA report or IEE report together with an EMP or a due diligence report for each MWSIP project.. The MMDE will submit the above environmental planning instruments to project approving authorities (PAAs) in Sri Lanka and ADB for review and approval prior to the commencement of project implementation.

3. The need for an EARF arises from the fact that the MWSIP will be implemented as a multi-tranche financing facility (MFF). An EARF is required by the ADB before MFF initial program approval, and before the release of specific tranches. The purpose of initial and updated EARFs is to clarify environmental safeguard principles and requirements that govern component projects, so as to ensure that compliance with local regulations and ADB safeguard systems is maintained.

4. The MWSIP has three projects implemented in three tranches. An initial EARF was produced prior to the release of Tranche 1. This document updates the EARF prior to the approval of Tranche 2 release. This EARF outlines the measures and procedures to be followed if there are any changes to the layout, design and scope of the component projects subsequent to ADB's approval.

II. THE MAHAWELI WATER SECURITY INVESTMENT PROGRAM

5. ADB supports the Government of Sri Lanka to plan and implement the MWSIP through the MMDE by financing the following three investment projects of the planned North Central Province Canal Program (NCPCP). The MFF will comprise three tranches financing the following three projects:

(i) The Upper Elahera Canal Project (UECP) comprises two main sections. The first section is the 9 km Kalu Ganga-Moragahakanda Transfer Canal that will convey up to 771 MCM of water annually between Kalu Ganga and Moragahakanda Reservoirs, both of which are currently under construction. The reservoirs will retain local runoff and Mahaweli River flow diversions before supplying downstream irrigation and water supply schemes. The second section is the 65.5 km Upper Elahera Canal (UEC) that will annually convey up to 974 MCM northwards from Moragahakanda Reservoir to the existing Huruluwewa Reservoir, and a further 16.7 km of canals to supply the existing Manankattiya, Eruwewa and Mahakanadarawa Reservoirs; these existing reservoirs supply existing irrigation and water supply schemes. The project is divided into three stages: (a) stage 1 will construct the first 6.2 km of UEC's open canals and associated structures; (b) stage 2 will construct the Kalu Ganga-Moragahakanda Transfer Canal, and a 26km tunnel of the UEC; and, (c) stage 3 will construct the remaining 50 km of open and cut-cover canal sections, and four tunnels with lengths ranging from 70 m to 1.7 km.

(ii) The North Western Province Canal Project (NWPCP) will construct 96 km of new and upgraded canals, including three new tunnels between 540 and 800 m length and two new 25 m tall earthfill dams impounding the planned Mahakithula and Mahakirula Reservoirs to annually withdraw 130 MCM from Dambulu Oya River and the existing Nalanda Reservoir (via the existing Wemedilla Reservoir) to command new and existing irrigation and water supply reservoirs located throughout North Western Province. The project is divided into two stages: (a) stage 1 will construct two new dams impounding the new Mahakithula and Mahakirula Reservoirs, the 26.7 km of open canals between the Wemedilla tank and the new Mahakithula and Mahakirula Reservoirs, and the tunnels; and (b) stage 2 will construct the remaining open canal sections and associated structures. The stages are allocated to the following specific construction contracts:
- Stage 1 (Tranche 1): NWPC-ICB-1, NWPC-ICB-2, NWPC-NCB-1
- Stage 2 (Tranche 3): remaining packages

(iii) Minipe Left Bank Canal Rehabilitation Project (MLBCRP), located downstream of the Mahaweli Hydro Power Complex on the Mahaweli River, will: (a) add upstream storage by heightening the headwork's weir by 3.5 m to regulate generation inflows, (b) construct new automatic downstream-controlled intake gates to the left bank canal; (c) construct new emergency spill weirs to both left and right bank canals; and (d) rehabilitate the 74 km Minipe Left Bank Canal, including regulator and spill structures, to improve conveyance and reliability of service to existing farmers.

6. The investment program is being implemented over ten years and its proposed structure is shown in Table 1. The investment program will also include three consulting packages comprising: (i) "improving system efficiencies and water productivity" (ISEWP); (ii) "strengthening of integrated water resources management" (SIWRM); and (iii) the Program Management, Design

and Supervision Consultant (PMDSC) which will support the MMDE to manage the investment program and prepare packages.

7.

Table 1: Investment Program Structure and Implementation Schedule

Project	Subproject	Schedule
Civil Works		
Project 1 (Tranche 1)	UECP Stage 1 NWPCP Stage 1 MLBCRP	Q3 2016 – Q1 2021
Project 2 (Tranche 2)	UECP Stage 2 KMTCP Stage 1	Q4 2017 – Q4 2023
Project 3 (Tranche 3)	UECP Stage 3 NWPCP Stage 2 KMTCP Stage 2	Q3 2019 – Q1 2023
Consulting Services		
PMDSC	Stage 1 (tranche 1) Stage 2 (tranche 3)	Q4 2015 – Q4 2020 Q4 2020 – Q4 2024
ISEWP		Q4 2017 – Q4 2020
SIWRM		Q1 2019 – Q4 2020

ISEWP = improving system efficiencies and water productivity, MLBCRP = Minipe Left Bank Canal Rehabilitation Project, NWPCP = North Western Province Canal Project, PMDSC = program management, supervision and design consultant, SIWRM = strengthening integrated water resources management, UECP = Upper Elehera Canal Project
Source: Asian Development Bank

III. ENVIRONMENTAL ASSESSMENT AND REVIEW FRAMEWORK

8. The MMDE recognizes that rehabilitation and construction activities under the MWSIP will generate positive social and economic benefits as well as adverse environmental impacts and risks. As an environmentally informed and socially responsible Ministry of the Government, the MMDE is committed to avoid, minimize, or at least to mitigate adverse environmental and social impacts of the MWSIP. By combining national environmental safeguard regulatory frameworks and ADB's environmental safeguard policy principles, this EARF will guide the MMDE on screening and categorizing potential environmental impacts and risks, consultations, conducting assessments and the formulation of EA reports and EMPs, their disclosure, establishment of grievance redress mechanisms, implementation of EMPs, monitoring of results, and adequate reporting of monitoring results.

9. The EARF focuses on environmental safeguard compliance of the MWSIP, and is guided by the MMDE's commitment to integrate environmental protection into the MWSIP in a proactive manner in order to contribute towards sustainable development of water resources. To achieve a balance among developmental imperatives, environmental sustainability, and social well-being of its operations, the MMDE:

(iv) Will identify adverse environmental and social impacts and risks of the MWSIP at early stages of the project cycle, and will avoid, minimize, and mitigate them;
(v) Is committed to comply with all environmental policies, laws, and regulations of the Government, and will remain fully responsive to environmental and social safeguard policy requirements of ADB and other development partners; and,
(vi) Will apply the EARF projects of the MWSIP as per the safeguard principles and procedures, outlined in this document.

A. Objectives of the EARF

10. The EARF:

(i) Outlines safeguard best practices that will be applied to the MWSIP;
(ii) Provides a screening and categorizing system to screen potential environmental impacts associated with projects of the MWSIP;
(iii) Guides MMDE in conducting meaningful consultations with all project stakeholders;
(iv) Guides the MMDE in the preparation and updating of IEEs, EIAs, EMPs, and environmental due diligence reports;
(v) Guides the MMDE in the disclosure of environmental information to all project stakeholders;
(vi) Outlines institutional arrangements for the implementation of safeguard planning instruments, monitoring and reporting, and for undertaking corrective action plans, if any; and,
(vii) Helps enhance institutional capacity for safeguard compliance at MMDE, affiliated institutions and local government agencies, and among MWSIP contractors.

IV. ENVIRONMENTAL REGULATORY FRAMEWORK OF SRI LANKA

11. The environmental regulatory framework comprises policies, laws, regulations and guidelines that together form a composite framework for environmental planning, implementation and monitoring of development projects.

A. The National Environmental Policy of Sri Lanka, 2003

12. The Constitution of Sri Lanka makes it “the duty of every person in Sri Lanka to protect nature and conserve its riches”. The National Environmental Policy (Policy) acknowledges this duty and provides directions according to which steps will be taken to conserve and manage all aspects of Sri Lanka’s environment.

13. The Policy renews the commitment of the government, in partnership with the people, to effectively manage the environment for the benefit of present and future generations. The Policy aims to ensure sound environmental management within a framework of sustainable development in Sri Lanka. This Policy is supported by many other policies and strategies for other sectors.

14. The Policy emphasizes that caring for the environment is the duty of any institution, government or non-government organisation, and of any individual who uses, or otherwise carries out an activity that has an impact on environmental resources.

15. The Policy binds all organisations and individuals who use environmental resources or otherwise have an impact on the resources to exercise due care to avoid environmental degradation. The implementation of the Policy will pave the way for sustainable development.

B. Policy Objectives

16. The Policy anticipates achieving the following objectives:

(i) To promote the sound management of Sri Lanka's environment in its entirety without compromise, balancing the needs for social and economic development and environmental integrity, to the maximum extent possible, while restricting inimical activities;
(ii) To manage the environment by linking together activities, interests, and perspectives of all groups, including the people, nongovernment organizations and government at both the central and the local levels; and,
(iii) To assure environmental accountability.

C. Policy Principles

17. Policy principles are:

(i) The guiding principles of environmental management will be "polluter pays" and the need to reduce consumption, and recycle and reuse materials to the maximum extent possible;
(i) When living natural resources are used, it will be ensured that such use is wise, sustainable, and consistent with the integrity of ecosystems and evolutionary processes;
(ii) When non-living resources are used, it will be ensured that such use is consistent with environmental best-practices, bearing in mind the need to also provide for future generations;
(iii) Traditional knowledge and practices will be respected in the development of environmental management systems; and,
(iv) Effective governance will be ensured through the decentralization of environmental management services to the maximum extent possible.

D. Policy Statement

18. The following statement summarizes its key aims:

(i) Resources such as land, water, air, minerals, and biodiversity will be managed in a manner consistent with the viability of ecological processes;
(ii) Environmental management will be through participatory, transparent, predictable and accountable decision-making processes at all levels;
(iii) In addition to protecting the environment from abuse, management systems will take into account the need to restore environments damaged in the past;
(iv) Environmental management systems will be encouraged to be flexible so as to adapt to changing situations and adopt the precautionary principle;
(v) The economic value of environmental services will be recognized so as to assure the sustainability of such services for the benefit of the people;

(vi) The state of the environment will continuously be assessed and reported on, through an appropriate institutionalized monitoring framework based on a comprehensive set of indicators;
(vii) The institutional framework for sound environmental management will be strengthened through capacity building, legislative enactments, and improved inter-institutional coordination and linkages; and,
(viii) "Life cycle" and "cleaner production" principles will be applied to improve the efficiency of natural resource use and to improve environmental quality.

E. Environmental Laws

1. The Constitution of Sri Lanka

19. The Constitution of Sri Lanka contains several provisions relating to the environment, such as Article 18 ("It is the duty of every person of Sri Lanka to protect nature and conserve its riches") and Article 27 (14) ("The state shall protect, preserve and improve the environment for the benefit of the community"). The 13th Amendment to the Constitution created new institutions at the provincial level for environmental protection and management. Each provincial government under this Amendment has legislative and executive powers over environmental matters (Articles 154 (A), 9, 19 and (III) 17). Using such provincial legislative and executive powers, the North Western Provincial (NWP) Council has established the North Western Provincial Environmental Authority to supervise and monitor environmental activities in the North Western Province of Sri Lanka. To date, of the nine provincial councils, only the NWP has established its own environmental authority.

2. National Environmental Act No. 47 of 1980 (and its subsequent Amendments)

20. The National Environmental Act (NEA) provides conservation and development guidelines for natural resources management including water, forest, flora and fauna in Sri Lanka. The 1988 amendment to the Act appointed the Central Environmental Authority as the enforcement and implementing agency of the Act. The CEA has special powers to assess and monitor critical environmental conservation programs and to advise the government on environmental protection, conservation, management and development issues.

21. Types of projects that need mandatory environmental clearance ("prescribed projects") were made public after the amendments to NEA was approved in 1988. The Act 1988 states that all prescribed projects undertaken by any government department, corporation, statutory board, local authority, company, firm or an individual will be required to obtain approval before their implementation. The approval will have to be obtained from the appropriate PAAs who are concerned or connected with such prescribed projects. At present, there are 31 such PAAs that deal with review and approval of environmental plans. The CEA has an oversight function over the PAAs.

22. Projects under the MWSIP could also come under the purview of the laws outlined in the following sections, according to specific circumstances. However, screening, scoping, formulation of any EIAs, IEEs, EMPs and procedures for their disclosure and public consultations will be governed by the NEA of 1980 and its subsequent amendments of 1988 and 2000, and by environmental regulations (see below).

3. Pradeshiya Sabha Act No. 15 of 1987

23. Section 12 (2) of the Pradeshiya Sabha Act authorizes the appointment of a committee at the divisional level to advise on environmental matters. Section 105 of the Act prohibits polluting water or any streams, while Section 106 refers to pollution caused by industry and related offences. The Pradeshiya Sabha grants permission for construction activities within its jurisdiction. Such construction needs to comply with environmental requirements stipulated in permits.

4. Flood Protection Ordinance Act No. 22 of 1955

24. This ordinance provides for the acquisition of land or buildings or part of any land or building for the purpose of flood protection.

5. State Land Ordinance Act No. 13 of 1949

25. The State Land Ordinance provides guidelines for:

(i) The protection of natural water springs, reservoirs, lakes, ponds, lagoons, creeks, canals, and aqueducts;
(ii) The protection of the source, course and bed of public streams;
(iii) The construction or protection of roads, paths, railways, and other means of internal communication systems;
(iv) The prevention of soil erosion; and,
(v) The preservation of water supply sources.

26. Section 75 of the Ordinance highlights riparian proprietors' rights and duties. The occupier of land on the banks of any public lake or public stream has the right to use water in that water body for domestic purpose, but cannot divert water through a channel, drain or pipe or by any other mechanical device.

6. Soil Conservation Act No. 25 of 1951

27. The Soil Conservation Act provides for the conservation of soil resources, prevention or mitigation of soil erosion, and for the protection of land against damage by floods and droughts. Under the Act, it is possible to declare any area defined as an 'erodible area' and prohibit any physical construction. The following activities are also prohibited under Act:

(i) Weeding of land or other agricultural practices that cause soil erosion;
(ii) Use of land for agriculture purposes within water sources and banks of streams; and,
(iii) Exploitation of forests and grassland resources and setting fire in restricted areas.

7. Mines and Minerals Act No. 33 of 1992

28. Under this Act, mining falls within the purview of the Geological Survey and Mines Bureau (GSMB). Mining of minerals including sand must be done with a license issued by the GSMB. Mining is not permitted within archaeological reserves or within specified distances from designated monuments. New mining licenses are subject to the EIA process, if the type and extent of mining is listed under the EIA regulations. Additionally, the GSMB has the power to stipulate conditions including cash deposits and insurance policy for the protection of the environment. Regulations made by the GSMB under the Act cover a variety of environmental stipulations, criteria and conditions for licensing and operating mines. This also covers the disposal of mine

wastes. The Act also deals with the health, safety and welfare of miners. Mining rights on public and private land are subject to licensing by the GSMB, and all minerals wherever situated belong to the State. The right to mine public land parcels are subject to EA procedures.

8. Fauna and Flora Protection Ordinance Act No. 49 of 1983 (and subsequent Amendments)

29. The Act provides for the protection, conservation, and preservation of the fauna and flora of Sri Lanka. Under the Act, five categories of protected areas are established, namely, strict nature reserves, national parks, sanctuaries, nature reserves, jungle corridors, and intermediate zones. Section 9 (a) states that “no person or organization, whether private or state, shall within a distance of 1 mile of the boundary of any national reserve declared by an order issued under Section 2 of the Ordinance carry out any development activity of any description whatsoever, without obtaining the prior written approval of the Director”. Each application for a development activity has to follow the procedures stipulated under the NEA. An application that falls within the meaning of Section 9(a) has to be supported by an EIA or an IEE according to the significance of expected environmental impacts. Since some of the activities to under the MWSIP are within areas under the jurisdiction of the FFPO, this law is applicable to the overall investment program.

9. Forest Ordinance, No 17 of 1907 (and its Amendments)

30. The Forest Ordinance of 1907 was amended by Act No. 13 of 1966, No. 56 of 1979, No. 13 of 1982, No. 84 of 1988, No. 23 of 1995 and No. 65 of 2009. It is now cited as the 'Forest Conservation Ordinance'. The four categories of forests protected by the Forest Conservation Ordinance are Conservation Forest, Reserved Forest, Village Forest and Other forests. Each category is declared under the Forest Ordinance. Provisions to protect and manage them are provided in the Ordinance. Acts prohibited in conservation forests are given in Section 6, in reserved forest in Section 7, in village forest in Section 14, in forest other than conservation, reserved forest or village forest in Section 20. Protected Areas under the Department of Wildlife Conservation are National Reserves - Strict Natural Reserves, National Parks, Nature Reserves, Jungle Corridors, Refuge, Marine Reserves, Buffer Zone, and Sanctuaries. Under Section 5 of the Ordinance, a Forest Officer has power to stop any public or private watercourse which goes through a reserved forest. It shall be lawful for the District Secretary to determine the amount of compensation to be paid in case that the water course adversely affects the interests or one or more individuals. Under Section 6 of the Act, the following activities are prohibited: trespassing or permitting cattle to trespass; damage by negligence in felling any tree, cutting or dragging any timber; wilfully striping off of bark or leaves from, or girdles, lop, taps, burns or otherwise damage any trees; poison water; mine stone, burns lime or charcoal, or collect any forest produce; and extracts coral or shells or digs or mines for gems or other minerals.

10. The Urban Development Authority Law No. 41 of 1978

31. The Urban Development Authority (UDA) promotes integrated planning and implementation of social, economic and physical development of areas which are declared as urban development areas under the UDA Act. UDA provides technical support to local councils who require assistance in developing plans. It has the authority to develop plans when local authorities fail to do so. The UDA monitors urban areas, and develops land use policies for designated development areas.

11. Municipal Council Ordinances and Acts – Urban Council Ordinance 61 of 1939, Act 29 of 1947, Act 18 of 1979, and Act 13 of 1979.

32. The Municipal Councils and Urban Councils share with Pradeshiya Sabhas, powers regarding the approval of buildings plans, control of solid waste disposal, sewerage and other public utilities. Under these laws, new constructions and modifications to current buildings require approval of the Municipal or Urban Council or Pradeshiya Sabha. Municipal and Urban councils follow the planning and building guidelines of UDA.

33.

12. Antiquities Ordinance No. 9 of 1940 (and subsequent Amendments)

In areas so designated under the Antiquities Ordinance, an Archaeological Impact Assessment (AIA) may be required for new projects, at the discretion of the Director General of Archaeology (section 47 and 43A of the Antiquities Ordinance. Extraordinary Gazette no 1154/14 dated 4th October 2000.)

V. ENVIRONMENTAL ASSESSMENT PROCESS IN SRI LANKA

34. The EA process is primarily concerned with assessing direct and indirect impacts of a project on the biophysical and human environment, and ensuring that these impacts are addressed by appropriate environmental protection and enhancement measures.

35. The laws, regulations, and procedures that govern an EA of a project are found in the NEA and environmental regulations. They are supported and elaborated by sector specific laws and their regulations, outlined above.

36. The NEA of 1980 recommends the adoption of an environmental assessment for each development project. The amendment to NEA in 1988 made an environmental assessment mandatory for each project with significant potential environmental impacts. The 31 types of projects that need EIAs are listed in the Gazette Extraordinary No 772/22 and No 1104 of 1993. Under the National Environmental Act, prescribed projects are stipulated in three parts listed in the schedule of the respective Gazette. Part I identifies prescribed projects based on type and magnitude; Part II identifies prescribed projects as all subprojects identified in Part I, irrespective of their magnitude and selected high-polluting industries, if near culturally and/or environmentally sensitive areas defined in Part III of the schedule Gazette Extraordinary of 772/22 of 24 June 1993. All industrial projects that are located close to environmental, archaeological, or culturally-sensitive areas require full environmental impact assessments.

37. The evaluation and approval of environmental assessment reports (EARs) are delegated by CEA to various agencies depending on the nature of the project. Among these PAAs are Ministries of National Planning, Lands and Land Development, Irrigation and Water Resources Management, Transport and Highways, Energy, Agriculture and Forests, Urban Development authority, Board of Investments, Department of Wildlife Conservation, GSMB, Ceylon Tourist Board, and the Mahaweli Development Authority. A project proponent cannot perform the functions of PAA for the same project, and but should refer the project's environmental planning documents to CEA for approval.

38. The EA process guides projects to report on viable alternatives to ensure that environmentally less damaging options are also considered.

39. Project proponents will provide relevant, adequate, and accurate information and data required by the PAA to conduct an effective review of a project proposal. The PAA conducts scoping of the proposed project to determine its potential environmental impacts and risks.

40. The PAA solicits project-affected persons' views and opinions, queries project proponents for clarifications, and decides the categorization of the project as "prescribed" or "non-prescribed". If categorized as a prescribed project, the PAA will decide based on the significance of potential environmental impacts of the project, whether an EIA is required or a less comprehensive environmental assessment such as an IEE is sufficient to address and resolve identified adverse environmental impacts of the project. It will prepare the terms of reference of the EA in either case.

41. Project proponents formulate an EIA or IEE with subject matter specialists following the approved ToR and submits the EIA or IEE report to the PAA in Sinhala or Tamil or English for review and approval. It will be translated into the other two national languages.

42. The PAA discloses the EA for public comments. The PAA will announce in national newspapers in three national languages that the EIA is available for 30 working days for comments. It will also disclose the locations where it could be read. Such comments will be considered in finalizing EA reports.

43. The PAA and/or CEA review an EIA report. An IEE is reviewed by the relevant PAA based on the information provided by project proponents. A review of an EA report by the CEA and/or the PAA is guided by the following criteria:

(i) Environmental considerations are integrated into overall project planning;
(ii) Environmental assessment is sound; and,
(iii) Proposed environmental mitigation measures are adequate and effective.

44. If the proposed project is controversial, the PAA or CEA may decide to conduct public hearings on the project and the EA. A public hearing can also be initiated if such hearing would help in verifying facts and findings of the EA, and the adequacy of proposed mitigation measures.

45. The PAA in consultation with the CEA approves or disapproves the EA. Alternatively, an EA can be approved subject to conditions to be met within the stipulated timeframe. If the project is rejected because of an unsatisfactory EA, project components can appeal against the decision to the CEA.

46. If the project is approved, the project proponents and PAA monitor the implementation of the EMP prepared together with the EA to set out remedial actions and to ensure that they meet the standards established.

47. Generally, the application of environmental laws and regulations to development projects is satisfactory. The EA process is well understood by officials and by the public. The courts have interpreted environmental laws proactively and insist on close adherence to procedures in formulating environmental planning documents and their implementation. The EA process has succeeded in introducing mechanisms for transparency, consultation, and disclosure of EA reports, their results and monitoring reports.

48. The environmental training programs conducted by the Ministry of Environment and Renewable Energy (MERE), the CEA, universities, and development partners have produced

hundreds of trained environmental professionals in the government and private sectors, among civil society organizations and academia. In addition, the EA process is being taught at postgraduate level at local universities. As a result, the capacity to formulate, implement and monitor environmental plans exists adequately in Sri Lanka.

49. Sri Lanka has ratified several international environmental conventions, protocols, and framework conventions. Several of them apply to the investment program. Each EIA of the Program will follow applicable international environmental agreements to examine its environmental impacts and risks, and to propose remedial and mitigation actions (see below)

Table 2: International Environmental Agreements Ratified by Sri Lanka

Agreement	Ratification Date	Key Objectives
Atmosphere		
Vienna Convention for the Protection of the Ozone Layer (1985)	15 December 1989	Protection of the Ozone Layer through international cooperation in scientific research, monitoring and information exchange.
Montreal Protocol on Substances That Deplete the Ozone Layer (1987)	12 December 1989	Reduction and the eventual elimination of the consumption and production of Un-anthropogenic Ozone Depleting Substances
United Nations Framework Convention on Climate Change (UNFCCC 1992)	23 November 1993	Stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climatic systems
Kyoto Protocol (1997)	3 October 2002	The Annex 1 parties (Developed Countries) to reduce their collective emissions of greenhouse gases by at least 5% of the 1990 level by the period 2008 –2012.
Biodiversity		
International Plant Protection Convention (1951)	12 February 1952	To maintain and increase international co-operation in controlling pests and diseases of plants and plant products, and in preventing their introduction and spread across national boundaries
Plant Protection Agreement for Asia and Pacific Region (1956)	27 February 1956	To prevent the introduction into and spread within the region of destructive plants
CITES - Convention on International Trade in Endangered Species of Wild Fauna & Flora (1973)	4 May 1979	To protect certain endangered species from being over-exploited by adopting a system of import/export permits, for regarding the procedure.

Agreement	Ratification Date	Key Objectives
Convention on the conservation of Migratory Species (CMS-1979)	6 June 1990	To protect those species of wild animals which migrate across or outside national boundaries
Convention on Biological Diversity (CBD-1992)	23 March 1994	Conservation of biological diversity, sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including appropriate access to genetic resources and by appropriate transfer of relevant technologies and appropriate funding
Cartagena Protocol on Bio Safety (2000)	28 April 2004	To ensure adequate level of protection in the field of the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specially focusing on trans boundary movements.
Land		
United Nations Convention to Combat Desertification (UNCCD- 1994)		To combat desertification and to mitigate the effects of drought in countries experiencing serious droughts and/ or desertification with the final aim being to prevent land degradation in the hyper arid, arid, and semi-arid, dry sub humid areas in the countries that are parties of the Convention
Chemicals		
Basel Convention on the Control of Trans-boundary movements of Hazardous Wastes and Their Disposal (1989)	28 August 1992	To reduce trans-boundary movements of hazardous waste; to dispose of hazardous and other waste as close as possible to the source; to minimize the generation of hazardous waste; to prohibit shipments of hazardous waste to countries lacking the legal, administrative and technical capacity to manage & dispose of them in an environmentally sound manner; to assist developing countries in environmentally sound management of the hazardous waste they generate
Rotterdam Convention (1998)	19 January 2006	To promote shared responsibility and cooperative efforts in the international trade of certain hazardous chemicals, to protect human health and the environment; to contribute to the environmentally sound use of those hazardous chemicals by facilitating information exchange, providing for a national decision-making process on their import/export
Stockholm Convention on Persistent Organic Pollutants (POPs - 2001)	22 December 2005	To protect human health and the environment from persistent organic pollutants (POPs).

VI. ADB'S ENVIRONMENTAL SAFEGUARD POLICY PRINCIPLES

50. The environmental safeguard policy principles of ADB are embodied in the SPS (2009). It applies to all projects and programs supported by ADB. The SPS aims to (i) help avoid adverse project impacts on the environment and on affected people and communities, (ii) minimize,

mitigate and/or compensate for adverse project impacts, if unavoidable, (iii) help borrowers to strengthen their safeguard systems; and (iv) develop their capacity in managing the environmental and social risks.

51. The environmental safeguards policy principles are:

- Use screening process for each proposed project to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.
- Conduct an EA for each proposed project to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential trans-boundary and global impacts, including climate change. Use strategic EA where appropriate.
- Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.
- Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.
- Carry out meaningful consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.
- Disclose a draft EA (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.
- Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.
- Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the

environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development and management of renewable natural resources.

- Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the *World Bank Group's Environmental, Health and Safety Guidelines, 2007*. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage.
- Avoid the use of hazardous materials subject to international bans or phase-outs. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.
- Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.
- Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.

52. The MWSIP is likely to trigger all environment safeguard policy principles of the SPS. In order to ascertain how well the national environmental regulatory framework meets ADB's environmental safeguard policy principles, a comparison between the two is done in the next section. (See Annex 1 for details).

VII. NATIONAL ENVIRONMENTAL REGULATORY FRAMEWORK AND ADB'S ENVIRONMENTAL SAFEGUARD POLICY – A COMPARISON

53. The NEP addresses all relevant aspects of environment protection, environmental sustainability and enforcement. The Policy matches the environmental safeguard policy principles of the SPS. The NEA, its amendments, and sector level legislation that support it, have sufficiently transformed the Policy into a satisfactory environmental regulatory framework.

54. The composite government environmental clearance process, in principle, is consistent with ADB's environmental assessment process and public disclosure requirements. Disclosure of the EIAs for development projects that are categorized as "prescribed" projects is mandatory. The prescription is based on the magnitude and potential for adverse environmental impacts of a proposed project. The CEA and PAAs have been reviewing and approving the EIAs for prescribed projects since 1993 and have developed a solid technical expertise and capacity for this task with technical assistance projects from United States Agency for International Development (USAID), the Netherlands, ADB, and the World Bank over the past two decades.

55. Both ADB and NEA prescribe that the implementation of an EMP will be a part of construction contract. Both CEA/PAA will monitor the progress in implementing an EMP.

56. ADB and the CEA require that EAs would not award contracts until the EIAs/IEEs and EMPs are endorsed by them.

57. The procedures of ADB and CEA differ on categorisation of environmental impacts and risks. ADB's environmental categorisation has four categories, namely, A, B, C and FI, whereas the CEA uses 'prescribed' and 'non-prescribed' projects. As outlined earlier, the criteria for determining whether the EA should take the form of an EIA or IEE are also different.

58. In the following key areas, Sri Lanka's environmental assessment displays some weaknesses and deficiencies for which the following gap-filling measures are adopted from ADB's environmental safeguard policy principles and international best practices.

59. As per the NEA and its amendments of 1988 and 2000, and regulations, a project proponent provides the "project affected people" (PAPs) and other stakeholders an opportunity to express their views, comments, and complaints before finalising an EA report. The draft EIA report is usually made available to the public for 30 working days in the local government offices, at district CEA offices, and at the CEA Head Office at Battaramulla.

60. Evidence suggest that for many projects, the PAPs do not know about the project or its EA report, until it is too late. Often the project proponents do not provide sufficient project information to the PAPs or adequately disclose the EA reports. As a result, the PAPs often fail to interpret and understand EA reports. In theory, these difficulties could be at least partially alleviated by public hearings conducted on EA reports. In these meetings, project proponents and EA consultants could explain in local languages the salient features of the project and its environmental impacts and measures to avoid or at least to mitigate them. In practice, such public hearings are held at the discretion of the PAA. Moreover, the IEEs are not required to be presented for public consultation. These weaknesses can be overcome by following the public consultation, participation, and disclosure procedures of the EARF, which outlines how to conduct meaningful consultations with all stakeholders including the PAPs. Such consultations are to be conducted periodically starting from project planning through implementation and monitoring.

The local environmental regulatory framework does not prescribe a due diligence or environmental audit to check existing facilities at project site(s) to determine whether they could cause or are causing environmental impacts and risks. The SPS requests environmental due diligence or audit in such circumstances. If the project does not foresee any major expansion except refurbishment of existing buildings and facilities, the due diligence or environmental audit constitutes the environmental assessment for the project.

VIII. SCREENING AND CATEGORIZATION OF POTENTIAL ENVIRONMENTAL IMPACTS

61. In screening projects for environmental impacts and risks, the MMDE should use the screening and categorisation system outlined in the ADB SPS to determine whether there will be any significant potential environmental impacts and risks, and their magnitude. ADB, along with project authorities, will screen each proposed project at the earliest stage of project preparation when sufficient project information is available. The purpose of the exercise is to identify environmental impacts and risks, their significance, and to identify the level of assessment and institutional sources required to prepare safeguard planning instruments. It will also indicate disclosure requirements of such planning instruments. The environmental impact category of a project is determined by its most environmentally-sensitive component, including direct, indirect, cumulative, and induced impacts within the project area of influence.

62. The project screening and categorization system applicable to MWSIP is given below:

(i) **Category A:** The project is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, and may affect an area larger than the sites or facilities subject to physical works. An EIA and a comprehensive EMP are required.

(ii) **Category B:** The project is likely to have adverse environmental impacts that are less adverse than those of Category A, which are site-specific, few, mostly reversible, and in most cases, mitigation measures can be designed more readily than in Category A projects to address them. An IEE and EMP are required.

(iii) **Category C:** The project is likely to have minimal or no adverse environmental impacts. No EA is required although environmental implications of the project need to be reviewed and addressed.

63. Under this MFF projects have been screened and categorized as follows: (i) The Kalu Ganga-Moragahakanda Transfer Canal and Upper Elahera Canal Project – Category A; (ii) North Western Province Canal Project – Category A; and (iii) Raising of Minipe Anicut and Rehabilitation of Minipe Left Bank Canal Project – Category B. Since the investment is a time slice investment, all three projects have been initiated in Tranche 1. With the exception of the Minipe Anicut and Rehabilitation Project the other two projects continue through to Tranche 3. Therefore, all three tranches are categorized as A. Under the National Environmental Act, the first two projects require EIA's and the last project has required an IEE. Therefore, the categorization based on SPS and NEA was equivalent. The terms of reference initially drafted by CEA were amended to incorporate ADB's SPS requirements.

The following EAs have been approved by ADB and CEA:

(i) Initial Environmental Examination for the Minipe Left Bank Canal Rehabilitation (April 2015), and approved by the CEA on 16 October 2015;

(ii) Addendum to the Initial Environmental Examination Report for the Minipe Left Bank Canal Rehabilitation (date April 2016);

(iii) Mahaweli Authority of Sri Lanka (2015), Environmental Impact Assessment Report. Modifications to Configurations of Moragahakanda-Kaluganga Projects. Proposed Upper Elehera Canal (UEC) from Mannakkattiya Tank to Mahakanadarawa Tank and Kaluganga-Moragahakanda Link Canal Project. Prepared by Mahaweli Consultancy Bureau Pvt Ltd. June. (Approved by the CEA on 31 March, 2016);

(iv) Environmental Impact Assessment Report for the North West Province Canal Project (June 2015), and approved by the CEA on 23 February, 2016;

64. An Addendum to the NWP EIA has been prepared to accommodate design changes during detailed design. Prior to the approval of Tranche 2, an Addendum to the EIA for UEC will be drafted. This will be submitted to the CEA and to the ADB, and approved before Tranche 2 financing can be released.

65. During the implementation, if there is any change in the alignment or scope of the project, MMDE will inform CEA and ADB. Once ADB is informed of these changes, ADB will reassess the category of the project and if required re-categorize the project and also assess the need for additional studies or fresh assessments to update the EIA's and/or IEE.

IX. CONSULTATION AND PARTICIPATION

66. The MMDE will conduct meaningful consultations with PAPs and other stakeholders throughout the project life. Consultations: (i) begin early in the project preparation phase and continue through all phases of the project; (ii) share adequate information with the PAPs and stakeholders in a timely manner, (iii) conduct consultations in an atmosphere which is conducive, to arrive at decisions that are beneficial to the project, the PAPs, and other stakeholders; and (iv) include women and vulnerable groups in discussions. This ensures that the views of all affected parties are taken into consideration in environmental planning. For environment category 'A' projects, such consultations will at least include a round of consultations at the early stage of EIA fieldwork, and again when the draft EIA report is available for disclosure and discussion before the project is appraised by ADB.

67. The MMDE will prepare a consultation plan and inform the PAPs and other stakeholders the locations where consultations will be held. The Environmental Group at the Program Management Unit (PMU) of the MWSIP will lead the consultations with the help of environmental officer at the Project Implementation Unit (PIU). The proceedings and outcome of such consultations will be recorded. The EA report will have summaries of such consultations – who attended, the manner in which they were conducted, key topics discussed, and the decisions arrived at with participants' support and participation.

68. The MMDE will actively seek the PAPs' participation in formulating the EA updates, EMPs and their implementation. The MMDE will discuss with the PAPs and other stakeholders the draft EMPs. Through periodic consultations and grievance redress mechanisms, the MMDE will engage them in project planning, implementation, and monitoring.

X. ANTICIPATED ENVIRONMENTAL IMPACTS OF MWSIP

69. Both beneficial and adverse environmental impacts of projects have been identified during the environmental assessments undertaken to date. Direct, indirect; reversible and irreversible; long-term and short-term; and cumulative impacts on physical, biological, socioeconomic, and physical and cultural resources have been examined to determine their significance and scope. Impact identification has focused on design and planning (pre-construction), construction, and post-construction phases. Stakeholder consultations and field surveys have been undertaken. In some cases, impacts have already been avoided or at least minimized through design modification and route realignment.

A. Anticipated Beneficial Impacts

1. Income and Employment Benefits

70. The MWSIP aims to improve agricultural production through better irrigation facilities in several regions of the dry zone. The positive impact of the diversion of the Mahaweli River water to medium and small reservoirs in the dry zone, where acute problem of water scarcity prevails, will be significant. The MWSIP is geared towards to increasing the cropping intensities and agricultural production under reservoirs by providing water to cultivate total cultivable area in the Yala (dry) season as well. This will generate more employment opportunities for agricultural labourers, thereby increasing their income and living standards. These changes will have a direct beneficial impact on food security and rural poverty.

2. Community Benefits

71. The overall investment program will also provide drinking water to rural communities. Such benefits directly impact on households' health, sanitation and labour. The availability of drinking water, for example, releases women from fetching water daily from faraway places. This would provide time for them to engage themselves in productive activities such as home gardening and other income-generating activities and also to participate in community activities.

3. Benefits to Wildlife

72. Canals will act as a barrier to encroachment by people onto protected areas. The provision of water bodies along canals will benefit wild life especially during drought seasons. On the other hand, the canals will act as a barrier to wild animals crossing into human settlements thereby removing the need to maintain electric fences at those locations.

B. Impacts Requiring Mitigation, Compensation and Correction

73. Most potentially negative impacts need careful planning of mitigation measures at pre-construction, construction and post-construction phases. Mitigation measures, together with resources, institutional support and a time table are to be elaborated in the contract package-specific EMPs.

C. Impacts on Physical Resources

1. Water and Hydrology

74. Potential environmental impacts on water and hydrology include changes in groundwater levels, changes in stream flow including environmental flows, changes in drainage patterns and their impacts on ecosystems. Impacts may include soil erosion, water contamination, drains and waterway blockages during site clearances. Vegetation not properly disposed of could also spread invasive species causing environmental degradation. Pools of stagnant water could generate health risks by creating vector populations. Site clearance could also lead to or aggravate soil erosion, especially during the rainy season.

2. Waste Generation

75. Any construction will generate construction debris which, unless disposed of appropriately and in a timely manner, will pollute adjoining areas, including potentially sensitive sites and residential areas. The lack of proper construction waste disposal could also block natural drainage systems and create breeding grounds for mosquitoes and for waterborne diseases. The lack of appropriate mechanisms to dispose of hazardous and toxic waste could lead to the contamination of soil and water resources.

3. Resource Extraction

76. The construction and refurbishment of irrigation canals will result in high quantities of cut and fill. Sand mining in nearby rivers and stream and extraction of gravel from borrow pits and quarries could negatively effect nearby communities.

D. Impact on Air Quality

77. Air quality can deteriorate during the pre-construction and construction phases of projects owing to dust and exhaust fumes, transportation of construction materials and rock blasting. Transportation of construction material will increase traffic on some roads in project areas, and the amount of dust released into the air could be significant. Resettlement site development, building of worker camps, land clearance, drilling, tunnelling and other construction activities may affect air quality during the construction periods.

E. Noise Pollution

78. Tunnel excavation, particularly through drill and blast methods will increase noise pollution. Noise and vibrations generated by excavation, cutting, filing and compaction work as well as operation of heavy vehicles during the construction phases may cause disturbance especially to the fauna that inhabit project areas. Birds and mammals may also be affected as some projects will traverse sanctuaries and nature reserves.

F. Soil Stability and Soil Erosion

79. Loss of soil stability and soil erosion can take place due to the removal of vegetation cover for project activities. This can result in the loss of soil fertility and induce slope instability. Such risks are possible during the construction phases. Dumping of excavated soil and rocks on river banks and slopes could cause environmental damage by soil wash and subsequent siltation of downstream land areas or water bodies.

G. Impact on Mineral Resources

80. Canal sections, cut and cover sections, conduits and tunnel sections, all of which are concrete lined, comprise restricted cross sections. Along their lengths, the canals pass several types of mineral deposits, and especially through some quartz veins of high purity. Tunnelling has to pass through marble in confined areas. The excavation method adopted for tunnelling would determine the usability and disposability of marble coming out as tunnel muck.

H. Ecological Impacts

1. Fauna

81. The MWSIP will construct canals which will traverse through protected areas and modified habitats. The main habitat types observed along the canal traces include undisturbed and degraded dry-mixed evergreen forest, scrubland, riverine forests, vegetation associated with rock outcrops, grasslands, home gardens, paddy lands, abandoned land, chena (slash-and-burn) land, and teak tree plantations. Each habitat supports a rich faunal and floral assemblage especially in protected areas. The main negative impact of the MWSIP will be the loss of habitat and the blockage of movement paths of animals, especially elephants and other ground-dwelling species. Canal design alternatives will attempt to minimize such impacts.

2. Impact on Biodiversity

82. The projects will be located in the low country dry zone of Sri Lanka, with the exception of the Minipe rehabilitation project. The dry zone habitat includes rich repositories of indigenous flora, fauna, especially large animals such as elephants and leopards. In project areas, dry-mixed evergreen forests, disturbed evergreen forests and scrubland function as rich biodiversity repositories. Some of these areas will be lost permanently to the MWSIP which will have an irreversible impact on the biodiversity inhabiting these habitats. Environmental management plans will assess impacts on habitat and introduction of invasive alien species and on the use of natural resources in unsustainable manner.

I. Impacts on Archaeological Sites

83. All archaeological remains are to be located and identified and recorded on maps with the assistance of the Archaeological Department. An archaeological assessment has been carried out for the NWP and UEC projects, with summaries and recommendations contained in each EA report. Further, the Archaeological Department has issued clearances to enable construction activities to begin on these two projects. An archaeological assessment was not undertaken for Minipe, as it was an Initial Environmental Examination, and a rehabilitation project with no new structures associated with it. Despite this, the PMU has informed the Archaeology Department about the works, and no objection has been forthcoming.

J. Socioeconomic Impacts

1. Loss of Property and Physical Relocation

84. Acquisition of land belts along canals will directly affect households. Some people will lose their residences or land or both. Disturbances to human settlements, forced relocation, social conflicts between resettlers and their host communities, loss of income sources, livelihoods, social

networks and safety nets are associated with land loss and relocation. These key project impacts will be addressed through the Resettlement Implementation Plans (RIPs) formulated for each project of the MWSIP. Both social and environmental safeguard planners will work together on this impact by sharing information and data.

2. Exposure of Construction Workers to Occupational Hazards

85. The recruitment of construction workers for project activities will necessitate the establishment of campsites and they will generate sewage, waste water, and solid waste. Workers may engage in activities that are detrimental to natural habitats such as hunting, gem excavation, and illegal extraction of timber. On the other hand, construction workers are exposed to occupational hazards, unless proper safety procedures are followed at construction sites.

K. Environmental Management Plans

86. An EMP provides a link between the impacts predicted and mitigation measures to address them. While there is no standard format for an EMP, it should reflect a project's specific environmental circumstances and requirements. In case of the three projects of the MWSIP, detailed EMPs were included in the EIAs and IEE outlined above in Section VIII.

87. During bidding, the contract specific EMPs are prepared and included in the bid documents. Accordingly, contractors are clear as to the environmental requirements that should be part of their Contractor Environmental Management Plans (CEMPs).

88. Each EMP clearly indicates different phases of a project's physical activities. For each phase, it includes proposed mitigation measures against adverse environmental impacts and risks, institutional arrangements to deliver them, capacity development and training measures, implementation schedule, cost estimates, environmental monitoring indicators, and reporting requirements. The EMPs will define expected outcomes as measurable events and include performance indicators or targets that can be tracked over a defined period of time. The investment program will not support any activities identified in ADB's Prohibited Investment Activities List in the EIA and EMP (Annex 3).

XI. DISCLOSURE OF SAFEGUARD PLANNING DOCUMENTS

89. Project specific safeguard planning documents – the EIAs, IEE, EMPs, due diligence reports, mitigation plans, and corrective action plans will be disclosed to the PAPs and other stakeholders. Environmental safeguard monitoring reports of projects will also be disclosed to the PAPs and other stakeholders, and copies will be made available at project offices, the MWSIP PMU Office and at the MMDE. These documents will also be uploaded to the ADB website. Each of these documents will be translated into Sinhala or Tamil or both in its entirety based on the locations of the project. The translated documents are also disclosed. In addition, key environmental information about the project will be kept at project locations which are accessible to all the PAPs and others for reference. The translation of documents and their disclosure will be done in a timely manner by competent translators.

90. All environmental planning documents will be sent to ADB and the CEA for review. The Program Director of the MWSIP will submit to ADB and the CEA the following documents for review and disclosure on ADB's website:

(i) Draft EIA/IEE (including the draft EMP);

(ii) Final EIA/IEE with EMP;
(iii) New or updated EIA/IEE and corrective action plans, if any, during implementation; and,
(iv) Environmental monitoring reports (bi-annually for the two projects requiring EIAs and annually for the sub-project requiring an IEE).

(V)

XII. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

A. Executing Agency and Implementing Agencies

91. The MMDE is the executing agency of the MWSIP, and it will be responsible for the overall coordination of MWSIP's planning, implementation, and monitoring. The proposed package on 'Strengthening of Integrated Water Resources Management' (SIWRM) will strengthen the MMDE's water resources management capacity and will also help strengthening water resources management and irrigation sector policies, legislation and institutions.

B. Project Management Unit

92. Each project of the MWSIP will get advice on safeguard policy issues and safeguard compliance from the environmental unit at the PMU of the MWSIP located in Colombo in the MMDE. The unit is operated by an environmental safeguard specialist who possesses a good academic background and at least 10 years of field experience in environmental safeguards. Three project implementation units (PIU) have been established for the implementation of the three projects and are based in the locality of the project sites. The PMU environment specialist is supported by three environment officers based in each of the three PIUs. An international and national environmental specialist attached to the Program Design Management Consultancy group will provide technical guidance and support the PMU and PIU environmental officers in their tasks.

93. The environmental unit at the PMU together with the safeguard focal person at each PIU is be responsible for the (i) preparation of checklists (if there are any changes in scope or alignment during implementation that warrant more studies), updating the EIAs, IEEs, and EMPs; (ii) conducting due diligence and preparing reports; and (iii) monitoring of safeguard compliance. It will also formulate and use safeguards awareness training models on environment safeguards. Such activities could be outsourced; but the responsibility for environmental planning, implementation, environmental sustainability of projects and monitoring of their results will stay with MMDE.

94. The environmental unit at the PMU of the MWSIP will ensure that the EMPs are included in contract documents. It will also ensure that contractors will adhere to the implementation and mitigation measures listed in the project EMPs.

95. The environmental unit at the PMU will organize awareness programs and training sessions for implementation staff at the project level on environmental safeguard requirements and safeguard compliance. It will prepare safeguard training materials and pamphlets for the benefit of project personnel, safeguard monitors, the PAPs and project contractors.

96. The environmental unit will establish direct links with all projects of the MWSIP and will develop and maintain an environmental safeguard database. It will be shared with project personnel, monitors and project stakeholders. The environmental unit could obtain the services from outside, if required, for EA, safeguard awareness programs, and training sessions.

C. Project Implementation Unit (PIU)

97. The PIU of each project is responsible for overseeing project construction works and for ensuring such works are in compliance with safeguard requirements, outlined in this EARF. The following PIU offices have been established:

(i) Minipe: Elahera
(ii) NWPCP: Kurunegala
(iii) UEC: Madatugama

98. Each PIU has appointed an environmental officer who is in direct contact with the environmental unit of PMU at MMDE for all safeguard issues at the project level. The official coordinates with district and provincial CEA offices and divisional secretariats. The official will help the contractor to obtain permits and licenses and other clearance for project activities that would trigger environmental impacts. The safeguard official's key role is to ensure that all new construction and refurbishment of canals and other facilities comply with environmental safeguards, and EMPs are implemented in a timely and satisfactory manner.

99. It is necessary to prepare a full plan of institutional arrangement for each project indicating the agencies involved, their TORs, time tables, and budgets. A diagram should outline the proposed institutional arrangements and their links with the PMU.

XIII. GRIEVANCE REDRESS MECHANISM

100. In order to receive and facilitate the resolution of possibly affected peoples' concerns, complaints, and grievances concerning the project's performance, a Grievance Redress Mechanism (GRM) has already been established for the entire MWSIP project, and is being enhanced at local and PIU level, at the Project sites. The GRM addresses potentially affected people's concerns and complaints proactively and promptly, using an understandable, communicated and transparent process that is gender responsive, culturally appropriate and readily accessible to all community members at no cost and without retribution. The mechanism will not impede access to the Country's judicial or administrative remedies.

A. Types of Grievance

Legal issues:

(i) Application of LAA and its limitations to arrive at replacement cost of acquired property.
(ii) Difficulties in obtaining abstracts of deeds from Land Registry.
(iii) Rules and regulations determining the ownership of land and amount of compensation.

Practical Issues.

(v) Lack of knowledge on the acquisition process and how to present claims.
(vi) Delays in payment of compensation.
(vii) Delays in payments of resettlement assistance and provision of benefits.
(viii) Most contracts on leased land are verbal. Difficulty in transforming into written contracts.
(ix) Inability to find new land for building new houses.
(x) Inability to construct new houses in a short period of time.
(xi) During the construction period: temporary disruptions.
(xii) Cracks in structures.
(xiii) Noise pollution.
(xiv) Environmental Pollution.

(xv) Dust problems.
(xvi) Other environmental issues.

B. Levels of Grievance Redress in the Program

101. This section outlines the 4 levels of grievance redress on the Project plus the additional systems through the Land Acquisition Act and the courts. Many grievances arise because of inadequate understanding of Project policies and procedures, but can be promptly resolved by proper explanation of the situation to the complainant. The four levels of the Project Grievance Redress Mechanism are as follows:

(i) **Grievance Redress Committee – Grama Niladari Level** - The complainant may submit a Grievance[1] either in writing or orally to the PIUs Project Resettlement Officer, or the PIUs Project Environmental officer, or to the Grama Niladari (GN). The Grama Niladari is the closest community administrative representative to the affected household, and is under the Divisional administration. The GRC at the Grama Niladari level includes Grama Niladhari (Chair), village level government officers (Samurdhi, Agrarian Service or DOI), village level priest (Buddhist, Hindu, Christian, Islam), community-based organization leaders, project representatives (environment and resettlement officers), two representatives from the contractor and consultant, and any other officers if required based on the issue.
It is expected that most complaints will be resolved at this level. A resolution will be determined within one week. However, if the complaint cannot be resolved through the Grama Niladari GRC, then the grievance is passed to the GRC – PIU level.

(ii) **Grievance Redress Committee –Project Implementation Unit (PIU) Level** – A resolution will be determined within one week. If a resolution cannot be determined at this level, then the complaint will be passed to the GRC - Divisional Secretary level by the Project Director. The GRC PIU level is made up of: Project Director of the PIU (Chair) and officers from project-related line agencies (Social, Samurdhi);; Secretary (Pradesiya Saba), Grama Niladari of relevant Grama Niladari Division; four members of community-based organization or representatives of PAPs; and, two representatives from the contractor and consultant.

(iii) **Grievance Redress Committee – Divisional Secretary Level** – At this stage, the grievance is determined by representatives of Divisional Secretary (Chair); project-related government agencies such as Land Registration Officer; Inland Revenue Officer; Forest Department; Wildlife Department; Samurdhi Officer; Surveyor, Grama Niladari; PIU staff (Environment and Resettlement Officer); four PAPs; and, two representatives from contractor and consultant. A resolution is expected to be determined within one week. In case the complaint cannot be resolved at this level, the complaint will be brought to the Executive Agency GRC.

(iv) **Grievance Redress Committee – Executive Agency (PMU) at Ministry Level** - In case the complaint cannot be resolved, a resolution could take up to four weeks (inclusive of GRC levels i-iv). This level includes the Secretary to the Ministry or nominated representative (Chair); District Secretary; Divisional Secretary; Resettlement Specialist; Environment Specialist; Project Director for respective project; four members of community-based organization or representatives of PAPs; and, two representatives from contractor and consultant. This is the final level of the GRM system.

[1] A Grievance or complaint any be Project related, environmental or social.

102. ADB's SPS 2009 requires that the Project-level system should not impede access to the country's judicial or administrative systems and thus the complainant has the right to access the legal court system at any time of the resolution process.

103. The GRM does not cover matters pending in the courts or any disputes concerning compensation rates. However, compensation rate disputes do fall under the LAA. Under the LAA, an Appeal must be constituted to deal with appeals against compensation offers. This process will minimize the grievances. However, a person who does not agree with the decision of the Board of Appeal may still take the case before the Supreme Court claiming a higher amount of compensation. This option is costly and time consuming and is rarely used.

104. The GRM will be responsive to the PAPs' needs, and to facilitate this, it will develop approaches that would enable all PAPs to gain access to the GRM. Cultural appropriateness of the constitution of the committee and procedures of hearings will be governed by cultural traditions in the project area. A feedback mechanism has to be built into the GRM to check how its clients treat it and their acceptance of it as an impartial and fair mechanism open to all project-affected persons. The Committee will address the PAPs' concerns and complaints promptly, using a transparent process that is gender responsive, culturally appropriate, and readily accessible to the PAPs at no cost. Each complaint will be recorded and acknowledge by the GRC's Secretary. A complaint will be dealt with within four weeks and the decision of the GRC will be conveyed to the complaint in writing soon after the decision is made.

XIV. MONITORING AND REPORTING

105. The MWSIP will ensure that environmental safeguard impacts and risks are adequately addressed. Periodic monitoring by the PMU and PIUs and ADB's assistance in addressing any weaknesses will help enhancing the quality of the application of environmental safeguards to projects of the investment program. The PMU will develop a mechanism with ADB's assistance to reduce safeguard risks through an environmental monitoring system.

106. An environmental monitoring system is a part of the EMP(s). It will ensure that the proposed mitigation measures have the intended results and meet national environmental standards and ADB's environmental safeguard policy requirements.

107. The PMU's environmental unit will establish an environmental monitoring system. The monitoring system will have the following components:

- Monitoring indicators for evaluating the performance of each mitigation measure;
- Monitoring mechanisms and methodologies;
- Monitoring staff;
- Monitoring frequency;
- Monitoring locations;
- Safeguard compliance reporting plan; and,
- A budget.

108. The PMU environmental unit will:

- Verify a project's compliance with safeguard requirements;

- Document and disclose monitoring results and identify necessary corrective and preventive actions in biannual monitoring reports;
- Submit safeguard monitoring reports to ADB; and,
- Follow-up on recommended actions to ensure desired outcomes are achieved

109. The monitoring data of each project will be fed into the safeguard database maintained at the PMU Office. Such data will be the baseline for verification of results in the spheres of environmental safeguard application, adequacy, and sustainability.

110. The Contractors will submit an environment method statement in keeping with the EMP at start of contract and obtain approval from the Project Engineer. The Contractor in his periodic progress reports should described the implementation of the EMP and any issues arising from it.

111. For the two category A projects MIWR will submit semi-annual and for the Category B project annual environmental monitoring reports to ADB and CEA. During loan review missions, ADB will monitor environmental safeguard compliance of selected projects of the MWSIP and work with the PMU to develop action plans, if significant lapses in safeguard compliance are noted. A draft environmental monitoring report format is presented in Annex 2.

Annex 1

Comparison between Local Safeguard Regulatory Framework and Environmental Safeguard Policy Principles of ADB

Policy Principle	Triggered by the Investment Program	Gap Analysis	
		Congruence Between Local Environmental Regulatory System and ADB's Environmental Safeguard Requirements	Assessment of Implementation Capacity
1. Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment	Yes	The NEA of 1980, its1988 amendment and Gazette Extraordinary No. 772/22 and No.11064 of 1993 provide for screening of each proposed project by a PP. The PP submits preliminary information about the project to PAA to initiate EIA/IEE process. The PP submits preliminary information through the Basic Information Questionnaire which could be obtained from the CEA Head Office or Provincial/District Offices, or downloaded from CEA website. As in case of SPS screening criteria, NEA screening guidelines use the type, scale, and magnitude of the proposed project as well as its location in determining the category— prescribed or non-prescribed. If the category is "prescribed", then PAA decides whether EIA or IEE should be prepared for the project. The environmental safeguard policy principle and procedures of SPS are congruent with that of Sri Lanka's environmental screening process applicable to MWSIP. SPS provides more details of environmental categorization which could easily be adapted to the local regulatory system. The difference between NEA and SPS requirements is that NEA applies a prescribed list whereas in ADB's case all projects will be categorized.	The CEA, MMDE and MASL have adequate experience in screening and categorization of projects for environmental impacts and risks.
2. Conduct an environmental assessment for each proposed project to identify potential direct,	Yes	PAA provides the TOR for environmental assessment. It guides project proponents in selecting qualified experts to do necessary fieldwork and consultations.	MMDE has environmental safeguard expertise. This is augmented by hiring qualified specialists or

Policy Principle	Triggered by the Investment Program	Gap Analysis	
		Congruence Between Local Environmental Regulatory System and ADB's Environmental Safeguard Requirements	Assessment of Implementation Capacity
indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic, and physical cultural resources in the project's area of influence.		The local regulatory system applicable to MWSIP is adequate for this task. Guidelines for environmental assessment in local regulatory framework is compatible with environmental principles and procedures of SPS	outsourcing environmental assessment to competent agencies or persons to complete under the supervision of PMU of MWSIP
3. Examine alternatives to the project's location, design, technology, components, and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the "no project" alternative.	Yes	The local environmental regulatory framework through PAA provides sufficient guidelines on examining alternatives to the project location, design, and technology. In tranche 1, preliminary traces of canals were selected after considering several alternatives to avoid harm to environment and human settlements.	See above.
4. Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an EMP that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.	Yes	See note on Principle 1 above. Each "prescribed" project with environmental impacts will require an EIA or IEE and an EMP. The environmental regulatory framework provides limited directions on the actual formation of IEE and EMP when compared with ADB's safeguard requirements, although through TOR, PAA provides guidance for IEE and actions to overcome the adverse environmental impacts. The MWSIP's EARF will provide sufficient and comprehensive guidance in this regard. The EMP is considered an integral part of IEE and is not submitted separately to PAA for review. IEE includes all action plans to overcome adverse impacts. A detailed outline of EMP and a format of an EMP are provided below to overcome this gap (Annex 2).	MMDE is aware of the importance of avoidance and minimization of adverse environmental impacts and enhancement of positive impacts. Its past projects reflect these capabilities and their adequacy. Capacity building measures such as the appointment of the Environmental Group at PMU of MWSIP would certainly further augment this capacity.

Policy Principle	Triggered by the Investment Program	Gap Analysis	
		Congruence Between Local Environmental Regulatory System and ADB's Environmental Safeguard Requirements	Assessment of Implementation Capacity
5. Carry out meaningful consultation with affected people and all other stakeholders. Continue consultations during project implementation.	Yes	The environmental regulatory framework provides limited opportunity for consultation with PAPs and other stakeholders although consultations are part of IEE/EIA formulation and approval under NEA. It is limited to presenting comments, complaints, and recommendation at the EIA/IEE review phase. 30 working days are given for such public response in case of an EIA. PAA could hold a public hearing to ascertain facts and to get affected persons views and recommendation which will be incorporated into EIA when the final document is prepared. Consultation during implementation of a project is the responsibility of PP and PAA.	There is no institutional vehicle to ensure consultation with all stakeholders at MMDE, with the exception of consultation with farmers prior to water issuance. This needs development as part of capacity development of MWSIP. The establishment of the Environmental officer at PMU and the appointment of a focal safeguard officer at each project would help resolve this capacity deficiency.
6. Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.	Yes	Environmental regulatory framework directs PAA to disclose draft EIA/IEE to the public and to seek their views, comments and recommendations. Public meetings could be organized by PAA for public hearing. The Framework however, does not provide for the disclosure of final EIA/IEE to the public. EARF provides an adequate framework for the disclosure of planning documents.	To enable MMDE to ensure timely disclosure of safeguard documentation in local languages, it is necessary to build institutional capacity at PMU and PIU levels. The establishment of an Environmental officer at PMU would help to address this gap.
7. Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.	Yes	Limited scope in the local regulatory framework to monitor the implementation of actions in EIA/IEE and the formulation of corrective actions, if required. The EARF has elaborated these requirements and provide guidance on this aspect.	An EMP is sometimes not a part of the contract documents of a project. Hence, the probability that contractors follow good safeguard practices is low. Training and capacity building are needed in the

Policy Principle	Triggered by the Investment Program	Gap Analysis	
		Congruence Between Local Environmental Regulatory System and ADB's Environmental Safeguard Requirements	**Assessment of Implementation Capacity**
			implementation of EMP at the project level. Also EMP should be part of a contract.
8. Do not implement project activities in areas of critical habitats. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. Use a precautionary approach to the use, development, and management of renewable natural resources.	Yes- located within legally protected areas	The regulatory framework provides for adequate protection of critical habitats and environmentally sensitive areas. Projects in environmentally sensitive areas will fall into EIA category of "prescribed" projects under NEA 1980.	MMDE has sufficient experience in implementing programs to promote the conservation aims of protected and reserved areas. It applies the precautionary approach in selecting project traces to avoid critical habitats and to manage renewable natural resources.
9. Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges,	Yes	NEA and its amendments and regulations provide sufficient instructions in this regard. Environmental regulatory framework generally meets the World Bank's Environmental, Health and Safety Guidelines. The EARF has elaborated them further.	The general recommendation for more training, awareness creation and capacity building among project personnel and contractors is valid here too.

Policy Principle	Triggered by the Investment Program	Gap Analysis	
		Congruence Between Local Environmental Regulatory System and ADB's Environmental Safeguard Requirements	Assessment of Implementation Capacity
including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.			
10. Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.	Yes	The environmental regulatory framework provides for the conservation of physical cultural resources and to protect such resources.	Sufficient expertise and programs are available with MMDE to conserve affected cultural resources.
11. Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures.	Yes	The local laws and procedures cover sufficiently these aspects.	Need better training on safety of workers and communities and resources.

ADB = Asian Development Bank, CEA = Central Environmental Authority, EIA = environmental impact assessment, EMP = Environmental Management Plan, IEE = initial Environmental Examination, MMDE = Ministry of Mahaweli Development and Environment, NEA = National Environmental Act, PAA = project approving agency, SPS = Safeguard Policy Statement, 2009, TOR = terms of reference, MWSIP = Mahaweli Water Security Investment Program.

ANNEX 2
Draft Outline for Environmental Monitoring Report:

A safeguard monitoring report may include the following elements:

(i) Background/context of the monitoring report (adequate information on the project, including physical progress of project activities, scope of monitoring report, reporting period, and the monitoring requirements including frequency of submission as agreed upon);

(ii) Changes in project scope and adjusted safeguard measures, if applicable;

(iii) Qualitative and quantitative monitoring data;

(iv) Monitoring parameters/indicators and methods based on the EMP previously agreed upon with ADB;

(v) Monitoring results compared against previously established benchmarks and compliance status (e.g., obtaining necessary approvals for establishment of certain facilities, national environmental emission and ambient standards and/or standards set out in the WB's EHS guidelines; timeliness and adequacy of environmental mitigation measures;, and training; budget for implementing EMP, timeliness and adequacy of capacity building, etc.);

(vi) Monitoring results compared against the objectives of safeguards or desired outcomes documented (environmental impacts avoided or minimized, etc.);

(vii) If noncompliance or any major gaps identified, include a corrective action plan;

(viii) Records on disclosure of monitoring information to affected communities;

(ix) Identification of key issues, or grievances from affected people, or recommendations for improvement;

(x) Monitoring adjustment measures recommended based on monitoring experience/trends and stakeholders response;

(xi) Information about actual institutional arrangement for implementing the monitoring program/plan provided or adjusted, as may be required;

(xii) Proposed items of focus for the next report and due date.

ANNEX 3
ADB Prohibited Investment Activities List

The following investment activities will not qualify for ADB support:

(i) Production or activities involving harmful or exploitative forms of forced labour[1] or child labour;[2]
(ii) Production of or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements or subject to international phase outs or bans, such as (a) pharmaceuticals,[3] pesticides, and herbicides,[4](b) ozone-depleting substances,[5] (c) polychlorinated biphenyls[6] and other hazardous chemicals,[7](d) wildlife or wildlife products regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora,[8] and (e) trans boundary trade in waste or waste products;[9]
(iii) Production of or trade in weapons and munitions, including paramilitary materials;
(iv) Production of or trade in alcoholic beverages, excluding beer and wine;[10]
(v) Production of or trade in tobacco;[10]
(vi) Gambling, casinos, and equivalent enterprises;[10]
(vii) Production of or trade in radioactive materials,[11] including nuclear reactors and components thereof;
(viii) Production of, trade in, or use of unbonded asbestos fibres;[12]
(ix) Commercial logging operations or the purchase of logging equipment for use in primary tropical moist forests or old-growth forests; and
(x) Marine and coastal fishing practices, such as large-scale pelagic drift net fishing and fine mesh net fishing, harmful to vulnerable and protected species in large numbers and damaging to marine biodiversity and habitats.

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[1] Forced labor means all work or services not voluntarily performed, that is, extracted from individuals under threat of force or penalty.
[2] Child labor means the employment of children whose age is below the host country's statutory minimum age of employment or employment of children in contravention of International Labor Organization Convention No. 138 "Minimum Age Convention" (www.ilo.org).
[3] A list of pharmaceutical products subject to phaseouts or bans is available at http://www.who.int.
[4] A list of pesticides and herbicides subject to phaseouts or bans is available at http://www.pic.int.
[5] A list of the chemical compounds that react with and deplete stratospheric ozone resulting in the widely publicized ozone holes is listed in the Montreal Protocol, together with target reduction and phase-out dates. Information is available at http://www.unep.org/ozone/montreal.shtml.
[6] A group of highly toxic chemicals, polychlorinated biphenyls are likely to be found in oil-filled electrical transformers, capacitors, and switchgear dating from 1950 to 1985.
[7] A list of hazardous chemicals is available at http://www.pic.int.
[8] A list is available at http://www.cites.org.
[9] As defined by the Basel Convention; see http://www.basel.int.
[10] This does not apply to investee companies who are not substantially involved in these activities. Not substantially involved means that the activity concerned is ancillary to an investee company's primary operations.
[11] This does not apply to the purchase of medical equipment, quality control (measurement) equipment, and any equipment for which ADB considers the radioactive source to be trivial and adequately shielded.
[12] This does not apply to the purchase and use of bonded asbestos cement sheeting where the asbestos content is less than 20%.

ANNEX 4

Environmental Safeguard Requirements in Contracts

The following environmental safeguard requirements are to be included in the section on employers requirements in the bid documents together with the individual EMPs prepared for each project.

A. General

(i) The Contractor and contractor's employees adhere to the mitigation measures set down in the EMP and take all necessary measures required to prevent harm, and to minimize the impact of operations on the environment.

(ii) The contractor on completion of construction should take full responsibility in ensuring a clean and safe construction premises.

B. Disposal of solid waste and debris

(i) All construction debris and residual spoil material including any left earth shall be disposed by the contractor at a location approved by the Local Authority for such a purpose.

(ii) The debris and spoil shall be disposed in such a manner that (i) waterways and drainage paths are not blocked; (ii) the disposed materials will not be washed away by floods; and (iii) such materials should not cause public nuisance.

C. Protection of Ground Cover and Vegetation

Contractor shall provide necessary instructions to his workers not to destroy ground vegetation cover unnecessarily.

D. Soil Erosion

(i) Contractor shall take all steps necessary to ensure the stability of slopes including those related to temporary works.

(ii) Work that will lead to heavy erosion shall be avoided during the rainy season. If such activities need to be continued during rainy season, prior approval must be obtained from implementing agencies and local authorities by submitting a proposal on actions that will be undertaken by the contractor to prevent erosion.

(iii) The work, permanent or temporary, shall consist of measures as per design to control soil erosion, sedimentation and water pollution. Typical measures would include grass cover, slope drains, retaining walls etc.

E. Labour Camps

(i) Labour camps shall be provided with adequate and appropriate facilities for disposal of sewage and solid waste. The sewage systems shall be properly designed, built and operated so that no pollution to ground or adjacent water bodies/watercourses takes place. Garbage bins shall be provided in the camps and regularly emptied. Garbage should be disposed of in a hygienic manner.

(ii) Contractor shall ensure that all camps are kept clean and hygienic. Necessary measures shall be taken to prevent breeding of vectors and diseases.

(iii) Contractor shall report any outbreak of infectious disease of importance at a labour camp to the Medical Officer of Health (MOH) or to the Public Health Inspector (PHI) of the area immediately.
(iv) Contractor shall remove the labour camps fully after its need is over, empty septic tanks, if instructed by the engineer shall be closed, remove all garbage, and debris; and clean and restore the area back to its former condition.

F. Dust Management

(i) To prevent dust pollution during the construction period, the Contractor shall carry out regular watering of the construction site and shall cover material stocks onsite to prevent dust and other particles getting airborne.
(ii) All vehicles delivering materials shall be covered to avoid spillage and dust emission.

G. Health and Safety

(i) Contractor shall take necessary actions to prevent breeding of mosquitoes at places of work, labour camps, material stores, etc. Stagnation of water in all areas including gutters, used and empty cans, and containers shall be prevented.
(ii) Contractor shall keep all places of work, labour camps, plus office and store buildings clean and devoid of garbage to prevent breeding of rats and other vectors such as flies.
(iii) Construction vehicles, machinery, and equipment shall be used and stationed only in designated areas of the work site and should not pose any danger to nearby communities, if any.
(iv) Material stockpiles shall be located sufficiently away from the areas from human settlements and water bodies.
(v) Construction sites should be fenced out temporarily in order to avoid any risk posed to people who live nearby areas from construction activities.
(vi) The contractor shall enforce vehicle speed limits for construction vehicles in areas near and inside construction premises

H. Sourcing of Raw Material

The contractor shall ensure that all raw materials such as sand, rubble, metal, and timber required for the construction of the building are sourced from licensed sources. If the contractor plans to operate own quarry/sand pit, all necessary approvals should be obtained from relevant authorities.

Resettlement Plan for Package UEC-ICB-2A

Available at: https://www.adb.org/projects/documents/sri-47381-005-rp

Resettlement Due Diligence Report for Package UEC-ICB-2B

Available at: https://www.adb.org/projects/documents/sri-47381-005-sddr

UPDATED RISK ASSESSMENT AND RISK MANAGEMENT PLAN

Risk Description	Rating	Mitigation Measures	Responsibility
Financial Management			
MMDE does not prepare full sets of financial statements to the Treasury.	L	Treasury is conducting a detailed study, with the view of implementing new guidelines. MMDE, MASL and DOI should encourage financial staff to study and become familiar with structure of full set of financial reports in the basic accrual accounting process. That generally includes 4 statements: (i) balance sheet, (ii) income statement, (iii) cash flow statement, and (iv) notes to financial reports.	MMDE
Treasury tends to re-prioritize project financing, resulting in delays in counterpart funding and project implementation.	L	The investment program's undertakings and loan covenants commit Treasury to release to MMDE capital funds required for the investment program without any undue delays and to prioritize the investment program for fund disbursements.	MMDE
MMDE, MASL and DOI generally under-spend their capital expenditure budget. One reason is inaccuracy in forecasting capital costs.	M	MMDE, MASL and DOI need to ensure expenditures are estimated accurately. Cost estimation to be based on the market price with an average percentage of price escalation for the past 3 years.	MMDE
MMDE's 5-year corporate plans are not comprehensive and are not updated frequently, resulting in underspending of capital budgets	M	MMDE should improve its 5-year corporate plans following ADB best practices, and update them annually. This will be done as a capacity building exercise during implementation of the investment program.	MMDE
Procurement			
Inexperience of national contractors	M	Raising the capacity of inexperienced Sri Lankan contractors will be encouraged by the investment program through (i) forming joint ventures; (ii) relaxing the qualifying criteria to the lower range, as suggested in ADB's User's Guide to Procurement of Works for simple and repetitive works;[a] and (iii) allowing road sector contractors to bid for simple canal construction packages.	MMDE
Low interest in competitive bidding	M	The procurement plan for the investment program limits the number of midsize contracts to $10 million–$40 million since few contractors in Sri Lanka are qualified and foreign entities may be less interested.	MMDE
Contract administration capacity of PMU and PIU officers	L	The investment program will strengthen contract administration and management skills—focusing on contract variations, settlement of claims and disputes, adjudication, and arbitration—through regular on-the-job training by involving expertise from project consultants (such as the PMDSC) in these activities. Improvements have been observed during tranche 1 implementation.	MMDE
Corruption			
Corruption	L	The investment program's undertakings commit MMDE ensuring that anticorruption provisions acceptable to ADB are included in all bidding documents and contracting, including provisions specifying the right of ADB to audit and examine the records and accounts of the executing agency and all contractors, suppliers, consultants, and other service providers as they relate to any project under the investment program.	MMDE

Risk Description	Rating	Mitigation Measures	Responsibility
Implementation			
Contract cost escalation during implementation	L	Cost estimates for goods and works contracts should be prepared by the executing agency and PMU as close as possible based on realistic market rates. PMU should investigate the market for major standardized items and establish a database of rates which can be utilized as reference. The PMDSC, acting as the engineer for all civil works contracts, is responsible for measuring and certifying payment certificates, and advising on contract variations and will be closely monitoring contract implementation.	MMDE
Delayed commencement of civil works, resulting in implementation delays	L	The PMU and PIU were established prior to Board approval of the investment program, and the PMDSC were recruited under tranche 1. Advanced actions for all tranche 2 works packages have been initiated.	MMDE
Unforeseen ground conditions and extreme weather conditions lead to delays in implementation	S	Comprehensive ground investigations have been conducted during the design phase. A tunnel boring machine will be used to construct most of the 28 kilometer UECP tunnel, which will help expedite implementation and minimize construction risks. The contracts for tunnel construction include penalty clauses. During implementation, a systematic risk management program will be used to identify risks and advise on mitigation actions.	MMDE
Benefits of the investment program will be reduced if water management is not improved and if the government does not complete the NCPCP	M	The investment program will support MMDE to improve water management in the investment program areas. MMDE assures that recommendations from pilot studies financed by the investment program are up-scaled for the entire Mahaweli system. The government has expressed commitment to completing the NCPCP. The PMDSC will support preparation of the remaining NCPCP components, and will prepare due diligence reports (technical, economic, financial, safeguards) and documentation for possible ADB financing.	MMDE
Climate change impacts on water availability exceed projections.	S	The sensitivity of climate change projections was assessed under the water balance study for the NCPCP. The water balance is being updated under tranche 1 and will include an updated assessment. As an adaptation response, the capacities of canals, reservoirs and spillways have been increased. Implementing interventions recommended under the ISEWP package, financed under tranche 1, to address on-farm water management will be further considered and should help mitigate adverse impacts.	MMDE
PMU and PIUs unable to attract and retain suitably qualified staff	L	Government has committed to recruit contractual staff at competitive market rates. In addition, the PMDSC will act as engineer, and will be responsible for contract management and construction supervision. Several international and national consultants will also be recruited to (i) assist the PMU and PIUs to set up operational systems; and (ii) provide hands-on training to the PMU and PIU staff.	MMDE

H = high, S = substantial, M = moderate, L = low.
ADB = Asian Development Bank; DOI = Department of Irrigation, ISEWP = improving system efficiencies and water productivity, MASL = Mahaweli Authority of Sri Lanka, MMDE = Ministry of Mahaweli Development and Environment; NCPCP = North Central Province Canal Program; NPA = National Procurement Authority; PIU = project implementation unit; PMDSC = program management, design and supervision consultants; PMU = program management unit, UECP = Upper Elahera Canal Project.
[a] ADB. 2016. *User's Guide to Procurement of Works. Standard Bidding Document.* Manila
Source: ADB estimates.

Appendix 13: Updated Procurement Capacity Assessment
Appendix 14: Updated Financial Management Assessment
Appendix 15: Updated Communication Plan
Appendix 16: Tranche 2 Design Summary Report

Available upon request.