



Technical Assistance Report

Project Number: 52156-002
Transaction Technical Assistance (TRTA)
November 2018

Democratic Socialist Republic of Sri Lanka: Preparing the Integrated Water Productivity Improvement Project

This document is being disclosed to the public in accordance with ADB's Public Communications Policy 2011.

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 25 October 2018)

Currency unit	–	Sri Lankan rupee/s
SLRe1.00	=	\$0.0058
\$1.00	=	SLRe172.65

ABBREVIATIONS

ADB	–	Asian Development Bank
IWMI	–	International Water Management Institute
PIU	–	project implementation unit
PMU	–	project management unit

NOTE

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

Vice-President	Wencai Zhang, Operations 1
Director	Hun Kim, South Asia Department (SARD)
General	
Director	Mio Oka, Environment, Natural Resources and Agriculture Division (SARD)
Team leader	Lance Gore, Senior Water Resources Specialist, SARD
Team members	K.M. Palitha Bandara, Senior Project Officer (Natural Resources and Environment), SARD Arnaud Cauchois, Principal Water Resources Specialist, SARD Marie L'Hostis, Water Resources Specialist, SARD Roshan Ouseph, Counsel, Office of the General Counsel Rebekah Ramsay, Social Development Specialist, SARD
Peer reviewers	Sanmugam Prathapar, Senior Water Resources Specialist, Sustainable Development and Climate Change Department

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TRANSACTION TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data		Project Number: 52156-002	
Project Name	Integrated Water Productivity Improvement Project	Department/Division	SARD/SAER
Nature of Activity Modality	Project Preparation Regular	Executing Agency	Asian Development Bank
Country	Sri Lanka		
2. Sector	Subsector(s)	ADB Financing (\$ million)	
✓ Agriculture, natural resources and rural development	Irrigation		0.70
	Rural water policy, institutional and capacity development		0.10
	Water-based natural resources management		0.20
	Total		1.00
3. Strategic Agenda	Subcomponents	Climate Change Information	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Climate Change impact on the Project	Low
Environmentally sustainable growth (ESG)	Disaster risk management Natural resources conservation		
4. Drivers of Change	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Institutional development Institutional systems and political economy Organizational development	Effective gender mainstreaming (EGM)	✓
Knowledge solutions (KNS)	Knowledge sharing activities Pilot-testing innovation and learning		
Partnerships (PAR)	Commercial cofinancing International finance institutions (IFI)		
5. Poverty and SDG Targeting		Location Impact	
Geographic Targeting	No	Rural	High
Household Targeting	No		
SDG Targeting	Yes		
SDG Goals	SDG2, SDG8, SDG9, SDG13		
6. Risk Categorization	Low		
7. Safeguard Categorization	Safeguard Policy Statement does not apply		
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		1.00	
Transaction technical assistance: Technical Assistance Special Fund		1.00	
Cofinancing		0.20	
Multi-Donor Trust Fund under the Water Financing Partnership Facility (Full ADB Administration)		0.20	
Counterpart		0.05	
Government		0.05	
Total		1.25	
Currency of ADB Financing: USD			

I. THE ENSUING PROJECT

1. The transaction technical assistance (TRTA) will prepare the proposed Integrated Water Productivity Improvement Project. The project will improve water management within the selected river basins and irrigation subprojects will be improved under the project with the following outputs and interventions. Output 1: resource management systems improved, will (i) strengthen river basin coordination and management by undertaking river basin mapping and modelling and preparing river basin management plans; (ii) increase hydrological and meteorological data collection and strengthening the national hydrology archive; and (iii) provide modern asset management tools and procedures. Output 2: irrigation infrastructure modernized, will (i) implement irrigation modernization works; (ii) expand irrigation systems where there is adequate water availability; and (iii) increase overall water storage capacity. Output 3: modern crop production and marketing promoted, will assist farmers with modern best practices for improving on-farm water management and increase their crop productivity by (i) implementing training programs for farmers (including targeting women farmers) and government staff on improved water management and crop production; (ii) establishing new demonstration farms; and (iii) strengthening farmer organizations. These outputs will result in the following outcome: water productivity in irrigated lands of selected river basins increased. The project will be aligned with the following impact: food security and water use efficiency enhanced recognizing the impact of climate change.¹ The Country Operations Business Plan for Sri Lanka 2019–2021 includes a TRTA for approval in 2018 and an investment loan amounting to \$170 million from ADB’s regular ordinary capital resources for Board consideration in 2020.²

II. THE TECHNICAL ASSISTANCE

A. Justification

2. The proposed TRTA is required to develop the project concept to feasibility level and support the recruitment and management of the project readiness financing (PRF) consultants (PRFC). The objectives of the TRTA are to: (i) assist the government to select priority river basins to be covered under the project; (ii) develop hydrologic models and river basin management plans in two sample river basins; (iii) identify representative sample subprojects representing at least 30% of the works and prepare subproject pre-feasibility and feasibility studies; (iv) assess the irrigation and agriculture sectors policy and institutional frameworks, identify gaps associated with achieving the project objectives and improvement recommendations; (v) update irrigation design guidelines to address modern best practices, farmers evolving needs, and resilience to climate change; (vi) prepare draft loan documents for ADB Board consideration; (vii) prepare consulting packages for the remaining subproject feasibility studies, detailed designs, construction supervision, project implementation support, farmers agriculture support services and institutional strengthening; (viii) undertake social and environmental impact assessments in sample subproject locations, prepare safeguard and gender related documents; and (ix) support the early recruitment of the PRFC and their management for meeting the project readiness criteria.

B. Outputs and Activities

3. The major outputs and activities are summarized in Table 1.

¹ Department of National Planning. 2017. *Public Investment Programme, 2017–2020*. Colombo.

² ADB. 2018. *Country Operations Business Plan: Sri Lanka, 2018–2022—Transition to Upper Middle-Income Country Status*. Manila.

Table 1: Summary of Major Outputs and Activities

Major Outputs	Delivery Dates	Key Activities with Milestones
1. Project river basins selected, and hydrologic models and river basins management plans developed.	1.1 Feb 2019	1.1 Prepare GIS database and maps of all river basins which are partially or entirely within the boundaries of the Uva and North Western provinces. The maps will provide detailed information on land use, water resource uses and availability, population, irrigation development, protected areas, etc.
	1.2 Feb 2019	1.2 Refine project river basin selection criteria and propose/confirm list of priority river basins to be covered under the project.
	1.3 Apr 2019	1.3 Confirm selection of four representative priority river basins (two in each province) and develop calibrated hydrologic models using SWAT software.
	1.4 May 2019	1.4 Undertake water resources optimization scenarios taking surface and groundwater into account using the SWAT models and prepare integrated water resources management river basin planning framework.
	1.5 Jul 2019	1.5 Develop river basin management plans of the four sample river basins with stakeholder consultations.
	1.6 Jul 2019	1.6 Prepare guidance note for future river basin hydrologic modelling and basin plan development under the project.
	1.7 Jun 2019	1.7 Need assessment and development proposal of rain and flow monitoring stations in all project river basins.
2. Subprojects selected, and feasibility of representative sample sub-projects appraised.	2.1 Feb 2019	2.1 Prepare subprojects typology and selection criteria for each type.
	2.2 Aug 2019	2.2 Select sample subprojects for TRTA appraisal (30% of civil works) and long list of remaining 70% subprojects to be considered under the project.
	2.3 Nov 2019	2.3 Undertake a feasibility study for each sample subproject including technical, economic and social due diligences.
	2.4 Aug 2019	2.4 Develop project agriculture modernization support plan to enhance agriculture productivity.
3. Policy and institutional frameworks assessed and proposal for improvements identified	3.1 Apr 2019	3.1 Assess river basin management policy and institutional framework, gap analysis and proposal for improvement.
	3.2 Apr 2019	3.2 Assess irrigation asset operation and maintenance strategies, guidelines and procedures and recommendations for improvements.
	3.3 Apr 2019	3.3 Assess current water, land management and agriculture policy, legal and institutional framework and improvement recommendations required to achieve the project benefits.
	3.4 Jul 2019	3.4 Economic and financial analysis comparison of deferred maintenance versus routine maintenance.
4. Draft loan documentation produced, and project implementation start-up facilitated	4.1 Jan 2019	4.1 Prepare terms of reference of consulting package(s) for preparing detailed designs and bid documents (to be financed under the PRF).
	4.2 Jul 2020	4.2 Prepare terms of reference of consulting package(s) for construction supervision, project implementation support, agriculture support services, and policy and institutional strengthening.
	4.3 Dec 2020	4.3 Assist in preparation of loan documentation.
	4.4 Jan 2021	4.4 Review PRFC deliverables.
	4.5 Jan 2021	4.5 Establish indicators/benchmarks for sector performance.

GIS = geographic information system, PRF = project readiness financing, PRFC = project readiness financing consultants, SWAT = soil and water assessment tool, TRTA = transaction technical assistance.

Source: Asian Development Bank.

C. Cost and Financing

4. The TRTA is estimated to cost \$1,200,000, of which \$1,000,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF 6) and \$200,000 will be financed on a grant basis from the Multi-donor Trust Fund³ under the Water Financing Partnership Facility. The key expenditure items are listed in Appendix 1. The government will provide counterpart support in the form of counterpart staff, office accommodations, and other in-kind contributions. The government was informed that approval of the TRTA does not commit ADB to finance any ensuing project.

D. Implementation Arrangements

5. ADB will administer the TRTA and will be responsible for selection, supervision, and evaluation of consultants and procurement of surveys and studies financed by ADB under the TRTA. The implementation arrangements are summarized in Table 2.

Table 2: Implementation Arrangements

Aspects	Arrangements		
Indicative implementation period	November 2018–October 2021		
Executing agency	MIWRDM		
Implementing agencies	ADB through the South Asia Department		
Consultants	To be selected and engaged by Asian Development Bank		
	ICS	International: 28 person-months	\$772,950
	ICS	National: 11.5 person-months	\$62,050
	Direct contracting	1 contract	\$100,000
Procurement	To be procured by Asian Development Bank		
	Direct contracting	1 contract	\$50,000
	To be procured by the consultants		
	Request for quotations	multiple contracts	\$140,000
Advance contracting and retroactive financing	Advance contracting will be undertaken for this TRTA for direct contracting the International Water Management Institute and individual consultant recruitments.		
Disbursement	The TRTA resources will be disbursed following <i>ADB's Technical Assistance Disbursement Handbook</i> (2010, as amended from time to time).		
Asset turnover or disposal arrangement upon TRTA completion	Not applicable		

ADB = Asian Development Bank, ICS = individual consultant selection, MIWRDM = Ministry of Irrigation and Water Resources and Disaster Management, TRTA = transaction technical assistance.

Source: Asian Development Bank estimates.

6. **Consulting services.** ADB will engage the consultants following the ADB Procurement Policy (2017, as amended from time to time) and its associated project administration instructions and/or staff instructions.⁴ The consultants will procure (i) land acquisition and resettlement census data, (ii) topographical surveys, (iii) support staff for structure condition assessment and preliminary designs, and (iv) agri-socioeconomic surveys. The International Water Management

³ Financing Partners: Australia, Austria, Spain and Switzerland

⁴ Terms of Reference for Consultants (accessible from the list of linked documents in Appendix 2).

Institute (IWMI) will be recruited through direct contracting to undertake GIS mapping and database development under Output 1. The direct contracting modality is considered appropriate on the basis of recruitment efficiency, value-for-money, and because the assignment will be relatively small. It will also be a continuation of similar assignments that IWMI is already undertaking with the government, and IWMI has the necessary information, tools, and skills.

COST ESTIMATES AND FINANCING PLAN
(\$'000)

Item	Amount		
	ADB ^a	External Source ^b	Government ^c
A. Consultants			
1. Remuneration and per diem			
a. International consultants	656.3	0.0	0.0
b. National consultants	67.1	0.0	0.0
2. Out-of-pocket expenditures			
a. International and local travel	47.6	0.0	0.0
b. Office space rental and related facilities	0.0	0.0	0.0
c. Goods (car rental)	54.0	0.0	0.0
d. Reports and communications	5.0	0.0	0.0
e. Miscellaneous administration and support costs ^d	5.0	0.0	0.0
B. Surveys	60.0	180.0	0.0
C. Training, seminars, and conferences			
1. Facilitators	2.0	0.0	0.0
2. Venue rental and related facilities	1.0	0.0	0.0
3. Participants	1.0	0.0	0.0
4. Representation	1.0	0.0	0.0
D. Contingencies	100.0	20.0	0.0
Total	1,000.0	200.0	0.0

Note: The transaction technical assistance (TRTA) is estimated to cost \$1.25 million, of which contributions from the Asian Development Bank and the Netherland Trust Fund under the Water Partnership Financing Facility are presented in the table above. The government will provide counterpart support in the form of counterpart staff, office accommodation and secretarial assistance, and other in-kind contributions. The value of government contribution is estimated to account for 4% of the total TRTA cost.

^a Financed by the Asian Development Bank's Technical Assistance Special Fund TASF-6.

^b Multi-Donor Trust Fund under the Water Financing Partnership Facility. Administered by the Asian Development Bank. Funds will be disbursed on a pro-rata basis.

^c The government will provide counterpart support in the form of counterpart staff, office accommodations, and other in-kind non-cash contributions.

^d For office consumables and equipment as required.

Source: Asian Development Bank estimates.

LIST OF LINKED DOCUMENTS

<http://www.adb.org/Documents/LinkedDocs/?id=52156-002-TARreport>

1. Terms of Reference for Consultants

TERMS OF REFERENCE FOR CONSULTANTS

I. DIRECT CONTRACTING WITH INTERNATIONAL WATER MANAGEMENT INSTITUTE

1. For selected river basins: (i) prepare GIS database, base maps that include detailed information on the hydrological network within the river basins and subproject boundaries; (ii) develop detailed and calibrated Soil and Water Assessment Tool models and train transaction technical assistance (TRTA) consultants and Ministry of Irrigation and Water Resources and Disaster Management (MIWRDM) staff on their use; (iii) provide remote sensing analysis of long-term historic satellite imagery to assess actual and potential evapotranspiration to identify water stressed subprojects; and (iv) provide other key information for selection of potential sub-watersheds and subprojects.

II. INDIVIDUAL CONSULTANTS

A. Scope of services, output and activities

2. The objectives of the TRTA are to: (i) assist the Government of Sri Lanka to select priority river basins and subprojects to be covered under the project; (ii) develop river basin management plans in four sample river basins with the support of the International Water Management Institute (IWMI) GIS database, mapping and hydrologic modelling team; (iii) identify representatives sample subprojects and prepare subproject prefeasibility and feasibility studies of sample subprojects representing at least 30% of the works; (iv) assess the irrigation and agriculture sectors policy and institutional frameworks, identify gaps associated with achieving the project objectives and improvement recommendations; (v) modernize the irrigation system design criteria to address farmers evolving needs and resilience to climate change; (vi) prepare draft loan documents for ADB Board consideration; (vii) prepare consulting packages for the remaining subproject feasibility studies, detailed designs, construction supervision, project implementation support, farmers agriculture support services and institutional strengthening; and (viii) support recruitment planning and the eventual management of the consultants to be engaged under the planned Project Readiness Financing (the “PRF Consultants” or “PRFC”).

3. The major outputs and activities are summarized in Table 1

Table 1: Summary of Major Outputs and Activities

B. Major Outputs	Delivery Dates	Key Activities with Milestones
1. Project river basins selected, and hydrologic models and river basins management plans developed.	1.1 Feb 2019	1.1 Prepare GIS database and maps of all river basins which are partially or entirely within the boundaries of the Uva and North Western provinces. The maps will provide detailed information on land use, water resource uses and availability, population, irrigation development, wildlife parks, etc.
	1.2 Feb 2019	1.2 Refine project river basin selection criteria and propose/confirm list of priority river basins to be covered under the project.
	1.3 Apr 2019	1.3 Confirm selection of four representative priority river basins (two in each province) and develop calibrated hydrologic models using SWAT software.
	1.4 May 2019	1.4 Undertake water resources optimization scenarios using the SWAT models and prepare integrated water resources management river basin planning framework.

B.	Major Outputs	Delivery Dates	Key Activities with Milestones
		1.5 Jul 2019 1.5 Jul 2019 1.7 Jul 2019 1.8 Jun 2019	1.5 Develop river basin management plans of the four sample river basins with stakeholder consultations. 1.6 Prepare a climate risk and vulnerability assessment for the project areas. 1.7 Prepare guidance note for future river basin hydrologic modelling and basin plan development under the project. 1.8 Need assessment and development proposal of rain and flow monitoring stations in all project river basins.
2.	Subprojects selected, and feasibility of representative sample sub-projects appraised.	2.1 Feb 2019 2.2 Aug 2019 2.3 Nov 2019 2.4 Aug 2019	2.1 Prepare subprojects typology and selection criteria for each type. 2.2 Select sample subprojects for TRTA appraisal (30% of civil works) and long list of remaining 70% subprojects to be considered under the project. 2.3 Undertake a feasibility study for each sample subproject including technical, economic and social due diligences. 2.4 Develop project agriculture support plan.
3.	Policy and institutional frameworks assessed and proposal for improvements identified	3.1 Apr 2019 3.2 Apr 2019 3.3 Apr 2019 3.4 Jul 2019	3.1 Assess river basin management policy and institutional framework, gap analysis and proposal for improvement. 3.2 Assess irrigation asset operation and maintenance strategies, guidelines and procedures and recommendations for improvements. 3.3 Assess current water, land management and agriculture policy, legal and institutional framework and improvement recommendations required to achieve the project benefits. 3.4 Economic and financial analysis comparison of deferred maintenance versus routine maintenance.
4.	Draft loan documentation produced, and project implementation start-up facilitated	4.1 Jan 2019 4.2 Jul 2020 4.3 Dec 2020 4.4 Jan 2021 4.5 Jan 2021	4.1 Prepare terms of reference of consulting package(s) for preparing detailed designs and bid documents (to be financed under the PRF). 4.2 Prepare terms of reference of consulting package(s) for construction supervision, project implementation support, agriculture support services, and policy and institutional strengthening. 4.3 Assist in preparation of loan documentation. 4.4 Review PRFC deliverables. 4.5 Establish indicators/benchmarks for sector performance.

GIS = geographic information system, PRF = project readiness financing, PRFC = project readiness financing consultants, SWAT = soil and water assessment tool, TRTA = transaction technical assistance
Source: Asian Development Bank.

C. Consulting Services Inputs

4. The TRTA will be implemented over a period of 36 months from fielding consultants, from November 2018 to October 2021. An estimated total of 39.5 person-months of consulting services (consisting of 28 person-months of international and 11.5 person-months of national input) will be required for project preparation and assistance in project start-up. The consultant requirements are shown in Table 2 below.

5. During project start-up, key members of the team will work closely with the project management unit (PMU) and the project implementing units (PIU) to establish systems and

develop capacity for the necessary financial, management and reporting for project management and benefit monitoring, and support the PMU with initial procurement actions.

Table 2: Summary of Consulting Services Requirement

	Positions	Remarks	Person-Months Required
International			
1	Water Resource Engineer/Team Leader	individually	7.5
2	Junior Engineer (Hydraulic Design and Water Resources)	recruited	5.0
3	Irrigation Planning & Design Engineer	consultants	6.0
4	Economist		3.0
5	Social and Gender Specialist		1.5
6	Irrigated Agriculture Specialist		2.5
7	Institutions Specialist		2.5
	Sub-total		28.0
National			
8	Environment Specialist		3.5
9	Social and Gender Specialist		3.5
10	Economist		3.0
11	Financial Management Specialist		1.5
	Sub-total		11.5
	Total		39.5

Source: Asian Development Bank estimates.

D. Implementation procurement and logistics arrangements

6. MIWRDM will be the executing agency for the TRTA while the Asian Development Bank (ADB), through the South Asia Department, will be the implementing agency and will be responsible for the selection and the supervision of the consultants.

7. MIWRDM will provide office accommodation, counterpart staff and secretarial support in Colombo and in the North Western and Uva provinces. ADB will provide funds through the TRTA for car rental, communications and reports printing, workshops and seminar. The TRTA will also provide funds for preparing GIS data base and mapping and hydrologic modeling of river basins to be considered under the project. GIS mapping and hydrologic modelling will be directly procured by ADB through direct contracting with IWMI. Topographic surveys and support staff for structure condition assessment and preliminary design preparation, agri-socioeconomic surveys, land acquisition and resettlement census and initial environmental examination studies.

E. Deliverables

8. Collectively, under the direction of the Team Leader, the team will: (i) prepare the TRTA inception, interim, draft final and final reports and associated technical reports; (ii) draft the report and recommendation of the President (RRP) and related linked documents (LDs) in ADB format; and (iii) assist the government in the preparation of social and environmental safeguard documents. A key activity in the preparation of the project will involve stakeholder consultation to (a) identify necessary system improvements, (b) explore options to involve farmers in the construction and rehabilitation of system facilities (including control structures, canals and development of tertiary and on-farm distribution systems). The draft technical deliverables and

briefing reports will be issued MIWRDM and ADB as required. The detailed can be found in Table 3 below.

Table 3: Reports and other Technical Deliverables

SN	Report/Deliverable	Due Date (months from start)
1	Bi-monthly Reports Monthly reports should be concise and include details of consultants deployed, reports submitted, list of activities and status, bottlenecks, and mitigation plans.	1–24
2	Inception Report – Development Intent and Stakeholder Engagement <ul style="list-style-type: none"> • Summary of proposed modernization works, with focus on engineering work and survey • Scope of studies and surveys • Preliminary plan for agriculture and irrigation management • Plan for stakeholder engagement – consultations and awareness 	1.5
3	Technical Reports/ Working Papers <ul style="list-style-type: none"> • Typology of subproject with subproject selection criteria – long list of potential subprojects, short list of sample subproject to be appraised by TRTA (30% of investment works) • Updated design guidelines • IWRM based river basin planning framework and four river basin management plans • Institutional, policy, legal and information management systems assessment and strengthening proposals (three reports including river basin management, asset management and agriculture productivity enhancement) • Project agriculture support plan • Hydro-met network assessment and upgrading proposal • Deferred maintenance versus routine maintenance comparative economic analysis 	2 – 12
6	Feasibility Study Report <ul style="list-style-type: none"> • Technical feasibility • Economic feasibility • Environment and social safeguards and gender 	11
7	Terms of reference <ul style="list-style-type: none"> • For consultancy package(s) for detailed design, construction supervision and project implementation • For Agriculture support services 	1.5 10

9. The deliverables required for project loan processing and delivery timeframes to ADB are detailed in Table 4 below.

Table 4: Deliverables required for ADB Project Approval/Loan Processing

SN	Deliverable	Expert Responsible	Due Date (months from start)
1	Draft RRP	Team Leader	11
2	Sector Assessment (Summary), sector policy framework	Team Leader/Institution Specialist	6
3	Country Economic Indicators	Economist	6

SN	Deliverable	Expert Responsible	Due Date (months from start)
4	Project Administration Manual	All experts – Team Leader to lead	11
5	Poverty and Social Assessment (PSA)	Social and Gender Specialists	9
6	Summary Poverty Reduction and Social Strategy (SPRSS) (Executive Summary to the PSA)	Social and Gender Specialists	9
7	Gender Equality and Social Inclusion (GESI) Plan (Attachment to the PSA)	Social and Gender Specialists	9
8	Safeguard Categorization Checklists (Involuntary Resettlement, Indigenous Peoples and Environment)	Social and Gender Specialists / Environment Specialist	1.5
9	Resettlement Framework and Sample Resettlement Plan(s) (if required)	Social and Gender Specialists	11
12	Indigenous Peoples Framework and Sample Indigenous Peoples Plan(s) (if required)	Social and Gender Specialists	11
13	Stakeholder Communications and participation Strategy	Social and Gender Specialists	6
14	Environment Assessment and Review Framework and sample subprojects Initial Environmental Examination	Environment Specialist	11
15	Risk Assessment and Risk Management Plan	Team Leader	6
16	Financial Capacity Management Assessment	Financial Management Specialist	6
17	Financial and economic analysis	Economist	12
18	Contribution to the ADB results Framework	Team Leader	6
19	Development Coordination	Team Leader	8
20	Medium or long-term sector/subsector development plan); a statement on sector policies that affect the development of the sector/subsector concerned; and an assessment of the technical and managerial capabilities of the sector institutions to develop, process, and implement projects.	Institutional Specialist	7
20	Climate change: climate risk and vulnerability assessment and project adaptation action report	Team Leader	6
21	Procurement Assessment	TBD	6

F. Terms of Reference for International Consultants

10. **Team Leader/Water Resources Engineer** (international, 7.5 person-months). The specialist will preferably have a master's degree in Water resources Engineering (or equivalent) and 15 years of experience in undertaking similar projects with canal and tank systems, experience in river basin planning and IWRM approaches and preferably experience of leading ADB project preparation teams and of working in Sri Lanka. As team leader, the specialist will work with the team and be responsible for, among others:

- (i) Overall management of the TRTA team;
- (ii) Managing relationships with the government and ADB;
- (iii) Conducting quality control of outputs from the TRTA team members;
- (iv) Advising on overall sequencing of the investment project;

- (v) Preparing various documentation required for loan processing
- (vi) Compiling inception, interim and final reports; and,
- (vii) Facilitating and supporting ADB missions.

11. As a **Water Resources Engineer** the main task of the expert, among other will include:

- (i) Reviewing IWMI river basin GIS mapping and hydrologic modelling;
- (ii) Assess water management/allocation scenarios in four sample river basins with IWMI technical support;
- (iii) Prepare IWRM river basin planning framework and river basin management plan of 4 river basin through multi-stakeholder consultation;
- (iv) Review long list of subprojects provided by the irrigation department regional offices and provincial offices and prepare a typology of subproject;
- (v) Finalize strategies/criteria for sub-project selections and prepare list of sample sub-project to be appraise under the TRTA and long list of potential subprojects to be appraised during the project implementation;
- (vi) Planning and procurement and general oversight of required studies and surveys, as well as preliminary design activities for the sample sub-projects;
- (vii) Providing state of the art inputs on all necessary associated designs and specifications;
- (viii) Preparing the terms of reference for consultancy for further subproject appraisal, detailed design of works, construction supervision of works and project implementation support;
- (ix) Support and oversee the preparation of feasibilities for sample sub-project representing 30% of the civil works;
- (x) Review deliverables of the PRFC for the first year (detailed design for 30% of the works);
- (xi) Support the institution specialist with sector policy, institutional and legal gap analysis and identification of improvements; and,
- (xii) Undertake need assessment and development proposal of rain and flow monitoring stations in all project selected river basins. Assess hydrology data management /archive systems, propose and cost a modernization approach. Support institution specialist in identifying possible reorganization and capacity building requirement of the hydrology division.

12. **Junior Engineer (Hydraulic Design and Water Resources)** (international, 5 person-months). The specialist will have preferably a post-graduate civil engineering degree (or equivalent) and 5 years of experience in undertaking similar projects, and preferably have experience of working in the region. Experience in hydraulic structure design and water resource management is highly desirable. The specialist's responsibilities will include:

- (i) Support for required studies and surveys, including water balance, condition assessment, topographic surveys;
- (ii) Prepare the climate risk and vulnerability assessment per ADB requirements;
- (iii) Support the preparation of sample river basins management plans; and,
- (iv) Support preliminary design activities.

13. **Irrigation Planning and Design Engineer** (international, 6 person-months). The consultant should have a master's degree or equivalent in hydrology, water resources management, or closely related discipline with minimum experience of 15 years encompassing hydrologic and water resources modeling and design, climate change, and irrigation planning and

design. He /she will have demonstrated ability to work in a multidisciplinary team and be familiar with standard design software including proficiency in the use of AutoCAD. Regional and project preparation experience is preferred. The consultant, in close collaboration and consultation with the Irrigation Department, will:

- (i) **Revised the Design of Irrigation Headworks** including (a) review the current guidelines for the Design of Irrigation Headworks for Small Catchments (2nd Ed., by A.J.P Ponrahah, dated May 1984) published by the Irrigation Department of Sri Lanka; (b) review available information on the expected impacts of climate change on water resources and agriculture in Sri Lanka, particularly the results of downscaling of global and regional climate modeling conducted under the Phase 5 of the Coupled Model Intercomparison Project (CMIP5) of the World Climate Research Program supporting the Intergovernmental Panel on Climate Change Fifth Assessment Report to project local conditions (precipitation, temperature, and evaporation time series and statistics, including extreme value analysis) for the short-, medium-, and long-term horizons; (c) review existing, ongoing, and planned projects and activities involving the use of downscaling of outputs of the CMIP5 global projections; (d) based on (b) and (c), propose updated methodologies to undertake hydrological analysis for the design of irrigation systems, headworks and other structures in small catchments in order to estimate (1) flood flows and cross drainage requirements, (2) assess water resources and crop water requirements for alternative cropping patterns, (3) assist in designing discharge capacity of main and distributary canals based on crop water requirements and irrigation schedules for tertiary and secondary canal and (4) develop reservoir operating rules;
- (ii) **Subproject planning** including (a) review all irrigation system types to be considered within the scope of the Project, including tanks, anicuts, eua, groundwater, and pumped/lift systems; (b) assist in the identification of subprojects; (c) supervise structure condition assessment survey for sample sub-projects, (d) for sample each subproject, assess the opportunities to improve irrigation management within the context of the watershed/river basin, taking into consideration existing water use, rights and allocations; (d) identify possible improvements which may include: (1) watershed improvement; (2) headworks improvement; (3) tank capacity enhancement; (4) construction/enhancement of link canals between irrigation systems; (e) rehabilitation and modernization of irrigation distribution systems, as well as control structures, gates, turnouts and flow measurement facilities; (5) development of drainage systems; (6) enhancement of on-farm distribution systems, including application of micro irrigation, and consideration of land levelling and; (7) rehabilitation/development of agricultural roads (within-scheme and local access); (e) working closely with the irrigation and hydraulic design engineers and agricultural specialists, prepare feasibility studies of identified subprojects, describing agricultural development, water requirements, infrastructure, organizations and management and; (f) identify system management, operation and maintenance requirements and procedures; and
- (iii) **Sample sub projects preliminary design** Prepare a generalized design brief/guideline for irrigation design engineers in Sri Lanka to operationalize the methodologies proposed in (i) for review and eventual publication by the Irrigation Department. The expert will: (a) specify and supervise topographic surveys (if required); (b) plan irrigation layouts and ensure needs are water users are taken account of in designs of canals and structures of selected sample subprojects; (c)

design/provide detailed specifications of critical modernization features to improve the systems performance (d) produce preliminary designs of canals, drains and related structures of selected sample sub-project (e) estimate cost of subprojects (including construction and future O&M), (f) provide on the job training to counterpart staff from the Irrigation Department and, (f) review deliverables of the PDIC for the first year (detailed design for 30% of the works).

14. **Economist** (international, 3 person-months, national, 3 person-months). The specialist will have preferably a post-graduate degree in Economics, or equivalent with 15 years of professional experience in undertaking economic assessments, preferably within the irrigation, agriculture and water resources management sectors. The specialist will also have financial assurance experience, which ideally will include relevant prior ADB experience, preferably in the same country and sector. The specialist should have good understanding of public financial management and international best practices in accounting and auditing. Responsibilities will include:

- (i) Undertaking a detailed economic analysis in accordance with ADB's Guidelines for the Economic Analysis of Projects (2017);
- (ii) Identifying the economic risks associated with the project and undertaking a sensitivity and risk analysis;
- (iii) Undertaking financial sustainability analysis of the sample subproject;
- (iv) Preparing the costing of the project;
- (v) Preparing and managing all necessary sub-contracts for collection of necessary survey data from the field, government or other institutions, for example farm budgets, "cost of cultivation" survey or other regular data collection;
- (vi) 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 ADB prior to initiating the analyses);
- (vii) Characterizing baseline input-output characteristics for agricultural production at system and sub-system levels from household survey data for each major season of production;
- (viii) Identifying current and future seasonal cropping patterns in the sample sub-project system command areas from household survey and and/or secondary sources at the system and sub-system levels;
- (ix) Undertaking an econometric analysis that effectively isolates the effect of irrigation development from covariates, including factors conditioning program placement and farmer participation, to rigorously predict the effects of irrigation modernization on cropping intensity, yields and variable production costs (methods may include Propensity Score Matching, endogenous switching regressions, instrumental variables or other control function approaches);
- (x) Calculating the conversion factors for translating financial prices into economic prices;
- (xi) Applying parameters on cropping patterns, baseline input-output characteristics, and expected "treatment" effects of irrigation to calculate output market supply shifts and consequences for producer, consumer and labor in explicit economic surplus analyses for major crops;
- (xii) Compiling the detailed costing of the project, collecting component-wise detailed costs from other experts, and contribute to project packaging. The consultant will follow the guidance set out in the ADB's Financial Due Diligence Note (2009) and Note on Preparation and Presentation of Cost Estimates (2008, revised 2010) and

will prepare project cost estimates using excel for each main project cost item including base costs, physical contingencies, price contingencies, and financial charges during implementation. Base costs are expressed in domestic currency and on real price basis. Base costs also distinguish between foreign exchange and local currency components, as well as recurrent and investment costs, and separate identification of taxes included within cost components. Project costs would also include estimates of resettlement costs, if applicable;

- (xiii) Applying the project's costing and economic surplus estimates in economic rate of return analysis;
- (xiv) Undertaking sensitivity and switching value analysis on the parameters estimated and key assumptions/risks underpinning the rate of return calculations;
- (xv) Undertaking a distribution analysis between different groups, calculating poverty impact ratio and analyzing project impact on farmers' incomes (farm budget analysis);
- (xvi) Application of economic efficiency principles to the selection of subproject alternatives", as consideration of project alternatives is an area of economic analysis under ADB's Guidelines;
- (xvii) Preparing draft and final reports detailing the above tasks and outputs;
- (xviii) Preparing the project costing and a financial analysis of the project following the guidance set out in the ADB's Financial Due Diligence Note (2009) and Note on Preparation and Presentation of Cost Estimates (2008, revised 2014);
- (xix) Preparing projections of future incremental costs, assess whether the implementing agencies will have funding to cover long-term costs as needed to ensure investment program sustainability, and identify actions needed to ensure investment program financial sustainability as conditions;
- (xx) Preparing a disbursement schedule including S-curve for projections of contract awards and disbursements, and standard cost estimates tables (by expenditure category, by financier, by Output, and by Year);
- (xxi) Preparing a project financing plan taking to account of any prospective cofinancing and assess veracity of proposed counterpart funding;
- (xxii) Co-developing with MIWRM the projected cash flow statements for a 10-year period including projected revenue and costs;
- (xxiii) Assisting in developing the project financial covenants, if necessary – in particular, actions needed to ensure project sustainability should be identified covering operating performance, liquidity and debt serviceability; and,
- (xxiv) Undertake a comparative analysis of subprojects economic performance with "deferred maintenance" versus "with routine maintenance". Prepare a knowledge note explaining findings.

15. **Social and Gender Specialists** (international, 1.5 pm, 3.5 national). The specialists will have post-graduate degrees in social sciences (or a related field). The International Social and Gender Specialist (International Specialist) will have a minimum of 10 years of relevant work experience, with at least 5 years working as a social development/gender specialist for a project funded by ADB, World Bank, JICA or equivalent. The National Social and Gender Specialist (National Specialist) will have a minimum 8 years of relevant work experience, with at least 3 years working on a multilateral-funded project. The International Specialist will assume primary responsibility for assisting and guiding the National Specialist in the preparation of all required social documents. The International Specialist will guarantee the credibility and quality of social assessments and outputs prepared for the project, consistent with international standards and best practice. Specific tasks of the 2 experts include but are not limited to the following:

- (i) Conduct sensitization training workshops on ADB safeguard and social development requirements with the executing agent staff. Familiarize the Implementing agent staff ADB social policy and required documents with respect to; gender, stakeholder communications, poverty and social assessments and safeguards. Ensure that project engineers working on the technical project design participate.
- (ii) Establish sex-disaggregated baseline data to inform the social documents, frameworks and plans listed below. Note that a project budget was assigned to conduct 1) the census and inventory of losses within the sample sub-project areas and 2) a social and economic survey to inform the Poverty and Social Assessment. The social development specialist must ensure that relevant questions and indicators are included in all surveys. The specialists will conduct additional interviews, focus groups, or other meetings with stakeholders to confirm their needs, demands, capacities, constraints, and willingness to participate in the project. The specialists will ensure all data is sex-disaggregated and tailored to the project. Baseline data must be compiled so that the project team can monitor and evaluate the project impacts during implementation.
- (iii) Preparation, analysis and write up of all social assessments, checklists and the formation of plans and frameworks to comply with ADB requirements. Outputs include:
 - (a) Safeguard categorization: Indigenous peoples and involuntary resettlement
 - (b) Resettlement Framework, Plan(s) and Due Diligence
 - (c) Indigenous Peoples Framework and Plan(s) (if required)
 - (d) The Poverty and Social Assessment (PSA)
 - (e) The Summary Poverty Reduction and Social Assessment (SPRSS)
 - (f) Gender Equality and Social Inclusion Plan (GESI)
 - (g) Stakeholder Communications Strategy
 - (h) Establishment of a Grievance Redress Mechanism (in coordination with the Environment specialist)
- (iv) The International Specialist will undertake a final review of all outputs before submitting to ADB.

16. Irrigated Agricultural Specialist (international, 2.5 person-months). The specialist will preferably have a post-graduate qualification in Agronomy (or similar) with relevant experience in agro-economics. The specialist will have preferably 10 years of experience in agro-economics/agronomy. The specialist should have experience in the development of irrigated agriculture projects and climate smart agriculture projects, economic value chains and market-based crop production analysis. The specialist should have experience working in multi-disciplinary teams. The specialist's main tasks include:

- (i) Providing detailed assessment of current cropping systems and farmers' farming strategies in the Uva and North Western provinces frontiers and representative sample sub-project and recommending opportunities for improving on-field water management and crop production, and crop diversification;
- (ii) Supporting the irrigation planning team in determining realistic with project cropping patterns, crop water requirements with/ without project and carrying out water balance for the sample sub-projects command area taking into account climate change impacts;

- (iii) Supporting the economist and others by gathering necessary data on cropping and farm budgets. Also collect “crop cut” yield data and correlation with water supply/ location/ distance from canal as appropriate;
- (iv) Working with others to designing and carryout out an agro-economic social survey.
- (v) Engaging in a series of stakeholder consultations along with other team members with various farmer groups including farmers organizations;
- (vi) Consult relevant government agencies (Department of Agriculture and others) and with relevant private sector firms/ operators engaged in agriculture value chains (input suppliers, buyers, processors, financial, extension and other service providers) to identify key constraints and opportunities to enhance agriculture value addition and strengthen the engagement of farmers in value chains;
- (vii) Assess the current water, land management and agriculture policy, legal and institutional framework and improvement recommendations required to achieve the project benefits;
- (viii) Based on the above, identify climate smart strategies to raise agricultural productivity across the project selected river basins and sub-projects, by targeting interventions related to inputs, extension services, finance, technology and knowledge solutions, marketing and so on; and,
- (ix) Preparing an agriculture modernization support plan for the project detailing support activities, concerned institutions/ parties, implementation arrangements and cost.

17. **Institutions Specialist** (international, 2.5 person-months). The consultant should have a master’s degree in water resources management, irrigation management or equivalent with minimum experience of 10 years encompassing sector institutional development, management operation and maintenance improvement in the irrigation /water resource sector including participatory irrigation management. The specialist should have experience working in multi-disciplinary teams. The specialist’s main tasks include:

- (i) Undertake a comprehensive project stakeholders analysis considering the interests and opinions of players affected by the project. Identify key stakeholders, their relationships, their interest and perceptions, their dividers and connectors, etc. Here, stakeholders involved in or affected by water management and irrigation are considered, including different levels of government and its agencies, the private sector and civil society;
- (ii) Undertake a comprehensive sector analysis that covers the factors that affect performance, including the policy, institutional, legal, and regulatory frameworks; recent trends in current and capital expenditures; the type and composition of the expenditures; the respective roles of the public and private sectors and their relationships; the sustainability of investments; and the possibility of intra-sectoral resource allocation. The sector analysis will include specific assessment on (a) river basin management policy and institutional framework, gap analysis and proposal for improvement (with support from the team leader) and (b) irrigation asset O&M strategies, guidelines and procedures and recommendations for improvements (with support from the irrigation planning and design specialist);
- (iii) in collaboration with the team leader and the agricultural specialists, undertake stakeholder consultation and work closely with farmers organisations to (a) identify necessary O&M system improvements, (b) explore options to involve farmers in the construction and rehabilitation of system facilities (including control structures, canals and development of tertiary and on-farm distribution systems), (c) discuss proposals for strengthening of water user groups for system management and

operation, agricultural production and marketing and operation; (d) facilitate participatory studies of tertiary units and ensure user participation in preliminary design;

- (iv) undertake an institution analysis and need assessment at various levels of implementation to determine the capacity building needs at these levels. Prepare a sector capacity building plan to be implemented under the project;
- (v) prepare a stakeholder participation plan; and,
- (vi) Prepare a medium or long-term sector/subsector development plan); a statement on sector policies that affect the development of the sector/subsector concerned; and an assessment of the technical and managerial capabilities of the sector institutions to develop, process, and implement projects.

18. **Environmental Specialist** (national, 3.5 person-months). The specialist will have preferably a master's degree in Environmental Sciences or equivalent and 8 years of experience in preparing environmental impact assessments (EIAs) or initial environmental examination (IEE) for donor agencies including ADB. Experience with ecology, agriculture, climate change and environmental assessments will be appreciated. The specialist will be responsible for preparing the environmental assessment study for the IWPIISP by undertaking necessary surveys for baseline information, analyzing potential environmental impacts and preparing environmental management plan (EMP) or sample sub-projects, conducting public consultation with affected people and creating a grievance redress mechanism. He will assist MIWRDM to prepare an Environment Assessment and Review Framework (EARF) for the project and sample subproject EIAs (if required) and IEEs. The EIA and IEE reports will be prepared in accordance with ADB's Safeguard Policy Statement, 2009 (SPS). To fulfill with the requirements described in ADB SPS, the following are shall be carried out:

- (i) Consult with the technical team to confirm the project design and activities, proposed location of project activities and obtain the details of the sample sub-projects that will be assessed for this study;
- (ii) Perform the scoping activities to identify the potential environmental impacts and environmental parameters/indicators that will affected by the subproject design and activities;
- (iii) Gather data in the subprojects areas that cover water resources, geophysical environment, climatic condition and climate change scenarios, ecological environment, and social-economic conditions. Confirm availability of all secondary data parameters identified at the scoping stage are available;
- (iv) Identify the potential impacts from the subprojects to and from the environment. It is essential to assess the impacts of subprojects activities and designs to other components of the project;
- (v) Assess institutional arrangement to implement proposed mitigation measures and arrangement for handling grievance from affected people;
- (vi) Consult with the Central Environment Authority for the compliance of the project activities and design to environmental and forest standards;
- (vii) Prepare an EARF per ADB's SPS 2009 and government requirements;
- (viii) Prepare the EMP matrix to show, activities that caused impacts, potential impacts, proposed mitigation measures, and who will implement mitigation measures and who will monitor the implementation, proposed cost to implement mitigation measures;
- (ix) Discuss with MIWRDM/DOI the proposed environmental management and prepare a grievance redress mechanism (GRM) and get a principle agreement for all proposed mitigation measures from MIWRDM;

- (x) Translate the agreed EMP matrix into local language as the materials to be distributed during public consultation;
- (xi) Conduct public consultations to ensure the proposed project including the potential environmental impacts, the location of the impacts and the persons affected by the impacts are clearly explained to affected people;
- (xii) Ensure that all concerns from the participants are addressed and discuss with MIWRDM/DOI any potential issues raised during public consultation;
- (xiii) EIA and IEE reports will be prepared in compliance with ADB SPS and government requirements; and,
- (xiv) Establish the GRM in coordination with the Social and Gender Specialists.

19. **Financial Management Specialist** (national, 1.5 person-months). The expert will have a degree in accounting, finance, or a related field, and will have a recognized professional accountancy qualification. The expert should have at least 8 years' experience, including in financial due diligence (FDD). The expert will conduct FDD in accordance with ADB's requirements.¹ Relevant guidance is available at <http://www.adb.org/projects/operations/financial-management-resources>. The FDD will include:

- (i) Conducting a financial management assessment of the executing and implementing agencies, including (a) assessing whether previous financial management assessments have been conducted by ADB or other agencies and, if so, reviewing the results and ascertaining whether these can be used as input, (b) assessing capacity for planning and budgeting, management and financial accounting, reporting, auditing, internal controls, and information systems (c) reviewing proposed disbursement and funds-flow arrangements, and (d) concluding on the financial management risk rating and identifying and confirming measures for addressing identified deficiencies;
- (ii) Supporting the preparation and agreement of cost estimates and a financing plan, which are based on verifiable data and are sufficient to support project implementation;
- (iii) Assist in preparing financial projections and conducting financial analyses of the executing and implementing agencies, and incremental recurrent costs, to determine financial sustainability, and reviewing proposed cost-recovery and tariff policies, including affordability;
- (iv) Conducting financial evaluations (financial cost-benefit analyses) including sensitivity analyses of project components that have a cost-recovery objective;
- (v) Where significant risks are identified to project financial sustainability or viability, proposing relevant financial performance indicators to be incorporated in financial covenants; and
- (vi) Assessing and reaching agreement on financial reporting, auditing and public disclosure arrangements for the project, and, as appropriate, identifying and agreeing arrangements for receiving financial statements from executing and/or implementing agencies.