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Report No: 86225-LK

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF SDR 71.7 MILLION
(US$110 MILLION EQUIVALENT)

TO THE

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

FOR A

CLIMATE RESILIENCE IMPROVEMENT PROJECT

March 21, 2014

Disaster Risk and Climate Change Unit
Sustainable Development Department
South Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective January 31, 2014)

Currency Unit	=	Sri Lankan Rupee (LKR)
130.75 LKR	=	US$1
1.5342 US$	=	SDR 1

FISCAL YEAR

January 1 – December 31

Vice President:	Philippe H. Le Houerou
Country Director:	Francoise Clottes
Sector Director:	John Henry Stein
Sector Manager:	Bernice K. Van Bronkhorst
Task Team Leader:	Marc Forni
Co-Task Team Leader:	Suranga Kahandawa

ABBREVIATIONS AND ACRONYMS

ADT	Average Daily Traffic
CAT DDO	Catastrophe Deferred Drawdown Option
CBSL	Central Bank of Sri Lanka
CEA	Central Environmental Authority, GoSL
CPS	Country Partnership Strategy
CQS	Consultant Qualification Selection
CRPU	Climate Resilience Planning Unit
DA	Designated Account
DC	Direct Contracting
DEM	Digital Elevation Model
DPL	Development Policy Loan
DRM	Disaster Risk Management
DSWRPP	Dam Safety and Water Resources Planning Project
EA	Environmental Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan
ESMF	Environmental and Social Management Framework
FA	Financing Agreement
FR	Financial Regulations
FM	Financial Management
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
GoSL	Government of Sri Lanka
GSMB	Geological Survey and Mines Bureau
IA	Implementing Agency
IAU	Internal Audit Unit
IBRD	International Bank for Reconstruction and Development
IC	Individual Consultant Selection Procedure
ICB	International Competitive Bidding
CRIP	Climate Resilience Improvement Project
ID	Irrigation Department
IDA	International Development Association
IFR	Interim Financial Report
IPF	Investment Project Financing
IRR	Internal Rate of Return
IUFR	Interim Unaudited Financial Report
LAA	Land Acquisition Act
LKR	Sri Lankan Rupee
MASL	Mahaweli Authority of Sri Lanka
MDM	Ministry of Disaster Management
M&E	Monitoring and Evaluation
MIS	Management Information System
MIWRM	Ministry of Irrigation and Water Resources Management

MoFP	Ministry of Finance and Planning
NCB	National Competitive Bidding
NBRO	National Building Research Organization
NIRP	National Involuntary Resettlement Policy
NPV	Net Present Value
O&M	Operating and Maintenance
ORAF	Operational Risk Assessment Framework
QBS	Quality Based Selection
QCBS	Quality and Cost Based Selection
PD	Project Director
PDO	Project Development Objective
PMU	Project Management Unit
RDA	Road Development Authority
RDI	Regional Director of Irrigation
RFP	Request for Proposal
RSAP	Road Sector Assistance Project
SA	Social Assessment
SBD	Standard Bidding Document
SMF	Social Management Framework
SPU	Special Projects Unit
SSS	Single Source Selection
TA	Technical Assistance
USD	United States Dollar
VOC	Vehicle Operating Cost
VOT	Value of Time

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
Climate Resilience Improvement Project

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Democratic Socialist Republic of Sri Lanka

Climate Resilience Improvement Project

PROJECT APPRAISAL DOCUMENT

South Asia

Disaster Risk and Climate Change Unit

Basic Information

Date: March 20, 2014	Sectors:	General finance sector (20%), General public administration sector (20%), General water, sanitation and flood protection sector (30%), Flood protection (30%)
Country Director: Francoise Clottes	Themes:	Natural disaster management (100%)
Sector Manager/Director: Bernice K. Van Bronkhorst / John Stein	EA Category:	B – Partial Assessment
Project ID: P146314		
Lending Instrument: IPF		
Team Leader(s): Marc Forni / Suranga Kahandawa		

Joint IFC:

Borrower: Democratic Socialist Republic of Sri Lanka

Responsible Agency: Ministry of Finance and Planning, Colombo, Sri Lanka

Contact:	Title:
Telephone No.:	Email:

Project Implementation Period: Start Date: April 30, 2014 End Date: May 30, 2019

Expected Effectiveness Date: May 31, 2014

Expected Closing Date: May 30, 2019

Project Financing Data(US$M)

[ ] Loan	[ ] Grant	[ ] Other
[X] Credit	[ ] Guarantee	

For Loans/Credits/Others

Total Project Cost :	110	Total Bank Financing :	110
Total Cofinancing :		Financing Gap :	

Financing Source	Amount(US$M)
BORROWER/RECIPIENT	
IBRD	
IDA: New	110
IDA: Recommitted	
Financing Gap	
Total	110

Expected Disbursements (in USD Million)									
Fiscal Year	FY15	FY16	FY17	FY18	FY19				
Annual	12	22	30	30	16				
Cumulative	12	34	64	94	110				

Project Development Objective(s)

To reduce the vulnerability of exposed people and assets to climate risk and to improve Government's capacity to respond effectively to disasters. The PDO will be achieved through evidence-based investment planning and urgent risk mitigation measures

Components

Component Name	Cost (USD Millions)
Development of Basin Investment Plans	13
Increasing Climate Resilience of Infrastructure	90
Project Implementation	5
Contingent Emergency Response Component	2

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [X]
Does the project require any waivers of Bank policies?	Yes [ ]	No [X]
Have these been approved by Bank management?	Yes [ ]	No [NA]
Is approval for any policy waiver sought from the Board?	Yes [ ]	No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No [ ]

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	X	
Natural Habitats OP/BP 4.04	X	
Forests OP/BP 4.36		X
Pest Management OP 4.09		X
Physical Cultural Resources OP/BP 4.11	X	
Indigenous Peoples OP/BP 4.10		X
Involuntary Resettlement OP/BP 4.12	X	
Safety of Dams OP/BP 4.37		X
Projects on International Waterways OP/BP 7.50		X
Projects in Disputed Areas OP/BP 7.60		X

Legal Covenants

Name	Recurrent	Due Date	Frequency
Fully staffed Project Management Unit	Full project period		
Full time project accountant in place	Full project period	May 31, 2014	
Full time procurement officer in place	Full project period	May 31, 2014	

Full time financial management officer in place	Full project period	May 31, 2014	
Final version of the Operations Manual	Full project period		
Compliance with safeguards instruments including Environmental Assessment & Management Framework and the Social Management Framework	Full project period		

Description of Covenant

Team Composition

Bank Staff

Name	Title	Specialization	Unit	UPI
Marc Forni	Sr. Disaster Risk Management Specialist	Disaster Risk Management	SASDC	263040
Suranga Kahandawa	Disaster Risk Management Specialist	Disaster Risk Management	SASDC	397758
Yohannes Kesete	Disaster Risk Management Specialist	Climate Risk Management	SASDC	458322
Jack Campbell	Disaster Risk Management Specialist	Climate Risk Management	GFDRR	376473
Amali Rajapaksa	Senior Infrastructure Specialist	Transport	SASDT	257950
Darshani de Silva	Environment Specialist	Environment	SASDI	333145
Susrutha Goonasekera	Social Specialist	Social	SASDS	329127
Enoka Wijegunawardene	Financial Specialist	Financial Management	SARFM	349269
Sunethra Chandrika Samarakoon	Procurement Specialist	Procurement	SARPS	333182
Sandya Salgado	Senior External Affairs Officer	External Affairs	SAREX	388923
Dugkeun Park	Sr. Disaster Risk Management Specialist	Disaster Risk Management	GFDRR	412908

Non Bank Staff

Name	Title	Office Phone	City
Henk Ogink	Consultant - Senior Hydraulic Engineer		
P. P. Ghnanapala	Consultant - Senior Hydraulic Engineer		

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments

I. STRATEGIC CONTEXT

A. Country Context

1. Sri Lanka has seen dramatic changes in recent years. A 26-year conflict ended in May 2009, and resettlement of internally displaced people is largely complete. The country is now in a position to boost economic growth and achieve equitable and sustainable human development. The Government's aims – articulated in the National Development Policy Framework Vision, Mahinda Chintana 2011-16 – are to preserve Sri Lanka's cultural values and traditions while developing a knowledge-based economy and supporting better living standards.

2. Sri Lanka is recently experiencing strong growth rates. The economy is worth US$64 billion (2012 International Monetary Fund estimate) and per capita Gross Domestic Product (GDP) is US$7,900 (Purchasing Power Parity), which puts the country ahead of other countries in the South Asian region. The main economic sectors of the country are tourism, tea export, apparel, textile, rice production and other agricultural products. In addition to these economic sectors, overseas employment contributes highly in foreign exchange. Remittances from the nearly 2 million Sri Lankans living abroad in 2012 accounted for US$5 billion, equivalent to 8 percent of the country's GDP.

3. Growth in Sri Lanka has been inclusive, with poverty rates declining dramatically to 9 percent in 2010 from 22 percent in 2002[1]. Moreover, inequality in per capita consumption expenditure has declined as reflected by a decline in the Gini coefficient from 0.40 to 0.36 between 2002 and 2010. Sri Lanka notably outperforms the South Asia average on progress towards meeting the Millennium Development Goals. While South Asia as a whole is on track or is an early achiever for only nine indicators, Sri Lanka manages this for 15 of the 22 Millennium Development Goal indicators. Given that Sri Lanka has managed to bring down the poverty rate to below 10 percent, the authorities are focused on tackling pockets of poverty in the country, notably in the tea estate sector[2]. Here, the human development indicators have been consistently below that of the rural and urban sectors since the country's independence.

B. Sectoral and Institutional Context

4. Climate-related hazards are a significant threat to economic and social development in Sri Lanka. Extreme variability of rainfall is the defining feature of Sri Lanka's climate. Climate projections indicate increasing rainfall trend in the wet zone and decreasing rainfall trend in the dry zone, meaning that the risks associated with water-related climate variability are likely to intensify and worsen.

[1] http://www.statistics.gov.lk/poverty/PovertyIndicators2009_10.pdf.
[2] Estate workers comprise 6.3 percent of the population.

5. A World Bank study published in June 2013[3] on the regional impacts of extreme climate events highlights how a 4-degree centigrade increase in temperature would adversely affect the South Asia Region. The major impact of climate change in the region is expected to be extremes of water scarcity and excess. Climate change is expected to increase inter-annual and intra-seasonal variability of monsoons and the number of dry days and droughts, with adverse consequences for human lives. A decrease in ground water resources, crop yield and energy security will also be results of a 4-degree centigrade increase in temperature. The study expects that agricultural production would likely suffer from the combined effects of unstable water supply, the impacts of sea-level rise, and rising temperatures. The negative effects will not be limited to rural areas; dense urban areas are expected to be vulnerable to heat extremes, flooding, and vector borne disease. Many of these climate risks and impacts that pose potential threats to populations in the region can be linked back to changes to the water cycle.

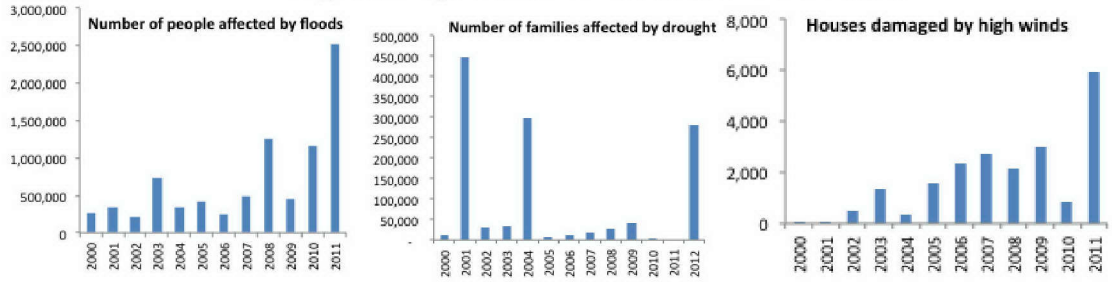
6. The region is highly vulnerable even at warming of less than 2-degree centigrade given the significant areas affected by droughts and flooding at present temperatures. In addition, the projected risks to crop yields and water resources, and sea-level rise reaching 70 cm by the 2070s, are likely to affect large populations.

7. In Sri Lanka, where water is used by different agencies, including the energy sector, projected increases in variability of, and long-term decreases in, river flow is expected to lead competition for water across different sectors. For example, the uncertainty in precipitation in the central highlands of Sri Lanka may affect water use in the Mahaweli Scheme, which provides 29 percent of national power generation and 23 percent of irrigation water. Going forward, this uncertainty is expected to pose a major challenge for the design and operation of hydropower plants and irrigation schemes.

8. Despite the evident risks, there is a lack of clarity on specific current and future levels of disaster risk that the country faces. The country lacks a comprehensive and nationally owned disaster risk assessment. As a result of rainfall variability, floods and droughts are the key threat to many communities (Figure 1). Droughts vary in their intensity, duration, and spatial coverage. River systems are also highly flood-prone. Floods are a natural and necessary feature of river systems with variable seasonal flows, but excessive flows often cause extensive damage. Lack of well-developed flood management infrastructure means that flooding events are recurring. Compounding this is a lack of coordination across upstream management of dams, and downstream management of irrigation and flood risk. Effective flood risk management requires a comprehensive, basin-wide approach, with due consideration to the upstream effects and downstream impacts.

[3] Schellnhuber, Hans Joachim et al. 2013. Turn down the heat : climate extremes, regional impacts, and the case for resilience - full report. Washington DC ; World Bank.

Figure 1. Impacts of disasters in Sri Lanka since 2000



9. Recent disasters have caused major economic and social impacts, which are driving the Government's interest to build resilience to climate-related risks. The annual fiscal loss is significant, estimated to be in excess of US$50 million[4], while, in some years, the fiscal loss is much greater. The Eastern Province has been severely affected by floods consecutively for the last three years. Floods in January 2011 affected more than a million people in the Northern, North Central and Eastern provinces and had caused more than US$600 million in direct damages. Floods of December 2012 affected nearly a half a million people and caused further significant damage. These recent flood events had significant impact on the agriculture sector in particular, destroying crops, livestock and agricultural infrastructure.

10. Flooding is endemic, affecting many parts of the country in most years. Since 2000, the average number of people affected by floods is more than 375,000 per year. Floods have cumulatively affected more than 8.5 million people, while droughts have affected more than 5 million[5]. Floods of 2003, 2006, 2008, 2010, 2011[6] and 2012, and the droughts of 2001, 2004 and 2012 have all caused widespread impact. Generally, the total impact of these events tends to be under-estimated. In available figures, indirect losses or impacts on economic flows are not considered, for example. Experience in post-disaster assessments in other disaster-affected countries demonstrates that indirect impacts for floods can often exceed direct impacts observed.

11. A number of factors exacerbate the impact of extreme rainfall events. These include: (i) upstream land use changes increasing runoff; (ii) lack of coordination on spill gate opening at upstream reservoirs; (iii) insufficient outflow capacity at lagoon mouths to discharge flood water to the sea; (iv) encroachment into waterways and flood plains by construction and illegal settlements; (v) blocked canals and streams, due to insufficient maintenance, dumping of solid waste, natural siltation etc.; and (vi) damage to storm water systems and insufficient drainage capacity in urban, semi urban and rural areas.[7]

12. Upland areas of the country are particularly vulnerable to landslides often triggered by extreme rainfall events. A database on recorded landslide events, maintained by the National Building Research Organization (NBRO)[8], highlights that the most vulnerable

[4] Ministry of Disaster Management
[5] Sri Lanka Disaster Information System
[6] The World Bank contributed US $48 million to restore the flood damages that occurred in 2010/11 through the Re-awakening Project.
[7] Flood mitigation in the Ampara and Batticaloa Districts, Disaster Management Center & UNDP, 2010
[8] See http://www.nbro.gov.lk/web/images/pdf/landslides_districts.pdf

districts include Badulla, Kandy, Matale, Nuwara Eliya, Kegalle and Ratnapura. For example, a major landslide occurred in November 2006 destroying local businesses and interrupting road traffic for weeks near the city of Kandy, on a key route between the city and the capital Colombo. This event triggered an investment of over Sri Lankan Rupee (LKR) 100 million by the Sri Lankan government[9] to mitigate the risk of further landslides at this site. Landslides occurred in January 2007 impacted more than 17,000 people in Kandy and Nuwara Eliya districts and destroyed more than 1,500 houses. Hundreds of people were air rescued from the vulnerable slopes. In some areas, it took more than two years to resettle people in safe lands.

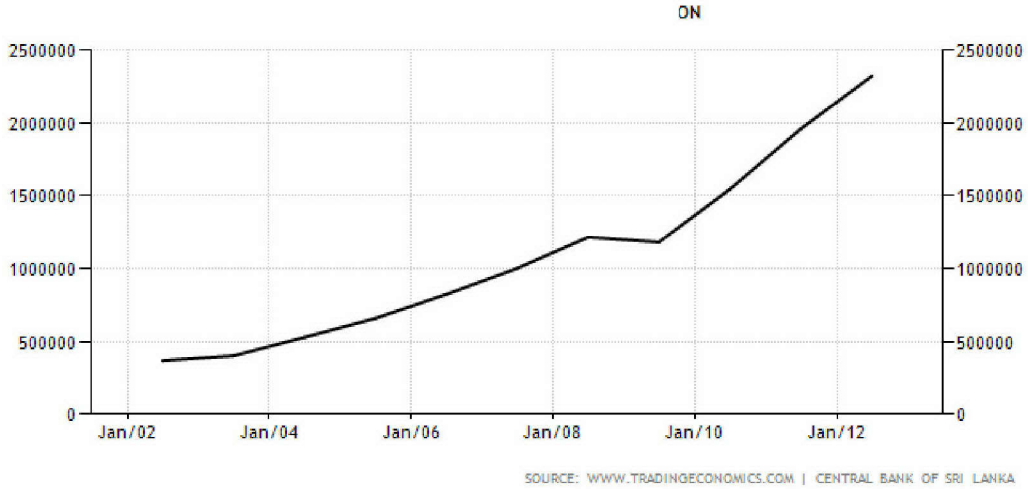
13. Public infrastructure is particularly vulnerable to landslide risk. For example, Sri Lanka's road network has been rapidly expanding, but without due attention to landslide risk. Unstable slopes have led to road damage, which in turn lead to detours, increasing the cost of transportation. The problem has also left vulnerable communities marooned for several days a year, impacting emergency response. Moreover, low lying bridges have also created similar problems; hindering connectivity, increasing cost of transportation, and exacerbating upstream flooding. A priority for the Government is to ensure that key transport connections are not compromised by landslide events, such as that which occurred in Kandy in 2006.

14. Against this backdrop of hazard risks and vulnerabilities, the country is emerging from a 26-year civil war. This is leading to rapid investment in infrastructure. Since 2009, growth rose to 8 percent initially, largely reflecting a "peace dividend". This performance was underpinned by strong private consumption and investment, which rose at an average of 9.6 and 12.5 percent, respectively. The public sector supported broad economic development through large infrastructure projects - including investments on account of post war reconstruction efforts in the Northern and Eastern provinces. The country's target is to achieve US$4,000 GDP per capita by 2016, from US$2,900 in 2012.

15. This drive for development offers a window of opportunity to hardwire resilience to climate-related hazards into the infrastructure of the country. This includes through the rehabilitation of flood protection, and through the mitigation of flood and landslide risks to roads, schools and other new and existing public infrastructure. Mahinda Chinthana Vision for Future (2010) sets out a clear investment program in the modernization of the road and water resources infrastructure in particular. A key indicator of this investment trend is the increase in gross fixed capital formation, which as a percentage of GDP increased from 24.4 percent in 2009 to 30.6 percent in 2012. In absolute terms, gross fixed capital formation is firmly on an upward trend (Figure 2).

[9] See www.nbro.gov.lk/web/index.php?option=com_content&view=article&id=173&Itemid=133&lang=en

Figure 2. Sri Lanka gross fixed capital formation



16. Sri Lanka has invested significantly in emergency preparedness and response capacity since the Tsunami in 2004. This was the game-changing moment for many Asian countries in improving the management of disaster risks, due to the excessive loss of life and evident lack of preparedness. Since that disaster, the Government of Sri Lanka (GoSL) has made considerable efforts to reduce vulnerability to adverse natural events, including: (i) strengthening the country's disaster monitoring and early warning systems; (ii) emergency preparedness and planning; (iii) increasing awareness and capacity of sub-national officials and schools; and (iv) introducing and enforcing Disaster Risk Management (DRM) aspects into land-use and development planning. As reported to the 2013 Global Platform for Disaster Reduction[10], the country is now protected by a tsunami alert system, which means that the authorities are able to evacuate coastal areas within one hour of a warning. Similarly early warning and response capacity for floods and landslides has improved markedly. In 2013, for example, the GoSL commissioned a national Doppler radar system to further enhance early warning.

17. Despite this significant progress, large-scale, systematic investment in risk understanding and mitigation across sectors is not yet in place. The GoSL is making efforts to integrate DRM into its investment plans. A five year Plan for DRM is due to be submitted to Cabinet in early 2014. This will set a framework for scaling up investment in risk mitigation, which will include a significant budget line for flood mitigation works. The investments planned under this Climate Resilience Improvement Project (CRIP) provide a critical first investment drive under this Plan, through improving physical resilience to hydro-meteorological events and a first wave of 'no-regret' mitigation investments. In so doing, the project will provide an experiential foundation on which the country can develop a longer term investment plan to build disaster resilience.

[10] See the full statement transcript at http://www.preventionweb.net/files/33106_addressbyhonmahindaamaraweeraatglob.pdf

C. Higher Level Objectives to which the Project Contributes

18. The proposed project falls within the disaster risk management pillar strategic objectives of the Country Partnership Strategy (CPS) FY2013 – FY2016 (Report No. 66286-LK, discussed at the board on 05/22/12), which is being revised through a CPS Progress Report to be delivered in FY14. While the strategic objectives of the FY13-16 CPS remain relevant through FY16, the Progress Report proposes strengthening Sri Lanka's resilience to natural disasters and climate change as a priority for the country's development agenda.

19. A comprehensive program is proposed to reduce the adverse impact of climate change and to adapt the stock of infrastructure to extreme climate shocks. To increase resilience, physical investments will be financed to address short term infrastructure weaknesses, coupled with a contingent credit line to safeguard against immediate fiscal impacts of a disaster. The program will be comprised of: i) the CRIP aimed at the immediate reduction of physical risk and improving understanding of disaster risks to direct future investment; ii) a project to be developed that will uplift the recommendations provided in the CRIP; and iii) a Development Policy Loan with a Catastrophe Deferred Draw Down Option to strengthen fiscal resilience to events. The Additional Finance for the Dam Safety project will serve this purpose as well, through rehabilitation of additional dams that could not be included in the original project due to conflict at that time.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

20. The proposed Project Development Objective (PDO) is to reduce the vulnerability of exposed people and assets to climate risk[11] and to improve Government's capacity to respond effectively to disasters. The PDO will be achieved through evidence-based investment planning and urgent risk mitigation measures.

B. Project Beneficiaries

21. A total of approximately 11.5 million People living and working in districts where these projects will be implemented are considered to be the indirect beneficiaries of this investment. The total direct beneficiaries from all the components of the project are estimated to be 450,000 spread out among 15 districts. Approximately 48 percent of the beneficiaries will be women. Physical investments are represented geospatially in Annex 7.

C. PDO Level Results Indicators

22. Achievement of the PDO will be monitored through the following proposed key outcome indicators: i) climate risk is incorporated in development programs; ii) flood and drought risks from hydrometeorogical events are reduced; iii) transport interruption risk is reduced; and, iv) schools are protected from landslide risks.

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[11] Climate risks managed under this project will include hydro-meteorological risk of flood, drought, and landslides

III. PROJECT DESCRIPTION

A. Project Components

23. The main aim is to help Sri Lanka begin a process that would build a more climate-resilient economy. With rapid economic progress in recent times, the assets at risk to extreme hydrometeorological events have increased significantly. Investments in disaster and climate resilient infrastructure will ensure continued and sustainable growth.

24. Given the current lack of understanding of the multisectoral impacts of climate change, flood/drought modeling and scenario analysis work is required. Once completed a large climate resilience investment program would be identified and financed through multiple funding sources. Key line ministries would be brought together in the assessment of risks or impacts on particular sectors and an investment road map would be developed.

25. While there is a lack of understanding of comprehensive climate and disaster risk, there are urgent climate risk mitigation investments required to ensure the short-term integrity of flood control and irrigation infrastructure, transport network and critical education facilities at risk. Given the impacts of floods and landslides of the north central, central and eastern provinces in recent years, urgent investment is required to implement the immediate risk mitigation activities.

26. To address long-term capital development needs and short-term flood mitigation requirements, the project will comprise the following four components.

27. ***Component 1: Development of basin investment plans (US$13 million).*** The objective is to identify over US$1 billion of investments in the form of basin investment plans. These investment plans will be informed by a robust understanding of climate risks. Government engineers and experts will be supported to carry out comprehensive flood and drought modeling and assessment of the underlying causes of flood and drought. These models will take into account climate risks such as expected extremes of water scarcity and excess, increase in inter-annual and intra- seasonal variability of monsoons, increase in duration of droughts, and depletion of ground water resources, which are all expected to adversely affect livelihoods and human lives in the near future.

28. To comprehensively assess the climate risks and identify investments, the technical capacity of the Ministry of Irrigation and Water Resources Management (MIWRM) will be strengthened. In particular, the growing Special Projects Unit (SPU) will benefit from technology transfer and technical assistance. In the medium term, the SPU will bring in additional sectoral experts and will evolve into a Climate Resilience Planning Unit. The analytical work will be undertaken by Government engineers, guided by international experts as required to build capacity and to promote a similar approach across the country in the coming years. Investments to be financed include: i) acquisition of a digital elevation model; ii) flood and drought risk modeling; and, iii) identification of basin investment programs.

29. ***Component 2: Increasing climate resilience of infrastructure (US$90 million).*** The objective is to implement urgent climate risk mitigation investments that have been identified

and prioritized by the GoSL. Investments will be made in the following areas: i) flood mitigation; ii) transport continuity; and iii) school protection, as detailed below.

30. Flood risk mitigation (US$47 million): Investments will focus primarily, on rehabilitating infrastructure damage by recent floods or particularly at risk to future floods. Approximately 60 percent of investments can begin immediately to reduce flood risk, while 40 percent of the investments will require detailed localized modeling to ensure interventions consider the inter-related flood risk of the project areas. These interventions have been determined based on historical losses and field survey assessment by Irrigation Department (ID) and Mahaweli Authority of Sri Lanka (MASL). Such an approach is expected to ensure that mitigation interventions are sustainable and lead to resilient infrastructure. Investments will not involve construction of new infrastructure, but instead critical reinforcement to existing structures to withstand future floods. All rehabilitation works under this component are on canals and bunds downstream of dams. The interventions will improve carrying capacity of canals and reduce flooding due to overtopping of flood bunds but will neither improve nor undermine safety of dams as no head-work or any part of an existing dam will be retrofitted under this project.

31. Transport Continuity (US$36 million): The transport investments aim to reduce direct loss to transport infrastructure, indirect economic losses due to detours, and increase the effectiveness of post disaster response. Rapid expansion of the road network development has led to greater road failures due to landslide, while low bridges constructed in flood plains continue to be flooded on a regular basis. To mitigate landslide risk, investments will focus on reinforcing road infrastructure on the Colombo – Ratnapura – Wellawaya – Batticaloa, Peradeniya – Badulla - Chenkaladi, Kandy – Mahiyangana - Padiyatalawa, Tennekumbura – Rikiligaskada – Ragala, Kegalle – Bulathkohupitiya – Karawanella, Gampola - Nawalapitiya, Dehiwela – Maharagama, Gangodawila – Boralesgamuwa, Matale – Illukkumburu – Pellegama, Batticaloa – Tirikkondiadimadu – Trincomalee, Polonnaruwa – Tambala – Sungwila – Somawathiya and Bogahawewa – Pulmuddai roads. A total of about 3kms of unstable, high risk road side slopes will be augmented to improve the corridor's resilience to landslides triggered by heavy rains. To mitigate the flood risk to low lying bridges, nine key vulnerable river crossings with a combined span of approximately 260 meters will also be strengthened. This will include raising and lengthening of bridges for sufficient water flow capacity in place of existing narrow bridges or causeways.

32. School protection (US$7 million): Investments will be made to improve slope stability and drainage capacity of 18 schools that serve about 30,000 students and have been identified as highly vulnerable to landslides. Currently, given the high landslide risk, these schools close during heavy rainfall periods, for two to four weeks annually. Improvements to slope stability will promote education continuity as schools will not need to close and also will protect the residents of these hill slopes from potential landslides.

33. ***Component 3: Project implementation (US$5 million).*** The project will be implemented through the current Project Management Unit (PMU) of the Dam Safety and Water Resources Planning project (DSWRPP) under the MIWRM. Such an approach will leverage the existing strong capacity of the PMU, which will be able to implement the project

efficiently. However, given that this project more than doubles the amount of funds executed through the PMU, resources will be required to increase staffing and provide support to manage the project. The PMU will have an additional team of accountants, procurement and administration staff. Additional equipment, software and logistics will also be required. In addition, implementing agencies (IA) will also require support to execute the project.

34. ***Component 4: Contingent emergency response (US$2 million)*:** These funds are available to help government respond to adverse natural event that causes disasters. The Government may request the Association to re-allocate project funds from other components to partially cover emergency response and recovery costs.[12].

B. Project Financing

Lending Instrument

35. This project will be financed by 110 million United States Dollars (USD) International Development Association (IDA) credit. The lending instrument will be Investment Project Financing (IPF), and the implementation period for the project is four years. An IPF provides the flexibility to build human and institutional capacity, construct infrastructure, and to support the gradual design and implementation of a strategic basin plans for the identified basins. This instrument also allows for close follow-up of defined activities and procedures and allows for adjustments where necessary, on the part of the Government and the Association.

Project Cost and Financing

Table 1. Cost and financing for all four components

Project Components	Project cost	IDA Financing	% Financing
1.Development of Basin Investment Plans	13	13	100
2.Increasing climate resilience of infrastructure	90	90	100
3.Project Implementation	5	5	100
4.Contingent Emergency Response Component	2	2	100
Total Project Costs	110	110	100
Interest During Implementation			
Front-End Fees			
Total Financing Required			

* In addition the GoSL will make 1.8 million USD available for payment of seconded government staff

C. Program Objective and Phases

36. The overarching goal of this project is to provide an entry point for longer term, larger scale investment and policy dialogue on climate and disaster resilience. The CRIP will be delivered to the Board for approval in FY14, alongside the proposed US$102 million Development Policy Loan (DPL) with Catastrophe Deferred Drawdown Option (CAT DDO).

[12] Such a reallocation would not constitute a formal Project restructuring, as permitted under the particular arrangements available for contingent emergency response components (ref. Including Contingent Emergency Response Components in Standard Investment Projects, Guidance Note to Staff, April 2009, footnote 6).

The CAT DDO will increase fiscal resilience in the short term through a line of credit to be used in case of a disaster, and associated technical assistance (TA). Both projects will be presented to the Board as a holistic package, as part of a multi-phased Improving Climate Resilience Program.

37. As such, the Program addresses both short and long term needs of the country by addressing the risks posed by hydrometeorological events. To manage contingent fiscal risk, a line credit will be put in place in the short term, while, over the long-term, a series of financial instruments will be put in place to manage the liabilities. To reduce the liabilities, physical investments will be financed to address both short term system weaknesses and to increase the long-term resilience of infrastructure development.

D. Lessons Learned and Reflected in the Project Design

38. The following lessons learned have been incorporated into the project design.

39. *Having an integrated flood and drought management system is crucial for reducing risk from these perils.* Experience from different countries show that an integrated design and operational management of water resources could address both flood and drought risk issues effectively.

40. *Cooperation among different stakeholders is crucial for ensuring the sustainability of the project.* Different government ministries have varying and often conflicting objectives in terms of management of water resources. It is important that the interests of the each stakeholder is noted and the design and operational requirements be drawn to minimize negative effects on any stakeholder or group.

41. *Data related to flood and drought should be readily available and easily accessible to all key stakeholders.* A centralized database system of flood and drought hazards and exposures should be setup so that stakeholders can easily use it to understand the risks to their interests.

42. *Investments should be made to build the capacity of government through, for example, training of personnel on how to update input data and modify analytical tools.* Ensuring government officers are able to provide regular inputs and manipulate analytical tools will significantly increase the sustainability of the project. Input data update and recalibration of models are very important aspect of risk modeling, as natural hazard data are often very scarce. The flood and drought models should be an open system so that it could be expanded to include additional features in the future.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

43. The project will be implemented by the DSWRPP PMU. The PMU is currently staffed with a project director, civil engineers, a full-time accountant, a procurement specialist, an environmental specialist, and a social development specialist. To implement the

proposed project, this team will be augmented with additional financial management (FM), procurement, engineering and administrative personnel. Given that the PMU is currently implementing the DSWRPP, it is well versed in handling World Bank funded operations, including financial management and procurement. To absorb the additional financing that will flow through the proposed project the PMU will work with four IAs to execute the physical works. These agencies include ID, MASL, the Road Development Authority (RDA) and NBRO. A focal point from each of these IAs will be assigned to manage the execution of investments and to coordinate with the PMU.

44. The performance of the PMU has been consistently rated Satisfactory and there are no overdue audit reports or ineligible expenditures. A simplified procurement FM assessment has been undertaken, which found the procurement and FM arrangements to be sufficient. The staffing plan was also found to be sufficient in view of the new project. Suitable risk mitigation measures and capacity building elements will be accordingly proposed.

B. Results Monitoring and Evaluation

45. Baseline survey for the project included: an assessment of rehabilitation requirements completed by ID; landslide vulnerability analysis completed by NBRO for both schools and the transport sector; an analysis of bridges vulnerable to flooding; a study of the country's physical and analytical capacity for basin risk assessments; and a review of institutional capacity/skills related to components 1 and 2. The project outcomes and results will be measured against this baseline, as reflected in Annex 1. The PMU will be responsible for monitoring outcomes with assistance from independent monitoring and evaluation (M&E) consultants.

46. The results framework in Annex 1 will be used to monitor and evaluate the achievement of the PDO and the outcomes. Project monitoring will occur as a periodic function, and will include process reviews, accounting audits, social audits, reporting of outputs, and maintenance of records. Broad thematic areas that will be supervised and monitored include the following: i) Social and Environmental Monitoring; ii) Regular Quality Supervision & Independent Quality Monitoring; and iii) Annual Reporting.

47. *Social and Environmental Monitoring:* This will involve monitoring compliance with environmental regulations, social safeguards, and Environment and Social Management Framework.

48. *Regular Quality Supervision and Independent Quality Monitoring:* Regular supervision will be carried out by the respective IAs and reported to the Association by the PMU. The IAs will be responsible for supervision of investment activities in their respective sectors while the PMU will contract an external technical audit. Independent quality monitoring will be led by the PMU, which will commission third party technical audits. It will submit quarterly reports in an appropriate format to the Ministry of Finance and Planning (MoFP), Department of Project Management and Monitoring, IAs and the Association no later than 45 days after the end of each quarter. Quarterly reports will describe physical and financial progress and expected completion dates of contracts, progress

on institutional components, training, studies and the activities of the project's consultants with explanations for shortfalls between the plan and achievements. The reports will also include financial and procurement information, including: (i) comparison of actual and forecast physical and financial outputs and updated forecasts for the next six months; (ii) project financial statements, including sources and application of funds, statements of expenditure by category and reconciliation of special accounts; and (iii) a procurement management report showing status and contract commitments.

49. *The PMU will prepare an annual report to be submitted no later than 31 January each year*. The report will cover: (i) the progress of each component, implementation of key features of the environmental management plan, key performance indicators, details of operation of project facilities and financial statements; and (ii) the annual work plan for implementation, annual funds required for implementation, an updated disbursement profile, planned actions for mitigating negative effects during construction and target indicators for the coming year. A midterm review of the project will be carried out by the Borrower and the Association by December 31, 2016. The Borrower will submit its own implementation completion report to the Association no later than six months after the closing date of the project.

C. Sustainability

50. **Physical Sustainability:** The investments are designed to be more resilient to physical conditions than they are at the present time, which will assure improved physical sustainability of the infrastructure. Using international best practices for engineering designs, construction supervision, and technical audits, quality of work for flood control, bridge expansion, slope stabilization, and school safety investments will be assured. In addition, the design will account for demographic, topographic, hydrologic, and land use/cover changes.

51. **Financial Sustainability:** The project, through Component 1, will support the development of a long term strategy for climate resilient development. The modeling and analyses will result in a better understanding of the probable occurrence of an adverse natural event, and the expected damages and losses caused by such an event. Increased understanding will result in investment planning that more accurately captures the currently underestimated rate of return for averting losses. The physical investments being made will reduce the annual contingent liability posed by disasters, and therefore reduce the fiscal burden on government accounts.

52. **Institutional Sustainability:** A key outcome of the project will be improved capacity of line agencies to engage in long term planning to build and maintain climate resilient infrastructure investments. Of particular emphasis is analytical and technical support to the MIWRM to improve its approach to flood and drought management – from an ad hoc system of rehabilitation to a data-driven decision making approach founded upon long term planning. In addition, RDA and NBRO will benefit from further institutional strengthening. Finally, the PMU will also receive significant institutional support to enhance its project management capabilities.

V. KEY RISKS AND MITIGATION MEASURES

A. Risk Ratings Summary Table

Table 2. Risk rating summary

Risk	Rating
Stakeholder Risk	**L**
Implementing Agency Risk	
- Capacity	**M**
- Governance	**M**
Project Risk	
- Design	**S**
- Social and Environmental	**L**
- Program and Donor	**L**
- Delivery Monitoring and Sustainability	**M**
Overall Implementation Risk	**M**

B. Overall Risk Rating Explanation

53. There is a clear commitment by the GoSL to this project. In part due to the 2011 floods and 2012 drought, the Government recognized the need to increase resilience to hydrometeorological events. Further, the GoSL has expressed a desire to proactively address future climate risk in an integrated manner that addresses water management systems holistically, taking into consideration the implications on agriculture, transport, land use, power, urbanization and drinking water. The proposed project is directly aligned with the Government's approach, which should ensure strong government support during both preparation and implementation.

54. However, there are risks associated with changing the way climate risk is addressed including the evolution from a siloed to a multi-sectoral approach. This may delay decision-making due to bureaucratic processes in place and the number of actors involved. This risk is being addressed through the establishment of the SPU, which incorporates each of the departments under the MIWRM. As the unit strengthens and expands additional sectors will be incorporated and it is envisioned that the SPU will evolve into the Climate Resilience Planning Unit. Therefore, on balance, the risk at preparation is considered as Moderate.

55. Such a project, with a large number of small contracts, particularly in the MIWRM, is generally expected to experience implementation challenges and delays. These delays are due to the length of time required to design each of the works, and the time required to tender the works. Compounding these challenges is the limited dry season periods in which these works can take place. As a result, significant emphasis was placed during project preparation to address potential delays. This includes agreement on a prioritized long list of works. In

addition, at project appraisal, approximately 30 percent of bidding documents have been prepared and will be tendered. This should enable the signing of a significant portion of the project immediately after signing. In addition, the establishment of a SPU, a technical working group of key stakeholders, will facilitate the modeling and design of flood and drought mitigation works under component 1 of this project, hence reducing delay risks. Agreements have also been reached to ensure a large minimum threshold for contracts and the packaging of individual works into larger contracts.

56. The project will be implemented through a PMU that has substantial experience working with World Bank systems and is well trained. However, the scope of work managed by the PMU will more than double and the timeframe to execute the investments is short. To mitigate this risk, the capacity of the PMU will be strengthened through recruitment of additional staff, which has advanced substantially at the time of appraisal. As a result of these mitigation measures, there is a Moderate level of risk of during implementation.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analyses

57. Economic analysis was performed to assess the rate of return of capital investments in flood and drought risk mitigation, transport connectivity and school protection components of the project. The objective of the physical investments financed by this project is to avert future losses that would be caused by flood and landslide events. Therefore, the benefits are measured primarily in the form of losses that are averted due to strengthened infrastructure that is more resilient to high rainfall events. This analysis does not take into account the monetary value of social, indirect benefits and the value of human lives, which implies that the benefits are understated.

58. Given the lack of robust historical hydrometeorological data, and precise information on the frequency of flood and landslide events, and the vulnerability of physical structures, it is difficult to exactly determine the likelihood and magnitude of losses. To incorporate this uncertainty into the understanding of the benefits of the investments, statistical tools need to be applied. In this case, a Monte Carlo simulation analysis was performed to account for the uncertainty in the values of variables such as frequency of flood events and landslide occurrence; average damage to homes; crop and cattle prices; disruption of tourism income; cost of rehabilitation of damaged roads; vehicle speed and occupancy; and average number of road blockages.

59. The analysis over a period of 20 years of the life of the project leads to a net present value (NPV) of $57 million and an internal rate of return (IRR) of 22.7%. The simulated IRR ranges from 12.3% to 34.7%. The range of benefits is due to the uncertainty in determining the frequency and intensity of the flood and landslide hazards; and the vulnerability of physical structures and crops to these perils. The results show that the probability that the IRR would fall below 12% is zero.

B. Technical

60. The long term objective of the project is to support the Government in making investments in a holistic manner that considers current and future climate risk across sectors. To accomplish this objective, the project will operationalize the SPU under the MIWRM. Initially, this Unit will draw upon the experience gained through the small cells established under DSWRRP and comprise engineers and planners from the Ministry, the ID, the MASL and an international risk modeling firm. The international consultant will be responsible for building the capacity of government engineers by guiding and training them to complete the flood and drought risk models for the selected basins. The analytical work to be completed by SPU will consist of: i) geospatial information, including a high accuracy Digital Elevation Model (DEM); ii) and hydro-meteorological information; iii) hydraulic information; iv) generation of probabilistic hazard an the development of exposure data; v) modeling of flood and drought risk; vi) identification and feasibility study of investments; and, vii) development of strategic environmental assessment.

61. The objective of the operationalization of the SPU goes beyond successful completion of this project. The ultimate goal is for SPU is to serve as the foundation for a Climate Resilience Planning Unit (CRPU) that will act as a multi institutional planning cell comprising key government agencies. The CRPU will have a mandate to ensure sustainability and resilience of works by incorporating climate risk as a key parameter in the design and implementation of investments. In particular, the CRPU will convene departments that compete for water resources in order to rationalize the allocation of water across key sectors such as power, agriculture, urban development and others.

62. The physical investments to be supported under Component 2 have been identified by the IAs based on recent damage and vulnerability assessments. Designs for these investments are underpinned by hydraulic and hydrological modeling to ensure that the infrastructure addressed is resilient to future adverse events. The RDA will incorporate recent climate variability into the design of the bridge expansion and causeway replacement projects. An international landslide expert has supported the NBRO in the design of slope stabilization and school safety works in order to ensure they meet the standards of international best practice.

C. Financial Management

63. The proposed FM procedures are in line with fiduciary requirements of section 6 of OP 10.00. The PMU on behalf of Secretary MIWRM would be responsible for overall FM arrangements of the project. The PMU is well versed in handling World Bank funded operations, including FM procedures and the project has a 'Modest' FM risk rating. The FM performance of the DSWRPP has been continuously receiving a 'Satisfactory' rating, including in the December 2013. However, a simplified FM assessment was undertaken on the adequacy of FM arrangements and the proposed FM arrangements were found to be acceptable. Suitable risk mitigation measures and capacity building elements have been accordingly proposed. There are no overdue audit reports or ineligible expenditures under the existing implementing agency.

64. FM Staffing: The existing Finance Manager of the PMU will provide the overall direction and guidance for the project in relation to FM. Two additional accountant/s and two accounting assistants are proposed to be hired and is in the process of being recruited to handle the increased scope and workload due to the new project.

65. Funds Flow: The funds requirement for the project will be budgeted in the annual budget of the MIWRM and drawn by the PMU, based on the annual work plan. For components implemented primarily under MIWRM, funds will flow from PMU to respective Regional Director of Irrigation (RDI) offices, MASL and other existing agencies as already in the DSWRPP. For project components implemented by RDA, funds will flow from PMU to RDA as need arises. A dedicated special USD account will be opened to be handled by the PMU to manage the funds flow of the project.

66. Disbursements: Disbursements will be report-based. An initial advance would be deposited into the segregated Designated Account (DA) maintained in USD. Thereon, withdrawals from the DA will be on the basis of six monthly forecasts as reflected in the quarterly Interim Financial Reports (IFR) by the project. Quarterly IFRs are due to be submitted within 45 days of end of quarter by the PMU.

67. Audit arrangements: An internal audit unit (IAU) established under PMU will carry out the internal audit. An external audit of the project will be carried out by the Auditor General of Sri Lanka. The annual audit reports will be submitted within six months of the end of the financial year and monitored in Portfolio Risk Management System. The audited financial statements will be made available for public disclosure.

D. Procurement

68. General: Procurement of goods, works and services will be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works and Non-Consulting Services under International Bank for Reconstruction and Development (IBRD) Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 (Procurement Guidelines); and "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 (Consultant Guidelines) and the provisions stipulated in the Financing Agreement (FA). Unless otherwise agreed with the World Bank, the World Bank's Standard Bidding Documents (SBD), Requests for Proposals, and Forms of Consultant Contract will be used. The summary of the procurement capacity assessment of the IAs and precise arrangements are presented in Annex 3.

Procurement Risk Assessment and Mitigation

69. The project would be implemented under MIWRM within the PMU currently implementing the DSWRPP. While designing sub-projects, preparation of technical sections in the bidding document such as: Bills of Quantities; Specifications; Drawings will be carried out by the IAs. The IAs, except NBRO, will be responsible for overall procurement including the preparation of bidding documents/Request for Proposals (RFP), inviting bids/proposals, evaluation of bids/proposals and contract awards. PMU will handle the

procurement for projects implemented under NBRO. The existing Procurement Specialist of the PMU will provide the overall direction and guidance for the project in relation to procurement. Two additional procurement officers will be recruited to handle the increased scope and workload due to the new project.

70. The procurement capacity assessment and procurement arrangement is described in details in Annex 3. The summary of risk mitigation measures to address the residual risks are: (i) improving and publishing complaint handling mechanism; (ii) use of SBDs as agreed for procurement of goods and works following National Competitive Bidding (NCB) and the World Bank SBDs for International Competitive Bidding (ICB) and consulting services; (iii) project Procurement Manual in line with World Bank Procurement Guidelines which will be prepared and agreed with the Association; and (iv) further training of procurement staff in "Procurement in World Bank Financed Projects".

71. The World Bank has provided training and support to the PMU throughout the implementation of the DSWRPP, including those involved in procurement. As the size of the PMU increases, it will develop a comprehensive training program to implement over the life of the project, including procurement and contract management. The Operations Manual will include all procurement processes, decision making, and safe upkeep and management of records.

72. *Procurement Plan*: The Recipient has developed the initial procurement plan for project implementation and has agreed with IDA on the basis for the procurement methods. This plan has been agreed between the Recipient and the Association on 02/17/2014 and the respective plans are available at the PMU. It will also be available in MIWRM website and in the World Bank's external website. The Procurement Plan will be updated annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

73. *Frequency of Procurement Supervision*: In addition to the prior review supervision to be carried out by the Association, the capacity assessment of the IAs has recommended semi-annual supervision missions to visit the field to carry out reviews of procurement actions.

E. Social (including Safeguards)

74. The overall social impacts are expected to be positive. The project's social aspects were identified and remedial measures to mitigate social risks are being designed on the basis of a Social Assessment, and an accompanying Social Management Framework (SMF). The SMF will be cleared by the Association and will be disclosed by the GoSL and at Infoshop. No new construction will be financed under the project and, as a result, no significant social impacts are envisioned. However, given the nature of the interventions, the involuntary resettlement policy (OP 4.12) is being triggered to accommodate any unforeseen requirements for the acquisition of land.

75. OP/BP 4.12 Involuntary Resettlement: In the event land acquisition is unavoidable, participatory and transparent processes would be followed in accordance with the World

Bank's operational policy on Involuntary Resettlement. Normal government procedures would be followed for documentation of transfer of government owned and donated land.

76. Component 2 may give rise to some social issues, which require mitigation measures to be developed in accordance with the SMF.

F. Environment (including Safeguards)

77. The project overall is environmentally beneficial since the development objective of the project is to reduce the vulnerability of exposed people and assets to climate risk[13] and to improve Government's capacity to respond effectively to disasters. However, the rehabilitation work proposed will require due diligence to be in place and environmental management action will need to be incorporated into the investment planning process. The project is categorized as **Category B** and the following environment safeguards are triggered under the project, and described below: i) OP/BP 4.1, Environmental Assessment; ii) Natural Habitats OP/BP 4.04, and iii) Physical Cultural Resources OP/BP 4.11. Safeguards information was disclosed in the DSWRPP website and the World Bank external website on January 24, 2014.

OP/BP 4.1, Environmental Assessment

78. While the net environmental benefit of the project is expected to be positive, the project activities are likely to have some environmental risks unless properly planned and executed. Component, 1 while developing flood and drought risk models, will identify mitigation measures and investment plans to alleviate losses. The project design envisions the incorporation of environmental assessments into the investment planning process, as the basins identified consists of environmentally critical areas. Component 2 will give rise to environmental risks due to proposed physical investments downstream of hydraulic infrastructure, landslide stabilization of school and rehabilitation of roads and bridges. These include planning and construction related impacts, structural stability related issues and potential impacts on environmentally important sites during and after rehabilitation work. Component 3, on emergency response will likely to have environmental impacts through potential recovery activities.

79. An Environment Management Framework (EMF) has been prepared, which outlines the processes and serve as a guideline to undertake environmental and social assessments (ESAs) and/or environmental and social management plans (ESMPs) as required. Sub-project specific ESAs and/or ESMPs will be undertaken for physical activities and these will be prepared for sample of first year investments prior to appraisal. Safeguards process to be followed as per the OP 10.0 will be also included as part of the framework for any emergency support that may likely to be supported during the project implementation period. A Strategic Environmental Assessment will be conducted to cover the basin investment plans that will be developed for future investments. This will be undertaken as a need beyond the current project's physical investments and as part of the planning process.

[13] Climate risks managed under this project will include hydro-meteorological risk of flood, drought, and landslides

Natural Habitats OP/BP 4.04

80. As many of the structures to be rehabilitated will be to some extent associated with natural habitats such as lagoons, rivers, mangrove habitats, terrestrial wetlands, etc. this policy is triggered. The due diligence requirements will be covered under the EMF.

Physical Cultural Resources OP/BP4.11

81. Given the project areas consist of number of historical sites and the nature and extent of impacts of proposed repair and rehabilitation is unknown at this point of time, it is possible that 'chance finds' at work sites is a likely impact that would have to be managed. Therefore, all subprojects identified prior to appraisal will be assessed for likely impacts during the project preparation. It is proposed that sub-projects that may have significant negative impacts on physical cultural resources will be included in the negative list and chance find procedures applicable during implementation will be incorporated in the EMF.

Annex 1: Results Framework and Monitoring

SRI LANKA: Climate Resilience Improvement Project

Project Development Objective (PDO): to reduce the vulnerability of exposed people and assets to climate risk and to improve Government's capacity to respond effectively to disasters. The PDO will be achieved through evidence-based investment planning and urgent risk mitigation measures

PDO Level Results Indicators	Core	Unit of Measure	Baseline	Cumulative Target Values				Frequency	Data Source/ Methodology	Responsibility for Data Collection	Notes
				YR 1	YR 2	YR3	YR 4				
Development of basin investment plans that are based on integrated understanding of climate risk		Number of basin investment plans	0	0	0	9	9	Annual	GoSL/ Modeling	Consultants, MIWRM	9 basin investment plans will be developed based on comprehensive risk modeling
Decrease in expected annual flood loss from 5 years return period to 25 years		Hectares protected (1000)	0	0	37	74	123	Annual	Construction reports / field surveys	MIWRM, MDM	Decrease in flooding in both urban and rural areas
Reduction in people at risk to climate related transport interruptions		Persons (1000)	0	0	216	433	721	Annual	Field surveys	RDA	Road side slopes will be stabilized, bridges raised and causeways replaced to decrease transport interruptions
Number of schools protected against landslides		Number of schools	0	0	6	12	18	Annual	Construction reports / Field surveys	NBRO	

INTERMEDIATE RESULTS

Improved Understanding of Flood and Drought Risk in Selected Basins

Intermediate Result Indicator	Core	Unit of Measure	Baseline	Cumulative Target Values				Frequency	Data Source/ Methodology	Responsibility for Data Collection	Notes
DEM and hydro-meteorological data for the nine basins collected and compiled for analysis		Percentage	0%	70%	100%	100%	100%	Annual	GoSL/ Satellite data	Consultants, MIWRM	Most of the input data will be gathered in the first year to be able to finish the modeling in three years

Flood and drought risk models developed		Percentage	0%	20%	70%	100%	100%	Annual	Modeling	Consultants, MIWRM	
Strategic Environmental Impact Assessment developed		Percentage	0%	0%	0%	100%	100%	Annual	Environmental impact assessment	Consultants, MIWRM	
Number of MIWRM staff trained in modeling climate risks	☒	Person	0	10	15	20	20	Semi-annual	MIWRM Staff Survey	MIWRM	Training will include generation of hazard, development of exposure data and risk modeling
Reduced Flood Risk											
Intermediate Result Indicator	**Core**	**Unit of Measure**	**Baseline**	**Cumulative Target Values**				**Frequency**	**Data Source/ Methodology**	**Responsibility for Data Collection**	**Notes**
Local flood risk analyses and modeling to support immediate mitigation		Percentage	0	75%	100%	100%	100%	Annual	GoSL / Modeling	MIWRM	These flood risk models will support investments under component 2 of the project
Detailed flood mitigation designs completed		Percentage		65%	100%	100%	100%	Annual	GoSL/Design	MIWRM	
Length of improved distribution canals		Km	0	161	322	483	643	Semi-annual	Construction reports / Field surveys	MIWRM	
Number of improved structures in distribution canals		Number of structures		1159	2317	3476	4634	Semi-annual	Construction reports / Field surveys	MIWRM	e.g. drop structures
Length of improved flood drainage canal		Km	0	194	389	583	778	Semi-annual	Construction reports / Field surveys	MIWRM	
Length of rehabilitated flood bund		Km	0	100	200	299	399	Semi-annual	Construction reports / Field surveys	MIWRM	
Length of improved spill tail canal		Km	0	43	87	130	173	Semi-annual	Construction reports / Field surveys	MIWRM	

Number of improved culverts and small bridges		Number of structures	0	22	45	67	89	Semi-annual	Construction reports / Field surveys	MIWRM	
Length of improved link roads		Km	0	27	55	82	109	Semi-annual	Construction reports / Field surveys	MIWRM	These roads are agricultural access roads
Improved transport continuity											
Intermediate Result Indicator	**Core**	**Unit of Measure**	**Baseline**	**Cumulative Target Values**				**Frequency**	**Data Source/ Methodology**	**Responsibility for Data Collection**	**Notes**
Detailed road side slope stabilization and bridge designs completed		Percentage	0	70%	100%	100%	100%	Annual	GoSL/Design	NBRO, RDA	
Length of road side slopes stabilized against landslides		Km	0	0.76	1.51	2.27	3.03	Annual	Construction reports / Field surveys	NBRO, RDA	
Number of bridges raised and causeways replaced		Number of bridges	0	2	5	9	12	Annual	Construction reports / Field surveys	RDA	
Improved School Safety											
Intermediate Result Indicator	**Core**	**Unit of Measure**	**Baseline**	**Cumulative Target Values**				**Frequency**	**Data Source/ Methodology**	**Responsibility for Data Collection**	**Notes**
Detailed landslide stabilization designs completed		Percentage	0	50%	100%	100%	100%	Annual	GoSL/Design	NBRO	
Vulnerable school areas protected from landslide		Hectares protected	0	1.46	2.93	4.39	5.85	Annual	Construction reports / Field surveys	NBRO	

Annex 2: Detailed Project Description

SRI LANKA: Climate Resilience Improvement Project

1. The project consists of two main components and two additional components. The first component focuses on analytical activities and long term development planning, while the second component addresses urgent rehabilitation investments to increase resilience to climate risks. The remaining two components support project implementation and provide flexible funding to recover from a flood event that may occur during project implementation.

2. Component 1 involves a detailed modeling of flood and drought risk in nine major river basins in the country. These basins were selected based on a combination of probability of occurrence of climate related disaster losses and value of exposed assets at risk to disaster. The purpose of the modeling is to develop comprehensive basin wide investment plans that incorporate the competing risks of both flood and drought. Component 2 provides resources to address urgent rehabilitation activities required to reduce short term flood risk in three sectors. The first subcomponent strengthens hydraulic structures that have been identified as highly vulnerable to flood loss. The second subcomponent strengthens the transport network to reduce the probability of loss due to high rainfall events. Investment will improve transport continuity during flood events by stabilizing vulnerable road slopes currently at high risk to landslide and by expanding bridges that become impassible during heavy rains. This is especially critical during disaster situations to ensure efficient response and recovery. The third subcomponent stabilizes 18 landslide prone schools that have been identified as high risk. Since they are identified as high risk schools by the NBRO, they are closed for an average of two weeks each school year due to safety concerns.

3. Components 3 supports the execution of Components 1 and 2 by providing the staff and equipment to the PMU and the IAs identified as necessary for efficient implementation of the project. Component 4 is the Contingent Emergency Response Component that enables access to rapid disaster recovery activities. This component also allows for the reallocation of resources from the investment components in order to partially cover emergency response and recovery costs.

Component 1: ***Development of basin investment plans (US$13 million)***

4. The objective is to identify over US$1 billion of investments in the form of basin investment plans. These investment plans will be informed by a robust understanding of climate risks. Government engineers and experts will be supported to carry out comprehensive flood and drought modeling and assessment of the underlying causes of flood and drought including rainfall variability and land use changes.

5. Nine river basins have been identified for investment planning. The selection of the basins was based on extensive discussions with ID and MASL, taking into consideration several key criteria. The overarching criteria include the: i) historical major flood and/or drought events and associated human and economic impacts; ii) the concentration of human and economic assets in the hazard prone areas; and iii) potential for water resources development and plans for economic development. The selected nine basins constitute significant proportion of the water

resources of the country and include the following: i) Mahaweli Ganga (including Kalu Ganga and Amaban Ganga) ; ii) Kala Oya in combination with Mee Oya; iii) Dedura Oya; iv) Maha Oya; v) Attanagula Oya; vi) Kelani Ganga; vii) Gin Gana; viii) Nilwala Ganga; and ix) Gal Oya.

6. The analytical work under this component will serve as a basis for future climate resilience investments and will help the Government to understand the risk and adopt the required risk mitigation measures. The resulting output will be: i) flood and drought maps that can be used by the Government to establish appropriate water and land use policies; ii) development of flood and drought risk models that will help quantify the expected losses; iii) recommended mitigation measures and investment plans; iv) feasibility study of investment plans; and, v) strategic environmental assessment of investment plans

7. The risk modeling work under this component will include the following elements:

- Development of hydrological and hydraulic models as flood and drought. Since events are partly manmade due to operation of hydraulic structures upstream, and operation policies are part of the possible interventions, it is essential that the meteorological and hydrological time series be representative for current and future climate are stored and available.
- Generation of a probabilistic catalog of flood and drought events to be used as an inputs to the risk model
- Development of flood and drought exposure and vulnerability data to be integrated with the flood/drought event model to calculate probable damage
- Development of vulnerability curves based on engineering and agricultural output assessment and past historical data
- Determination of expected human impacts as well as economic damages and losses
- Creation of alternative mitigation measures and investment plans to alleviate losses
- Creation of water resources operations guidelines that address flood and drought
- Assessment of environmental impact, including social aspects particularly related to resettlement of people from vulnerable areas

8. A high-resolution DEM will be used in the flood modeling exercises. Acquisition of the DEM will be an integral part of this component and will be carried out early in the project to ensure that the project will be delivered on time.

9. The long term objective of the project is to support the Government in making investments in a holistic manner that considers current and future climate risk across sectors. To accomplish this objective, the project will operationalize the SPU under the MIWRM. Initially, this Unit will draw upon the experience gained through the small cells established under DSWRRP and comprise engineers and planners from the Ministry, the ID, the MASL and an international risk modeling firm. The international consultant will be responsible for building the capacity of government engineers by guiding and training them to complete the flood and drought risk models for the selected basins. The analytical work to be completed by SPU will consist of: i) geospatial information, including a high accuracy DEM; ii) and hydro-meteorological information; iii) hydraulic information; iv) generation of probabilistic hazard, development of exposure data; v) modeling of flood and drought risk; vi) identification and feasibility study of investments; and, vii) development of strategic environmental assessment.

10. The objective of the operationalization of the SPU goes beyond successful completion of this project. The ultimate goal is for SPU is to serve as the foundation for a Climate Resilience Planning Unit (CRPU) that will act as a multi institutional planning cell comprising key government agencies. The CRPU will have a mandate to ensure sustainability and resilience of works by incorporating climate risk as a key parameter in the design and implementation of investments. In particular, the CRPU will convene departments that compete for water resources in order to rationalize the allocation of water across key sectors such as power, agriculture, urban development and others.

11. Below is a summary showing budget allocation to different components of the basin investment planning.

Table A2-1. Budget allocation for development of basin investment plan

Development of basin investment plans	USD millions
Understanding climate risk	
LIDAR and Digital Elevation Model	
Analysis of hydromet data	
Flood and Drought Modeling	
Climate resilient investment program	
Identification of basin investments	
Completion of feasibility analysis	
Strategic Environment and Social impact Assessments	
Special Projects Unit - Office of Long Term Planning	
Equipment	
Software	
Training	
TOTAL Investment	**13.0**

12. The result of this component would be the development of a comprehensive climate resilience investment plans that would be financed by the Government, the World Bank and other donors.

Component 2: ***Increasing climate resilience of infrastructure (US$90 million)***

13. The objective of this component is to: i) implement immediate flood and drought risk mitigation work; ii) reduce risk to of flood related transport interruptions; iii) protect schools from landslide risks. All interventions are identified and prioritized by recent risk assessments and engineering investigations. As such, this component consists of three sub-components. These include strengthening hydraulic infrastructure to mitigate flood loss, improving the

transport network to reduce the probability of loss due to high rainfall events; and stabilizing18 landslide prone schools that have been identified as high risk.

Sub-component 2.1: Flood Mitigation

14. The interventions under this sub-component will focus on rehabilitating hydraulic infrastructure that is at risk to flood loss. The infrastructure was identified for rehabilitation of recent flood damages because it is expected to result additional flood damage if left unattended. These interventions are not simple maintenance works, but are rather geared to strengthen the system in the event of future similar disasters and enhance them to meet future demands. These investments will be prioritized given the urgency to avoid any failure or additional loss due to flooding.

15. All improvement measures are supported by detailed local flood modeling. Based on the levels of risk identified using the models, detailed designs of the interventions have been prepared by ID and MASL. After extensive discussions and analysis with MIWRM, ID, and MASL, approximately 25 flood prone sites have been identified, all of which have experienced flood and/or drought disasters in the past decade. Various interventions are required but the main areas of work are described below:

- Increase of conveyance capacity by removing obstacles and bottlenecks
- Realignment of canals
- Upgrade and maintenance of flood pump stations
- Rehabilitation of flood bunds damaged by recent flooding
- Rehabilitation of diversion structures damaged by recent flooding

16. All rehabilitation works are on canals and bunds downstream of dams and not on the dams themselves. The interventions will improve carrying capacity of canals and reduce flooding due to overtopping of flood bunds but will neither improve nor undermine safety of dams as no head-work or any part of an existing dam will be retrofitted under this project.

17. Below is a summary of the budget allocation for the different types of works and equipment required to implement this sub-component.

Table A2-2. Budget allocation for flood mitigation

Increasing Climate Resilient Infrastructure	**USD millions**
Flood and Drought risk mitigation	
Reduction of physical flood risk	
Reduction of physical drought risk	
Procurement of equipment	
Design, supervision and technical assistance	
TOTAL Investment	**47.0**

Sub-component 2.2: Ensuring transport continuity: road and bridge improvements

18. The transport investments aim to reduce direct loss to transport infrastructure, indirect economic losses due to detours, and increase the effectiveness of post disaster response. Rapid expansion of the road network development has led to an increase in landslides while low bridges constructed in flood plains continue to be flooded on regular basins. The increase in the number of landslides is due in large part to a lack of consideration of landslide risk in the construction of new road links. The need to expand bridges is that several are too low to cross during flood events. Investments will be financed to support the stabilization of road slopes to minimize landslide risks and the expansion of low bridges or replacement of causeways that are frequently flooded.

19. A total of 28 segments of roads will be stabilized against landslides and 12 bridges will be rehabilitated. The stretch of road to be stabilized at each location ranges from 50 to 500 meters. The majority of the investments are on Kandy-Mahiyangana-Padiyatalawa road, which is significantly affected by flood and landslides. Below is summary of the budget allocation for design, supervision, and purchase of equipment and construction work.

Table A2-3. Budget allocation for transport continuity

Transport Continuity	
Reduction of physical landslide	
Physical improvement of bridges	
Procurement of equipment	
Design, supervision and technical assistance	
TOTAL Investment	**36.0**

Sub-component 2.3: School Safety – Landslide Mitigation

20. Investments will be made to improve slope stability and drainage capacity of 18 schools that serve about 30,000 students and have been identified as highly vulnerable to landslides. Currently, given the high landslide risk, these schools close during heavy rainfall periods. Improvements to slope stability will promote education continuity as schools will not need to close and also will protect the residents of these hill slopes from potential landslides.

21. Most of the landslides in Sri-Lanka occur in the central part of the country which is mostly mountainous with highly fractured basement rock overlain by residual soil. This mountainous area makes up about 20 percent of the total land area and is home to more than 30 percent of the population of the country. Major landslides in the past two decades have caused loss of thousands of lives and have left about 175,000 people homeless. The main landslide mitigation works to protect vulnerable schools include:

a) Slope re-shaping , benching and surface preparation with geo-textiles
b) Soil-anchoring/nailing
c) Slope protection measures with geo-mesh and geo-grids
d) Drainage development, both surface and sub-surface through lateral drains
e) Building retaining walls

22. The investigation, design and construction of these interventions will be carried out by NBRO. Below is a summary of the budget allocation for the implementation of this sub-component.

Table A2-4. Budget allocation for school safety

School Safety	
Reduction of physical landslide risk	
Procurement of equipment	
Design, supervision and technical assistance	
TOTAL Investment	**7.0**

23. The complete list of the schools along with an estimate of the beneficiaries and the cost of mitigation are given in the table below.

Component 3: Implementation Support (US$5 million)

24. The objective of this component is to ensure the successful implementation of the activities carried out under the proposed project. Activities to be supported under this component include: i) implementation support in the areas of project management, M&E, procurement, FM, and environmental and social safeguards; ii) public awareness and communications support regarding project interventions and management of public expectations; iii) support to the IAs in construction, supervision, and compliance with environmental and social safeguards; iv) purchase of vehicles, office furniture, and information technology equipment for the PMU; v) operating costs of the PMU; and, vi) hiring of experts to reinforce the staffing of the PMU.

25. Below is a summary of the budget allocation for purchase of vehicles and equipment, hiring of consultants, and training of staff.

Table A2-5. Budget allocation for implementation

Project Implementation	**USD millions**
Logistics	
Vehicles	
Operating Costs	
Equipment	
Office equipment	
Computer Hardware	
Software	
Consultants	
Accounts	
Procurement Officers	
Administrative Officers	

Training and Audits	
Fiduciary Training	
Technical Training	
Accounting Audits	
TOTAL Investment	**5.0**

Component 4: Contingent Emergency Response (US$2 million)

26. Following an adverse natural event that causes a major natural disaster, the GoSL may request the Association use these funds to finance immediate recovery activities. The Government may also request that project funds be reallocated to this component to further support response and reconstruction.

27. Disbursements would be made against a positive list of critical goods or the procurement of works, and consultant services required to support the immediate response and recovery needs of the Government. All expenditures under this component, should it be triggered, will be in accordance with OP 10.00 and will be appraised, reviewed and found to be acceptable to the Association before any disbursement is made. In accordance with OP 10.00, this component would provide immediate, quick-disbursing support to finance goods (positive list agreed with the Government), works, and services needed for response, mitigation, recovery, and reconstruction activities. Operating costs eligible for financing would include the incremental expenses incurred by the Government for early recovery efforts arising as a result of the impact of major natural disasters.

28. Goods, Works and Services under this component would be financed based on review of satisfactory supporting documentation presented by the government including adherence to appropriate procurement practices in emergency context. All supporting documents for reimbursement of such expenditures will be verified by the Internal Auditors of the Government and by the Project Director (PD), certifying that the expenditures were incurred for the intended purpose and to enable a fast recovery following the damage caused by adverse natural events, before the Application is submitted to the Association. This verification should be sent to the Association together with the Application.

29. Specific eligible expenditures under the category of Goods include: i) construction materials; water, land and air transport equipment, including supplies and spare parts; ii) school supplies and equipment; iii) medical supplies and equipment; iv) petroleum and fuel products; v) construction equipment and industrial machinery; and vi) communications equipment.

30. Specific eligible expenditures under the category of Works may include urgent infrastructure works (repairs, rehabilitation, construction, etc.) to mitigate the risks associated with the disaster for affected populations. Specific eligible expenditures under the category of Services may include urgent studies (either technical, social, environmental, etc.) necessary as a result of the effects of the disaster (identification of priority works, feasibility assessments, delivery of related analyses, etc).

Annex 3: Implementation Arrangements

Sri Lanka: Climate Resilience Improvement Project

Project Institutional and Implementation Arrangements

1. *Overall Project Execution and Management Arrangement:* The project would be implemented by the PMU. The PMU is currently staffed with a project director, civil engineers, a full-time qualified accountant, a procurement specialist, an environmental specialist, and a social development specialist. To implement the proposed project, this staff will be augmented with additional financial management (FM), procurement, engineering and administrative personnel. Given that the PMU is currently implementing the DSWRPP, it is well versed in handling World Bank funded operations, including financial management and procurement. To absorb the additional financing that will flow through the proposed project the PMU will work with four IAs to execute the physical works. These agencies include ID, MASL, RDA and NBRO. A focal point from each of these IAs will be assigned to manage the execution of investments and to coordinate with the PMU.

2. The PMU will remain responsible for all FM, M&E, and reporting aspects of the project, while implementation responsibilities will be assigned to various line departments, including ID, MASL, RDA, and NBRO. These IAs will be supported by consultants to assist in the development of detailed designs and construction supervision as necessary. The PMU will coordinate the IAs involved in project implementation to ensure overall quality and timeliness of investments, and monitor the agencies' compliance with the project's environmental and social safeguards.

3. The PMU will have the overall responsibility for project implementation including, but not limited to: i) FM, including payments to contractors and consultants ii) appointment and management of technical consultants to assist with project activities; iii) administration of third party audits ensuring quality of activities; iv) administration of financial audits and requisite reporting to the Association; v) maintenance of management information system (MIS) and quarterly reporting; and vi) ensuring compliance with agreed implementation procedures and other World Bank guidelines.

4. While the PMU is responsible for coordinating between the IAs and the Association, the IAs themselves are responsible for the overall design and implementation of their respective activities. The specific tasks of the IAs include, but are not limited to: i) design and planning of the project activity, including preparation of cost estimates, technical designs, and bidding documents; ii) procurement duties, including invitation and review of bids, preparation of bid evaluation reports, and final decision; iii) management and supervision of contracts; iv) provision of third party quality assurance checks for each contract; and v) provision of necessary payment-related documentation to the PMU for final contract payments[14].

[14] The exceptions to these arrangements are (i) PMU will be responsible for all procurement for projects implemented under NBRO and (ii) Designs of road side slope stabilization works will be carried out by NBRO, even though RDA is the implementing agency

5. *Project Implementation Responsibility:* Project implementation will be managed by an augmented PMU within MIWRM. This will require an increase in staffing of the PMU to meet the needs of the project. The PMU will coordinate project activities as well as coordinate all financial management aspects of the project. For payments, the PMU will transfer funds to the relevant IA to make payments to contractors. The PMU will also execute all procurements for consultancies and acquisition of goods and process payments related to their activities. With regards to the physical works, four IAs, including RDA, ID, MASL and NBRO will manage all technical aspects.

6. For Component 1: Development of basin investment plans, US$13 million – The DSWRPP PMU will be responsible for designs, procurement, supervision and financial management of the component activities.

7. For Component 2: Increasing climate resilient infrastructure, US$90 million – the IAs will have the following responsibilities. The ID and the MASL will be responsible for all technical aspects of the US$47 million of flood and drought investments. The RDA would be responsible for implementing all technical aspects of the US$36 million of transport continuity investments and the NBRO would be responsible for all technical aspects of the school safety investments. Particular arrangements for design, procurement, supervision and payment of works are detailed below for each subcomponent.

- For the US$47 million of physical mitigation investments, the ID and MASL will be responsible for completing designs, procurement and supervision of works. Payments for these activities will be authorized by ID and MASL and made by the Dam Safety PMU.

- For the US$7 million of bridge expansion investments, the RDA will be responsible for completing designs, procurement and supervision of works. Payments will be transferred to the RDA from the Dam Safety PMU to enable RDA to make payments to contractors.

- For the US$29 million of slope stabilization investments, RDA will contract the NBRO to complete the design and supervision of the works. The RDA will be responsible for procurement the works and. Payments will be transferred to the RDA from the Dam Safety PMU to enable RDA to make payments to contractors.

- For the US$7 million of school safety investments, NBRO will design and supervise the works, while the PMU will procure the construction and make the payments to contractors.

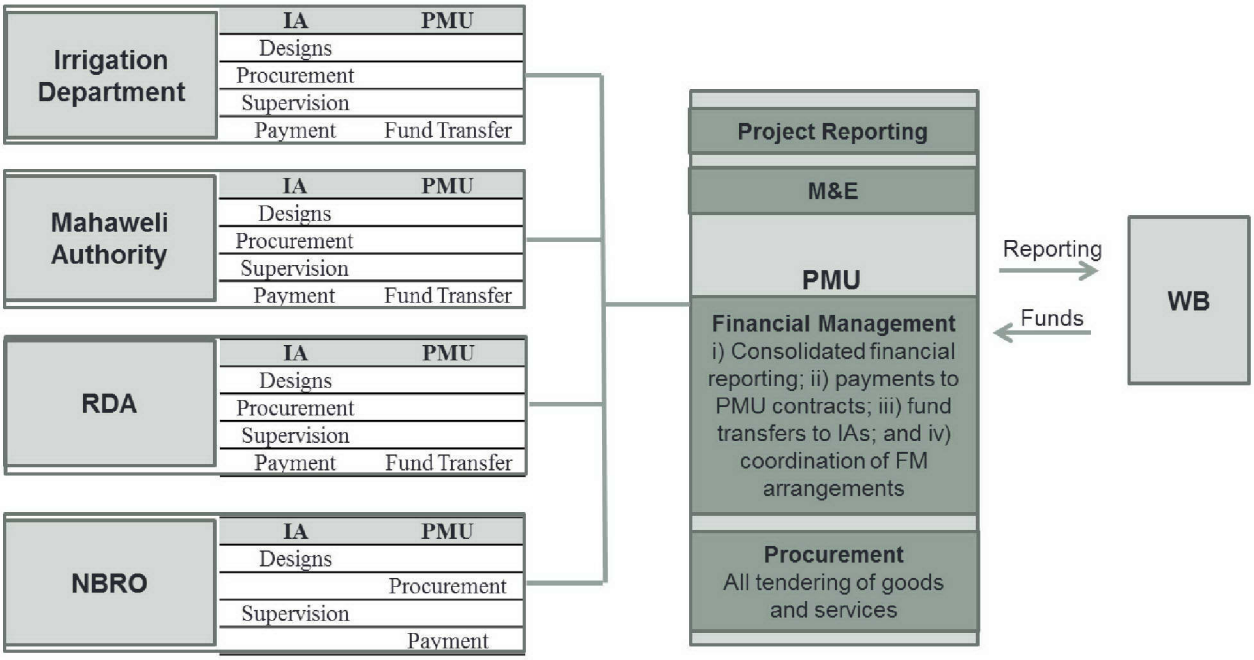
8. For Component 3: Project management, US$5 million – The Dam Safety PMU will be responsible for designs, procurement, supervision and financial management of the component activities.

9. For Component 4: Contingent Emergency Response, US$2 million – The Dam Safety PMU will be responsible for designs, procurement, supervision and financial management of the component activities.

10. *Functions of the Project Management Unit:* The PMU is headed by the Dam Safety Project Director. The PMU would be responsible for: overall project planning, management and coordination; M&E; providing timely and quality resources and technical assistance to support the project IAs; overall procurement administration and contract management; FM; budget planning and control; planning and management of training; assurance of technical standards and quality of project inputs/outputs; environmental and social safeguard compliance; corruption risk mapping and mitigation; grievance and complaints handling; financial, technical, social and environmental auditing of the project proceedings; and liaison with the MoFP and participating agencies.

11. The structure of PMU is illustrated in the following diagram:

Figure A3-1. PMU structure



Financial Management, Disbursements and Procurement

Financial Management

12. The primary responsibility for FM would rest with the PMU under MIWRM. The PMU already manages the World Bank financed DSWRPP. However, due to increasing scope and workload, the existing finance unit of the PMU would be strengthened with additional staff to carry out the FM of the project. The FM unit of the PMU headed by the Finance Manager would ensure that the FM arrangements are implemented to the satisfaction of the GoSL and the World Bank. The project accounting procedures would be governed by Government regulations and the project FM manual. The project would be subjected to continuous internal audit by IAU created

within the PMU directly reporting to the Secretary of ID at MIWRM. Year-end external audit would be carried out by the Auditor General's Department.

A. Financial Management Assessment

13. The PMU has an adequate system of accounting and reporting for expenditures. The PMU is well versed in handling World Bank funded operations, including FM procedures and the project has a 'Modest' FM risk rating. The FM performance of DSWRPP has been continuously receiving a 'Satisfactory' rating, including in the latest mission. However, a simplified FM assessment was undertaken on the adequacy of FM arrangements. Suitable risk mitigation measures and capacity building elements are accordingly proposed. There are no overdue audit reports or ineligible expenditures under the existing PMU.

14. Overall coordination and monitoring of FM arrangements will rest with the PMU in addition to the responsibility of directly handling FM pertaining to the components managed by PMU. The PMU will be strengthened with additional FM staff assessed to be necessary. The existing IAs involved under the DSWRPP (RDIs under ID and MASL) will continue to carry out FM activities for their activities as they did before. The RDA would perform the functions of a spending unit with regard to the activities to be executed by RDA under their component. The PMU will do fund transfers to RDA on need basis and RDA will manage the payments related to their contracts. They will also be responsible for the following: maintaining books of accounts, reporting back on expenditures incurred to PMU and providing information required for internal and external audit. It is expected that the existing PMU created for the World Bank financed Road Sector Assistance Project (RSAP), whose performance also had been satisfactory will manage the FM functions of this component as well. With regard to NBRO, there will be no funds transferred and all FM activities will be carried out by PMU.

15. It is proposed to open one Designated Account (DA) for the project, managed by PMU and the disbursements will be report based. Quarterly consolidated IFR will be submitted to the Association by PMU within 45 days of end of each quarter. The GoSL will perform the internal audit and the Auditor General of Sri Lanka will perform the external audit.

16. The PMU FM responsibilities will include: i) ensuring compliance with all financial covenants in the legal agreement; ii) managing funds in an efficient, effective and transparent manner, obtaining funds from the Association; iii) furnishing financial reports to the Association; iv) forwarding project audit reports to the Association; and v) overall co-ordination and monitoring FM activities of all IAs involved in the project and any other requests relating to FM made by the Association team. The existing Finance Manager of the DSWRPP will head the PMU and be responsible for overall management and supervision of FM activities. However, the day-to-day management of the activities implemented under the project will be supported by the full time finance accountant/s that will be responsible for carrying out all project-related FM activities. Relevant supporting staff also will be recruited to assist the accountant.

17. The accountant, who is a qualified and experienced accountant, will be responsible for project FM activities. This includes project budgeting, disbursement planning and forecasting, operation of the DA including claiming replenishments, disbursement of project funds, making

project payments, maintaining books and records for project financial transactions, submission of quarterly project interim financial reports to the Association, preparation of annual project financial statements and interact with project internal/external auditors on the audit issues and their follow up. The accountant will work under the overall supervision, direction and guidance of the PMU Finance manager.

18. The PMU will be responsible for preparing and submitting the Interim Unaudited Financial Reports (IUFR) to the Association. The PMU shall ensure that IUFRs of the project are prepared and submitted to the Association not later than forty five (45) days after the end of each calendar quarter, covering the quarter.

19. There are three main strengths in the proposed financial arrangements:

- The PD and Finance Manager of the PMU have already implemented the World Bank financed DSWRPP and has relevant and good experience in government financial regulations (FR) and World Bank procedures.
- Accounting officers in the offices of the Regional Directors of Irrigation of the ID, who would be responsible for the planning and implementation of the flood and drought mitigation works, already manage a large government budget, follow government FR and have experience in facing government external and internal audit; and Government FM procedures and regulations.
- Government FM procedures and regulations would be followed by the project. These procedures are comprehensive and time tested.

20. The weaknesses to the structure are as follows:

- The PD of the PMU will be heavily burdened by multiple projects. To mitigate this problem, the PMU will be augmented with additional financial management, procurement and administrative staff.
- The existing finance department of the PMU carrying out work for the DSWRPP might be inadequate in numbers to carry out the assigned FM related work in the project. This will be addressed by hiring and training more staff including an accountant to work under the existing Finance Manager of PMU.
- RDA is added as a new IA into this project which is not under the DSWRPP project and PMU will be responsible to coordinate the activities of RDA. As RSAP PMU is also familiar with bank operations, it is expected that the arrangements will work well.

B. Fund flows and disbursement arrangements

21. A DA in USD will be maintained at the Central Bank of Sri Lanka (CBSL). The DA will be operated by the PMU of the MIWRM. The Association will advance funds to the DA maintained at the CBSL and the funds to meet project expenditures for next 6 months, as forecasted within the quarterly IUFRs. The IUFR is submitted to the Association on a quarterly basis. Withdrawal applications will be prepared by the PMU and replenishments to the DA will be based on the IUFRs approved by the Association.

22. The PMU will open a separate dedicated LKR account operated by the PMU to make payments for eligible project expenditures. In a similar manner, all RDI offices, MASL and RDA will have separate rupee accounts opened to carry out payments related to their respective activities under the project. However, all the IAs will report back the expenditure incurred to PMU on a monthly basis. IAs will process payments, maintain accounting records and relevant supporting documentation related to their respective components and share information with PMU as relevant.

23. IDA credit proceeds will be used to finance productive expenditures necessary to meet the development objectives of the project with due attention to considerations of economy and efficiency in accordance with the provisions of the Legal Agreement. If the Association determines that credit funds have been used to finance ineligible expenditures, the amounts used for such expenditures should be refunded to the Association by the GoSL.

24. The Government has requested the Association to agree to a retroactive financing amount of up to US$5 million for eligible expenses incurred after September 1, 2013 to be refinanced from IDA credit at effectiveness. The expenditure must be backed by adequate documentation including evidence of payment and will have been procured according to the World Bank procurement guidelines. The retro-active financing would finance 100% of the Works, Goods and equipment, Consultants services and Incremental Operating Costs under Components 1, 2 and 3.

25. It was agreed between the Association team and the PMU that all fund transfers would be between bank accounts and that no cash transfers would take place. At present all key IAs have fully fledged accounting units that manage Government budgets, follow government procedures, and operate bank accounts. In addition, the existing finance staffs of the IAs have indicated their willingness to handle project financial activities in addition to their normal work load. The detailed project payment procedures that clearly state the responsibilities of each of the staff will be laid down in the FM Manual which will be developed based on the current FM manual existing for DSWRPP. It is expected that the FM manual for the project have been made available by 31st January 2014.

26. The table below summarizes the withdrawal requirements. Eligible Expenditures that may be financed out of the proceeds of the Financing ("Category"), the allocations of the amounts of the Financing to each Category, and the percentage of expenditures to be financed for Eligible Expenditures in each Category.

Table A3-1. Allocation of financing to each category

Category	Amount of the Financing Allocated	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, consultants' services, and Incremental Operating Costs for the Project (except under Part 4 of the Project)	$108,000,000	100%
(2) Emergency Expenditures under Part 4 of the Project	$2,000,000	100%
TOTAL AMOUNT	$110,000,000	

27. Staffing: A qualified accountant will function as the project finance manager. The finance manager already in place has sufficient experience in both public and private sector and has the capacity to handle the FM activities of the project. Additional FM staff will be recruited including an accountant to handle the new project activities under the supervision of PMU finance manager. It is expected that the additional staffing would be in place by 30th June 2014.

28. All staff of the PMU are expected to work on full-time for the project as much as possible. PMU staffs that are in Government service hired for the project will be paid according to the Management Circular 33 issued by the Management Services Department of the MoFP through GoSL funds.

29. Accounting Policies and Procedures: All funds for the Project will be routed through the PMU which will be responsible for funding all project expenditures, accounting for them, and for reporting on the financial and physical progress of the project. Coordination will be required with the IAs for the various activities and hence close liaison will be required with the accounting staff of these agencies in all areas of FM.

30. The PMU's accounting practices are governed by the GoSL FR. The PMU will maintain accounts on the cash basis of accounting and will also comply with the government finance regulations and applicable circulars. Bank accounts will be reconciled on a monthly basis and trail balances and financial statements will be prepared on monthly basis to facilitate monitoring of the progress of the project.

31. The computerized accounting system established within the PMU under the DSWRPP, is recommended to be used for the new project as well. The PMU already has had discussions with the system developers and it is expected that this system is will be ready to be used for the project by 1st April 2014.

32. Financial Reporting: All project funds will be routed through the PMU and the PMU will be responsible for the funding of all project expenditures, accounting for them and for reporting the financial and physical progress of the project. The PMU will coordinate with IAs involved in the project implementation and prepare financial reports required by the stakeholders. The World Bank reporting requirements, including the IUFRs are spelled out in the financing agreement. The formats of IUFRs, designed in accordance with the guidelines issued by the World Bank will be agreed during negotiations and the agreed formats will be attached to the disbursement letter. The PMU will submit quarterly IUFRs to the Association within 45 days of the end of the quarter, starting from the end of the first calendar quarter after effectiveness. Disbursements of the project will be based on the quarterly IUFRs submitted by the project which includes the cash forecast for the next six months.

33. Internal Controls: The framework of financial control procedures followed by the GoSL in expending and reporting on public funds are laid out in the FR. These regulations provide a good guidance on how to maintain a sound FM system with effective internal controls. It addresses all aspects of procedures and controls necessary for authorizing, approving, executing, recording, and reporting expenditure and covers important areas such as delegation of financial authority and inventory control.

34. The PMU and other IAs will comply with the government FR and all applicable circulars issued by the MoFP when incurring project expenditures and recording payments. The internal control environment is deemed to be adequate to ensure that projects funds will be used for the purposes intended with due attention to considerations of economy and efficiency. The level of compliance of the PMU and IAs to the GoSL FR and other applicable circulars will be assessed by internal auditors and annually by the Auditor General of Sri Lanka. Any non-compliance identified during the internal/external audits will be communicated to the Association through the internal/external audit reports.

35. Internal Audit: In addition to the annual financial statement audit, the Project will be subjected to an internal audit. An IAU will be established within the PMU, but reporting to the Secretary of MIWRM, who is the chief accounting officer of the Project. The Project Director of the PMU is responsible for the administrative and logistical support to the IAU. The IAU will assess whether the funds have been disbursed on a timely basis and used effectively and efficiently for the intended purposes. The internal audit will also examine the physical and qualitative aspects of the assets constructed or procured under the project. This will provide further assurance on the legitimacy and the eligibility of the payments made from the credit proceeds. It is agreed that this IAU will be established by 1st May 2014.

36. The overall scope of the internal audit will include: i) evaluating the internal control systems of the project and the integrity of the financial information produced by the project; ii) assess whether the project funds have been used for the purpose intended, iii) assessing the internal controls over disbursements made from the project account iv) appraising the economy and efficiency of resource utilization in accordance with the financing agreement; and vi) determining whether the PMU and IAs has complied with the GoSL FR, circulars and any other applicable laws and regulations.

37. The internal audit reports will be shared with the Association on a quarterly basis. The project internal audit report will be addressed to the Secretary of the MIWRM with a copy to the PD to initiate necessary follow up actions as required. The PMU will share the internal audit reports with the Association within 45 days of end of each quarter.

38. External Audit: The annual financial statements of the project will be prepared by the PMU and audited by the Auditor General of Sri Lanka which is the supreme audit institution of the country to maintain full transparency and provide reasonable assurance to all the stakeholders on the use of project funds. The external audit will cover project activities carried out by all IAs involved in the project and all payments made from the project accounts maintained by the PMU and IAs. The external audits would be conducted every fiscal year and will be submitted within 6 months of the end of the fiscal year. These external auditing arrangements have been agreed with the Auditor General's Department of Sri Lanka. The PMU is responsible for the timely submission of the annual audited financial statements to the Association.

39. Audit Reports: The following audit report will be monitored in the Audit Reports Compliance System. According to the World Bank's Access to Information Policy, the audit reports received by the Association for the project will be disclosed in the World Bank's external Website for public access.

Table A3-2. Audit report arrangements

Implementing Agency	Audit Report	Auditor	Date
PMU	Project Annual Financial Statements	Auditor General	June 30

40. Assets Management: The responsibility of managing project assets created or procured remains with the implementing entity that created/procured the asset. But, the PMU will also maintain a project fixed asset register to keep track of all fixed assets procured/built under the project. This will facilitate effective audit trail of the project fixed assets. The accountant is responsible for updating and maintaining the project fixed asset register. The respective implementing entities are responsible for adequately insuring the project assets owned by them.

41. Financial Covenants: The Financial covenants are: i) audited annual project financial statements to be submitted to the Association no later than six months of the following fiscal year; and ii) consolidated project IUFRs to be submitted to the IBRD no later than 45 days following the end of the reporting quarter.

Next Steps

1. Complete FM Manual by 31st January 2014

2. Implement Accounting system by 1st May 2014

3. Appoint additional FM staff by 31st May 2014

Procurement

A. General

42. Procurement for the proposed project would be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 (Procurement Guidelines); and "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 (Consultant Guidelines) and the provisions stipulated in the FA. Unless otherwise agreed with the World Bank, the World Bank's Standard Bidding Documents, Requests for Proposals, and Forms of Consultant Contract will be used.

43. In case of conflict contradiction between the World Bank's procurement procedures and any national rules and regulations, the World Bank's procurement procedures would take precedence. The general descriptions of various items under different expenditure categories are described below. For each contract to be financed by the Credit, the different procurement methods or consultant selection methods, the need for prequalification, estimated costs, prior review requirements, and time frames are agreed between the Borrower and the World Bank project team and included in the initial Procurement Plan. The PMU has prepared a detailed, project-specific, Procurement Administration Manual (cleared with the World Bank) that further elaborates the project procurement methods, procedures, arrangements, including arrangements for disclosure, complaint handling and procurement audits. Additionally, the PMU completed a detailed matrix for procurement (and FM) related corruption mapping and mitigating actions that would be used as an anti-corruption guiding document during project implementation. These documents are found in Project Files.

44. Retroactive Financing: Retroactive financing will be provided for activities agreed with the Association and subject to procurement procedures having been followed satisfactory to the Association. PMU will prepare a procurement plan for the contracts financed under retroactive financing and obtain the Association's prior clearance before commencing the procurement process.

45. Procurement of Works: Works procured under this project, would include the remedial works of approximately 25 hydraulic infrastructure systems, 18 schools, 28 stretches of roads and 12 bridges. Remedial works would include, but not be restricted to, rehabilitation of downstream canals, reinforcement of flood bands, protections of slopes etc. These works will be mostly procured following NCB and may involve shopping in some cases. The procurement of civil works is unlikely to involve any ICB.

46. The NCB Standard Bidding documents of the World Bank as agreed with GoSL will be used for procurement of all NCB civil works. A limited number of small works may be procured following Force Account and Community Based Procurement with clearance from World Bank. Procurement of such works shall be guided by the provisions applicable to them as laid down in the corresponding paragraphs of Procurement Guidelines as well as in the Procurement

Administration Manual of the project. Very small value procurements may be carried out following Direct Contracting.

47. Procurement of Goods: Goods and equipment that may be procured to assist in the implementation of project activities. Additionally, goods for operational work such as office equipment and supplies, photocopiers, computers, printers, UPS, communication equipment and computer software; office furniture; vehicles and motorcycles would also be procured. The procurement would be done using World Bank's SBDs for all ICB and National SBDs agreed with (or satisfactory to) the World Bank for all NCB and Shopping. Very small value procurements (up to US$500 or equivalent) may be done following Direct Contracting. All procurement of goods and equipment would be carried out by the PMU.

48. Requirements under National Competitive Bidding: In order to ensure economy, efficiency, transparency and broad consistency with the provisions of the Procurement Guidelines, goods, works, and non-consultant services procured under the NCB method shall be subject to the following requirements:

i. Only the model bidding documents for NCB agreed with the Association shall be used for bidding;
ii. Invitations for bids will be advertised in at least one widely circulated national daily newspaper, and bidding documents will be made available at least twenty one (21) days before, and issued up to, the deadline for submission of bids;
iii. Qualification criteria will be stated in the bidding documents, and if a registration process is required, a foreign firm declared as the lowest evaluated responsive bidder shall be given a reasonable time for registering, without let or hindrance;
iv. Bids will be opened in public in one location, immediately after the deadline for the submission of bids, as stipulated in the bidding document (the bidding document will indicate the date, time and place of bid opening);
v. Except in cases of *force majeure* or exceptional situations beyond the control of the implementing agency, the extension of bid validity will not be allowed;
vi. Bids will not be rejected merely on the basis of a comparison with an official estimate;
vii. Except with the prior concurrence of the Association, there will be no negotiation of price with bidders, even with the lowest evaluated bidder;
viii. A bidder's bid security will apply only to the specific bid, and a contractor's performance security will apply only to the specific contract under which they are furnished; and
ix. Bids will not be invited on the basis of percentage premium or discount over the estimated cost, unless agreed with the Association.

49. Selection of Consultants: Major consultancy services to be procured would include: flood and drought risk modeling experts for the two components: flood and drought modeling and basin investment planning. In addition, individual consultants would be hired to fill in staff gaps of the PMU and the IAs as described in the incremental staffing plan cleared with the Association.

50. Procurement of consultancy services shall follow the World Bank guidelines for selection of consultants and standard documents of the World Bank shall be used. Short lists of consultants

for services estimated to cost less than $300,000 or equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines. The World Bank's Standard RFP (October 2011) will be used as a base for all procurement of consultancy services under the Project. The following methods will be applicable for selection of consultants, consistent with the relevant sections of the World Bank's Consultant Guidelines:

1) Quality and Cost Based Selection
2) Quality-Based Selection
3) Least Cost Selection
4) Fixed Budget Selection
5) Direct Contracting (DC)
6) Selection based on Consultants' Qualifications (CQS): for services estimated to cost less than US$300,000 equivalent per contract, in accordance with the provisions of paragraph 3.7 of the Consultant Guidelines
7) Single-Source Selection (SSS)
8) Procedures set forth in paragraphs 5.2 and 5.3 of the Consultant Guidelines for the Selection of Individual Consultants
9) Sole Source Procedures for the Selection of Individual Consultants

51. Incremental Operating Costs: Incremental operating costs will include any reasonable costs incurred in the management and supervision of respective project components including costs of office utilities and supplies, communication, printing services, bank charges, advertising expenses, vehicle rental, operation and maintenance of vehicles, office equipment and facilities, travel, lodging and per-diem expenses, but excluding salaries and allowances of the Recipient's civil servants or other regular government staff. The Incremental Operating Costs would be incurred solely to support the project implementation.

B. Monetary Thresholds for Procurement Methods and Review

52. Review by the World Bank: Review thresholds and requirements for different methods of procurement of works and goods and selection of Consultants by the World Bank, based on the current procurement risk rating, and are listed in the following table. These thresholds and review requirements may be modified on the basis of reassessed risk ratings during implementation. However, any deviations from the initial or modified adjusted review thresholds and requirements would require prior clearance of the World Bank. The table below summarizes the thresholds for procurement methods and prior review.

Table A3-3. Procurement methods

Expenditure Category	Contract Value (Threshold)	Procurement Method	Contracts/Processes Subject to Prior Review
Works	>= US$7.500,000	ICB	All contracts over US$ 10 m equivalent
	<US$7,500,000	NCB	All contracts subject to post review
	<=US$50,000	Shopping	All contracts subject to post review

Expenditure Category	Contract Value (Threshold)	Procurement Method	Contracts/Processes Subject to Prior Review
Goods	>=US$600, 000	ICB	All contracts over US$ 1 m equivalent
	<US$600,000	NCB	All contracts subject to post review.
	<=US$50,000	Shopping	All contracts subject to post review
		DC	All contracts costing more than US$ 100,000 equivalent
Consultant Services (firms)	>=US$300,000	All competitive methods; advertise internationally	All contracts over US$1 m equivalent
	<US$300,000	All competitive methods; advertise locally	All contracts subject to post review.
	<US$300,000	CQS	
		SSS	All contracts costing more than US$ 100,000 equivalent
Individual Consultants		IC ((Section V of Consultant Guidelines)	All contracts over US$300,000 equivalent
		IC- Sole source	All contracts costing more than US$ 50,000 equivalent

53. Post Review: Contracts below the prior review threshold for goods, works and consultancy services shall be subject to post review as per procedure set forth in paragraph 4 of Appendix 1 of the World Bank's Procurement and Consultancy Guidelines. The Borrower shall retain complete documentation for each contract and make it available to the Association or its nominated find consultant for carrying out the post review.

C. Assessment of the Agency's Capacity to Procure

54. The project would be mainly implemented by the MIWRM under the supervision of a full time PMU staffed with a team of multi-disciplinary staff and is located within the MIWRM. For Component 2, Director (Planning and Design) of the ID and Executive Director (Technical Services) of the MIWRM would be responsible for all flood and drought protection works. They would engage the relevant Regional Directors of Irrigation of the ID, MASL, RDA and NBRO staff. Detailed arrangements and responsibilities of the IAs are elaborated in the Procurement Administration Manual.

55. The PMU is staffed with an experienced Procurement Specialist and procurement support staff. The assessment of the capacity of the IAs reviewed the organizational structure for

implementing the project and the interaction between the staff responsible for procurement. Only concern of the World Bank team is that the high turnaround of staff, specially the engineers may affect the composition of staffing under the PMU. The responsible managers would need to take necessary precautions to minimize such occurrences.

D. Procurement Risks and Mitigation Measures

56. The main procurement risks, which can be perceived at this stage, include the following:

- absence of systematic procurement performance and compliance monitoring mechanism at country level;
- limited experience in dealing with complaints, and fraud and corruption issues;
- lack of established system of public disclosure of information on procurement actions;
- possible collusive practices in procurement of works; and,
- procurement of goods and works has normal fiduciary risks of transparency, fairness and varying capacity in designing appropriate qualification requirements as per World Bank's SBD Goods and Works with an ability to influence the market in receiving appropriate pricing and delivery commitments.

57. The corrective measures which have been agreed include the following:

- the procurement team headed by an experience procurement specialist supported by an experienced procurement officer dedicated to this project will continuously support the PMU. As majority of the contracts are related to civil works, these procurement staff having engineering background will be and added advantage;
- procurement staff will be imparted with sufficient training specifically on fraud and corruption flags, and addressing of complaints;
- the project's operation manual will include all procurement procedures to be followed under each component of the project, together with the standard/model documents, formats and templates to be used, as agreed with the Association;
- the PMU will prepare and forward to the Association an annual procurement progress report, which will include, inter alia, procurement plan updates and post review reports; and,
- the PMU will implement a monitoring mechanism for procurement up to the delivery of the projects which includes implementation phase and the defects liability phase and the warranty phase of the contracts.

58. The following key indicators will be used for assessing procurement performance and the procurement risk rating over the course of the project, percentage of:

- procurement activities which have more than 15% delay in bid/proposal evaluation;
- contracts which have been extended and/or have more than 15% modifications by value;
- contracts completion period extended by 10% of the original contract period; and,
- procurement activities which had complaints.

59. The Association will carry out its own procurement post reviews annually, discuss the findings, and agree with MIWRM and project implementing staff on corrective actions to address deficiencies.

60. The overall project procurement risk is rated as 'moderate', and will be upgraded to 'low' once the remedial measures, as listed above, are in place.

61. Additionally, the key procurement staff of the PMU and the IAs would be trained on procurement procedures pertaining to World Bank Financed projects in general and specific to the project in particular. A workshop would be conducted for Procurement Staff and other key staff of the PMU and all the IAs to align them with the World Bank's procurement procedures as well as to introduce methods for identifying and mitigating risks, including corruption mapping and risk mitigation actions. The PMU would disseminate and conduct training on Procurement Administration Manual.

62. To improve procurement efficiency, the World Bank would facilitate training sessions on Government's procurement policy and procedures as applicable to World Bank financed projects as a measure to avoid potential confusion between the government procurement procedures vis-à-vis World Bank procurement procedures. Both short-term local and overseas training would be provided to select key staff in line with the actual requirements of the project.

63. Disclosure: The following documents shall be disclosed on the Borrower's Website: i) procurement plan and updates; ii) invitation for bids for goods and works for all ICB and NCB contracts; iii) request for expression of interest for selection/hiring of consulting services; iv) contract awards of goods and works procured following ICB/NCB procedures; v) list of contracts/purchase orders placed following shopping procedure on quarterly basis; vi) short list of consultants; vii) contract award of all consultancy services; viii) list of contracts following DC or CQS or SSS on a quarterly basis; and, ix) action taken report on the complaints received on a quarterly basis.

64. The following details shall be sent to the World Bank for publishing in the World Bank's external website and United Nations Development Business: (a) invitation for bids for procurement of goods and works using ICB procedures, (b) request for expression of interest for consulting services with estimated cost more than $300,000, (c) contract award details of all procurement of goods and works using ICB procedure, (d) contract award details of all consultancy services with estimated cost more than $300,000, and (e) list of contracts/purchase orders placed following SSS or CQS or DC procedures on a quarterly basis.

65. Complaint Handling Mechanism: To deal with the procurement complaints received by the PMU, a complaint handling mechanism for the project will be developed and will be published on the Borrower's website. On receipt of complaints, immediate action will be initiated to acknowledge the complaint and redress in reasonable time frame. All complaints will be dealt at levels higher than that of the level at which the procurement process was undertaken. Any complaint received will be forwarded to the Association for information and the Association will be kept informed after the complaint is redressed.

66. Procurement Plan: PMU has developed the initial procurement plan for project implementation and has agreed with IDA on the basis for the procurement methods. This plan has been agreed between the Recipient and the Association on 02/17/2014 and the respective plans are available at the PMU. It will also be available in MIWRM website and in the World Bank's external website. Procurement Plan will be updated annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

67. Frequency of Procurement Supervision: In addition to the prior review supervision to be carried out from World Bank offices, the capacity assessment of the IAs has recommended semi-annual supervision missions to visit the field to carry out reviews of procurement actions. In addition to the prior review of contracts by the Association, at least 15 percent of the contracts that have not been prior reviewed would be post reviewed in terms of the World Bank Guidelines given the procurement risk rating for the project is 'moderate.'

Environmental and Social Safeguards Management

68. The Project's primary thrust would be to ensure public safety and protection of assets against high rainfall events. Therefore, the project's overall impacts would be positive. The implementation of the project would not have significant irreversible adverse environmental and social impacts if proper screening and assessments are undertaken and mitigation measures are put in place. Therefore, the project has been classified as a Category B project for safeguard purposes. Overall, the project would have the potential to offer significant opportunities to further environmental and social development objectives.

A. Institutional and Implementation Arrangements

69. ***Environmental***. The policy and regulatory framework in Sri Lanka provides an adequate basis for the mitigation of potential impacts mentioned above. Under the National Environmental Act, administered by the Central Environmental Authority (CEA) and North Western Province Environmental Statute, ad ministered by North Western Provincial Environmental Authority, activities that fall into a prescribed category are required to go through a comprehensive environmental screening and planning process. Accordingly, all river basin development and irrigation projects, excluding minor irrigation works, require an environmental assessment (EA). In addition, activities in the coastal zone will be subjected to clearance from the Coast Conservation Department, as per the Coast Conservation Act. An agreement has been reached with the PMU and IAs that all upgrading and rehabilitation work and related activities financed under this project as well as any other activities that may lead to potential adverse environmental impacts would be required to undertake an EA, commensurate with the potential for environmental impacts, and prepare detailed Environmental Management Plan (EMP) that would be included for implementation as part of the civil works contract documents.

70. In view of resource extraction for construction work, the Geological Surveys and Mines Bureau (GSMB), which is the regulatory authority for all mining and quarrying activities in the country, is important. Approval of the GSMB is required prior to commencement of commercial mining (for example, sand). Licenses by the GSMB are issued for identified sites for a stipulated quantity based on technical evaluations. However, monitoring of such sites and activities to ensure conformity with stipulated conditions are rather weak. Therefore, in addition to the

supervisory consultants being responsible for ensuring that civil works contractors adhere to the GSMB licensing conditions, the PMU Environmental Specialist would ensure compliance with environmental standards. It should be also noted that site clearances for construction material extraction will also require CEA approvals.

71. Details of the role and responsibilities of the project as well as the Department of Archeology would be as outlined in Government's notification on 'The Antiquities Ordinance' and as per Projects Procedure Regulations No 01 of 2000. Procedures for dealing with the cultural property would be incorporated in the civil works contract documents with a provision for an orientation program for the project authorities as well as contractors. Chance find procedures will be followed as per the guidelines provided in Environmental and Social Management Framework (ESMF).

72. Conducting site-specific environmental assessments. The primary responsibility for coordinating work related to EAs would rest with the PMU. For this purpose, an environmental specialist would be appointed to the PMU staff whose main task would be to ensure that EAs/EMPs are prepared for all the sites selected for rehabilitation and for works. In addition the specialist will ensure that suitable mechanisms are mobilized to ensure the implementation of the EMPs. During EA/EMP preparation consultations will be held with key stakeholders and beneficiaries and such consultations will be documented as part of the respective EA/EMP. IDA clearance of the EAs/EMPs is a prerequisite for disbursement of funds for the civil works. The prescriptions detailed in the EMP are mandatory and would be contractually binding as it would form a part of the contract.

73. EA/EMP implementation, monitoring and reporting: The implementation of EAs/EMPs will be the responsibility of the contractors selected. The supervisory consultants and PMU Environmental Specialist will ensure compliance through continuous monitoring and will take appropriate and timely remedial actions to address any shortcomings. They will also be responsible for reporting on the progress of implementing EMPs and any other safeguard requirements.

74. ***Social***. No new construction will be financed under the project and, as a result, no significant adverse social impacts are envisioned. However, given the nature of the interventions, the involuntary resettlement policy (OP 4.12) is being triggered to accommodate any unforeseen requirements for the acquisition of land.

75. All roads, bridges and associated facilities that will be rehabilitated and improved with IDA finances needs to prepare a social assessment (SA) to ensure compliance with the World Bank's safeguard policies and the relevant provisions under the GoSL Land Acquisition Act (LAA), national involuntary resettlement policy (NIRP), and associated regulations.

76. The SA helped to understand the social impacts in the context of the proposed project, including the legal-institutional setting, socio-economic situation, social risks and impacts, legal framework for handling involuntary resettlement, implementation arrangements and experience with regard to involuntary resettlement management, and for addressing social inclusion, accountability and gender issues.

77. Based on this SA, plus the fact that actual impacts of all investments is not known except for the first year interventions, SMF have been prepared to provide guidelines on social safeguards management. The SMF has been prepared through a series of stakeholder interactions and consultations with the likely to be affected community groups. This SMF provides procedures for legal framework, entitlements, procedures for assessing impacts, and planning and implementing resettlement action plans (if required) for the proposed activities, including grievance redress mechanism, monitoring and evaluation, linking social management and civil works activities, and implementation arrangements.

78. The policy framework available to deal with adverse social issues (including involuntary resettlement) comes under the LAA and the NIRP. The capacity and experience related to the application of these law / policies in the country have been diverse across projects.

79. Key institutional arrangements for implementing the SMF will include: (a) appointment of Social Specialist / Social Management Cell at the PMU and, as necessary, establishment of Land Acquisition cells and Resettlement and Rehabilitation teams/officer in each IA to carry out/coordinate social assessment, including screening and impact survey; (b) if needed, prepare and implement Resettlement Action Plans (RAPs) for Year-II activities; (c) unified mechanism at MIWRM to address and monitor livelihood issues; (d) a Grievance Redress Mechanism; (e) Independent Safeguard Monitoring and Review Mechanisms.

MONITORING AND EVALUATION

80. A results-based M&E system, as described below, is designed to promote learning and improvement through implementation performance monitoring and impact evaluation. The results framework in Annex 1 will be used to monitor and evaluate the achievement of the PDO and the outcome indicators. Project monitoring will occur as a periodic function, and will include process reviews, accounting audits, social audits, reporting of outputs, and maintenance of records.

A. Organizational Arrangements

81. M&E would be undertaken in parallel by the PMU as well as the project IAs for the project components and subcomponents for which they are responsible. The PMU would be responsible for the overall M&E. It would employ and maintain throughout the project period, a senior fill-time M&E officer and a local M&E consultant firm to design and manage the M&E system. The PMU would also develop and maintain a computerized MIS to collect, consolidate and manage data from the various IAs and its own staff. Data would be used to update key performance indicators shown in the Results Matrix and to prepare quarterly, semi-annual and annual progress reports. The PMU would carry out a mid-term evaluation and submit the evaluation report to the Association to complement the formal mid-term review of the project carried out by the World Bank team. The M&E system would use modern information tools (e.g. Geographic Information System) to collate, compare, analyze and visualize the information.

82. Environmental and social safeguard monitoring would be a key activity of the project particularly for the implementation of Component 2. The PMU would employ and maintain a full time and qualified environmental officer and a community development specialist throughout the duration of the project to oversee and monitor the environmental and social safeguard performance of the project respectively. The environmental officer would oversee, guide and monitor the environmental safeguard management in accordance with the agreed Terms of References for EAs and EMPs. Similarly, a Process Map depicting step by step procedure for addressing and mitigating adverse social impacts of hydraulic structure repair works has been prepared. The community development specialist would be responsible for monitoring the implementation of the activities of the process map and evaluation of the impacts.

B. Arrangements for results monitoring

83. Institutional issues: The project monitoring and evaluation system will consist of a three tier system at the PMU, and IAs, supplemented with consultants as necessary. The regular reporting of these agencies and updating of implementation progress data drawn from the duly completed questionnaires of all the stakeholders in the project at different levels/activities will assist the PMU in providing timely interventions at appropriate levels to remove impediments in project implementation and building capacity of stakeholders who are involved and benefiting from the project.

84. Capacity: Institutions engaged in the project have capacities to avail necessary information/data. To ensure timely completion of envisaged activities under the project, the institutions will also be supplemented by consultants.

C. Reporting

85. PMU would furnish to the Association quarterly progress reports. These would include: i) up to-date physical and financial expenditure data compared to annual and end of project targets; ii) updated project performance indicators compared to annual and end of project targets; iii) successes and problems encountered during the reporting period, with suggested remedial actions; and, iv) socio-economic and environmental impacts of the project. In addition, the Project's Annual Work Program would be prepared and submitted for the Association's review and comments prior to the start of that fiscal year.

86. The M&E team would submit: i) brief monthly reports summarizing concurrent monitoring observations to the PMU and respective IAs and ii) quarterly reports summarizing project M&E of the preceding quarter, main issues and recommendations, and updated project performance indicators and. The reports would be discussed at the PMU with the IAs and key stakeholders concerned to facilitate cross learning and adaptive management decisions required. In addition to the regular monitoring reports, the M&E consultants are to help with the preparation of the government's Mid Term Review Report and Implementation Completion Report.

Annex 4: Operational Risk Assessment Framework (ORAF)

SRI LANKA: Climate Resilience Improvement Project
Stage: Board

Project Stakeholder Risks						
Stakeholder Risk	**Rating**	Low				
Description: *Borrower Relations.* Sri Lanka's most flood and drought affected communities would be the primary stakeholders of the project. Adverse hydrometeorological events occur regularly in Sri Lanka, causing significant loss and disruption, both to farmers and to urban residents. The key line ministries including the Irrigation and Water Resources Management, Disaster Management, and Environment would be key stakeholders involved in the process.	**Risk Management:** Stakeholder participation will be promoted in all phases of project preparation and implementation, to improve transparency and accountability.					
	Resp: Client	**Stage:** Prep & Impl	**Recurrent:** Ongoing	**Due Date:**	**Frequency:** Annual	**Status:** Ongoing
Implementing Agency Risks (including fiduciary)						
Capacity	**Rating**	Moderate				
Description**:** Though the MIWRM has a PMU in place with a track record of implementing donor	**Risk Management:** During early stages of project preparation, the PMU will have guidance of past experience gained from the implementation of other Bank financed projects to ensure timely project preparation and thereafter project implementation.					

financed projects. There PMU is staffed with the necessary full-time professional core FM, procurement, social and environmental planning, and engineering personnel. However, the requirement of additional resources on above areas needs to be assessed.	**Resp:** Bank	**Stage:** Prep	**Recurrent:** Ongoing	**Due Date:**	**Frequency:** Quarterly	**Status:** Ongoing
	Staffing of the existing PMU will augment to support the project implementation. Additional technical skills, particularly in hydrometeorological event modeling will be recruited and placed into the PMU.					
	Resp: Client	**Stage:** Prep & Impl	**Recurrent:** Ongoing	**Due Date:**	**Frequency:** Annual	**Status:** Not started
	A capacity needs assessment of the local agencies will be conducted at very early stage of project preparation to identify areas where technical assistance and capacity building is required.					
	Resp: Client & Bank	**Stage:** Prep	**Recurrent:**	**Due Date:** March 2013	**Frequency:** Quarterly	**Status:** Not started
	Risk Management: Bank will continuously support on training and professional development programs to strengthen skills and capacities of staff in procurement and FM. Bank will support the Client in implementation of effective procurement monitoring mechanism.					
	Resp: Client and Bank	**Stage:** Prep & Impl	**Recurrent:** Ongoing	**Due Date:**	**Frequency:** Annual	**Status:** Not started
Governance	**Rating**	Moderate				
Description: *Decision Making and Ownership* The successful fast-tracked preparation of the project given the limited time period greatly depends on (i) the leadership and commitment of the MIRWM, Ministry of Disaster Management and MoFP to the project objectives, (ii) ensuring coordinated and integrated planning, (iii) full ownership of the project design band and its specific components by all the project agencies. These factors would continue to	**Risk Management:** The project will include adequate funding for capacity building activities to support line agencies in project implementation. The overall risk of implementation delays due to overlapping mandates is reduced by facilitating inter-agency coordination, headed by the Secretary of MIWRM.					
	Resp: Client & Bank	**Stage:**	**Recurrent:** Ongoing	**Due Date:**	**Frequency:** Quarterly	**Status:** Not Started

remain in place during project implementation. Overlapping laws, regulations and mandates of ministries and line agencies could lead to difficulty or delays in implementing project components.						
Project Risks						
Design	**Rating**	Substantial				
Description: *Technical Complexities* Given the technical complexity required to develop the basin investments plans is high, there is risk that the objective will be met. Development of the basin investment plans requires a new approach to flood and drought risk that considers a multisectoral approach. The physical works to be implemented have been identified by Government and are judged to be of low risk.	**Risk Management:** To support the limited capacity of the technical agencies, required studies, analysis and preparation of design briefs will be supported through technical expertise recruited by the Bank and the PMU to fast track the preparation stage and identify suitable interventions. The establishment of SPU, a technical working group of key stakeholders, will facilitate the modeling and design of flood and drought mitigation works and the development of basin investment plans, hence reducing delay risks. Technical support will be provided to design the analytical program required to create the dynamic flood and drought models. In addition, technical consultants will be hired to work with the PMU on reviewing bidding documents, hiring firms, and supervising implementation.					
	Resp: Client and Bank	**Stage:** Prep & Impl	**Recurrent:** Ongoing	**Due Date:**	**Frequency:** Annual	**Status:** Ongoing
Social and Environmental	**Rating**	Low				
Social: No significant and/or irreversible adverse social impacts are anticipated. The nature of the interventions planned under the project will improve social conditions by decrease the probability of adverse hydrometeorological events.	**Risk Management:** In order to mitigate potential environmental impacts, all project interventions will be assessed though the process identified in the ESMF. Particular attention will be paid to post-EA monitoring of compliance with agreed mitigation measures.					

	Resp: Client & Bank	**Stage:** Prep & Impl	**Recurrent:** Ongoing	**Due Date:**	**Frequency:** Annual	**Status:** Not Started
*Environme*nt: No significant and/or irreversible adverse environmental impacts are anticipated. The nature of the interventions planned under the project will improve the environmental conditions by decreasing the probability of adverse hydrometeorological events.	In order to mitigate potential environmental impacts, all project interventions will be assessed though the process identified in the ESMF. Particular attention will be paid to post-EA monitoring of compliance with agreed mitigation measures.					
	Resp: Client & Bank	**Stage:** Prep & Impl	**Recurrent:** Ongoing	**Due Date:**	**Frequency:** Annual	**Status:** Not Started
Program and Donor	**Rating**	Low				
Description: The project proposes an integrated approach to addressing climate risk. The result of the project will include a series of basin investment plans that would include hundreds of millions of dollars of potential investments. Successful uptake of these plans by other agencies, for example by the Asian Development Bank (ADB) or by Japan International Cooperation Agency (JICA) will greatly strengthen the impact of the project. Donor dependence is very low in Sri Lanka and as such, is not a major concern for sustainability.	**Risk Management:** Partnership with bilateral donors will be promoted as part of project preparation, to ensure complementarity of interventions.					
	Resp: Partner	**Stage:** Prep & Impl	**Recurrent:** Ongoing	**Due Date:**	**Frequency:** Annual	**Status:** Ongoing
	Risk Management: Regular consultations will be conducted with major donors active in the disaster risk management sector to ensure collaboration.					
	Resp: Client & Bank	**Stage:** Prep & Impl	**Recurrent:** Ongoing	**Due Date:**	**Frequency:**	**Status:** Ongoing
Delivery Monitoring and Sustainability	**Rating**	Moderate				
Description: *Implementation:* The risk is medium given the high level of technical competency required to	**Risk Management:** Quality of deliverables will be assured by allocating adequate funding for technical review of outputs by consultants.					
	Resp:	**Stage:**	**Recurrent:**	**Due Date:**	**Frequency:**	**Status:**

develop the basin investment plans. *Sustainability:* To be assessed at pre-appraisal stage	Partner	Prep & Impl	Ongoing		Annual	Ongoing
	Risk Management: Component 3 of the project will make resources available to local agencies to develop their institutional capacity and support project implementation. Support to local agencies to engage technical expertise for project planning, preparation and implementation will be explored.					
	Resp: Bank and client	**Stage:** Prep & Impl	**Recurrent:** Ongoing	**Due Date:**	**Frequency:** Annual	**Status:** Not Started

Overall Risk
Implementation Risk Rating: Moderate
Description: Though the MIWRM has a PMU in place with a track record of implementing donor financed projects, it will require additional resources and staff. This will be augmented through additional staffing and capacity building. Ensuring coordination of different implementing agencies will also be crucial for the success of the project. The risk of overlapping mandates will be addressed by facilitating inter-agency coordination, headed by the secretary of MIWRM

Note: Include on average no more than 3 Risk Management Measures per Risk Category

Annex 5: Economic and Financial Analysis

SRI LANKA: Climate Resilience Improvement Project

1. Economic analysis was performed under the Climate Resiliency Improvement Project to assess the rate of return of capital investments in flood and drought risk mitigation, transport connectivity and school protection components of the project. The benefit streams of these investments vary by sector but generally come from averted losses, increase in productivity, decrease in operation costs, and time savings. The results give the lower end of the overall benefits, as there are social, indirect benefits and value of human lives that are not quantitatively measured in this analysis.

2. The benefits quantified in monetary value for the flood and drought risk mitigation project come from increase in agricultural yield, decrease in home damages, increase in productivity, decrease in disruption of major regional income sources such as tourism, decrease in loss of livestock and an increase in crops protected from flood. The benefits analyzed quantitatively for the transport connectivity component arise from travel time and operation cost savings. For the school protection component of the project the benefits come from the protection of the physical assets inside and outside of the schools, such as buildings and roads, and educational equipment and contents.

3. The data used in the analysis was obtained from various sources. For the flood and drought risk mitigation component, the cost of the interventions for all the schemes; the number of beneficiaries; the size of the flood prone area; information on past flood damages of crops, houses and livestock was obtained from the MIWRM. The analysis for the transport connectivity component was based on data obtained from RDA, which included Average Daily Traffic (ADT), percentage of ADT by vehicles type, Value of Time (VOT) and Vehicle Operating Cost (VOC). The social benefits of the improvements in terms of access to market and the composition of the nearby residents were qualitatively surveyed using secondary sources and publications. The data for the school protection study was obtained from NBRO, which included the type and value of assets at risk in side each school and it surroundings, the number of students and teachers in each school, and public infrastructure such as roads that could potentially be affected.

Project Benefits

4. The objective of the physical investments financed by this project is to avert future losses that would be caused by flood and landslide events. Therefore, the benefits are measured primarily in the form of losses that are averted due to strengthened infrastructure that is more resilient to these perils. Given the lack of robust historical hydro meteorological data, and precise information on the frequency of flood and landslide events and the vulnerability of physical structures and crop cultivations, it is difficult to exactly determine the likelihood and magnitude of losses and hence the averted losses. To account for this uncertainty in determining averted losses due to the investments under this project, a range of all possible values of input variables was probabilistically considered.

5. The benefits for the flood and drought risk mitigation component come from flood protection and rehabilitation of flood damaged irrigation schemes covering 123,000 hectares of land. Approximately 94% of this land is paddy land while the rest is cultivated with other crops. The improvement of flood bunds, damaged drainage and distribution canals will benefit a total of 154,000 farmers. Other benefits are from averted flood losses to properties and infrastructure including about 5,000 homes and 109 km of agricultural access roads and 1,500 livestock. The improvement of access road enhances the productivity of farmers and serves in flood control operation by reducing the time it takes irrigation engineers to operate gates. Historical cultural sites are also protected from potential flooding under this project. The economic analysis takes into account the uncertainty around the value of all these exposures and the probability of damage.

6. Benefits from improving transport connectivity calculated in terms of monetary value are based on savings in VOT and VOC. A total of 720,000 people are affected from recurring transportation interruptions due to flooded bridges and slope failure accidents that block major national roadways for days. In the event of an interruption due to flooded bridges and slope failures, it takes about 3 to 5 days and 5 to 8 days, respectively, to recover and open the road for the public. In the past at least 3 such events have been occurring in a single year at each of the sites identified under this project. During this time travelers take alternative secondary routes that are longer and of less quality. The combination of longer distance and lower travel speed leads to significant time and productivity loss. The economic analysis takes this alternative route information, the average speed on these routes and the number of days of interruption to calculate the time and operation cost savings. Benefit such as access to market was surveyed qualitatively; about 90 percent of the economy around the project area is based on agriculture, with high perishable food cultivation covering a total area of about 200,000 hectares. The improvement of the roads and bridges under this project will provide quick access of these perishable products to markets. The uncertainty around travel speed in existing and alternative routes, vehicle occupancy rate and the number of days it takes to open roads to the public and the benefit associated with time and operation cost saving is probabilistically considered.

7. The Benefits from school protection component come from the protection of school buildings, auditoriums, school swimming pool and other assets. A total of 27,464 students and teachers will be protected from potentially fatal disasters as the buildings could completely collapse in the event of a landslide. Similarly, benefits outside of the school come from protection of nearby buildings, roads and service establishments such as banks. Landslide events and the associated damage they cause are extremely difficult to predict because the events are highly localized and unique, limiting the use of historical hazard and loss data for prediction. To account for this uncertainty, a wide range of frequency of landslide events was probabilistically considered in the analysis.

Project Costs

8. The project costs for all the components of the project are estimated based on detailed identified interventions by the various IAs. To account for incremental increase in cost, operating and maintenance (O&M) cost was applied.

Economic Analysis

9. A Monte Carlo simulation analysis was performed to account for the uncertainty in determining the return period of flood and landslide events and the vulnerability of physical structures and crops to these perils. Uniform distributions of all the variables that are estimated based on engineering judgment, local knowledge and assumptions were used in order to account for the uncertainty of the values and to ensure that the calculation of the rate of return is robust. For the flood and drought risk mitigation component of the project, uncertainties in frequency of flood events, usage of access roads, crop and cattle prices, average damage to homes, disruptions to tourism income, and cost of rehabilitation of damaged roads are considered. Similarly possible variations in speed, vehicle occupancy rate, and average number of road blockage per year are accounted for the transport connectivity component. For school protection, uncertainties around the occurrence of landslides and the value of missing a day of school are accounted using a range of values.

10. The economic analysis was made over a period of 20 years using a discounting rate of 12%. The 20 year project life assumption is on the lower end which leads to conservative results. O&M costs ranging from 0.5% to 1% were also assumed over the period of the project life.

11. The results of the analysis are expected IRR of 30.4%, 16%, 18.9% and NPV of US$44.6 million, $10.1 million and $2.7 million for flood and drought risk mitigation, transport connectivity, and school protection components respectively. The wide range of benefits for the flood and drought component is due to the deep uncertainty that comes with the extensive area affected by these hazards and the wide range of losses they can cause to property, agriculture and overall livelihood of the beneficiaries of this project. Overall, the probability that the benefits of any of the components of the project would fall below 12% is either zero or extremely low. See Table 1 below.

Table A5-1: IRR an NPV for each of the components of the project

	Flood and drought risk mitigation		Transport Connectivity		School Protection	
	IRR	NPV (M USD)	IRR	NPV (M USD)	IRR	NPV (M USD)
Expected Value	30.4%	$44.64	16.0%	$10.14	18.9%	$2.66
Standard deviation	11.6%	$26.21	2.3%	$6.00	3.2%	$1.23
Minimum	10.5%	-$3.91	10.5%	-$3.66	12.0%	$0.01
Maximum	56.3%	$97.27	23.0%	$28.44	26.4%	$5.43
Coefficient of Variance	0.38	0.59	0.15	0.59	0.17	0.46
Probability of low* outcome	1.2%	1.2%	3.2%	3.2%	0.0%	0.0%

*low: < 12% IRR, < 0 NPV

12. Overall the project fairs very well with IRR of 22.7% and NPV of about $57 M. The probability that the IRR would fall below 12% is zero. The possible IRR ranges of between 12.3% and 34.7% show that the rate of return on the investments is sufficiently high and satisfactory, even when values of the variables that impact benefits are at their probable lower ends. See Table 2.

Table A5-2: IRR an NPV for the overall project

	IRR	NPV (M USD)
Expected Value	22.7%	$57
Standard deviation	5.4%	$28
Minimum	12.3%	$1
Maximum	34.7%	$118
Coefficient of variance	0.24	0.48
Probability of low* outcome	0.0%	0.0%

*low: < 12% IRR, < 0 NPV

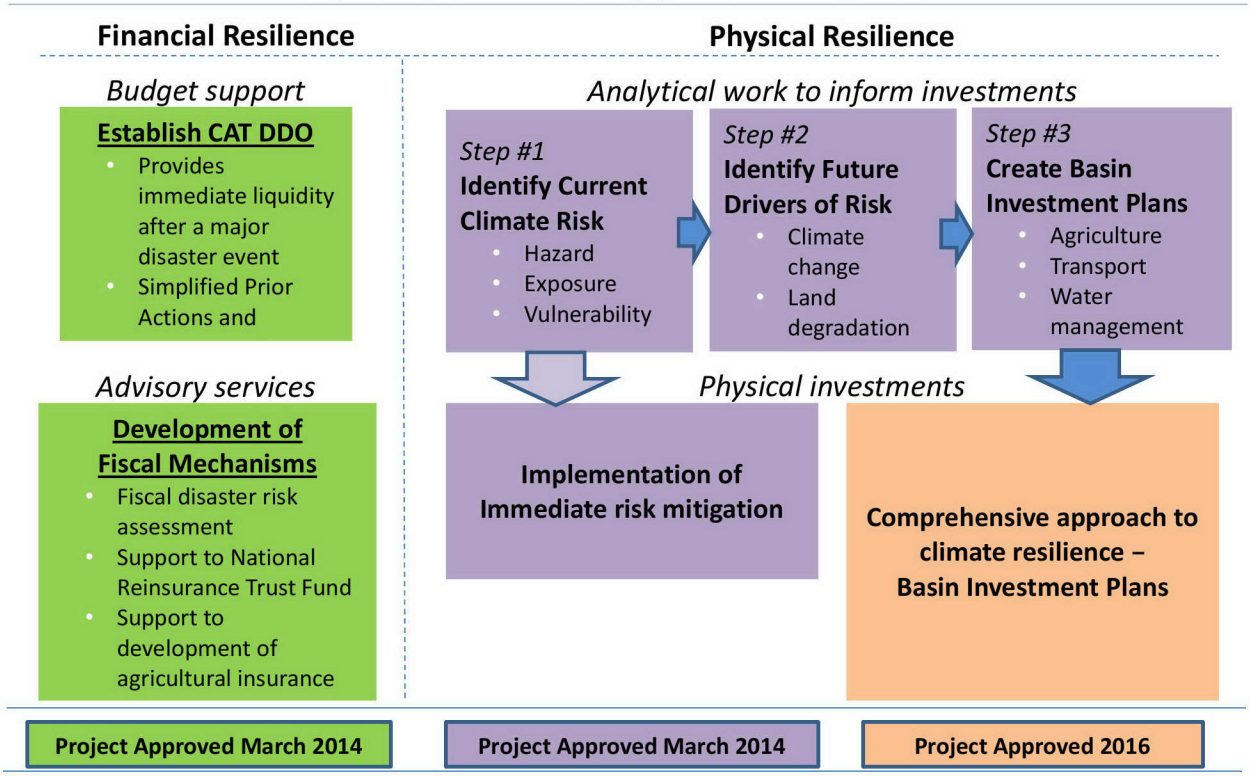
Annex 6: Financial and Physical Resilience Strategy

SRI LANKA: Climate Resilience Improvement Project

1. The climate resilience program comprises three core elements, or projects, to increase fiscal and physical resilience to climate and disaster risk. As such, the program addresses both short and long term needs of the country by addressing the risks posed by hydrometeorological events. To manage contingent fiscal risk, a line credit will be put in place in the short term, while, over the long-term, a series of financial instruments will be put in place to manage the liabilities. To reduce the liabilities, physical investments will be financed to address both short term system weaknesses and to increase the resilience of long term infrastructure development. The overarching goal of this project is provide an entry point for longer term, larger scale investment and policy dialogue on climate and disaster resilience.

2. The proposed DPL with CAT DDO will be delivered to the Board for approval in FY14, alongside the US$110 million CRIP. The CAT DDO will increase fiscal resilience in the short term through a line of credit to be used in case of a disaster, and associated technical assistance TA. The Climate Resilience Improvement Project will provide support the GoSL through a first phase of short-term investments to build physical resilience to climate-related hazards. Both projects will be presented to the Board as a holistic package.

Figure A6-1: Financial and physical resilience overview



Annex 7: Investment Distribution Maps

SRI LANKA: Climate Resilience Improvement Project

Figure A7-1: Locations of selected projects by type of project and total investment by district