Environmental Monitoring Report

3 Semi-annual Report (January–June 2022)
July 2022

Nepal: Priority River Basins Flood Risk ManagementProject

Prepared by Department of Water Resources and Irrigation, and the Department of Hydrologyand Meteorology, Ministry of Energy, Water Resources and Irrigation for the Asian Development Bank.

ABBREVIATIONS

ADB	Asian Development Bank
BOQ	Bill of Quantity
CBDRM	Community-Based Disaster Risk Management
CW	Construction Work Site
DHM	Department of Hydrology and Meteorology
DWRI	Department of Water Resources and Irrigation
EMP	Environmental Management Plan
FFEWS	Flood Forecasting and Early Warning Systems
GON	Government of Nepal
GRM	Grievance Redress Mechanism
IEE	Initial Environmental Examination
JV	Joint Venture
MEWRI	Ministry of Energy, Water Resources and Irrigation
MK	Mohana Khutiya
MR	Mawa Ratuwa
OHS	Occupational Health and Safety Plan
PIC	Project Implementation Consultant
PIU	Project Implementation Unit
PMU	Project Management Unit
PRBFRMP	Priority River Basins Flood Risk Management Project
QBAOP	Quarry and Borrow Management Plan
SD	Safeguard Desk
SEMP	Site-specific Environment Management Plan
SOP	Standard Operating Procedure

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1. INTRODUCTION

1.1. Background

1. Priority River Basins Flood Risk Management Project (PRBFRMP) is being implemented by the Ministry of Energy, Water Resources and Irrigation (MoEWRI) with the financial assistancefrom Asian Development Bank (ADB). The project covers six priority river Basins in Terai region ranging from east to far west of the country. The priority river basins include (i) Mawa-Ratuwa, (ii)Bakraha, (iii) Lakhandehi, (iv) East Rapti, (v) West Rapti, and (vi) Mohana & Khutiya Rivers. Factors such as likelihood/ magnitude of flood damage, poverty index, impact on human wellbeing, loss of life, as well as equitable distribution of projects between regions, were taken into consideration while selecting the river basins as well as the location of interventions.

2. The areas under the six river basins considered by the project are vulnerable to flooding due to in-migration of people in search of better livelihoods and insufficient flood protection infrastructure or early flood warnings and low community awareness on how to respond to flooding. Flood risk is expected to progressively increase due to the impacts of climate change and global warming. An estimated, 29,356 hectares (ha) of land and 70,428 populations are exposed to 1-in-50-year flood. The project areas have minimal reactive embankment interventionsthat provide limited flood protection. In this regard. the project aims to improve the resilience of communities to flooding in the selected river basins. The project has been designed for 1-in-50- year period flood events with an aim of increasing community resilience through structural as wellas non-structural measures. The project supports Nepal's National Water Plan to reduce social and economic losses from water induced disasters through blending structural and nonstructural measures. The project will protect agricultural land and households in priority areas by constructing flood embankments, spurs and outlet structures. The local response to flooding will be strengthened through the development of flood forecasting and early warning systems (FFEWS) and community-based disaster risk management (CBDRM) with construction of flood shelters.

3. The Department of Water Resources and Irrigation (DWRI) and the Department of Hydrology and Meteorology (DHM) will be the implementing agencies. The $50 million loan to Nepal was signed in December 2020 and declared effective in January 2021. The project completion date is September 2027 having seven years' implementation period.

The Project Basic Data

<table>
<tr><td colspan="2">Project Name: Priority River Basins Flood Risk Management Project</td></tr>
<tr><td>Project Number: 52195-001</td><td>Approval Number:</td></tr>
<tr><td>Country: Nepal</td><td>Executing Agency: Ministry of Energy, Water Resources and Irrigation</td></tr>
<tr><td>Project Procurement Risk: Medium</td><td>Implementing Agency:
Department of Hydrology and Meteorology, BabarmahalDepartment of Irrigation, Kathmandu,
Department of Water Resources and Irrigation formerlyknown as Department of Irrigation, Jawalakhel</td></tr>
<tr><td>Project Financing Amount: US$ 63,750,000
ADB Financing: US$ 50,000,000
Cofinancing (ADB Administered): US$ 750,000
Non-ADB Financing: US$ 13,000,000</td><td>Project Closing Date: 30 September 2027</td></tr>
</table>

4. The project has the following three outputs:

- **Output 1.** *Flood protection infrastructure improved*. The project will reduce direct impacts from flooding through (i) construction of flood control infrastructure (embankments, spurs, and outlet structures); (ii) planning and implementation of bioengineering of river embankments for enhanced flood risk management, using suitable vegetative methods to prevent soil erosion; and (iii) development of maintenance manuals and an asset management system for flood protection infrastructure. The construction works are expected to generate employment for at least 10% of the affected households, including indigenous peoples, Dalits andwomen.

- **Output 2.** *Flood forecasting and response systems enhanced*. The project will supportthe government and communities in flood-prone areas to improve early flood warningsystems through (i) installing about 40 rain gauges and 30 hydro meteorologicalstations, (ii) developing about 5 flood forecasting early warning system (FFEWS), and(iii) Improving maintenance of FFEWS.

- **Output 3.** *Flood prevention and preparedness capacity improved*. This will be deliveredby (i) undertaking an organizational capacity building program on flood risk management and infrastructure planning for the DWRI and local governments (municipalities, village municipalities and provincial governments); (ii) developing the capacity of local communities on disaster preparedness; (iii) constructing about 48 flood shelters with gender-responsive features; and (iv) developing community-based disaster risk management (CBDRM).

5. Department of Water Resources and Irrigation (DWRI) is responsible for Output 1 and Output 3. People's Embankment Program offices, considered as Field Office, in the respective river basins of the project area will be responsible for the implementation of project activities on behalf of DWRI. Project Management Unit (PMU) holds responsibility for overall management of the Project including coordination with ADB.

6. Department of Hydrology and Meteorology (DHM) will implement the project activities withregard to Output 2 which will include establishment of hydro-meteorological stations, collecting data at those stations and forecasting flood incidents downstream. Overall project management will be carried out by Project Implementation Unit (PIU), established within DHM. However, PMUwill be solely responsible for submitting withdrawal applications to ADB pertaining to financial management of Field Offices and PIU.

1.2. Sub-projects Description and Progress

7. The seven priority river basins are divided into six sub-projects covering as shown in Figure 1. The Project primarily comprises the following activities:

- Flood management works in Mawa-Ratuwa River Basin (Morang, Jhapa), Mohana-Khutiya River Basin (Kailali, Kanchanpur), Bakraha River Basin (Morang), Lakhandehi River Basin (Sarlahi),West Rapti Basin (Dang);
- Flood forecasting and early system establishment in Mawa-Ratuwa River Basin, Mohana-Khutiya River Basin, Bakraha River Basin, Lakhandehi River Basin, East Rapti Basin (Chitwan);
- Community based disaster management activities including capacity building and shelter house construction in all the river Basins.

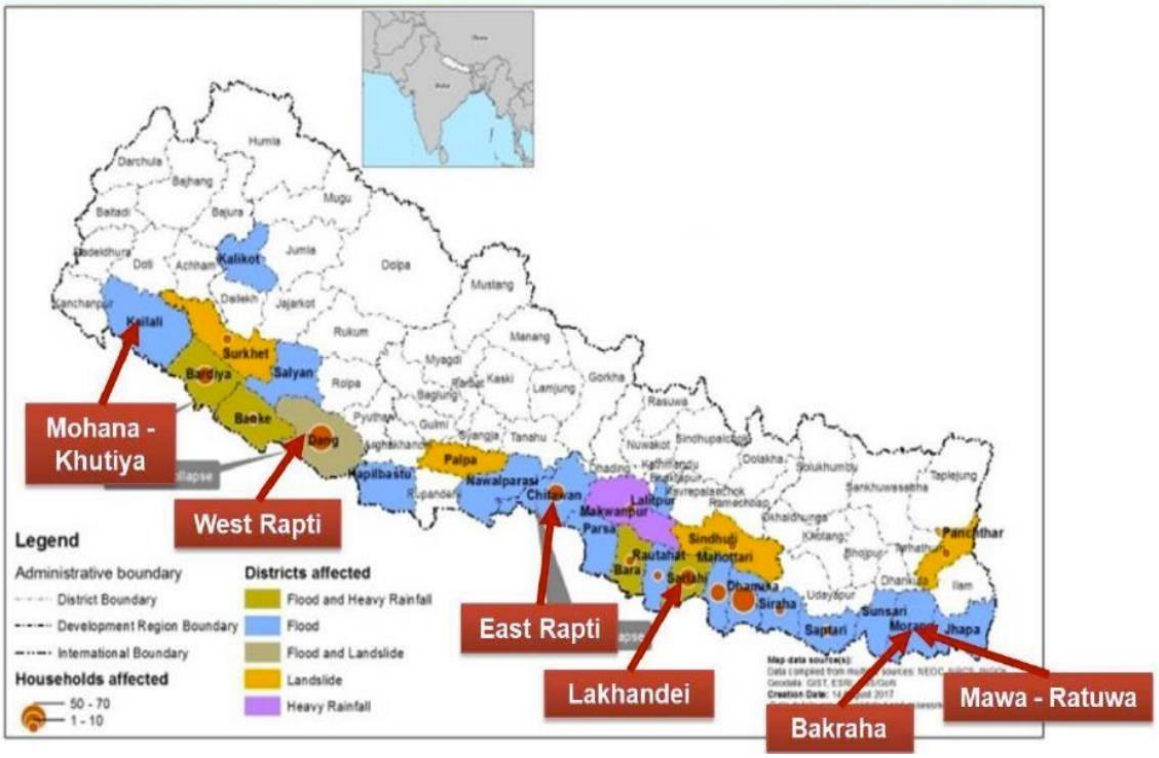

Figure 1: Map showing Sub-projects in Districts of PRBFRMP

8. Among the 6 sub-projects, civil works contracts for Mohana Khutiya (CW-01) and Mawa Ratuwa (CW-02) River Basins were started since March 2022. The working activities in both sub-projects has started with little progress. Less than 500 m distance of embankments with launching apron and revetment works have been completed till date. The sub-projects scope and the progress status are summarized in the **Table *1***.

Table 1: Scope and Physical Progress of Sub-projects

SN	Sub-projects	Stage of Sub-project	Progress of Works
1	Mawa-Ratuwa Basin	Contract awarded to HZMC–Mainachuli–Roshan JV, Sinamangal, Kathmandu on 24th May 2021	Work started in PRTW-04, PRTW-12(L/B) and PRTW-12(R/B), - 13th June 2024 is the work completion date for the sub-project
2	Mohana-Khutiya Basin	Contract awarded to TEAMS–Rajendra–Kumar JV, Dhangadhi, Kailali on 29th June 2021	Work started in PRTW-01 and PRTW-03-18th July 2024 is the work completion date for the sub-project
3	West Rapti Basin	Finalized the Detailed Engineering Design	IFB has been published on 8th July 2022
4	Lakhandehi Basin	Finalized the Detailed Engineering Design	IFB has been published on 8th July 2022
5	Bakraha Basin	Finalized the Detailed Engineering Design	IFB has been published on 8th July 2022
6	East Rapti Basin	Contract signed with NARI Group Corporation, China on 2nd May 2022	A joint team from the PIU Office (DHM) and the contractor visited the proposed locations for the establishment/installation of hydrological and meteorological stations in East Rapti Basin

2. CONSIDERATION OF ENVIRONMENTAL SAFEGUARD IN PROJECT

9. Each sub-project has undergone environmental screening and environmental assessmentreports were prepared. Project has already started steps toward institutionalization of safeguard mechanism. Please refer following section and **Annex 1** for environmental safeguard planning status.

2.1. Preparation of Environmental Assessment

10. The Project falls in Category B for environment according to the ADB's Safeguard Policy Statement 2009 (SPS). Hence, Initial Environmental Examination (IEE) Reports were prepared for the 6 river basins. All of them were cleared by ADB and approved by GON, and have been disclosed in ADB web.

2.2. Institutionalization of Environmental Safeguard in Project

11. MEWRI is executing agency for PRBFRMP and has established Project Management Unit (PMU) at the center and has recruited Project Implementation Consultant (PIC) for support. The reporting mechanism has been established at central project level. Please refer **Table 2** for summary relating to institutionalization of safeguard.

Table 2: Status of Safeguard Institutionalization

Position, Office	Name	Inputs	Email	Remarks
Safeguard Liaison Officer (SLO) and Focal Person (GRM)	Ms. Shabnam Samal	Full time (PMU)	shabnamsamal @gmail.com	Assigned
Environment Officer, DWRI	Mr. Hari Shankar Jha	Full time (Environment Section)	jha.s.hari@gmail.com	Assigned
Focal Person (SD), Field Office	-	-	-	Due; and project has targeted to establish the safeguard desk soon
Field Level Monitors (Safeguard), Field Office	-	-	-	Currently Sub-engineers of the FOs are fulfilling the duty of Field level monitors
Focal Person (GRM), Field Office	- Site Engineers	Full time MR and MK basins	-	Site Engineers also acting as Focal persons for GRM
Environmental Safeguard Expert, PIC	Mr. Resham Baniya	9 Months	reshambaniya @gmail.com	Intermittent Input
Social Safeguard Expert, PIC	Mr.Shiva Dhakal	9 Months	sshivadhakal@gmail.com	Intermittent Input
Safeguards Assurance Staff	Mr. Bishal Bhattrai	*	bishalb2015@gmail.com	Orientation attended but no

Position, Office	Name	Inputs	Email	Remarks
and Safety Steward, Contractor	Mr. Bikash Bastola	*	bastola.bikash @gmail.com	reporting till date
Safeguards Assurance Staff and Safety Steward, Contractor	Mr. Tarka Raj Joshi	*	tarkraj2001@g mail.com	Orientation attended but no reporting till date
	Mr. Paras Khadka	*		

**Note-Safeguard and Safety Officers from the contractor's side are not mobilized during construction period.*

12. The project envisaged to institutionalize safeguards by establishing focused mechanism. In this regard, the project has established Central Safeguard Desk (CSD) at PMU. Grievance Redress Mechanism is also established with the focal person assigned at PMU. The status safeguard institutionalization status in the project is presented in Table 2. However, establishment of Safeguard Desk with assignment of safeguard focal person at field office level is still due. The 2nd tier GRC was formed in both the basins and the site engineers of the Field Offices are the members of the committee. The site engineers of MK and MR river basins are currently the focal person for the GRM in their respective basins. The 3rd tier GRC will be established within 30 September 2022

2.3. Incorporation of Environmental Safeguard into Project Contractual Arrangementsand Bill of Quantity (BOQ)

13. The contract agreement and BOQ of Mawa–Ratuwa River Basin and Mohana – Khutiya River Basin in reference to environment assessment document shows that that Environmental Management Plan (EMP) activities are to be implemented by utilizing lump sum amount available in provisional sum (please see **Annex 2**). For the OHS activities, the responsibility falls under the provision of contractor.

14. The contract has identified quality and specification of safeguard requirements as its clauses (please see **Annex 3**)

3. SUBMISSION OF PRE-REQUISITE DOCUMENTS

15. The pre-requisite documents of Mawa–Ratuwa River Basin and Mohana – Khutiya River Basin; Site-specific Environmental Management Plan (SEMP), Occupational Health and Safety Plan (OHS), Standard Operating Procedure (SOP), Quarry and Borrow Management Plan (QBAOP) and Workers Code of Conduct submitted by the contractors at both subprojects were approved by PMU on 15 February 2022.

4. COMPLIANCE STATUS WITH ENVIRONMENTAL SAFEGUARD AND OHS MEASURES

16. In both river basins, the progress of the construction activities is lagging behind the schedule. The contractors are not serious and they have not mobilized sufficient work force (labours and equipment) to expedite the works. In the Mawa Ratuwa River Basins, only the earthen embankments are completed in PRTW 04 and 12(R/B) to some extent but it is not protected by gabion revetment and launching apron. But in 12(L/B) gabion revetment and launching apron has been provided. The monsoon floods are eroding these embankments and are being washed away. So, temporary measures are instantly required to check the bank erosion and should be done immediately by the contractor.

17. Although, both of the basins contract are the International Bidding Contract (ICB), the construction management and work quality is not up to the expected standards. As mentioned in the pre-requisite documents and site specific plans, the Occupational Health and Safety provisions in both the sub-project are not complied. The labor forces are not provided with the minimal safety requirements. The workers deployed are less in numbers and staying in the rented houses in both subprojects. The PIC field engineer reported that no any safety gears were made available to the labors. Similarly, the project is lagging in regular monitoring of the environmental safeguards since there are no subject matter specialist in the PIU (Field Offices) nor the contractor environmental safeguard and safety experts are mobilized for the daily monitoring activities during the construction period. The Inspector of Works from the PIC field office team are mobilized for inspecting the construction works as well as the monitoring and reporting the safeguard compliance as field monitors in the basin. They are sending the safeguard status information to the Central Level Safeguard team.

18. After approval of the pre-requisite documents of both the subprojects, the Central Level Safeguard Desk with support from PIC team provided orientation on environmental safeguards to the field office engineers and contractors in Mawa Ratuwa subproject on 25 March 2022, and Mohana Khutiya subproject on 10 April 2022. The monitoring checklist for the sub-project level EMP implementation were provided to the PIU and the contractor engineers as presented in Annex 4 and Annex 5. In both sub-projects during 4 months of construction period the safeguard compliance status were observed to be in poor conditions, thus the PMU and PIU with support from the PIC team should make compulsion to the contractors for the safeguard standards to be followed strictly as mentioned in the pre-requisite documents.

19. As per the suggestions from ADB review mission 20-29 June 2022, PMU/PIU/PIC shall organize monthly joint safeguard review meeting with the contractors of each of the ongoing contract packages. For the effective environmental safeguard implementation in the project and rating the contractor working procedures with OHS activities adopted, labor camp standards and other environmental mitigation measures with regular follow is needed.

20. ADB NRM has developed Automated Safeguard Monitoring (AMS)system for real-time safeguard monitoring and reporting system. Once the ADB will rollout the ASM system the PIC environmental safeguard expert shall make orientation to the PIUs safeguard focal persons and the contractors safeguard officer for the real time monitoring and submission of the monthly monitoring reports to the central level safeguard unit.

21. The overall environmental safeguard performance status in the project is presented in **Table 3.** General structure of the monitoring report will be as following.

Table 3: Status of overall environmental safeguard performance in the project

Indicator	Assessment question	Response/Status	Remarks / Actions Required
A. Contract Awards			
1. ENV: No works contracts are awarded before the EMP(s) cleared by ADB and any conditions of any national EIA/IEE clearance are incorporated into contract documents	For any project outputs/components with environmental impacts or risks, are there any works contracts that have been awarded by the borrower without EMP(s)*cleared by ADB and any conditions of anynational EIA/IEE clearance incorporated into the contract documents? *(Note: This includes project contracts outside ADB procurement process, andwithin the project's scope)*	EMPs included in Civil Works Packages	
B. Project implementation: Instruments			
4. ENV: Requisite national environment, health and safety clearances* and ADB environment safeguard clearances are obtained before commencement of applicable works. * Including permits, consents, licenses etc.	Requisite national environment, healthand safety clearances* and ADB environment safeguard clearances** areobtained before commencement of applicable works **Including permits (e.g. forest permit),consents (e.g. consent to operate), licenses etc.* *** updated EIA/IEE reflecting design changes; for site access final, detailed design EMPs for turnkey/DBO contracts;ESMS before first disbursement etc.* **** national EIA/IEE clearance, includingconsent to establish [construction] and consent to operate [operation] in DMCs where this is a requirement*	All 6 subprojects IEE posted on adb.org IEE Reports have been approved by GON except IEE of East Rapti since there are no any flood control construction works in the basin.	
C. Project implementation: Project Grievances			
6. There is a functioning GRM in place and no high-risk outstanding grievances related to implementation of safeguards	Does the project have a non-functioningGRM and/or any Accountability Mechanism (CRP)-eligible complaint(s)?	GRCs at first tier at ward level and second tier at Municipality level have been established in both contract awarded basins.	
D. Project implementation: Project Safeguards Non-Compliance			

7. There are no outstanding non-compliances related to implementation of safeguards* **excluding non-compliances covered under Q1, Q2, Q3, Q4 and Q5*	Does the project have outstanding non-compliances [can be notified by staff, external monitor, regulatory agencies, supervision consultants, borrower, or contractors]?	Work has not yet started	
E. Project execution: Monitoring			
8. Scheduled monitoring reports are submittedas per agreed schedule, commencing date of loan effectiveness.	Semi-Annual Environmental Monitoring Report	Two EMRs were finalized and submitted to ADB and this is the 3rd EMR	

5. ENVIRONMENTAL SAFEGUARD IN THE LOAN COVENANT ON ENVIRONMENT

22. Project has already started complying with the environmental safeguard covenants relatedwith the planning and pre-construction stage. Since two contracts for Mawa Ratuwa Sub-project and Mohona Khutiya Sub-project has been awarded, the environmental safeguard covenant relating to implementation activities is still due (please refer **Table 4**).

Table 4: Compliance with Environment Safeguard Related Covenants

Schedule ,para	Covenants	Complied (Yes / Not Yet Due / Ongoing / Partially Complied)	Progress Status/ Remarks
Schedule 4, para 4	The Borrower shall not award any Works contract which involves environmental impacts until: (a) the Borrower's Ministry of Forests and Environment has granted the final approval of the lEE; and b) the Government has incorporated the relevant provisions from the EMP into the Works contract.	Complied, ongoing	5 IEE Reports have been approved by GON except East Rapti. All 6 IEE reports are cleared by ADB. EMP is being incorporated in the bidding document and work contract
Schedule 4, para 5	The Borrower shall ensure that the preparation, design, construction, Implementation, operation and decommissioning of the Project and all Project facilities comply with (a) all applicable laws and regulations ofthe Borrower relating to environment, health and safety; (b) the Environmental Safeguards; and all measures and requirements set forth in each lEE and EMP, and any corrective or preventative actions set forthin a Safeguards	Ongoing	Contractor is mobilized for the pre-construction work in the site and still the construction work has not started yet
Schedule 4, para 8	The Borrower shall make available necessary budgetary and human resources to fully implement the EMP	Being complied bykeeping cost in BOQ	
Schedule 4, para 9	The Borrower shall ensure that all biddingdocuments and contracts for Works contain provisions that require contractorsto: (a) comply with the measures relevant to the contractor set forth in the lEE, the EMP(to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set forth in a Safeguards Monitoring Report; (b) make available a budget for all such environmental and social measures;	Being complied bykeeping cost in BOQ and contractual provisions in contract	

Schedule ,para	Covenants	Complied (Yes / Not Yet Due / Ongoing / Partially Complied)	Progress Status/ Remarks
	(c) provide the Borrower with a written notice of any unanticipated environmental,resettlement or indigenous peoples risks or impacts that arise during construction, implementation or operation of the Projectthat were not considered in the IEE, the EMP and (d) adequately record the condition of roads. agricultural land and other infrastructure prior to starting to transport materials and construction; reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.		
Schedule 4, para 10	The Borrower shall do the following: (a) submit semi-annual Safeguards Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission; (b) if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Projectthat were not considered in the IEE, the EMP and promptly inform ADB of the occurrence of such risks or impacts. With detailed description of the event and proposed corrective action plan; and (c) report any actual or potential breach ofcompliance with the measures and requirements set forth in the EMP or promptly after becoming aware of the breach.	Construction activities are not started yet. The safeguard compliance status and non-compliance observation with corrective actions will be documented in the upcoming SEMR.	

6. ESTIMATED BUDGET IN APPROVED EMP

23. Environmental Management Plan and OHS Cost in BOQ is NRs 42,00,000 for each river basin (Mawa-Ratuwa and Mohana Khutiya). As per the plan and budget allocated in the BOQ the project will implement following activities with the provided frequency. Contractor has prepared the SEMP document for both sub-projects with allocated budget in the following activities demanding mitigation measures as shown in **Table 5**. For the OHS measures of the workers, the responsibility falls under the provision of contractor.

Table 5: Cost demanding items while implementing EMP for Mawa Ratuwa Sub-Project

SN	Environmental issue	Proposed measures	Frequency	Locations	Allocated amount	Remarks
1.	Emission of the dust and increase in air pollution	Sprinkle water	Twice a day		NRs. 36,00,000/-	As of BoQ
		Air pollution level monitoring	Twice a year (At least 3 locations including	At camp, major settlement,	NRs. 2,50,000/-	As of BoQ
2.	Water pollution	Water quality testing	Twice a year for camp water and once in each embankment During excavation for foundation construction	Water supplied to camp and water US and DS of each embankment	(13*2+3* yrs*2 times*2 camps) = 38 times @3950 with total NRs.1,50,100	As of BoQ

7. CONCLUSION

24. The construction work in both sub-project river basins has been started since March 2022. The monsoon floods are currently damaging the protection works that were carried in Mawa-Ratuwa sub-project. Thus the temporary measures are instantly required to check the bank erosion and should be done immediately from the contractor side. The contractors have not mobilized the enough work force at this working period. As mentioned in the pre-requisite documents and site specific plans, the Occupational Health and Safety provisions in both the sub-project are not complied. Similarly, the project is lagging in regular monitoring of the environmental safeguards since there are no subject matter specialist in the PIU (Field Offices) nor the contractor environmental safeguard and safety experts are mobilized for the daily monitoring activities during the construction period. The overall safeguard performances in both contract packages are poor in this semi-annual period. In order to improve the safeguard performances a joint field visit shall be carried from PMU, PIU (Field Office) and PIC making immediate follow up actions with the contractors. The contractors shall ensure all safeguard and safety measures stated in the environmental management plan (EMP) are strictly complied during the construction period.

7.1 Issues and Way Forward

25. To improve the environmental safeguard performances, the PMU/PIU/PIC will organize a monthly joint safeguard review meeting with the contractors of construction ongoing sub-projects.

26. To consider safety of workers as top priority, the contractors shall provide the safety gears during the working conditions.

27. Contractors of both sub-projects have not mobilized the assigned Safeguard and Safety Officers during the construction period, as their name were assigned in the approved pre-requisite documents.

28. Both the PIUs (Field Offices) do not have sufficient human resources and logistics as anticipated in the PAM document to supervise the project. At least a subject related safeguard monitors need to be allotted for effective monitoring.

29. The project needs to operate the Automated Safeguard Monitoring (AMS)system for real-time safeguard monitoring, rating the contractor performance and timely reporting to the project.

Annex 1: Environmental Safeguard Planning Status

Name of Sub-projects	Environment Assessment						Forestry Clearance Obtained (Yes/No/ N/A)	Institutionalization of Safeguard					Safeguard Plan Implementation Arrangement			SOP for COVID Risk Management prepared and approved by Engineer
	Environmental screening is carried out? (Yes or No)	Environment category of the project / subproject (A/B/C/FI)	EARF is prepared (if applicable) (Yes/No)	EIA/IEE /DDR/BES with EMP is prepared (Yes/No)	ADB approved EIA/IEE/DDR /BES with EMP (Yes / Under Review /Not Yet Due/Over Due)	Government approved EIA/ IEE/ BES with EMP (Yes / Under Review / Not Yet Submitted)		Safeguard Unit established at Central Level with Focal Person	Safeguard Unit established at field office with Focal Person	Contractor mobilized safeguard assurance staff	Contractor mobilized OHS Supervisor	GRC is established (Yes/No)	EMP cost is included in BOQ as an individual item (Yes/No)	Environment Safeguard Provision in detail included in CA (Yes/No)	Incorporation of Safeguard in Automated Software (Yes/ Planned/No)	
Mohana Khutiya Basin	Yes	B		Yes	Yes	Yes	N/A	Yes	No	Yes	Yes	1st, 2nd tier	Yes	Yes	Planned	Prepared
Mawa– Ratuwa Basin	Yes	B		Yes	Yes	Yes	N/A	Yes	No	Yes	Yes	1st, 2nd tier	Yes	Yes	Planned	Prepared
West Rapti Basin	Yes	B		Yes	Yes	Yes	-	-	-	-	-	-	-	-	-	-
Lakhandehi Basin	Yes	B		Yes	Yes	Yes	-	-	-	-	-	-	-	-	-	-
Bakraha Basin	Yes	B		Yes	Yes	Yes	-	-	-	-	-	-	-	-	-	-
East Rapti Basin	Yes	B		NA	Yes	Yes	-	-	-	-	-	-	-	-	-	-

***Note**: EARF-Environment Assessment and Review Framework; EIA-Environmental Impact Assessment; IEE-Initial Environmental Examination; DDR-Due Diligence Report; BES-Brief Environment Study; EMP-Environmental Management Plan; EA-Executing Agency; IA-Implementing Agency; OHS-Occupational Health and Safety; GRC-Grievance Redress Committee; BOQ-Bill of Quantity; CA-Contract Agreement*

Annex 2: Environmental Management Plan and OHS Cost in BOQ

Project: Preparation of Priority River Basin Flood Risk Management Project (GRANT NO:0299-NEP)

Sub Project: Mohana Khutiya River
Name of Work: Embankment and Revetment, Spur,Single cell Pipe Outlet, etc.

Bill of Quantities

SN	Description	Unit	Quantity	Rate in Figure	Rate in Words	Amount	Remark
A	**CIVIL WORKS**						
	i) Mohana River (Kanchanpur)						
1	Cutting, uprooting and disposal ofgrasses with light compaction, levelling and cleaning the site allcomplete for the preparation of site	Sq.m	84,128.50				
2	E/W filling with excavated borrowed soil for making Embankment in 22 cm thick layer by layer including breaking soil lumps, levelling, dressing etc. andcompaction with 8/10 ton roller by using machine all complete and all haulage distance as needed	cu.m.	18,867.10				
3	E/W filling with ordinary soil including excavation for making Embankment in 22 cm thick layer by layer including breaking soil lumps, levelling, dressing etc. andcompaction with 8/10 ton roller by using machine all complete and all haulage distance as needed	cu.m.	95,219.15				
4	Earthwork in excavation of existingembankment in benches (0.3 mhigh and 0.6 m wide) for connection with new embankmentas per specification all complete and all haulage distance as needed	cu.m.	91.80				
5	E/W filling with 30 cm thick ordinary sweet soil including excavation for making Embankment as per design, drawing and specification including shaping and trimming all complete and all haulage distanceas needed	cu.m.	13,880.45				

SN	Description	Unit	Quantity	Rate in Figure	Rate in Words	Amount	Remark
6	Grass sodding works including sod cutting, transporting, placing in position and water sprinkling and Bio Engineering works (Plantation of suitable grass such as Napier, lemon grass etc.) allcomplete and for all haulage distance as needed	Sq.m	40,997.50				
7	Supply and Laying sub-base course of sand mixed gravel in 20cm. solid depth including loading &transporting material, levelling surface, hauling all complete and for all haulage distance as needed	Sq.m	15,700.00				
8	Supply and Laying base course ofsolid thickness 10 cm of broken stones including surface levelling and hauling all complete and for allhaulage distance as needed	Sq.m	15,700.00				
9	Rockfill embankment constructionwith graded stones as per specification all complete and for all haulage distance as needed	cu.m.	10,604.65				
10	Earthwork Excavation in soft soilsfor side drain and disposal all complete and for all haulage distance as needed	cu.m.	4,653.00				
11	Making roadside ditch from dry rubble masonry including haulageall complete and for all haulage distance as needed	cu.m.	3,257.10				
12	Supply and laying of geo textile filter under gabion boulder filling as per the instruction of site engineerall complete and for all haulage distance as needed	Sq.m	81,778.50				
13	Earth work excavation for foundation in sand silt with clay mixed soil for launching apron and at side slope all complete and all haulage distance as needed	cu.m.	26,931.51				
14	Supply of Boulder and filling in Gabion box all complete and for allhaulage distance as needed	cu.m.	33,775.66				

SN	Description	Unit	Quantity	Rate in Figure	Rate in Words	Amount	Remark
15	Supply and laying Machine made gabion box 10x12 hexagonal mesh size of 3mm dia mesh wire including selvedge wire and lacingwire of 3.9 mm and 2.4 mm respectively of required sizes all complete and all haulage distanceas needed	Sq.m	266,135.40				
16	Supply and Laying RCC pipe (60 cm dia & 2.5 m long) and its accessories with 1:2 cement sandmortar, jute, etc all complete and for all haulage distance as needed	RM	105.00				
17	Concreting of foundation, verticalfaces, walls (cement concrete 1:2:4 ratio) including supply of materials all complete and for all haulage distance as needed	Cum	55.21				
18	Concreting of foundation, vertical faces, walls (cement concrete 1:3:6 ratio) including supply of materials all complete and for all haulage distance as needed	Cum	28.13				
19	Supplying, cutting, bending, placing in position as shown in position in the drawings and binding by GI wire of reinforcement steel bars for RCC works all complete and for all haulage distance as needed	Kg	4,334.35				
20	Making wooden forms including supply of materials and removal after finishing the work all complete and all haulage distance as needed	m2	146.10				
21	Supply and Laying of 20-40mm well graded granular material as per design, drawing and specification all complete and for all haulage distance as needed	m2	92.25				
22	Supply and laying of Trash Rack at inlet as per specification all complete and for all haulage distance as needed	Nos	6.00				

SN	Description	Unit	Quantity	Rate in Figure	Rate in Words	Amount	Remark
23	Supply and laying of Pin jointed automatic flap gate as per specification all complete and for all haulage distance as needed	Nos	6.00				
24	Supply and Laying of Galvanised steel penstock with frame and spindle as per specification all complete and for all haulage distance as needed	Nos	6.00				
25	Diversion and Dewatering for complete works all complete and all haulage distance as needed			L.S.			
26	Site Clearance for complete works all complete and all haulage distance as needed			L.S.			
	Sub Total of (i)						
	ii) Mohana River (Kailali)						
1	Cutting, uprooting and disposal of grasses with light compaction, levelling and cleaning the site all complete for the preparation of site	Sq.m	31,328.00				
2	E/W filling with excavated borrowed soil for making Embankment in 22 cm thick layer by layer including breaking soil lumps, levelling, dressing etc. and compaction with 8/10 ton roller by using machine all complete and all haulage distance as needed	cu.m.	5,473.50				
3	E/W filling with ordinary soil including excavation for making Embankment in 22 cm thick layer by layer including breaking soil	cu.m.	37,129.60				
	lumps, levelling, dressing etc. and compaction with 8/10 ton roller by using machine all complete and all haulage distance as needed						
4	E/W filling with 30 cm thick ordinary sweet soil including excavation for making Embankment as per design, drawing and specification including shaping and trimming all complete and all haulage distance as needed	cu.m.	5,470.70				

SN	Description	Unit	Quantity	Rate in Figure	Rate in Words	Amount	Remark
5	Grass sodding works including sod cutting, transporting, placing in position and water sprinkling and Bio Engineering works (Plantation of suitable grass such as Napier, lemon grass etc.) all complete and for all haulage distance as needed	Sq.m	15,882.00				
6	Supply and Laying sub-base course of sand mixed gravel in 20 cm. solid depth including loading & transporting material, levelling surface, hauling all complete and for all haulage distance as needed	Sq.m	5,340.00				
7	Supply and Laying base course of solid thickness 10 cm of broken stones including surface levelling and hauling all complete & for all haulage distance as needed	Sq.m	5,340.00				
8	Rockfill embankment construction with graded stones as per specification all complete and for all haulage distance as needed	cum	3,094.50				
9	Earthwork Excavation in soft soils for side drain and disposal all complete and for all haulage distance as needed	cum	1,749.00				
10	Making roadside ditch from dry rubble masonry including haulage all complete and for all haulage distance as needed	cum	1,224.30				
11	Supply and laying of geo textile filter under gabion boulder filling as per the instruction of site engineer all complete and for all haulage distance as needed	Sq.m	29,061.00				
12	Earth work excavation for foundation in sand silt with clay mixed soil for launching apron and at side slope all complete and all haulage distance as needed	cu.m.	6,766.06				
13	Supply of Boulder and filling in Gabion box all complete and for all haulage distance as needed	cu.m.	9,133.88				

SN	Description	Unit	Quantity	Rate in Figure	Rate in Words	Amount	Remark
14	Supply and laying Machine made gabion box 10x12 hexagonal mesh size of 3mm dia mesh wire including selvedge wire and lacing wire of 3.9 mm and 2.4 mm respectively of required sizes all complete and all haulage distance as needed	Sq.m	82,141.80				
15	Supply and Laying RCC pipe (60 cm dia & 2.5 m long) and its accessories with 1:2 cement sand mortar, jute, etc all complete and for all haulage distance as needed	RM	47.50				
16	Concreting of foundation, vertical faces, walls (cement concrete 1:2:4 ratio) including supply of materials all complete and for all haulage distance as needed	Cum	27.61				
17	Concreting of foundation, vertical faces, walls (cement concrete 1:3:6 ratio) including supply of materials all complete and for all haulage distance as needed	Cum	14.06				
18	Supplying, cutting, bending, placing in position as shown in position in the drawings and binding by GI wire of reinforcement steel bars for RCC works all complete and for all haulage distance as needed	Kg	2,167.17				
19	Making wooden forms including supply of materials & removal after finishing the work	m2	73.05				
20	Supply and laying of 20-40mm well graded granular material as per design, drawing and specification all complete and for all haulage distance as needed	m2	46.13				
21	Supply and laying of Trash Rack at inlet as per specification all complete and for all haulage distance as needed	Nos	3.00				
22	Supply and laying of Pin jointed automatic flap gate as per specification all complete and for all haulage distance as needed	Nos	3.00				

SN	Description	Unit	Quantity	Rate in Figure	Rate in Words	Amount	Remark
23	Supply and Laying of Galvanized steel penstock with frame and spindle as per specification all complete and for all haulage distance as needed	Nos	3.00				
24	Diversion and dewatering for complete works all complete and all haulage distance as needed			L.S.			
25	Site Clearance for complete works all complete and all haulage distance as needed			L.S.			
	Sub Total of (ii)						
	iii) Khutiya River (Kailali)						
1	Cutting, uprooting and disposal ofgrasses with light compaction,levelling and cleaning the site all complete for the preparation of site	Sq.m	78,670.00				
2	E/W filling with excavated borrowed soil for making Embankment in 22 cm thick layer by layer including breaking soil lumps, levelling, dressing etc. andcompaction with 8/10 ton roller by using machine all complete and all haulage distance as needed	cu.m.	21,663.30				
3	E/W filling with ordinary soil including excavation for making Embankment in 22 cm thick layer by layer including breaking soil lumps, levelling, dressing etc. andcompaction with 8/10 ton roller by using machine all complete and all haulage distance as needed	cu.m.	51,115.80				
4	E/W filling with 30 cm thick ordinary sweet soil including excavation for making Embankment as per design, drawing and specification including shaping and trimming allcomplete and all haulage distance as needed	cu.m.	13,464.90				
5	Grass sodding works including sod cutting, transporting, placingin position and water sprinkling and Bio Engineering works (Plantation of suitable grass such as Napier, lemon grass etc.) all complete and for all haulage distance as needed	Sq.m	46,755.00				

SN	Description	Unit	Quantity	Rate in Figure	Rate in Words	Amount	Remark
6	Supply and Laying sub-base course of sand mixed gravel in 20cm. solid depth including loading & transporting material, levelling surface, hauling all complete and for all haulage distance as needed	Sq.m	21,600.00				
7	Supply and Laying base course ofsolid thickness 10 cm of broken stones including surface levelling and hauling all complete and for allhaulage distance as needed	Sq.m	21,600.00				
8	Rockfill embankment constructionwith graded stones as per specification all complete and for all haulage distance as needed	cum	7,425.95				
9	Earthwork Excavation in soft soilsfor side drain and disposal all complete and for all haulage distance as needed	cum	6,253.50				
10	Making roadside ditch from dry rubble masonry including haulageall complete and for all haulage distance as needed	cum	4,377.45				
11	Supply and laying of geo textile filter under gabion boulder filling as per the instruction of site engineer all complete and for all haulage distance as needed	Sq.m	76,912.50				
12	Earth work excavation for foundation in sand silt with clay mixed soil for launching apron and at side slope all complete and all haulage distance as needed	cu.m.	33,978.85				
13	Supply of Boulder and filling in Gabion box all complete and for allhaulage distance as needed	cu.m.	40,526.07				
14	Supply and laying Machine made gabion box 10x12 hexagonal mesh size of 3mm dia mesh wire including selvedge wire and lacingwire of 3.9 mm and 2.4 mm respectively of required sizes all complete and all haulage distanceas needed	Sq.m	287,015.65				

SN	Description	Unit	Quantity	Rate in Figure	Rate in Words	Amount	Remark
15	Supply and Laying RCC pipe (60 cm dia & 2.5 m long) and its accessories with 1:2 cement sandmortar, jute, etc. all complete and for all haulage distance asneeded	RM	102.50				
16	Concreting of foundation, verticalfaces, walls (cement concrete 1:2:4 ratio) including supply of materials all complete and for all haulage distance as needed	Cum	64.42				
17	Concreting of foundation, verticalfaces, walls (cement concrete 1:3:6 ratio) including supply of materials all complete and for all haulage distance as needed	Cum	32.81				
18	Supplying, cutting, bending, placing in position as shown in position in the drawings and binding by GI wire of reinforcement steel bars for RCCworks all complete and for all haulage distance as needed	Kg	5,056.74				
19	Making wooden forms including supply of materials & removal after finishing the work all complete and all haulage distanceas needed	m2	170.45				
20	Supply and Laying of 20-40mm well graded granular material asper design, drawing and specification all complete and for all haulage distance as needed	m2	107.63				
21	Supply and laying of Trash Rackat inlet as per specification all complete and for all haulage distance as needed	Nos	7.00				
22	Supply and laying of Pin jointed automatic flap gate as per specification all complete and forall haulage distance as needed	Nos	7.00				
23	Supply and Laying of Galvanisedsteel penstock with frame and spindle as per specification all complete and for all haulage distance as needed	Nos	7.00				
24	Diversion and Dewatering for complete works all complete and all haulage distance as needed			L.S.			

SN	Description	Unit	Quantity	Rate in Figure	Rate in Words	Amount	Remark
25	Site Clearance for completeworks all complete and all haulage distance as needed			L.S.			
	Sub Total of (iii)						
	TOTAL (A) (i+ii+iii)						
B	**GENERAL ITEMS**						
1	Preparation of as built drawing			L.S.			
2	Commission for PerformanceBond			L.S.			
3	Insurance of works			L.S.			
4	Third Party Insurance			L.S.			
5	Insurance against accident to thework man			L.S.			
	TOTAL OF COMPETITIVE ITEMS (A + B)						
C	**PROVISIONAL SUM ITEMS**						
4	Environmental Protection/Bio-Engineering/ Environmental Management Plan			P.S.		4,200,000.00	
	TOTAL OF NON-COMPETITIVE ITEMS (C)					**4,200,000.00**	
	VAT @ 13% of A + B						
	GRANT TOTAL (A + B + C + VAT)						

Annex 3: Environmental Safeguard Provision in Contract and Status of Compliance

Contract provision on	Particular conditions of contract	Status
GCC 2.3 (j)	i. Initial Environmental Examination (IEE) ii. Environmental Management Plan (EMP) iii. Environmental Monitoring Plan	i) IEE posted on adb.org
GCC80.1	The Contractor shall submit a site-specific environmental management plan (SEMP) and occupational health and safety plan based on subproject EMP within 15 days of signing of contract and get Employer's approval before field mobilization. Contractor will mobilize a full-time senior safeguard officer and a safety superintendent accredited in OHS. They will submit their biodata along with SEMP for Employer's approval prior to field mobilization. Contractor shall keep provision of a full-time safeguard & safety steward in each sub-project contract. The Contractor shall, throughout the execution of the Works and the remedying of any defects therein: a) Have full regard for the safety of all persons entitled to be upon the Site and keep the Site (so as the same is under his control) and the works (so far as the same are not completed or occupied by the Employer) in an orderly state appropriate to the avoidance of danger to such persons. b) Provide and maintain at his own cost all lights, guards, fencing, warning signs and watching, when necessary or required by the Project Manager or by any duly constituted authority, for the protection of the Works for the safety and convenience of the public or others. c) Take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation. d) Make his own arrangements for the supply of alternative sources of energy instead of firewood for cooking purpose at his camps and as a means of heating during the processing or preparation of any materials forming part of the Works. Collection of firewood from Government owned or privately-owned forest is strictly forbidden. e) Take all necessary precautions for the efficient protection of all surface and subsurface watercourses against all kinds of pollution arising from the execution of the Works f) Provide and maintain at his own cost efficient, adequate and sanitary latrine accommodation constructed to comply with the regulation in force in the Country for the use of the employees and labours and shall keep the latrines in a clean and sanitary condition. g) Modify any working practice or activity should the Project Manager consider, on the advice of the relevant Government	Contracts awarded to Mawa-Ratuwa and Mohana Khutiya River Basins.

Contract provision on	Particular conditions of contract	Status
	Departments, that the practices or activities will be harmful to wildlife. The Contractor shall comply with all applicable national, regional and local environmental laws and regulations. The Contractor shall (a) establish an operational system for managing environmental impacts, (b) carry out all of the monitoring and mitigation measures in accordance to Initial Environment Examination (IEE) and Environmental Management Plan (EMP), (c) allocate the budget required to ensure that such measures are carried out, and (d) comply with any corrective or preventative actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor implementation of the IEE and EMP. The Contractor shall submit quarterly reports on the carrying out of such measures to the Employer. Prolonged non-compliance by the Contractor of its responsibilities under the SEMP, upon three repeated notices of the Engineer to correct as required by the SEMP may, if such non-compliance is not attributable to actions or inactions of other parties, including the Employer, lead to penalty through deducting 1% of claim in the interim bills up to termination of contract. Such deducted amounts will not be paid to the Contractor unless the requirement is fulfilled, in the determination of the	
GCC 82	The Contractor shall comply with all relevant (a) labor laws and regulations applicable to the Contractors personnel, including staff, consultants, contractors, and agents; and (b) workplace health and safety laws. The Contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements. The Contractor shall base the employment relationship upon equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment or retirement, and discipline. The Contractor shall provide equal wages and benefits to men and woman for work of equal value or type.	Contracts awarded to Mawa-Ratuwa and Mohana Khutiya River Basins.

Annex 4: Environment Monitoring Checklist and the Safeguard Compliance Status of Sub-Project

	Activities	Monitoring Indicators	Compliance Status	Rating Score	Corrective Actions needed
Physical Environment	Spoil and Construction Materials conditions in the working sites and stock yard sites	Location of stock yard sites/ embankments			
		Quantity of construction materials stored in stock yard sites			
		Volume of spoil generated at embankments			
		Volume of safely disposed spoil			
	Quarry site management	Location			
		Volume/material			
		Clearance taken/Approval from the local government			
		Rehabilitation of the Quarry site			
	Air pollution and dust emission	Air Quality Monitoring(Dust Emission) Conducted			
		Spray of water for suppressing dust emission on earthen roads nearby embankments and stock yard sites			
	Water pollution	Water quality monitoring conducted at water source nearby working sites			
		Direct drainage discharge from camps in rivers			
		Spillage of materials like oil, grease, bitumen etc.			
	Material Handling and Storage	Stored in dedicated areas and not scattered			
		Any leakage and spills in storage & service yards			
Biological Environment	Any Issues of tree clearance and Beautification-Plantation nearby embankments	Approval received regarding tree cutting issues in the embankments			
		Tree loss (No and Name of Forest.)			
		Location			
		Plantation carried out (number of plants)			
		Plantation survival rate (%)			

	Activities	Monitoring Indicators	Compliance Status	Rating Score	Corrective Actions needed
	Bioengineering works	Location			
		Type of measures taken			
Socio-economic and Cultural	Events in Project Area	Name of Event			
		Location			
		No. of participants			
		Key Discussion/ achievement			
	Meeting convened by safeguard desk	Date			
		No. of participants			
		Key Discussion/ achievement/key issues			
	Grievances received and addressed	Name and Address of Person Registering Grievance			
		Description of Grievance Received			
		Actions Taken			
		Status			
	Unanticipated impact on community infrastructures	Details			
	Rehabilitation of affected structure	Details			

Annex 5: Environment Monitoring Checklist and the Safeguard Compliance Status of Sub-Project

Activities	Monitoring Indicators	Compliance Status	Rating Score	Corrective Actions needed
General safety provision	OHS plan prepared and approved			
	Safety Officer is available and competent as per requirement			
	Induction orientation provided to new worker			
Facilities - on site	Sufficiency of PPE to workers (%)			
	Use of PPE by workers (%)			
	Emergency contact details available on-site			
	Availability of drinking water for workers			
Labour Camp Management	Physical status of camp			
	Fencing of Camp			
	Availability of drinking water for workers			
	Separate sanitary facilities for male and female workers			
	Energy used for cooking			
	Facilities at camp			
	First Aid tool kit			
	Waste management			
	Separate medical room			
SOP	Preparation and approval of SOP			
	Activities carried			
	Monitoring of SOP			
Accident prevention and	Toolbox talk given to all workers on daily basis			

Activities	Monitoring Indicators	Compliance Status	Rating Score	Corrective Actions needed
management	Status on tools, equipment			
	Confined space entry is done through Permit to work system			
	Barricades installed with reflectors when working at sites			
Community Safety	Availability of Project information board			
	Safety Signage posted around the sites			
	Excavation areas provided with barricades around sites to protect accidental fall			
	Security guard deputed			
Traffic Management	Reflective traffic Signage available around the construction sites			
	Re-routing Signage sufficient to guide motorists			
Recording System	Daily monitoring sheets accomplished by the contractor EHS supervisor			

Annex 6: Photographs

Eroded/wash out earthen embankment due to recent flood, PRTW-04, Shanti Tole

Bamboo porcupine-temporary measures to check the eroded embankment, PRTW 04, Shanti Tole

Labors not wearing the safety gears during the Gabion launching construction work , PRTW-01

Eroded/wash out constructed earthen embankment (unprotected) due to recent flood, PRTW-12(L/B), Panchthare

Gabion launching apron under construction and no use of Safety Gears by labors, PRTW-01, Shanti Tole

Gabion revetment under construction, PRTW-01, Shanti Tole