

Environment Assessment and Review Framework (EARF)

August 2014

PAK: Federally Administered Tribal Areas Water
Resources Development Project (FWRDP)

Abbreviations

ADB	Asian Development Bank
EA	Executing Agency
EARF	Environmental Assessment and Review Framework
EMP	Environmental management plan
EIA	Environmental Impact Assessment
EMU	Environment Management Unit
FATA	Federally Administered Tribal Areas
FWRDP	FATA Water Resources Development Project
GOP	Government of Pakistan
GRM	Grievance Redress Mechanism
GRC	Grievance Redress Committee
GFP	Grievance Focal Point
IA	Implementing Agency
KP	Khyber Pakhtunkhawa
IEE	Initial Environmental Examination
PD	Project Director's
PIU	Project Implementation Unit
PMU	Project Management Unit
REA	Rapid Environmental Assessment
REA	Rapid Environmental Assessment
TA	Technical Assistant
ToP	Terms of Partnership

This Environmental Assessment and Review is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature. Your attention is directed to the "terms of use" section of this website.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

Contents

I.	INTRODUCTION	4
A.	ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY	44
1.	Asian Development Bank (ADB)	4
2.	Pakistan Environmental Protection Act (PEPA), 1997, Government of Pakistan	4
II.	ANTICIPATED ENVIRONMENTAL IMPACTS	5
A.	Description of the Project	5
B.	Anticipated Environmental Impacts	5
III.	ENVIRONMENTAL ASSESSMENT FOR SUBPROJECTS	6
A.	ENVIRONMENTAL SCREENING AND CLASSIFICATION	6
B.	Environmental Assessments and Environmental Management Plans	7
IV.	CONSULTATION, INFORMATION DISCLOSURE AND GRIEVANCE REDRESS MECHANISM	8
A.	Consultations and Information Disclosure	8
B.	Grievance Redress Mechanism	9
V.	INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES	11
A.	Environment Management Unit (EMU)	11
VI.	MONITORING AND REPORTING	12
	APPENDICES	14
	Appendix 1 Rapid Environmental Assessment (REA) Checklist: Irrigation	20
	Appendix 2 Outline of an Environmental Assessment Report	21

I. INTRODUCTION

This Environmental Assessment and Review Framework (EARF) has been prepared for the Federally Administered Tribal Areas (FATA) Water Resources Development Project (FWRDP) in Pakistan. The project will be operational in the federal territories at the western borders of Pakistan with Afghanistan. It focuses on increasing irrigation supplies in three tribal agencies, namely Mohmand, Khyber and Bajaur, to increase crop production and harvest water sustainably.

In order to adequately screen, assess, review, and monitor the environmental impacts of subprojects under the proposed project, a summarized Environmental Assessment and Review Framework is presented below. It includes assessment of legal framework and institutional capacity, anticipated environmental impacts, environmental assessment for subprojects and components, consultation, information disclosure, and grievance redress, institutional responsibilities of various agencies, and monitoring and reporting.

A. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

All subprojects selected will be screened, classified, and assessed based on ADB's Safeguard Policy Statement (2009), and Pakistan's legislation on environment protection.

1. Asian Development Bank (ADB)

FWRDP has been classified as ADB Environmental Category B. Category B projects require initial environmental examination (IEE), including public consultation and an environmental management plan (EMP). The IEE determines whether or not there are potential significant environmental impacts warranting an EIA. If there are none, the IEE becomes the final environmental assessment report.

2. Pakistan Environmental Protection Act (PEPA), 1997, Government of Pakistan

GOP enacted PEPA in 1997, and it covers entire Pakistan, including all its territories. Schedules I & II of the Act describe the criteria for various types of projects so as to qualify them for an IEE or an Environmental Impact Assessment (EIA). Table 1 describes the criteria, reproduced from the Act, for classifying projects, requiring an IEE. All IEEs are to be submitted to the Pakistan Environment Protection Agency (Pak EPA) for vetting and a no-objection letter to initiate civil works and construction phase.

Table 1 Environmental Classification of KWIP in accordance to PEPA 1997

Criteria for conducting an IEE by PEPA 1997, Schedule I	IEE Required
Dams and reservoirs with storage volume less than 50 million cubic meters or surface area less than 8 square kilometers	Yes
Irrigation and drainage projects serving less than 15,000 hectares	Yes

II. ANTICIPATED ENVIRONMENTAL IMPACTS

A. Description of the Project

The project is being proposed as a recommendation of the Water Assessment Study executed under the completed ADB supported FATA Rural Development Project of FATA Secretariat¹. The study identified 44 watersheds where the groundwater aquifers are depleting at a high rate, even under average weather conditions due to unplanned water extraction for irrigation and other associated purposes. It recommends shifting from groundwater to surface water, which remains totally unutilized, and identified potential sites for small reservoirs and diversion weirs in the 44 watersheds of Mohmand, Khyber and Bajaur Agencies of FATA.

The cost of FWRDP was tentatively estimated at \$40 million (as per ADB Concept Note for the S-PPTA) with ADB financing of \$30 million under a sector loan. The project will

- (i) Construct small reservoirs, diversion weirs and conveyance channels
- (ii) Develop command area, and
- (iii) Improve watershed management.

B. Anticipated Environmental Impacts

It is anticipated that the Project will have environmental impacts characteristic of construction of typical irrigation projects (such as dams, reservoirs, diversion weirs, etc.) in rural areas. Besides, site-specific impacts related to existence of environmentally sensitive areas and/or archeological/historical sites can occur. The potential environmental impacts include:

- *Physical Environment.* Potential impacts to area topography are likely to occur in the construction stage due to the possibilities of excavation, land leveling, blasting, borrow pits, and quarries. Earth-moving operations can cause soil erosion. Potential air quality impacts of the sub-projects during the construction phase can be anticipated due to fugitive dust generation in and around construction activities and related activities such as plants for crushing rocks, hot-mix and concrete mixer plants. Large water extraction volumes for construction purposes and camps can affect the availability of water for domestic or agricultural use. Fuel and lubricants used for transportation of material can contaminate groundwater and surface water if they are not properly stored and disposed. Potential impacts are also related to wastewater from construction camps. Noise and vibration impacts, generated by construction activities can affect noise-

¹ Water Assessment Study & Management Plan, Bajaur, Khyber and Mohmand, 2010, published by ADB and FATA Secretariat, produced under the ADB FATA Rural Development Project (FRDP)

sensitive receptors such as hospitals, schools in settlements and wildlife in specially protected areas;

- *Biological Resources.* Potential impacts related to biological resources include a risk of habitat fragmentation and loss, disruption of hydrology of streams, leaching of soils, soil pollution due to increased use of pesticides and fertilizers, improved accessibility and increase in poaching, physical disturbance of wildlife, removal of trees, road accidents involving wildlife etc. The alignments under sub-projects can run through existing or proposed protected areas;
- *Socio-Economic Environment.* Potential impacts to the social environment can include both adverse impacts such as loss of agricultural incomes downstream due to disrupted hydrology, unequal distribution of water in the command area, increased isolation of marginalized communities (elderly, women and children), resettlement, transmission of diseases and overall social unrest due to employing alien labor force, and positive impacts on income and unemployment trends. Potential impacts on archaeological, historical and cultural assets located within the project area can occur due to construction activities.

III. ENVIRONMENTAL ASSESSMENT FOR SUBPROJECTS

Following general criteria will be followed for all types of subprojects:

- (i) Types of projects listed in ADB SPS's Appendix 5 (ADB Prohibited Investment Activities List) will not qualify for ADB's financing.
- (ii) Subprojects that can have considerable adverse impacts to the environment or located in environmentally sensitive areas are subject to mandatory environmental assessment as detailed below.

All subprojects will be subject to environmental assessment process (Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA)). Environmental assessment is a generic term used to describe a process of environmental analysis and planning to address the environmental impacts and risks associated with a project. Depending on the significance of project impacts and risks, the assessment may comprise a full-scale environmental impact assessment (EIA) for category A projects, an initial environmental examination (IEE) or equivalent process for category B projects, or a desk review.

A. Environmental Screening and Classification

All subprojects to be included in the project will be screened to determine its environmental category based on the ADB's Rapid Environmental Assessment (REA) Checklist for Irrigation Projects. A template of the REA is given in Appendix 1. Once the project has been

classified as category A or B, requisite environment assessment will need to be carried out. In case of FWRDP, it is most likely that most subprojects will be classified as category B. In that case, an IEE will be mandatorily conducted, and established that a further detailed assessment in the shape of EIA is required or not.

B. Environmental Assessments and Environmental Management Plans

At the design stage of each sub-project, Project Directorate will identify potential direct, indirect, cumulative and induced environmental impacts on and risks to physical, biological, socioeconomic, and physical cultural resources and determine their significance and scope, in consultation with stakeholders, including affected people and concerned NGOs. This process will be undertaken as a part of an IEE exercise. For sub-projects with potentially significant adverse impacts that are diverse, irreversible, or unprecedented, the Secretariat will examine alternatives to the project's location, design, technology, and components that would avoid, and, if avoidance is not possible, minimize adverse environmental impacts and risks. The rationale for selecting the particular sub-project location, design, technology, and components will be properly documented, including, cost-benefit analysis, taking environmental costs and benefits of the various alternatives considered into account. The "no action" alternative will be also considered.

Impacts and risks will be analyzed in the context of each subproject's area that encompasses:

- (i) the primary subproject site location, in the context of local ecology and associated biodiversity;
- (ii) areas and communities potentially affected by cumulative impacts of the Subproject, and other sources of similar impacts in the geographical area; and
- (iii) areas and communities potentially affected by impacts from unplanned but predictable developments caused by the sub-project that may occur later or at a different location.

Environmental impacts and risks will also be analyzed for all relevant stages of the project cycle, including preconstruction, construction, operations, decommissioning, and post-construction activities such as rehabilitation or restoration.

For each subproject, an Environmental Management Plan (EMP) will be prepared that addresses the potential impacts and risks identified by the environmental assessment. The EMP will include the proposed mitigation measures, environmental monitoring and reporting requirements, emergency response procedures, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost

estimates, and performance indicators. The structure and composition of the EMP is provided in Appendix 2.

Objectives of an EMP will typically be as follows:

- Inform the project team as well as the contractors of the potential impacts, the mitigation measures and the costs involved in implementing the Plan
- Provide guidance on institutional and management structures required to implement the Plan
- Provide compliance requirements, monitoring parameters and frequency of monitoring
- Propose a capacity enhancement plan on areas related to environment and social management
- Enable the Environment and Social Management Team of the project, to ensure and oversee compliance

IV. CONSULTATION, INFORMATION DISCLOSURE AND GRIEVANCE REDRESS MECHANISM

FATA has a unique governance status, whereby all land is owned by tribes inhabiting the areas since generations. Any physical activity hence carried out needs the agreement of the locals, as well as land donation by them. Since it is an egalitarian society, chances of elite capture are minimum and major decisions are taken by *Jirga*, the tribal administrative and management body.

A. Consultations and Information Disclosure

For all subprojects, consultations will take place between Project Secretariat and local tribes, facilitated by the Political Administration of the said Agency. Detailed Terms of Partnership (ToP) will be developed, signifying the roles and responsibilities of all stakeholders and will be signed by the communities. A consultation exercise will be conducted at the design stage, with the following objectives:

- To identify the direct and indirect beneficiaries of the subproject
- Inform the communities of the costs of the subproject and verify the need for the subproject
- Inform the stakeholders of its impacts based on the REA Checklist classification and assessment

- Seek the consent of the communities and sign the ToP
- Inform the communities of the Grievance Redress Mechanism (GRM) and facilitate community nominations

A second round of consultations will take place prior to the initiation of construction, with the following objectives:

- To inform the stakeholders, including beneficiary communities, of the scope of work, construction schedule, and likely effects the construction activity will have on their routines
- Dissemination of EMP, and anticipated environmental impacts of the project, with the suggested mitigation measures
- Information about Grievance Redress Mechanism, and access of communities to it
- Overall benefits of the project

B. Grievance Redress Mechanism

- Keeping in mind the unique status of FATA, as well as the low literacy and technological development in the area, a simple but effective Grievance Redress Mechanism (GRM) will have to be designed by the Project Team. It will consist of multiple layers of contact points, from Sub Agency to FATA Secretariat level, with telephone (both stationary and mobile) being the main source of communications, followed by mail. The Political Administration will have to designate a focal point for GRM, so as to facilitate the tribal communities in contacting the Secretariat in Peshawar.
- A typical Grievance Redress Mechanism, to be established by the subproject, is described below:
 - FATA Secretariat/Project Director will facilitate the establishment of a Grievance Redress Committee (GRC) and Grievance Focal Point (GFP) at the project location prior to the Contractor's mobilization to site. The functions of the GRC and GFPs are to address concerns and grievances of the local communities and affected parties as necessary.
 - The GRC will comprise representatives from local political authorities (designate focal point by PA), affected parties and other well-reputed persons from related sectors, as mutually agreed with the Political Agent and affected persons. It will also comprise of Contractor's Environmental Specialist, FWRDP's Environment Specialist and Social Development/Safeguards Specialist. The role of the GRC is to address the Project related grievances of the affected parties that are unable to be resolved satisfactorily through the initial stages of the Grievance Redress Mechanism (GRM). The project will also assist

affected communities/villages identify local representatives to act as Grievance Focal Points (GFP) for each community/village.

- GFPs will ideally be designated personnel from within the community who will be responsible for i) acting as community representatives in formal meetings between the project team (including the contractors) and the local community he/she represents, and ii) communicating community members' grievances and concerns to the contractor during project implementation. The number of GFPs to be identified for the project will depend on the number and distribution of affected communities.

- A pre-mobilization public consultation meeting will be convened by the FATA Secretariat for KWIP, and will be attended by GFPs, contractor, Political Agents' representative and other interested parties (eg. Irrigation Dept, NGOs etc). Following the pre-mobilization public consultation meeting, environmental complaints associated with the construction activity will be routinely handled through the GRM as explained below:

- (i) Individuals will lodge their environmental complaint/grievance with their respective community's nominated GFP.

- (ii) The GFP will bring the individual's complaint to the attention of the Contractor.

- (iii) The Contractor will record the complaint in the onsite Environmental Complaints Register (ECR) in the presence of the GFP.

- (iv) The GFP will discuss the complaint with the Contractor and have it resolved;

- (v) If the Contractor does not resolve the complaint within one week, then the GFP will bring the complaint to the attention of the FWRDP's Environmental Specialist. The Environment Specialist will then be responsible for coordinating with the Contractor in solving the issue.

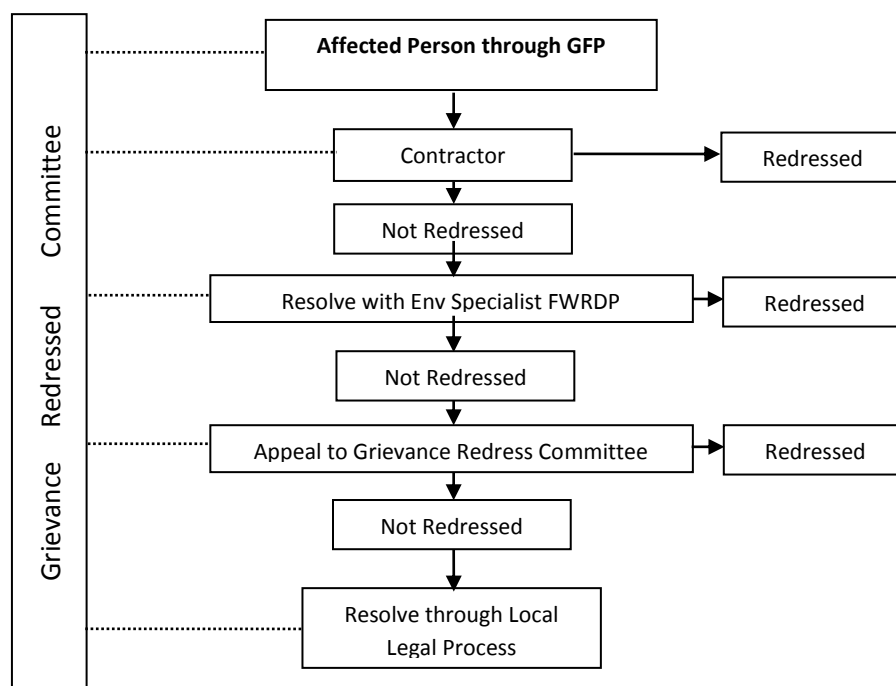
- (vi) If the Complaint is not resolved within 2 weeks the GFP will present the complaint to the Grievance Redress Committee (GRC).

- (vii) The GRC will have to resolve the complaint within a period of 2 weeks and the resolved complaint will have to be communicated back to the community. The Contractor will then record the complaint as resolved and closed in the Environmental Complaints Register.

- (viii) In parallel to the ECR placed with the Contractor, each GFP will maintain a record of the complaints received and will follow up on their rapid resolution.

- (ix) If the grievance is not resolved through this process, the issue will be taken to the local legal structures (Jirga, PA Office)

Proposed Grievance Redress Mechanism



V. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

A. Environment Management Unit (EMU)

For effective compliance of an EMP, roles and responsibilities will be defined at the onset, with relevant professionals hired as project team members at the executing or implementing agency (E/IA) levels. Moreover, these professionals will be placed in the project hierarchy in such a way whereby they cannot be influenced by the operational teams (engineers, procurement, contractors, etc.) in order to lessen their compliance monitoring responsibilities.

An EMU will be set up within the Project Director's (PD) Office at the E/IA level, with direct reporting line to the PD. An Environment Specialist and a Social Development Specialist will need to be a part of the EMU so as to ensure compliance to both parts of the EMP.

The responsibilities of EMU will be the following, but not limited to:

- Ensure effective compliance of EMP as per ADB Safeguards Policy requirements
- Provide technical assistance to the Project Team, in matters related to EMP in particular, and to environmental and social safeguards as a whole
- Put in place reporting mechanism and monitoring regimes for project staff as well as contractors
- Ensure that EMP related clauses specifically, and environment related clauses in general, are part of all the tender/bid/RFP documents.
- Provide technical input to the various training programs proposed as a part of the EMP
- Ensuring that all regulatory clearances (for example, Pak EPA) have been obtained before starting civil works for the subproject.
- Conduct on site spot checks to check the compliance level, as well as for any outstanding issue not being covered by the EMP
- Regularly report to PD as well as ADB on progress related to EMP Compliance

VI. MONITORING AND REPORTING

The extent of monitoring activities, including their scope and periodicity, will be commensurate with the project's risks and impacts. FATA Secretariat will be required to implement safeguard measures and relevant safeguard plans, as provided in the legal agreements, and to submit periodic monitoring reports on their implementation performance. ADB will require Secretariat to:

- (i) establish and maintain procedures to monitor the progress of implementation of EMPs;
- (ii) verify the compliance with environmental measures and their progress toward intended outcomes;
- (iii) document and disclose monitoring results and identify necessary corrective and preventive actions in the bi-annual environmental monitoring reports;
- (iv) follow up on these actions to ensure progress toward the desired outcomes,

(v) submit to ADB bi-annual environmental monitoring reports on implementation of the EMP and the environmental covenants in the legal agreements.

APPENDICES

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:

Sector Division:

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Protected Area			
▪ Wetland			
▪ Mangrove			

Screening Questions	Yes	No	Remarks
▪ Estuarine			
▪ Buffer zone of protected area			
▪ Special area for protecting biodiversity			
B. Potential Environmental Impacts Will the Project cause...			
▪ loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/cultural buildings/areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?			
▪ conflicts in water supply rights and related social conflicts?			
▪ impediments to movements of people and animals?			
▪ potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity?			
▪ Insufficient drainage leading to salinity intrusion?			
▪ over pumping of groundwater, leading to salinization and ground subsidence?			
▪ impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?			
▪ dislocation or involuntary resettlement of people?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ potential social conflicts arising from land tenure and land use issues?			
▪ soil erosion before compaction and lining of canals?			
▪ noise from construction equipment?			

Screening Questions	Yes	No	Remarks
▪ dust during construction?			
▪ waterlogging and soil salinization due to inadequate drainage and farm management?			
▪ leaching of soil nutrients and changes in soil characteristics due to excessive application of irrigation water?			
▪ reduction of downstream water supply during peak seasons?			
▪ soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides?			
▪ soil erosion (furrow, surface)?			
▪ scouring of canals?			
▪ clogging of canals by sediments?			
▪ clogging of canals by weeds?			
▪ seawater intrusion into downstream freshwater systems?			
▪ introduction of increase in incidence of waterborne or water related diseases?			
▪ dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ social conflicts if workers from other regions or countries are hired?			

Screening Questions	Yes	No	Remarks
risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			
community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			

A Checklist for Preliminary Climate Risk Screening

Country/Project Title:

Sector :

Subsector:

Division/Department:

Screening Questions		Score	Remarks ²
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?		

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1

² If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Very Likely	2
-------------	---

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High):_____

Other Comments:_____

Prepared by: _____

Appendix 2 Outline of an Environmental Assessment Report

This outline is part of the Safeguard Requirements 1. An environmental assessment report is required for all environment category A and B projects. Its level of detail and comprehensiveness is commensurate with the significance of potential environmental impacts and risks. A typical EIA report contains the following major elements, and an IEE may have a narrower scope depending on the nature of the project. The substantive aspects of this outline will guide the preparation of environmental impact assessment reports, although not necessarily in the order shown.

A. Executive Summary

This section describes concisely the critical facts, significant findings, and recommended actions.

B. Policy, Legal, and Administrative Framework

This section discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party.

C. Description of the Project

This section describes the proposed project; its major components; and its geographic, ecological, social, and temporal context, including any associated facility required by and for the project (for example, access roads, power plants, water supply, quarries and borrow pits, and spoil disposal). It normally includes drawings and maps showing the project's layout and components, the project site, and the project's area of influence.

D. Description of the Environment (Baseline Data)

This section describes relevant physical, biological, and socioeconomic conditions within the study area. It also looks at current and proposed development activities within the project's area of influence, including those not directly connected to the project. It indicates the accuracy, reliability, and sources of the data.

E. Anticipated Environmental Impacts and Mitigation Measures

This section predicts and assesses the project's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic (including occupational health and safety, community health and safety, vulnerable groups and gender issues, and impacts on livelihoods through environmental media), and physical cultural resources in the project's area of influence, in quantitative terms to the extent possible; identifies mitigation measures and any residual negative impacts that cannot be mitigated; explores opportunities for enhancement; identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions and specifies topics that do not require further attention; and examines global, transboundary, and cumulative impacts as appropriate.

F. Analysis of Alternatives

This section examines alternatives to the proposed project site, technology, design, and operation - including the no project alternative - in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. It also states the basis for selecting the particular project design proposed and, justifies recommended emission levels and approaches to pollution prevention and abatement.

G. Information Disclosure, Consultation, and Participation

This section:

(i) describes the process undertaken during project design and preparation for engaging stakeholders, including information disclosure and consultation with affected people and other stakeholders;

(ii) summarizes comments and concerns received from affected people and other stakeholders and how these comments have been addressed in project design and mitigation measures, with special attention paid to the needs and concerns of vulnerable groups, including women, the poor, and Indigenous Peoples; and (iii) describes the planned information disclosure measures (including the type of information to be disseminated and the method of dissemination) and the process for carrying out consultation with affected people and facilitating their participation during project implementation.

H. Grievance Redress Mechanism

This section describes the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental performance.

I. Environmental Management Plan

This section deals with the set of mitigation and management measures to be taken during project implementation to avoid, reduce, mitigate, or compensate for adverse environmental impacts (in that order of priority). It may include multiple management plans and actions. It includes the following key components (with the level of detail commensurate with the project's impacts and risks):

(i) Mitigation:

(a) identifies and summarizes anticipated significant adverse environmental impacts and risks;

(b) describes each mitigation measure with technical details, including the type of impact to which it relates and the conditions under which it is required (for instance, continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; and

(c) provides links to any other mitigation plans (for example, for involuntary resettlement, Indigenous Peoples, or emergency response) required for the project.

(ii) Monitoring:

(a) describes monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits and definition of thresholds that will signal the need for corrective actions; and

(b) describes monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation.

(iii) Implementation arrangements:

(a) specifies the implementation schedule showing phasing and coordination with overall project implementation;

(b) describes institutional or organizational arrangements, namely, who is responsible for carrying out the mitigation and monitoring measures, which may include one or more of the following additional topics to strengthen environmental management capability: technical assistance programs, training programs, procurement of equipment and supplies related to environmental management and monitoring, and organizational changes; and

(c) estimates capital and recurrent costs and describes sources of funds for implementing the environmental management plan.

(iv) Performance indicators: describes the desired outcomes as measurable events to the extent possible, such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods.

J. Conclusion and Recommendation

This section provides the conclusions drawn from the assessment and provides recommendations.

Sample Environmental Management Plan

Environmental Concerns	Mitigation Measures	Implementation	Supervision
IEE Approval	- Submit IEE to Fed EPA for approval and NOC for initiating construction	- Environment Specialist	Project Director
Excavation and blasting	- Contractor to be responsible as per contract document to minimize cutting of trees, use safety measures in handling explosives, prepare blasting schedules along with warning sirens, and ensure minimum damage to the landscape.	- Contractor	- Constructor Engineer
Construction waste	- The contractor will find a suitable landfill site alongside the stream for burying construction waste. No solid waste will be disposed into the stream.	- Contractor	- Construction Engineer - Environment Specialist
Labor camps and material storage	Contractor will - Locate the labor camps and stores, at 1 KM from the site at a secure location. - Sanitation system along with solid and liquid waste management system will be put in place Latrines with septic tanks and land fill site for solid waste will be identified and constructed.	- Contractor	- Construction Engineer - Environment Specialist
Soil Pollution due to fuel and oil spillage	- Contractor will follow strict rules for minimizing such spilling. - Labor associated with fuel filling and storage will be trained in optimum filling techniques, as well as penalties will be set for spilling diesel or motor oil. - In case of a spill, contractor will follow mitigation measures as per Guide Lines for Oil Spill Waste Minimization and Management issued by International Petroleum Industry Environmental Conservation Associate.	- Contractor	- Construction Engineer - Environment Specialist

Environmental Concerns	Mitigation Measures	Implementation	Supervision
Soil pollution due to excessive application of fertilizers and pesticides	- Agriculture extension programs targeting use of IPM, green manure, and limiting use of pesticides to required levels only will target farmer communities to inform and train them	- FATA Agriculture Directorate	- Project Director
Water quality and sedimentation load	- Periodic water sampling will be conducted in order to ascertain water quality during different seasons. Samples at locations, upstream and downstream of the dam, will be drawn for testing at the start of each season	- Environment Specialist	- Project Director
Use of irrigation water for cultivating high delta crops	- Cultivation of high delta crops will be strictly discouraged. Cropping pattern in accordance with the water balance model will be suggested and promoted.	- FATA Agriculture Department	- Project Director
Surface water contamination due to washing etc.	- Contractor will demarcate a washing area for all sorts of washing activities, with running water facility connected to a dedicated drain flowing into the septic tanks	- Contractor	- Construction Engineer
Drinking water	- Contractor will get stream water tested for chemical and biological contaminants, and assist in providing filtration to make water drinkable.	- Contractor	- Environment Specialist
Municipal liquid and solid waste	- Contractor will ensure solid waste bins are placed at labor eating and resting areas. Latrines and washing areas with septic tanks will be erected by the contractor at the construction site.	- Contractor	- Construction Engineer

Environmental Concerns	Mitigation Measures	Implementation	Supervision
Noise Pollution due to use of old machinery	- The contractor will ensure use of newer, well maintained machinery creates minimum noise and emissions as per NEQS 2000. - Vehicles used will be regularly checked for engine and exhaust noise. - Night time construction activities will be discouraged strictly, especially no blasting will take place after sunset.	- Contractor	- Construction Engineer
Dust from construction and smoke from plants and machinery	- Contractor will use water sprinkling to minimize dust. - The contractor will make best efforts to provide well maintained machinery in a workable condition and emits least possible emissions - Vehicles will be regularly tuned, and checked for vehicular emissions to reduce air pollution	- Contractor	Construction Engineer
Smoke from burning of waste or firewood	- Contractor shall strictly ban burning of waste or of wood, especially extracted from nearby shrubs and bushes. He must provide clean fuel to the labor to use for their daily purposes	- Contractor	Construction Engineer
Damage to flora, fauna and habitat	- Contractor will ban extraction from the surrounding vegetation for fuelwood (or any other purpose), hunting of any birds/mammals/fish by the labor employed. - If such a case is witnessed, it will be brought to the notice of the project management as well as the concerned APA	- Contractor - Environment Specialist - APA	Project Director
Tribal tensions and rivalries	- Ensure continuous liaison with the communities throughout the construction of the project, so as to identify any such incident in time. - Relevant political authorities will be kept abreast of the progress, as well as any such issue if in making.	Social Development Specialist	Project Director

Environmental Concerns	Mitigation Measures	Implementation	Supervision
Community safety risks due to both accidental and natural hazards	- Dam site will be located away from any settlement, or any public place where communities visit (graveyards, shrines, schools, etc.) - Public access to the site will be strictly prohibited, and a periphery fence will be erected. - Construction Camp Site will have first aid facility, with certain staff trained to handle emergencies. - Emergency Response Plan prepared and in place	- Contractor	- Social Development Specialist - Project Director
HSE protocols for labor	- Labour will be provided with protective gear including safety equipment, such as helmets, jackets, boots, torches, etc - Fire safety plans will also be prepared and drills carried out	- Contractor	- Construction Engineer