

measures and will be continually monitored by implementing and updating the EMP.

The overall finding is that the beneficial gains provided by Irrigation project will by far exceed the negative impacts – most of them being short-termed and without major interference to both the bio-physical and human environment. It is emphasized that the success of the EMP depends on the respective line agencies and institutions identified as key players in the implementation of the EMP. The timely and complete inclusion of the EMP's compliance clauses in the Contractor documents is mandatory to ensure the success of all environmental safeguard measures.

As the project is exclusively an irrigation system, all identified adverse environmental impacts during the rehabilitation and improvement works of the project will be of minor nature, easily to be mitigated by adequate implementation of the Environmental Management and Monitoring Plans. Entire command of the project components does not include any environmentally sensitive areas. The final conclusion is that, the project is environmentally safe and socially acceptable project.

A. INTRODUCTION

A.1 General

Environmental Assessment is a systematic process for evaluating the environmental consequences of any proposed Policy, Plan or Program initiative in order to ensure that the various concerns are fully included and appropriately addressed at the earliest stage of decision making at par with the economic and social considerations. The economic, social, and environmental change is inherent to development. Whilst, development aims to bring about positive change, it can lead to conflicts. In the past, the promotion of economic growth, as the motor for increased well-being, was the main development thrust with little sensitivity towards adverse social or environmental impacts. The need to avoid adverse impacts and to ensure long term benefits led to the concept of sustainability. This has become accepted as an essential feature of the development, if the aim of increased well-being and greater equity in fulfilling basic needs is to be met for the present and future generations. Environment Assessment thus, has three main functions:

- To predict positive and adverse impacts.
- To find ways to minimize/manage adverse impacts.
- To enhance positive effects.

The environmental study will be undertaken in accordance with ADB Environment Safeguards, 2009 requirement and recommendations. The abstract of TOR requires:

- An assessment of the environmental impacts of the project. Inclusion of costs for implementing recommended mitigation measures, environmental management and monitoring plans and any capacity strengthening measures in the project development costs; Preparation of
- Environmental Management Plan (EMP) or
- Initial Environmental Examination report and its summary (IEE)

A.2 Project Background

Federally Administered Tribal Areas (FATA) Water Resources Development Project (FWRDP) will be operational in the federal territories at the western borders of Pakistan with Afghanistan. It focuses on increasing irrigation supplies in three agencies, namely Mohmand, Khyber and Bajaur, to increase crop production and harvest water sustainability. The project is being proposed as a result of the Water Assessment Study executed under the completed ADB supported FATA Rural Development Project of FATA

Secretariat. The study identified 40 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 40 watersheds of Mohmand, Khyber and Bajaur Agencies of FATA.

With above background, ADB financed a Project Preparatory Technical Assistance, TA 8409-PAK (PPTA) for FATA Water Resources Development Project in preparing a project for financing consideration by ADB. ADB through FATA support implemented the PPTA during 2013-2014, in which a team of national consultants prepared a feasibility study for a water resources project for FATA. Based on the findings of the PPTA and on the request of Government of Pakistan, ADB approved, on 15 December 2014, the Federally Administered Tribal Areas Water Resources Development Project (FWRDP) contributing \$42.97 million from ADB's Special Funds. The Government will contribute \$4.93 million as counterpart fund. The ADB and Government of Pakistan signed the legal agreement on 17 April 2015 and declared the loan effective on 7 August 2015. The Project implementation period ends on 31 March 2020 and loan accounts will close on 30 September 2020.

Since the project is categorized as a category B project as per ADB's Safeguards Policy Statement 2009, an Initial Environmental Examination (IEE) exercise is required for each sub-project.

This Present study of Initial Environment Examination (IEE) is about construction of proposed Damano Weir in Bajaur Agency. Irrigated agriculture in FATA relies predominantly on groundwater abstracted by tube wells, dug wells and open wells; surface water utilization is low. Poor water resources management has become a major challenge to increasing agriculture productivity, which undermines efforts to improve the socioeconomic condition of FATA's inhabitants. Various factors such as poor water resource management, extensive deforestation and over grazing of rangelands have put immense pressure and stresses on FATA's watersheds. Their degraded condition has increased runoff and resulted in high soil erosion. In the absence of proper tree and vegetation cover, the run off leads to flash floods that often destroy the productive agricultural land in the valley bottom. This steadily worsening situation has severe repercussions for the overall sustainability and viability of the resource base of the watersheds, and thereby on the region's population, the majority of which are dependent on this resource base for their livelihoods. Increasing tree cover and the construction of check dams (where appropriate), will strengthen the watersheds, reduce

land erosion and the frequency and impact of flash floods, and improve water availability through replenishment of the aquifers.

A.3 PURPOSE OF THIS INITIAL ENVIRONMENTAL EXAMINATION (IEE)

Initial Environmental Examination (IEE) study takes into account the natural environment (air, water, land, flora & fauna), human health and safety. This study evaluates the Sub Project's potential environmental risks and impacts in its area of influence and outlines planning, designing and implementation by preventing, minimizing or mitigating for adverse environmental impacts and enhancing positive impacts throughout Sub Project implementation.

The civil work within the Sub Project area will cause some disturbances. The activities during construction period involve; construction of weir and water channels, development of command area, borrow material, stone pitching, camping grounds, material dump, machinery yard and other necessary facilities for the staff / labor to be engaged for the construction of the Sub Project. There is no such adverse environmental impact of the Sub Project but the construction-related impacts such as air pollution, noise and use of community resources can be well managed through the proper implementation of the mitigation measures, which have been identified in this report. The Sub Project has been classified as environmental category B according to ADB's Safeguards Policy Statement (SPS), 2009.

The Social Assessment (SA) has been conducted to evaluate the Sub Project's potential positive and adverse effects on the affected people and to examine Sub Project alternatives where adverse effects may be significant. The width, depth and type of analysis in the social assessment are proportional to the nature of the Sub Project and scale of its potential effects, positive or adverse, on the affected people.

The baseline data was developed and analyzed to identify potential environmental impacts of the Sub Project. A Rapid Environmental Assessment Checklist methodology was adopted to identify the high risk activities and suggest their mitigation measures. Where possible, eliminating the risk by altering the scope or method of execution of work was preferred rather than minimizing the risk with control measures.

A.4 Project Consultants

The client, FATA Water Resources Development Project, FATA Secretariat entered into a formal contract in Oct, 2016 for design and supervision consultants for the project with joint venture, led by BAK Consulting Engineers, AGES Consultants and Rehman Habib Consultants.

A.5 IEE Methodology

In the present study, standard methods were followed for Environmental and Social Impact Assessment. All the methods were structured for collection and organization of environmental baseline data and identification of environmental impacts using different survey tools and discussions with different stakeholders. The information, thus gathered, has been analyzed and presented in the form of a number of visual formats for easy interpretation and decision making.

A.6 Study Area

The study area related to IEE of the project comprised the following areas and features / aspects:

- i. Directly affected area of the project
- ii. Influence zone area that is the area in the region within 0.5 km from the project corridor.

A.7 Survey Process

A Survey was carried out in the project area for field studies including physical, biological and social impact assessment on June and July, 2017. The visit was made to the project area to understand the terrain, environment and social issues, and vegetation of the study area. During the visit, the preliminary interpreted data were tested and necessary corrections made after proper ground-truthing. The physiographic features on the satellite imagery appearing in different tones and textures were used to correlate image elements and ground features for accurate identification.

The purpose of the site visits was to familiarize with the physical, biological and socioeconomic environment of the proposed project area and the areas in the vicinity. Critical areas w.r.t environmental and social concerns were identified and assessment of positive as well as adverse impacts of the project on the environment was done. A summary of the main activities undertaken during the visit have been enlisted below:

- i. Collected information and required data from the project area for preparation of Initial Environmental Examination report.
- ii. Identified site-specific issues of microenvironment of the proposed project.
- iii. Information obtained regarding existing infrastructure in and around the project area.

- iv. Requirements of necessary mitigation measures to be integrated into the overall plan were identified.
- v. Consultations with the population settled in the vicinity of the project.
- vi. Survey of nearby Environmental Sensitive receptors.
- vii. Vegetation Survey
- viii. Different forest classes were identified and the degraded areas and scrubs were delineated. The grasslands/ alpine pastures and agricultural areas were also identified and delineated. The non-forest land cover was also delineated.
- ix. Interviews of the local for the presence and relative abundance of various animal species within each locality were also taken to have firsthand information.
- x. Data collection was carried out on habitat condition, animal presence by direct sighting and indirect evidences.

Spatial data base on the physiographic features was prepared based on the various data sources including Survey map of the project, topographic sheets, and satellite images data. These data were extracted and presented in accordance with the standard IEE methodology used for such studies.

The section on climatology has been taken from the Project Hydrology Report made by project Hydrologists.

The regional geology and seismo-tectonics of the region are discussed based on the various available data sources and reports. Particularly, the discussion on Project geology has been based on the data available in the Project Geology Report and field observations made in selective pockets of different project affected sites.

Land use and land cover mapping was carried out by standard methods of analysis of remotely sensed data followed by ground truth.

Forest types and plant species were recorded during the field visits and the floristic data for the catchment were sourced from the published literature. Based on the field data and available literature, frequency, density and cover of each species were calculated.

Rare and endangered species were identified referring to the Red Data Book of Pakistan and other available literature.

In order to collect the information on the fauna (mammals, avifauna, herpetofauna) in the area, primary as well as secondary sources were utilized.

The Forest Working Plans of the Forest Divisions falling in the project area were referred to for secondary information on the wildlife of the area.

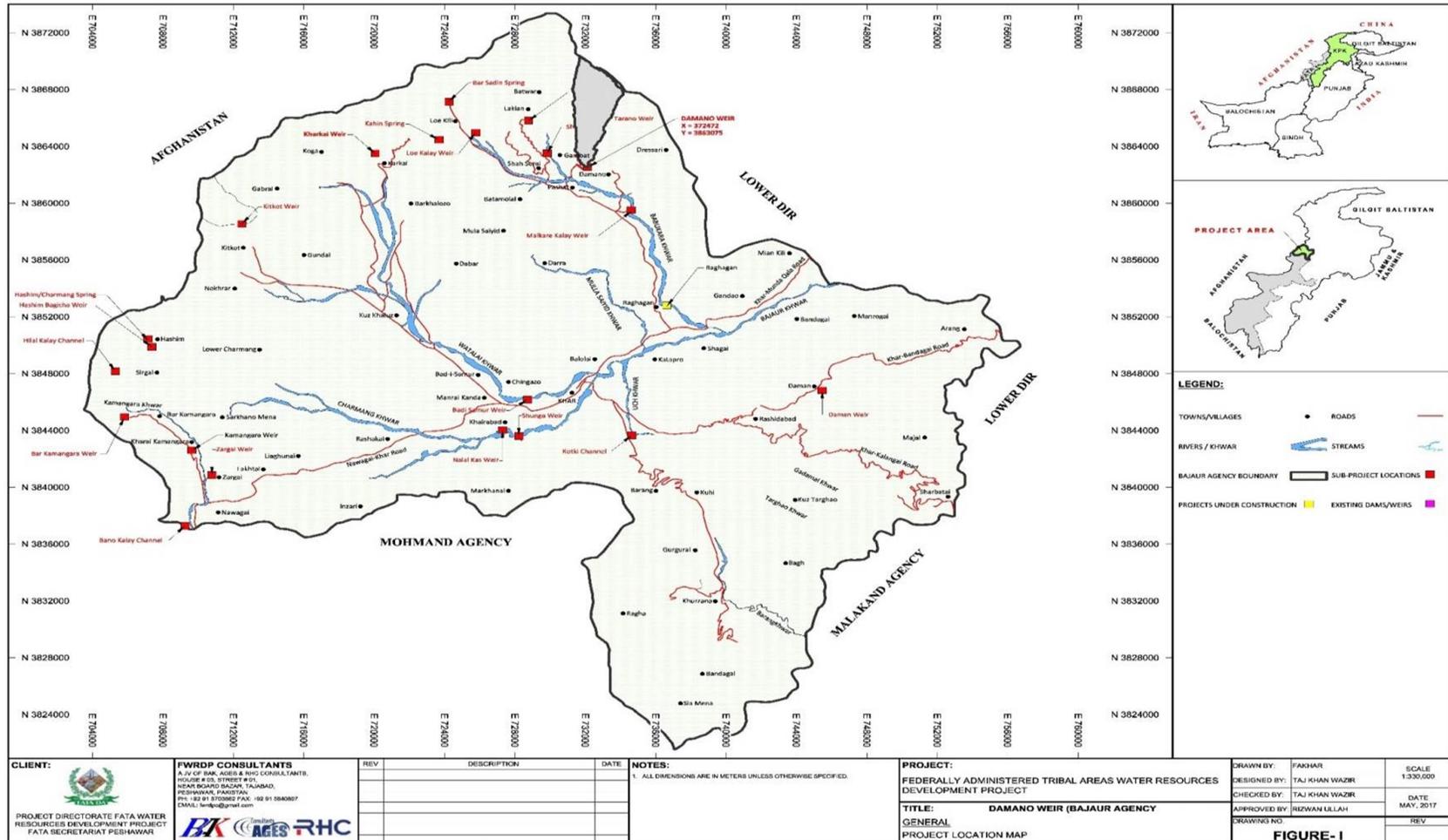


Figure 1.1: The Sub Project Location Map

A.8 Impact Prediction

Prediction of impacts has been based on a broad matrix group 'ecosystem' constituted by physical and biological components. The vulnerability of an ecosystem to various impacts resulting from an activity or multiple activities was identified and accordingly impacts predicted. The main theme of the ecosystem approach in visualizing impacts on various sets of environmental data revolves around the idea that natural processes and patterns are likely to be affected under impacts of a developmental activity.

In natural ecosystems, the impacts would surely change the existing state of equilibrium. In managed ecosystems and human societies, impacts could be of positive as well as adverse consequence. Similarly, in case of natural ecosystems, likelihood of adverse impacts could be seen in terms of direct and/or indirect, temporary or permanent impacts.

In the absence of long-term data availability on various environmental variables and also the paucity of studies on their likely responses to changes under developmental activities, it is difficult to predict impacts with a high degree of exactness and certainty. For example, it will not be possible to predict impacts of such a developmental activity on the behavioral patterns of animal and bird populations except for the fact that their habitats may come under stress. In that sense these predictive impacts could be said to have a limitation.

The impacts identified, in detail, were marked on the maps. Consultants utilized their own resources to carry out topographic survey of the project site. The Survey activities had been performed under the supervision and guidance of expert survey engineers.

The mitigation measures and environmental monitoring have been worked out in the light of environmental impacts assessed. Interviews, field visits/surveys, scoping sessions with officials/notables and concerned stakeholders were also made for the accomplishment of the study.

A.9 Report Format

Chapter A: Introduction consists of the background, project needs and objectives. It also explains the methodologies adopted for carrying out different environmental and socio-economic studies.

Chapter B: The legal and institutional framework section provides in detail, an overview of the government laws and rules that apply to regulate and control the environmental impacts due to project implementation, operation and maintenance,

together with the relevant guidelines, legislation and policies concerning the project.

- Chapter C:** It provides details of the project components and study of different project alternatives. This chapter also includes, route selection studies to select most viable route with maximum socio-economic benefits with minimum environmental adverse impacts.
- Chapter D:** It describes the baseline conditions like physical, biological and socioeconomic, and surrounding area people. It also provides information about the existing amenities like education, health, infrastructure, cultural heritage, water supply/availability, electricity, etc. in the area.
- Chapter E:** It provides the project impacts, both positive and negative/adverse, on the land, land based assets, infrastructure, crops, forest and fruit trees, existing amenities, sewage, waste material generation etc. due to the construction of the project. This section also deals with the mitigation of the adverse impacts identified in the shape of the compensation, rehabilitation, capacity building, provision of livelihood resources and other needed amenities etc.
- Chapter F:** This chapter ensures that healthy and friendly environment is created during the construction, operation and maintenance of the project by adopting effective Environmental Management Plan (EMP).
- Chapter G:** This chapter deals with consultation with different stakeholders of the project as well as the study area.
- Chapter H:** This chapter covers the process of complaints covers the process of complaints from stakeholders and general public, and also includes required actions taken on any issue raised by them during construction or operational phases of the project.
- Chapter I:** It summaries the positive and adverse impacts, mitigation measures of the adverse impacts and main recommendations based on the studies carried out and discussions/consultations with the affected persons, other stakeholders and notables of the project area.

B. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

B.1 General

This section provides an overview of the policy framework and national legislation that applies to the proposed sub-project. The project is expected to comply with all national legislation relating to environment in Pakistan and ADB Environmental Safeguards policy Statement (SPS) 2009.

B.2 National Policy and Legal Framework

The Pakistan's National Conservation Strategy (NCS) that was approved by the federal cabinet in March 1992 is the principal policy document on environmental issues in the country (EUAD/IUCN, 1992). The NCS outlines the country's primary approach towards encouraging sustainable development, conserving natural resources, and improving efficiency in the use and management of resources. The NCS has 68 specific programs in 14 core areas in which policy intervention is considered crucial for the preservation of Pakistan's natural and physical environment. The core areas, that are relevant in the context of the proposed sub-project, are pollution prevention and abatement and increasing energy efficiency while conserving biodiversity.

Prior to the adoption of the 18th Constitutional Amendment, the Pakistan Environmental Protection Act (PEPA) 1997 was the governing law for environmental conservation in the country. Under PEPA 1997, the Pakistan Environmental Protection Council (PEPC) and Pak Environmental Protection Agency (EPA) were primarily responsible for administering PEPA 1997. After the adoption of the 18th Constitutional Amendment in 2011, the subject of environment was devolved and the provinces have been empowered for environmental protection and conservation.

B.3 Regulations for Environmental Assessment, Pakistan EPA

Under Section 12 of Environmental Protection Act 1997, a project falling under any category specified in Schedule I (SRO 339, 10/2000) requires the proponent to file an Initial Environment Examination (IEE) report with concerned provincial or federal Environmental Protection Agency (EPA). Projects falling under any category specified in schedule II, the proponent shall submit an EIA with the Provincial or federal Agency, in this case Pakistan Environmental Protection Agency (Pak-EPA) Islamabad, as the project is located in FATA. Within 10 working days of IEE or EIA having been deposited, the concerned agency will confirm that the document submitted is complete for the purpose of review. During this time should the empowered agency require the proponent for revision, clearly citing those aspects that need further discussion the proponent will carry out necessary revision. Subsequently, the concerned agency will make

every effort to complete the process for an IEE review within 45 days and an EIA within 90 days of filing and issue a “No-Objection Certificate” to the project proponent.

B.4 Regulatory Clearances, EPA

In accordance with regulatory requirements, an IEE/EIA satisfying the requirements of the Pakistan Environmental Protection Act is to be submitted to Federal Environment Protection Agency for review and approval, and subsequent issuance of NOC before the commencement of construction.

B.5 Guidelines for Environmental Assessment, Pakistan EPA

The Pak-EPA has published a set of environmental guidelines for conducting environmental assessments and the environmental management of different types of development projects. The guidelines that are relevant to the proposed sub-project are listed below:

- Guidelines for the Preparation and Review of Environmental Reports, Pakistan, EPA1997;
- Guidelines for Public Consultations; Pakistan EPA May 1997;

B.6 Pakistan Environmental Protection Agency Review of IEE and EIA Regulations, (2000)

The Regulation classifies projects on the basis of expected degree of adverse environmental impacts and lists them in two separate schedules. Schedule I lists projects that may not have significant environmental impacts and therefore require an IEE. Schedule II lists projects of potentially significant environmental impacts requiring preparation of an EIA. The Regulations also require that all projects located in environmentally sensitive areas require preparation of an EIA. It also lists projects not requiring either an EIA or an IEE.

B.7 National Environmental Quality Standards (NEQS)

The National Environmental Quality Standards (NEQS) were first promulgated in 1993 and have been amended in 1995 and 2000. They have been revised and the latest NEQS were issued in 2010. These standards are also stringent with the International NEQs Regulation. The following standards that are specified in the NEQS are relevant to the proposed Sub Project. Air and Noise NEQS are also compared in the following Table 2.1, and Annex 111 at the end of the report.

Table 2.1: Comparison of Air & Noise NEQS with IFC/WHO EQS

Parameter	NEQS		EQS of IFC/WHO	
Air				
SO ₂ 24 Hours	120 µg/m ³		125 µg/m ³	
NO ₂ 1 year	40 µg/m ³		40 µg/m ³	
PM ₁₀ 24 hour	250 µg/m ³		150 µg/m ³	
Noise	Day	Night	Day	Night
Residential, Institutional/Educational	55Leq	45 Leq	55Leq	45 Leq
Industrial, Commercial	70Leq	65 Leq	70 Leq	70 Leq

- NEQS for Ambient Air – November, 2010 state the Maximum allowable concentration of pollutants (9 parameters) in gaseous emissions from vehicle exhaust.
- NEQS for Drinking Water Quality – 2010 describe the drinking water properties by outlining the defined physical and chemical parameters.
- NEQS for Noise – November 2010 states the maximum allowable limit of noise arising from vehicles in decibels (dB) separately for day and night times.
- NEQS for Waste Effluents –2000 states the Maximum allowable concentration of pollutants (32 parameters) in municipal and liquid industrial effluents discharged to inland waters, sewage treatment facilities, and the sea.
- These standards apply to the gaseous emissions and liquid effluents discharged by, campsites and construction machinery. The standards for vehicles will apply only during the construction phase of the Sub Project. Standards for ambient air quality have also been prescribed.

B.8 ADB's Safeguard Policy Statement (SPS), 2009

The Asian Development Bank's Safeguard Policy Statement (SPS) 2009 requires that environmental considerations be incorporated into ADB's funded project to ensure that the project will have minimal environmental impacts and be environmentally sound. Occupational health & safety of the local population should also be addressed as well as the project workers as stated in SPS.

All loans and investments are subject to categorization to determine environmental assessment requirements. Categorization is to be undertaken using Rapid Environmental Assessment (REA) checklists, consisting of questions relating to (i) the sensitivity and vulnerability of environmental resources in Sub Project area, and (ii) the potential for the Sub Project to cause significant adverse environmental impacts. Projects are classified into one of the following environmental categories:

Category A: A project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An Environmental Impact Assessment (EIA) is required.

Category B: A project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few, if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An Initial Environmental Examination (IEE) is required.

Category C: A project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.

Category FI: A project is classified as category FI if it involves investment of ADB funds to or through a financial intermediary (FI).

As a result of the completion of the REA checklist, the Sub Project has been placed in Category "B" thus a detailed Initial Environmental Examination has been prepared.

B.9 Project Categorization

Under Section 12 of Environmental Protection Act 1997, a project falling under any category specified in Schedule I (SRO 339, 10/2000) requires the proponent to file an Initial Environment Examination (IEE) report with concerned provincial or federal Environmental Protection Agency (EPA). Projects falling under any category specified in schedule II, the proponent shall submit an EIA with the Provincial or federal Agency, in this case Pakistan Environmental Protection Agency (Pak-EPA) Islamabad, as the project is located in FATA. Within 10 working days of IEE or EIA having been deposited, the concerned agency will confirm that the document submitted is complete for the purpose of review. During this time should the empowered agency require the proponent for revision, clearly citing those aspects that need further discussion the proponent will carry out necessary revision. Subsequently, the concerned agency will make every effort to complete the process for an IEE review within 45 days and an EIA within 90 days of filing and issue a "No-Objection Certificate" to the project proponent.

This project falls under schedule-I of the Pakistan Environmental Protection Agency (Review of IEE & EIA) Regulations, 2000 in water management, dams, irrigation and flood protection heading which states that dams and reservoirs with storage volume less than 50 million cubic meters of surface area less than 8 square kilometers require an IEE.

B.10 Other Environment Related Legislations

The Exhibit provides a summary of all legislations, guidelines, conventions and corporate requirements.

Table 2.2. Environmental Guidelines and Legislations

Legislation/Guideline	Description
National Environmental Policy (2005) (NEP)	NEP is the primary policy of Government of Pakistan addressing environmental issues. The broad Goal of NEP is, “to protect, conserve and restore Pakistan’s environment in order to improve the quality of life of the citizens through sustainable development”. The NEP identifies a set of sectoral and cross-sectoral guidelines to achieve its goal of sustainable development. It also suggests various policy instruments to overcome the environmental problems throughout the country.
The Forest Act (1927)	The Act empowers the provincial forest departments to declare any forest area as reserved or protected. It empowers the provincial forest departments to prohibit the clearing of forest for cultivation, grazing, hunting, removing forest produce, quarrying and felling, lopping and topping of trees, branches in reserved and protected forests
The Antiquities Act (1975)	It ensures the protection of Pakistan’s cultural resources. The Act defines “antiquities” as ancient products of human activity, historical sites, or sites of anthropological or cultural interest, national monuments, etc. The Act is designed to protect these antiquities from destruction, theft, negligence, unlawful excavation, trade, and export. The law prohibits new construction in the proximity of a protected antiquity and empowers the GOP to prohibit excavation in any area that may contain articles of archaeological significance. Under the Act, the project proponents are obligated to ensure that no activity is undertaken in the proximity of a protected antiquity, report to the Department of Archaeology, GOP, any archaeological discovery made during the course of the project.
Pakistan Penal Code (1860)	It authorizes fines, imprisonment or both for voluntary corruption or fouling of public springs or reservoirs so as to make them less fit for ordinary use.
The West Pakistan Fisheries Act 1961	The Fisheries Act requires protection of public waters as habitat of fish and other aquatic life. This is helping the Fisheries Department to provide effective protection to the fish and other aquatic life in the game Sanctuary upstream the barrage and the public waters downstream the barrage. Fish is a food to a good number of migratory birds.
The Public Health (Emergency Provision) Act 1954 read with West	These two laws cover the presentation and spread of human diseases, safeguarding the public health and providing and maintaining adequate medical services and other services essential to the health of the communities in the project area.