

**GOVERNMENT OF BALOCHISTAN
SECONDARY EDUCATION DEPARTMENT**



**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
(ESIA)
OF BALOCHISTAN EDUCATION SUPPORT PROJECT
(BESP)**

(April 2019)

Project Director

Project Management Unit

GLOBAL PARTNERSHIP FOR EDUCATION-BALOCHISTAN EDUCATION PROJECT

**SECONDARY EDUCATION DEPARTMENT
GOVERNMENT OF BALOCHISTAN**

Tel:

Acronyms

ADB	Asian Development Bank
AZRI	Arid Zone Research Institute
BEF	Balochistan Education Foundation
BEMIS	Balochistan Education Management Information
BESP	Balochistan Education Sector Plan
BHU	Basic Health Unit
BOQ	Bill of Quantity
BUIITEMS	Balochistan University of Information Technology, Engineering and Management Sciences
C&W	Communication and Works
CA	Coordinating Agencies
CMR	Central Mountains Range
CO	Carbon Monoxide
DEO	District Education Officer
DFAT	Department of Foreign Affairs and Trade Australia
DFP	District Focal Person
DPD	Deputy Project Director
EA	Environmental Assessment
EDSQA	Engineering Design Supervision and Quality Assurance
EFA	Education For All
EFP	Environmental Focal Person
EIA	Environmental Impact Assessment
EO	Education Officer
EPA	Environmental Protection Agency
ESIA	Environmental and Social Impacts Assessment
ESMP	Environmental and Social Management Plan
E&SSO	Environmental and Social Safeguard Officer
EUS	European Union Standard
FATA	Federally Administered Tribal Areas
FGD	Focus Group Discussion
GBHS	Government Boys High School
GBPS	Government Boys Middle School
GDP	Gross Domestic Product
GER	Gross Enrolment Rate
GHG	Green House Gases
GMS	Government Middle School
GOB	Government of Balochistan
GP	Gender Policy
GPE-BEP	Global Partnership for Education-Balochistan Education Project
GPS	Government Primary School
HDI	Human Development Index
I&P	Irrigation and Power Department Balochistan
ICT	Information Communication Technology
IEE	Initial Environmental Examination
ILO	International Labor Organization
IPs	Implementing Partners
IT	Information Technology
IUCN	International Union for Conservation of Nature
IWMI	International Water Management Institute
Km	Kilometer
KP	Khyber Pakhtunkhwa
MAF	Million Acre Feet

MCH	Maternal Care Health
MICS	Multiple Indicator Cluster Survey
NEQS	National Environmental Quality Standards
NGO	Non-Governmental Organization
NOC	No Objection Certificate
NGVS	No guideline Value Set
NRB	Nari River Basin
NWQMP	National Water Quality Monitoring Program
O&M	Operation and Maintenance
OP	Operational Policy
PAD	Project Appraisal Document
PC-1	Planning Commission Performa-1
PCC	Project Coordination Committee
PCRWR	Pakistan Council of Research in Water Resources
PD	Project Director
PEPA	Pakistan Environmental Protection Act
PGEB	Promoting Girls Education in Balochistan
pH	Potential of Hydrogen
PITE	Provincial Institute of Teacher Education
PLB	Pishin Lora Basin
PM	Particulate Matter
PMU	Project Management Unit
PPE	Personal protective equipment
PSC	Project Steering Committee
PTSMC	Parent Teacher School Management Committee
SDO	Sub-Divisional Officer
SDE	School Development Engineer
SE	Site Engineer
SED	Secondary Education Department
SMC	Site Monitoring Committee
Sq- km	Square Kilometer
TA	Technical Assistance
TCU	True Color Units
TDS	Total Dissolved Solids
TLM	Teaching and Learning Material
TPV	Third Party Validation
TSP	Total Suspended Particulate
UBC	Uniform Building Code
UNESCO	United Nation Educational, Scientific and Cultural Organization
UNICEF	United Nations Children Fund
USAID	United States Agency for International Development
WAPDA	Water and Power Development Authority
WB	World Bank
WHO	World Health Organization
ZRB	Zhob River Basin

4.1	Project Area	18
4.1	Geography.....	18
4.2	Topography and climate	19
4.3	Geology	20
4.4	Land Use and Soil Erosion	20
4.5	Soil Morphology	22
4.2	Seismology	23
4.6	Surface and Groundwater Resources	23
4.7	Meteorology, Climate, and Air Quality	30
4.8	Habitat, and Ecologically Sensitive Areas	31
4.9	Forests.....	31
4.10	Deforestation	33
4.3	Wetlands.....	34
4.11	Biodiversity degradation.....	34
4.4	Demographic Profile	34
4.12	Agricultural and Livestock’s Production.....	36
4.13	Drought	37
4.14	Healthcare Facilities.....	37
4.15	Education and Social Issues:	39
4.16	Education Facilities	39
4.17	Infrastructure Profile.....	43
4.18	Socio-economic Conditions.....	44
4.19	Culture, Religion, and Customs.....	45
4.20	Global Climate Change and GHG	46
5	Review of Implementation of ESIA/ ESMP in GPE-Balochistan Education Project.....	1
6	Stakeholder Consultations	3
6.1	Objective of Consultations.....	3
6.2	Consultations Carried out for during preparation of ESIA of GEP-BEP.....	3
6.3	Consultation with the PMU Staff of GPE-BEP	3
6.4	Consultation with the beneficiary representatives and PTSMC Members.....	3
6.5	Proposed Consultations during implementation of GPE-BEP.....	4
7	Analysis of Project Alternatives	5
7.1	No Project Option	5
7.2	Site Alternative.....	5
7.3	Design Alternative.....	6
7.4	Technological Alternatives.....	6
7.5	Options for Transport Vehicle.....	7
7.6	Management Option.....	7
8	Environmental and Social Impact Assessment and Mitigation Measures.	9
8.1	Environmental and Social Impact Assessment and Mitigation Strategies.....	9
8.2	Impact on physical environment	10
8.2.1	Land and Soil	10
8.2.2	Mitigation of Impacts on Land and Soil	11
8.2.3	Impacts of Surface Water Resources	11
8.2.4	Mitigation for Impacts on Surface Water Resources.....	12
8.2.5	Impacts on groundwater resources.....	12
8.2.6	Mitigation for Impacts on ground water resources.....	13
8.2.7	Impacts on Air Quality.....	13

8.2.8	Mitigation for impacts on air quality	14
8.3	Impacts on Biological Environment	14
8.3.1	Impact on natural vegetation	14
8.3.2	Mitigation for Impacts on natural vegetation.....	15
8.3.3	Impact on wildlife.....	15
8.3.4	Mitigation for biological impacts	15
8.4	Socio-economic impacts	16
8.4.1	Noise and Vibration	16
8.4.2	Mitigation for noise and vibrations impacts	16
8.4.3	Health and safety impacts.....	16
8.4.4	Mitigation for health and safety impacts.....	18
9	Environmental and Social Management Plan.....	1
9.1	Institutional Setup for ESMP Implementation.....	1
9.2	Roles and Responsibilities.....	2
9.3	Environmental Mitigation and Monitoring Plan	3
9.4	Environmental and Social Mitigation, Health and Safety Management Plan.....	4
9.5	Monitoring and Reporting	4
9.5.1	Internal Monitoring.....	4
9.5.2	External Monitoring/Third Party Validation	4
9.5.3	Reporting.....	5
9.6	Environmental Enhancement Guidelines	5
9.6.1	Rain Water Harvesting	5
9.6.2	Use of Alternate Energy Sources.....	5
9.6.3	Earthquake and Flood Resistant Designing of New Class Rooms	5
9.6.4	Eco-Friendly Design Guidelines for Construction of School.....	6
9.6.5	Tree Plantation and Landscaping.....	7
9.6.6	Health and Safety Guidelines.....	8
9.6.7	Ban on Child Labor	8
9.6.8	Livelihood Improvement Opportunities	8
9.6.9	Land Donations	8
6.1	Capacity Building and Training Programme.....	9
9.7	Disclosure.....	11
9.8	ESMP Cost	11
10	Grievance Redress Mechanism.....	1
10.1	Introduction.	1
10.2	Objectives of Grievance Redress Mechanism.....	1
10.3	Definition of Grievance/Complaint.....	1
10.4	Assessment of Grievance/Complaint.....	1
10.5	Duties of Grievance / Complaint Redress Committees	2
10.6	Grievance/ Complaints Redress Mechanism/Complaint Handling System Procedure	2
10.6.1	Minor Complaints/Grievances.	2
10.6.2	Major Complaints/Grievances	2
10.7	Complaints/Grievances Handling Procedure	2
10.7.1	Minor Complains/Grievances	2
10.7.2	Major Complaints/Grievances	3
10.8	Complaint/Grievance Redress Committees (GRCs)	3
10.8.1	Committee One.....	3
10.8.2	Committee Two.....	3

10.8.3	Committee Three (Complaint Redressal Cell (CRC))	4
10.8.4	General Complaints/Grievances at Public Affairs Cell	4
10.9	Procedure for Registering Complaint/Grievance and Redressing Complaint/ Grievance	5
10.9.1	Complaint/ Grievance Registering Means	5
10.9.2	Complaint/Grievance registration method.....	5
10.9.3	Dissemination of information regarding GRM.....	5
10.9.4	Record Keeping and Status of the Field Complaint/Grievance.....	5
10.9.5	Complain/Grievance Record and Registration Tool.....	5
	References	6

List of Tables

Table 1	Districts of Balochistan	2
Table 2	Legislations, Laws and acts of Government of Pakistan and Government of Balochistan and its relation with BESP Activities	1
Table 3	World Bank Operational and Safeguard Policies and their Relationship to BESP Activities	7
Table 4-	District wise Area and Population of Balochistan	18
Table 5-	Land Utilization Statistics of Balochistan	21
Table 6	Major River basins of Balochistan and Ground Water Availability (Billion Meter Cube (BCM))...	23
Table 7	Water quality test results of District Pishin.....	25
Table 8	Water quality test results of District Killa Abdullah	25
Table 9	Water quality test results of District Zhob	26
Table 10	Water quality test results of District Killa Saifullah.....	27
Table 11	Water quality test results of District Sherani	27
Table 12	Water quality test results of District Mastung.....	28
Table 13	Water quality test results of District Nushki	29
Table 14	Water quality test results of District Chagai	29
Table 15	District Wise Distribution of Forest Area (Acres)	32
Table 16-	District Wise Population Density	35
Table 17	District Wise Government and Private Health Facilities	38
Table 18	District Wise Government Schools in Balochistan	40
Table 19	District wise Government Colleges	41
Table 20	District wise enrolment in Schools.....	42
Table 21	District wise Roads in Balochistan.....	43
Table 22	Simplified Environmental and Social Impact's Matrix	1
Table 23	Role and Responsibility of Designated Officers	2
Table 24	Eco-Friendly Design Guidelines	6
Table 25	Capacity-building and Training Programme.....	9
Table 26	ESMP Training and Implementation Cost (Rs.)	11
Table 27	Environmental and Social Management Plan	1
Table 28	Health and Safety Management Implementation and Monitoring Plan for Construction Worksite.....	13

List of Exhibits

Exhibit 1 Map of Districts of Balochistan	1
Exhibit 2 Geophysical Features of Balochistan (Source IUCN).....	1
Exhibit 3 Seismic Zones of Pakistan (Source UN Habitat)	2
Exhibit 4 Annual Precipitation Balochistan (Source IUCN).....	3
Exhibit 5 Institutional Mechanism for ESMP Implementation and Monitoring	1

List of Annexures

Annex A List of Archaeological Sites and Monuments in Balochistan Protected under Federal Antiquities Act, 1975	8
Annex B Ecologically Protected Areas in Balochistan	9
Annex C IFC Environmental, Health and Safety Guidelines	11
Annex D Terms of Reference for Third Party Validation.....	20

FIRST DRAFT

Executive Summary

This Environmental and Social Management Analysis (ESIA), of Balochistan Education Support Project (BESP) has been prepared after completing designated steps for conducting Environmental and Social Impact Assessment (ESIA), carried out in compliance with the national environmental laws of Pakistan and the World Bank Operational Policies (Ops).

The BESP is continuation of the GPE-BEP and therefore, in this ESIA certain common features of ESIA Global Partnership for Education- Balochistan Education Project (GPE-BEP) have also been incorporated/ adopted, as referred in section 1.3, after carrying out thorough review of the ESIA of GPE-BEP.

The ESMP following a defined methodology identifies the environmental and social issues and associated potential adverse impacts which may possibly emerge as a result of project execution; and suggests appropriate mitigation measures to offset and/or minimize these impacts effectively. The report also suggests, where required, guideline for carrying out environmental enhancement while executing different infrastructure works to maximize benefits to the environment. The mitigation measures and Health and Safety guidelines have been organized in the form of an environmental and social management plan (ESMP) to be implemented by the Project Management Unit (PMU) of BES Project for avoiding or mitigating the significant environment and social impacts and achieving the project results while building upon the positive impacts of the project activities.

The scope of ESIA extends to the all 33 Districts, covering the entire 347190 Sq. Km of Balochistan, where activities of the BESP will be executed during project life. The ESIA was completed after thorough review of the existing ESIA Reports and ESMPs of GPE-BEP and PGEB Project and included thorough study of primary and secondary sources of information related to districts of province, collected during ESIA GPE-BEP and PGEB and their applicability in the current ESIA. The report also incorporates using secondary information, baseline condition of the project area which may be impacted upon by execution of the project activities.

The study is based on primary and secondary data sources. Primary sources of information soliciting information from key persons like Government functionaries, line department's briefs, focused group discussions with communities and visual photographs taken from the field during GPE-BEP execution. A specially developed impact assessment matrix has been used for collecting first-hand information from field observation, ascertaining, and characterization of the adverse impacts on selected parameters of the physical, biological, and social environments in the study area. The secondary sources of information include official documents of the Government of Balochistan and Federal Government, previous similar studies conducted in the province, papers and project brief provided by various line departments pertaining to the PGEB/GPE-BE/ BES

projects, websites of the Government and World Bank and other indirect sources of information collected from literature review and desk analysis.

The review concluded that the activities of BESP like GPE-BEP are isolated, small in scale and site specific in nature hence their impacts are of low to moderate in significance. The impacts pertaining to constructional activities on soil erosion and contamination, surface water quality, air quality, noise and vibrations, health and hygiene issues and inconvenience to public from improper stockpiling of material at schools. Whereby, the impacts associated to operation of Transport vehicle are on air quality, surface water quality, noise, vibrations. Health and safety issues, and inconvenience to public from traffic congestion and reckless driving of vehicles. Most of these impacts are of low to medium level and manageable by appropriate mitigation measures and good practices during project implementation and thereafter in operation phase.

The ESIA proposes mitigation measures for each stage of project activity. The site selection site selection and design stage measures include implementation of site selection guidelines, adopting eco-friendly designing of schools and apply appropriate building codes in designing of class rooms located in seismic zones and flood plains. The construction stage measures include preventive actions by the construction contractor to avoid adverse impacts, for example, covering the stockpiled material, limiting excavation activities after schooling hours, and ensuring worksite safety of school children, and workers. The mitigation measures relating to school operation include proper disposal of the solid waste, proper maintenance of water supply and sanitation system and ensuring supply of safe drinking water. The application of rainwater harvesting techniques, plantation of tree in and around newly constructed and functionalized class rooms are some of the environmental enhancement opportunities available in the area for which guidelines has been incorporated in the report. Similarly, the report also addresses the mitigation measures for impacts associated to the operation of Transport vehicle and also puts forth robust health and safety guideline for avoiding health and life risks which may arise from improper operation of vehicles.

The Environmental and Social Management Plan (ESMP) tailored for BESP provides a comprehensive mechanism for implementing the proposed mitigation measures and guidelines to attenuate the adverse impacts of the project to an acceptable level. The key components of the ESMP include environmental mitigation measures and guidelines for implementation by the architect / design engineer, construction contractor, Engineering Designing Supervision and Quality Assurance Firms (EDSQA) and monitoring by the environmental focal persons at the provincial and district level. The parameters for monitoring, roles and responsibilities of designated officers for monitoring have also been described in the ESMP.

An institutional mechanism has been proposed for implementing the mitigation measures and environmental guidelines by designating focal persons at provincial, district, and school level. The

School Development Engineers (SDE) of Project and Site Engineer (SE) of the EDSQA with the backstopping from Environmental and Social Safeguard Officer, will ensure upward and downward coordination, removal of bottlenecks, and maintaining a consolidated database. These designated officers will also ensure compliance of the ESMP mitigation measures and guidelines and carry out internal monitoring with active assistance of District Focal Persons (DFPs) of Education Department and community participation in the form of Parent Teacher School Management Committee (PTSMCs) at each school site.

The ESMP of GPE-BEP also provides internal monitoring mechanism to ensure compliance of the ESMP mitigation guidelines at various tiers and reporting of non-compliance issues for evaluation and mid-course correction by relevant actors amid project execution. External monitoring or third party validation in the form of an annual environmental audit has been proposed to be conducted by an experienced environmental expert or consultancy firm. The external monitoring is aimed at reviewing the ESMP implementation process, identify any environmental issues on ground, and to offer recommendations for keeping the project compatible with local context and changing conditions.

In order to ensure successful implementation, the ESMP proposes capacity building of the relevant staff and designated focal persons through specific and tailor made trainings on environmental and social impacts and mitigation measures. Fifty (50) training workshops viz. 5 at provincial level, 12 at divisional level and 33 at district level will be arranged during the entire project life. 37 Trainings will be imparted in the first year of the project whereby, one training for drivers and 12 two day trainings for teachers will be conducted in the 2nd year and 3rd year of the project respectively.

The Provincial and District level officers, EDSQA staff, contractors, teachers, SMIP staff and PTSMC members involved in the ESMP implementation will primarily attend these training workshops. These workshops will focus on environmental as well as social issues, confronted during ESMP implementation. Besides, these will also focus on sensitizing the participants about environmental and social stakes of the project, managing the on-ground problems, and assuring implementation of the ESMP.

The estimated cost of ESMP implementation of PKR 34.675 million for three-year project duration covers the capacity building cost of staff, including payments to the resource persons, training module and materials printing / reproduction costs, internal monitoring costs, ESMP implementation cost and costs associated to external monitoring/Third Party Validation (TPV). The cost of mitigation measures will be reflected in the tender documents of the project to be floated in the press and executed by the PMU through contractors.

The document also entails the grievance/complaint redress mechanism established for the project according to which the Project Director of the PMU is responsible for compliance of GRM under the project, assisted by the PMU M&E Section and DFPs/SMIPs. It allows a complainant to address any disagreeable decision, practice or activity arising from and /or non-compliance of ESMP and other relevant Safeguards concerns through a structured recording, handling and reporting mechanism within stipulated period of time.

FIRST DRAFT

1. INTRODUCTION

1.1 Background

The Government of Pakistan (GoP), in an effort to improve the deteriorated education indicators of Balochistan and KPK/FATA, resulting from heightened security and conflict in these areas for many years, requested The World Bank (WB) during 2012 has requested The World Bank for assistance to meet the needs of education sector in Balochistan. The World Bank established and administered a Multi-Donor Trust Fund (MTDF) to the tune of US\$ 10 million to respond to the assessed needs of Balochistan; by financing a 3 year long Promoting Girls Education in Balochistan Project (2012-2015) in 12 selected districts of Balochistan.

Meanwhile GoP joined Global Partnership for Education (GPE) in 2012 to which an allocation of US\$ 100 million was earmarked for Pakistan. Out of this pooled resource Government of Balochistan (GoB) received a financial grant of US\$34, with World Bank (WB) as Supervising entity and United Nations Children's Fund (UNICEF) as Coordinating Agency. GoB utilized this available resource for financing the, GPE-Balochistan Education Project (GPE-BEP) which aimed at supporting implementation of selected activities of Balochistan Education Sector Plan (BESP) (2013-2018). This 36 months long project, comprising of three (3) main components was started during 2015-16 and implemented its activities in all 32 districts of Balochistan.

The European Union (EU), realizing the education sector improvement needs of GoB, committed grant of Euro 20 million for complementing the selected activities BESP, with particular focus on enhancing school access for Girls; which were carried under GPE-BEP. EU has requested WB to administer part of this grant i.e. Euro 10 million for implementing a Project namely, Balochistan Education Support, in continuum of GPE-BEP. This project, being an additional support to existing GPE-BEP, has been classified in accordance with the World Bank's Operation Policy 4.01 (OP 4.01) as Environment Category "B" project because of a) construction activities associated with establishment of new class rooms, (b) functionalization of existing class room through rehabilitation of structures and allied facilities and (c) provision of green vehicles for transportation of girls and female teachers.

Therefore, in order to ensure compliance with the World Bank's Operation Policy 4.01¹ and National and Provincial legislations/regulations on environment, the Environmental and Social Impact Assessment (ESIA) of this project has been conducted. It is, however, pertinent to mention here that since the project is continuum of the PGEB and GPE-BEP, some of the study features of the ESIA of PGEB and associated addendum prepared for GPE-BEP, referred in the methodology sub-section, have also been adapted/incorporated in the current ESIA.

The principal World Bank Publications that were reviewed in the preparation of this ESIA are listed as under: -

1. The World Bank's Operations Manual

¹ The ESIA has been conducted using World Bank's Operational Policy 4.01 instead of the new Environmental and Social Framework (ESF), which suggests 10 Environment and Social Standards (ESS) since the captioned project is additional support to GPE-BEP and for which ESIA was prepared using OP 4.01.

2. The World Bank's Group Environment Health and Safety Guidelines
3. Environmental and Social Framework (ESF)

1.1 Objective of Study

The objective of this study is to assess and identify potential negative environmental and social impacts caused by the project activities in a manner consistent with World Bank's Operational Policy (OP 4.01) and the national and provincial legislations /regulations through preparation of an Environmental and Social Management Framework (ESMF).

The study also incorporates the good practices practiced under GPE-BEP for environmental enhancement at the schools and recommends institutional arrangement to manage the environmental and social aspects of the project. It further identifies environmental and social monitoring requirements for effective implementation of the mitigation measures and describes the environmental and social training and reporting mechanism during the project execution.

1.2 Scope of Study of BESP

The BES project will be executed in all 33 districts in Seven (7) administrative divisions of Balochistan province covering its entire geographical area of 347,190 Sq. Kilometers; therefore, the study encompasses the environmental and social impacts of BESP activities, which will be implemented in all these districts. **Exhibit-1 and Table-1.**

Table 1 Districts of Balochistan

S.No.	District	S.No.	District	S.No.	District
1	Awaran	12	Kharan	23	Nushki
2	Barkhan	13	Khuzdar	24	Panjgur
3	Chagai	14	Killa Abdullah	25	Pishin
4	Dera Bugti	15	Killa Saifullah	26	Quetta
5	Gwadar	16	Kohlu	27	Sherani
6	Harnai	17	Lasbela	28	Sibi
7	Jaffarabad	18	Lehri	29	Sikandarabad
8	Jhal Magsi	19	Loralai	30	Sohbatpur
9	Kachhi	20	Mastung	31	Washuk
10	Kalat	21	Musakhel	32	Zhob
11	Kech	22	Naseerabad	33	Ziarat

(source: www.balochistan.gov.pk: https://en.wikipedia.org/wiki/Districts_of_Pakistan)

1.3 Methodology

This study aiming at preparation of ESMF, has been conducted according to the Environmental Impact Assessment (EIA) Guidelines and rules and regulations of the Government of Pakistan and Balochistan and Work Bank's Safeguard Policy (Op 4.01). The methodology comprising of following steps were deployed:

-

1.3.1 Review of ESIA of GPE-BEP and its partial adaptation in BESP

The BES Project has been conceived to support and enhance the existing GPE-BEP established educational facilities and too in the similar environment, therefore, it was considered prudent to review the existing ESIA of GPE-BEP with a view to adaptation and inclusion parts of it into this ESMF.

The review process also involved through study of primary and secondary sources of information collected during ESIA of PGED and that of GPE-BEP and its relation and effectiveness in the study at hand. The review concluded as under: -

- The data pertaining to ESIA of PGEB and GPE-BEP, including reports of site visits, information collected from key persons like government functionaries, departmental briefs of line department, reports regarding focus groups discussion with communities and visual photographs of the educational facilities taken during field visits was reviewed and was found equally applicable to BESP.
- The Section pertaining to stakeholder consultations was also found very much relevant as inputs received from the stakeholders during consultations carried out during preparation of GPE-BEP are equally usable in the preparation of this ESMF.
- The activities of the PGEB and GPE-BEP was also compared for similarity using the project documents of all the three projects and it was concluded that the construction and rehabilitation activities planned under the BESP are identical to those carried out under PGEB and GPE-BEP. However, the project component under which transportation will be provided to the school girls and teachers have different environmental dynamics and require additional consideration in perspective of environmental impact and mitigation.
- Project alternative discussed in section 6 of ESIA of PGEB was found partially applicable to the BESP, consequent upon thorough review of the section in light of the project descriptions provided in project documents prepared by the World Bank and Government of Balochistan.
- The impact assessment matrix described in Section-7: Table 16 of ESIA of PGEB employed to assess the environmental and social impact of PGEB was also reviewed for its applicability in the current ESIA. It was concluded that owing to similarities in construction activities of GPE-BEP and PGEB, same impacts on physical, biological and socio-economic environment occur during execution of project activities of BESP. However, different environmental and social impacts are anticipated par execution of the project activity under which transport will be provided to the selected schools for too and fro transportation of school girls and teachers to schools from their home. Therefore, the impact assessment matrix can be adopted in the current ESIA after inclusion of the impact factors pertaining to transportation.
- The review of Baseline Information of the project area discussed in ESIA GPE-BEP concluded that this some of the baseline information would require inclusion additional / updated information; whereas the remaining sub-sections can be adopted as such because no recent information has been compiled pertaining to baseline conditions discussed in these sub-sections.

- The review of the ESMP of GPE-BEP also resulted in concluding that minor amendment in sub-sections pertaining to institutional setup, roles and responsibilities, internal monitoring, capacity building and training programs and ESMP cost will be required.

1.3.2 Preliminary Screening

The potential environmental and social issues associated with the BEP was identified through Preliminary screening of the project activities while following the WB guide lines. The significant environmental issues were that merit further assessed in detail in the subsequent phases and the issues and activities which were not relevant were screened out. The screening process was carried in the manner described below:

1.3.2.1 Understanding Project Activities

A thorough review of the proposed project activities listed in the project documents was carried out and in furtherance discussion with the relevant Education Manager and Development Manager of Project Management Unit (PMU) of GPE-BEP was conducted to assess the environmental impacts of these activities. Detailed meetings and discussions about project area, activities and associated environmental and social issues were also conducted with the Environmental and Safeguard Officer of GPE-BEP.

1.3.2.2 Literature Review

Secondary data on weather, soil, water resources, wildlife, vegetation, Green House Gases, Climate Change from ESIA of PGEB and GPE-BEP and published reports of the GoB was collected, compiled and reviewed.

1.3.2.3 Legislative and Policy Review

Information on legislations, regulations, guidelines and standard relevant to the project was also reviewed and compiled.

1.3.2.4 Identification of Potential Impacts

The information collected in the steps described above were reviewed and potential environmental issues arising from the project activities were identified and listed on merit.

1.3.2.5 Indicative List of Project Categories of WB

The indicative list of projects categories of WB, was compared with the information collected above steps and it was concluded that the BEP falls into category B.

Indicative List of Category B-Projects

- Small-scale infrastructure projects: power transmission and distribution networks, rural electrification, mini (run of the river with no major water impoundments) or micro-hydropower projects, small-scale clean fuel fired thermal power plants, renewable energy (other than hydropower), energy efficiency and energy conservation, rural water supply and sanitation, road rehabilitation, maintenance and upgrading; telecommunications, etc.;
- Health care service delivery, HIV-AIDS, education (with limited expansion of existing schools/buildings), repair/rehabilitation of buildings when hazardous materials might be encountered (e.g., asbestos, stored pesticides); and

- Small-scale irrigation, drainage, agricultural and rural development projects, rural water supply and sanitation, watershed management and rehabilitation, and small-scale agro-industries, tourism (small-scale developments).

1.3.3 Baseline Study

1.3.3.1 Primary Data

As regard primary data is concerned, since the BESP is a continuum of PGEB and GPE-BEP therefore, the primary data collected regarding physical and biological conditions surrounding schools, photographs taken during field survey and meeting conducted with the community during preparation of ESIA of GPE-BEP and firsthand information collected during execution of the GPE-BEP interventions in the field; is used as primary data in this ESIA. Since one additional project activity in the BESP viz. provision of transport is different from already executed activities of GPE-BEP, therefore, a more comprehensive Impact Assessment Matrix was tailored and filled in to identify the potential environmental and social issues relating to siting, design and construction, provision of transport and operation, temporary impact on livelihood and labor safeguard. Meeting with communities also provided useful qualitative information regarding solid and liquid waste, water availability and quality; health and hygiene issues. Quantitative data and studies on air, water and land collected and compiled by different department was also gathered for use in the current ESIA. Similarly, the information regarding water quality collected under GPE-BEP project was also made part this ESIA.

1.3.3.2 Secondary Data

The following documents have been reviewed for secondary data collection.

- i. Development Statistics of Balochistan, 2010
- ii. Balochistan Conservation Strategy
- iii. ESMF Balochistan Education Support Program
- iv. ESIA Promoting Girls Education in Balochistan Project
- v. ESIA GPE-Balochistan Education Project
- vi. Environmental Profile of Balochistan
- vii. Multiple Indicator Cluster Survey, Balochistan (2010)
- viii. Institutional Analysis of Air Quality Management in Urban Pakistan Draft Report
- ix. Balochistan Investment Guide (2009)
- x. Balochistan Development Issues and Prospects 2016
- xi. Comparative Statistics, By Province, Bureau of Statistics (2009)
- xii. Introduction to Special and Local Laws in Balochistan, by Mazhar Ilyas Nagi.
- xiii. Official Website of Balochistan Government
- xiv. PC-I of PGEB Project, Education Department, Balochistan
- xv. PC-I of GPE-BEP Education Department, Balochistan
- xvi. PC-I of BES Project Education Department, Balochistan

1.3.4 Impact Assessment

Assessment of impacts pertaining environment and social issues likely to arise from execution of activities of Balochistan Education Support Project (BESP) was carried out using an Impact Assessment Matrix (IAM). The impact assessment examined the interaction of the project activities with various

component of environment and its negative to adverse impacts on physical, biological and socioeconomic conditions and suggested appropriate mitigation measures.

1.3.5 Documentation

The study report was prepared according to the Environmental Impact Assessment (EIA) guidelines of Provincial Environmental Protection Agency and the World Bank's Operational Policies for Environmental and Social Safeguards. The report includes the findings of the assessment, project impacts and mitigation measures to be implemented during the execution of the proposed project activities.

1.4 Limitations of the study

Owing to the time constraint and prevailing security situation in Balochistan, field visits to entire project area was not possible therefore, greater reliance was made on local information, existing ESIA of PGEB and GPE-BEP and secondary sources of information gathered from staff of GPE-BEP who remained involved in project implementation and discussion with the communities of project targeted area in Quetta.

Professional judgement was used in predicting the environmental impacts of the program activities and mitigation measures proposed for reducing and minimizing the impacts during both construction and operation of phase of education facilities and use of transport.

1.5 Overview of the project and its activities

The overall objective of Balochistan Education Support Project (BESP) is to accelerate and further increase the number of children, in particular girls, enrolling in and completing quality elementary education in Balochistan. The project has the following specific objectives: -

- 1) To increase access to and retention in elementary education, particularly for girls, through community mobilization and awareness-raising, the construction and refurbishment of primary, middle and High school classrooms, including basic facilities, and recruitment and deployment of female teachers.
- 2) To enhance the quality of elementary education by reinforcing and retooling the system for the continuous professional development of teachers and;
- 3) To improve governance and management within the sector by improving the provincial data management, monitoring and planning systems.

The project under single component of Access and Equity will execute the following three (3) main activities: -

- ❖ Activity I -- Advocating education for girls by providing access to existing schools through provision of transport
- ❖ Activity II -- Classrooms functionalized to increase school access and support transition to higher levels of education.
- ❖ Activity III -- Mobilizing and engaging communities in siting and supporting primary schools and selection of female teachers through test-based recruitment.

1.6 Document Structure

The document has the following chapters which describes different stages of the ESIA study.

- **Executive Summary** provides a general summary of the ESMF contents and key findings of the study.
- **Chapter 1** introduces the study, objectives, scope and methodology of ESIA Study and briefly gives an outline of the project objectives, its components and associated activities.
- **Chapter 2** discusses the legislation, regulations, guidelines and policy frameworks of Government of Pakistan, Government of Balochistan and World Bank pertaining to environmental and social dimensions and their applicability to the BESP.
- **Chapter 3** gives detail account of the project, its component, physical activities and management structure of the BESP.
- **Chapter 4** presents the baseline conditions encompassing physical, chemical, biological, socio-economic conditions and cultural aspects of the project area based on review of the available data.
- **Chapter 5** This chapter discusses the compliance of ESMP of GPE-BEP during implementation.
- **Chapter 6** This chapter presents a summary of stakeholder consultants carried out during this study.
- **Chapter 7** presents various project alternatives if required; such as site alternatives, design alternatives and technological alternatives for implementation of BESP activities.
- **Chapter 8** describes the environmental and social impacts of the BESP project activities involving site selection, construction/refurbishment/rehabilitation, operational stages of schools; and operation of commutes. This chapter also proposes mitigation measures to reduce and minimize the impacts on environment.
- **Chapter 9** presents Environmental and Social Management Framework (ESMF) including institutional arrangements, mitigation plan, monitoring framework, budget, capacity building and inter-alia.
- **Chapter 10** This chapter presents the Grievance Redress Mechanism of the project

MAP OF BALOCHISTAN PROVINCE



Exhibit 1 Map of Districts of Balochistan

2 REGULATORY AND INSTITUTIONAL FRAMEWORK

The Environmental and Social Impact Assessment (ESIA) study has been carried out after careful review of the relevant environmental and social safeguard legislation and guidelines of the Government of Pakistan, Provincial Laws of Balochistan and the World Bank environmental safeguard policies applicable to the **BESP**.

2.1 Regulatory Framework of Governments of Pakistan and Balochistan

This sub-section entails, after careful review, the legislations, laws, acts, etc. of Government of Pakistan and Provincial Government of Balochistan which may be applicable to the BESP.

Table 2 Legislations, Laws and acts of Government of Pakistan and Government of Balochistan and its relation with BESP Activities

#	Legislation / Guidelines	Description
1	Balochistan Environmental Protection Act, 2012	<p>Post 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. Subsequently, the Balochistan government amended PEPA 1997 as Balochistan Environmental Protection Act 2012. The act is now the principal provincial legislation in Balochistan for the: -</p> <ul style="list-style-type: none">- Protection, conservation, rehabilitation and improvement of the environment- Prevention and control of pollution- Sustainable Development. <p>The Act is broadly applicable to air, water, soil, marine and noise pollution, as well as the handling of hazardous waste. Penalties have been prescribed to for those who contravene the provisions of this act. Powers of the Balochistan Environmental Protection Agency (BEPA) have been considerably enhanced under this legislation.</p> <p>Under section 15 of this Act, "No proponent of a project of public and private sector shall commence construction or operation unless be has filed an Initial Environmental Examination with the Government Agency designated by Balochistan Environmental Protection Agency, as the case may be, or, where the project is likely to cause an adverse environmental effects, an environmental impact assessment, and has been obtained from the Government Agency approval in respect thereof. This current Environmental and Social assessment has been made in consonance with the section 15 of this act.</p>
2	Pakistan Environmental Protection Act (PEPA) 1997	<p>Basic legislative tool empowering the Government of Pakistan to frame and enforce regulations for the protection of environment. The PEPA 1997 is broadly applicable to air,</p>

		<p>water, soil, marine and noise pollution, and handling of hazardous wastes. Penalties have been prescribed for those contravening provisions of the Act. Under section 12 of the PEPA 1997, no project involving construction activities or any change in the physical environment can be undertaken unless an IEE or EIA is conducted and a report submitted to the federal or provincial EPA.</p> <p>However, as a result of 18th Amendment this subject is now in the exclusive domain of the provincial government. The main consequences of this change are as follows: -</p> <ul style="list-style-type: none"> • The Ministry of Environment at the federal level has been abolished. Its functions related to the national environmental management have been transferred to the province. The international obligations in the context of environment will be managed by a ministry, the Ministry of Climate Change. • The Pakistan Environmental Protection Act 1997 (PEPA) is technically no longer applicable to the provinces. The provinces are required to enact their own legislation for environmental protection.
3	<p>Pakistan Environmental Protection Agency Review of IEE and EIA Regulations, (2000)</p>	<p>These Regulations classifies projects on the basis of expected degree of adverse environmental impacts and lists them in two separate schedules I and II. 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. The Regulations authorizes the government to issue specific guidelines for projects not listed in Schedule-I or II but located in environmentally sensitive areas to file an EIA for any type of project. However, the construction of schools or educational facilities is not listed in either schedule I or II of the IEE/EIA Regulation 2000.</p>
4	<p>National Environmental Quality Standards (1993, 2000 and 2013)</p>	<p>The NEQS specify standards for industrial and municipal effluents, gaseous emissions, ambient air requirements and emission levels for Sulfur dioxide and Nitrogen oxide, vehicular emissions and noise levels. The PEPA specifies the imposition of a pollution charge in case of noncompliance with the NEQS. During the construction and operation phase of the project NEQS will apply to all effluents and emissions. The BEBP project activities will comply with National Environmental Quality Standards (NEQS) and will ensure that the emissions generated from any project activity will be well within the NEQS.</p>

5	Pak EPA Environmental Guidelines	<p>The Pak-EPA has published a set of environmental assessment guidelines for conducting environmental assessments and the environmental management of different types of development projects. The guidelines that are relevant to the proposed project are listed below:</p> <ul style="list-style-type: none"> ➤ Guidelines for the Preparation and Review of Environmental Reports, Pakistan Environmental Protection Agency, 1997 ➤ Guidelines for Sensitive and Critical Areas, Pakistan Environmental Protection Agency, October, 1997 ➤ Environmental Assessment and Checklists for Construction of Rural Schools and Basic Health Units, (May,2004) <p>This ESIA has been prepared in line with the above guidelines.</p>
6	Land Acquisition Act, 1894 Including Later Amendments Viz Land Acquisition (Balochistan Amended) Act 1985	<p>The Land Acquisition Act (LAA) of 1984 and its Balochistan amended version is the de-facto policy governing land acquisition, resettlement and compensation in the country in general and in the province in particular. This Act, empower the Government of Balochistan to acquire any land for public use including the establishment and construction of educational facilities and provide compensation to the landowner according to the procedure described in this Act. The BESP does not involve any land acquisition under this act; as most of the constructional / rehabilitation activities shall be carried out within the vicinity of already existing schools that has been established on land provided by community by mutation in the name of the Government. Hence this act is not applicable to BESP.</p>
7	The Forest Act (1927)	<p>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. No protected forest is situated in the Project Area hence this act may not be applicable.</p>
9	The Federal Antiquities Act, 1975	<p>The Antiquities Act of 1975 ensures the protection of cultural resources in Pakistan. The Act provide legal basis to protect 'antiquities' from destruction, theft, negligence, unlawful excavation, trade and export. Antiquities have been defined in the Act as ancient products of human activity, historical sites,</p>

		<p>or sites of anthropological or cultural interest or national monuments. The law prohibits new construction of buildings in the proximity of a protected antiquity and empowers the Government of Pakistan to prohibit excavation in any area that may contain articles of archeological significance. Under this Act, the proponents of project are obligated to ensure that no activity is undertaken in the proximity of a protected antiquity, and if during the course of the project an archeological discovery is made, it should be protected and reported to the Department of Archeology, Government of Pakistan, for further action. This Act is to O&M activities of the proposed project as the construction activities will be carried out within the premises of existing schools.</p> <p>There are total 389 officially notified sites of cultural and archaeological importance in Pakistan protected under the Federal Antiquities Act, 1975. Out of these 389 sites, 27 sites are located in Balochistan province (Annex-A) No activity is anticipated to be carried out at or in the immediate vicinity of these sites under the proposed BESP.</p>
10	<p>The Provincial Motor Vehicles Ordinance of 1965 and The Balochistan Motor Vehicles (Amendment) Act No.01 of 2017.</p>	<p>This ordinance deals with the vehicle registration, penalty in default of registration and prohibit driving without the provision of appropriate license etc. According to this ordinance no one is allowed to drive a vehicle without proper registration and authorized licensed that too in accordance with the guidelines of this ordinance. The ordinance clearly states the power of court to order disqualification of a person convicted of an offence.</p> <p>It also outlines the speed limit of vehicles followed by the penalties of violating the same action. It also warns the drivers on using vehicle in unsafe condition as it may lead to make the others seated travelers vulnerable to serious accidents.</p> <p>This act is applicable for the project as under the BESP transportation facility will be provided to the girls' students and teachers at divisional level. The BESP will ensure that starting from the registration of car, hiring of a trained driver and while the driver is performing his duty all actions will be as per the provision of this act.</p>
11	<p>Balochistan Wildlife (Protection, Preservation, Conservation and Management) Act, 2014</p>	<p>The Balochistan Wildlife (Protection, Preservation, Conservation and Management) Act, 2014 caters to the protection of wildlife resources in the province. Besides ensuring an environment conducive for their rearing and livelihood, the Act also regulates hunting, poaching, possession, and trade in birds and animals. The Act also prescribes penalties for its contraventions. The Act also</p>

		<p>prescribes penalties for its contraventions. Government can notify and amend lists of protected ecosystems, national parks, wildlife sanctuaries, safari parks, and game reserves. This act is not applicable to BESP since all the activities of the project shall be carried out in the already established educational facilities and vehicles provided by the project for transportation of girls and teacher shall only ply on government constructed roads.</p>
12	<p>The Minimum Wages for Unskilled Labor Ordinance 1969</p>	<p>This ordinance was enacted to support the employment rights of workers. It has fixed the minimum wages for the unskilled workers employees. This ordinance bonds the employer to pay the wages to the working labor either directly or through a contractor. According to this ordinance the wage of the worker must include cost of living as well as the working days of employees have also been defined. This ordinance is applicable to the project as the execution of construction may not be completed without the hiring of working labor. The contractor working for the project will be bound to pay the worker as per the agreed guidelines of this ordinance.</p>
13	<p>The bonded labor system act 1992</p>	<p>Forced labor is any type of work or a kind of service in which someone engages involuntarily and under some implied pressure a manifest threat of a penalty or oppressive measure. Bonded Labor (which is a special type of Forced Labor) exists mainly in Asian and agricultural societies. Actually this type of labor mostly crops up in cases where monetary/financial deals occur such as loans, which if the debtor is unable to pay, he has to serve the creditor for some specified or unspecified term. Bonded labor can exist in following forms under different situations.</p> <ol style="list-style-type: none"> a. Bonded labor is prevalent in agriculture sector, brick kilns, domestic work and begging. b. Bonded labor of a Guarantor in exchange for debtor who was unable to pay off his debt c. Bonded labor in exchange of advance amount of money given before services are rendered received by a person or his family, d. Bonded labor as a consequence of some social or customary obligation, e. Bonded labor in exchange of an economic benefit/consideration received by a person or his family. <p>This act is applicable to the BESP as there may be chance of bounded labor at project focused construction sites. The BESP will ensure that all the contractors employed by the project will strongly be discouraged to opt for bounded labor.</p>

14	Pakistan Employment of Children Act 1991.	According to this Act, no child shall be employed or permitted to work in any of the occupations e.g. skilled and unskilled labor work or in any other activity who has not completed his fourteenth (14) year of age. The Act also laid down the standards and procedures for working hours and wages. The ESMP includes guidelines for employment of labors in the BESP project (Chapter 9 section 9.6.7) which will be implemented during project execution.
15	The Balochistan Cultural Heritage Preservation act 2010:	The act makes provision for preservation and protection of ancient places and objects of architectural, historical, archaeological, artistic, anthological, anthropological and national interest in the Province of Balochistan. This act acknowledges the right of province to acquire any type of heritage that is vulnerable to numerous threats. This act also states punishment for the intentional destruction to any of the archaeological site. This act may not be applicable in most of the cases since the project activities are limited to rehabilitation of class rooms, provision of missing facilities in schools and construction of new rooms that too in existing buildings. However, to be on safe side, if any cultural heritage or antiquity is found it will be handled as per guide lines of the aforementioned act and procedure described in (chapter 2 section 2.3.5)
	Balochistan Drinking Water Policy/Strategy 2017	Balochistan Drinking Water policy /Strategy provides strategic direction and a development framework to the stakeholders and addresses the issues and challenges faced by both to its urban and rural populations. It is envisaged that the efforts of all tiers of government and the local authorities shall be planned, executed and coordinated accordingly. The new policy/strategy proposes establishment of new drinking water supply systems, rehabilitation and upgradation of existing systems in urban as well as rural areas to ensure sustainable access of drinking water to the entire population of Balochistan.

2.2 World Banks' Operational Policy Framework.

This sub-section puts forth the World Banks' operation polices which were considered to be applicable to BESP.

Table 3 World Bank Operational and Safeguard Policies and their Relationship to BESP Activities

#	Operational Policy	Description
OP 4.01	Environmental Assessment	<p>This Operational Policy (OP) requires Environmental Assessment of the projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable with an objective improve decision-making process in these projects. The OP also categorizes projects on the basis of type, location, sensitivity, scale of the project and magnitude and nature of their potential environmental impacts and places them in one of the three categories Viz. A, B and C on merit and degree of severity.</p> <p>It is well understood that BESP activities are additional support to the activities of GPE-BEP and are likely to have low to medium level of adverse impacts on environment and human population therefore, the project, while in lieu of indicative list project categories of World Bank, has been classified as Category B Project.</p> <p>This ESIA and associated ESMF been prepared for in response to Operational Policy 4.01 considering the cumulative potential environmental and social impacts arising from execution of activities of BESP.</p>
OP 4.04	Natural Habitat	<p>The conservation of natural habitats, like other measures that protect and enhance the environment, is essential for long-term sustainable development. Through this OP, the WB supports the protection, maintenance, and rehabilitation of natural habitats and the sustenance of their functions.</p> <p>The BESP activities include limited quantum of constructional activities, related to rehabilitation of classrooms for their functionalization, construction of additional rooms, provision of facilities in already established schools and provision of transport for girls and teachers on divisional basis. None of these activities will affect any of the local or regional natural habitats. Therefore, this OP is not triggered.</p>
OP 4.09	Pest Management	<p>Through this OP, the WB supports a strategy that promotes use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides.</p> <p>The BESP does not involve any activity relating to agriculture production such as use of pesticides, fertilizer or other</p>

		chemical inputs except painting of doors and windows. Hence, this OP is not applicable to the BESP and the OP does not trigger.
OP 4.10	Indigenous Peoples	<p>This OP defines the process to be followed if the Program affects the indigenous people (i.e., people having the following characteristics: self-identification as members of a distinct indigenous cultural group, and recognition of this identity by others; collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories; customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and an indigenous language, often different from the official language of the country or region).</p> <p>This OP is not applicable to the BESP project since there are no reported indigenous people in the project area.</p>
OP 4.11	Physical Resources Cultural	<p>The World Bank’s general policy regarding cultural property (i.e., sites/artefacts of archaeological, cultural, historical, or religious significance) is to assist in their preservation, and to avoid their elimination. The construction activities the BESP is not likely to pose any risks to the cultural properties, assuming that they are already there and will not include any large-scale excavations or demolition of buildings. Hence no cultural property is likely to be affected which may trigger this OP. However, should any such sites or artefacts are discovered during project implementation, will be reported to the concerned department for preservation according to the relevant laws² and guidelines³. Detailed procedure for “chance find” management of archaeological site or artefacts is given in(Chapter 2 Section 2.3.5)</p>
4.12	Involuntary Resettlement	<p>This OP includes safeguards to address and mitigate the impoverishment risks (dislocation, asset loss, income loss, and others) associated with the involuntary resettlement caused due to the project operation.</p> <p>The BESP operations such as rehabilitation of classrooms for their functionalization, construction of additional rooms, provision of facilities in already established schools and provision of transport for girls and teachers on divisional basis does not involve any land acquisition. Since these operations</p>

² The Federal Antiquities Act, 1975

³ Guidelines for Environmentally Sensitive and Critical Area (October, 1997)

		<p>will be carried out in already established schools as continuation of the operations of GPE-BEP</p> <p>Most of the construction of new rooms as part of the project will be carried out on in the existing school premises thus, it will not cause any involuntary resettlement. Hence, this OP does not trigger.</p>
OP 4.20	Gender and Development	<p>The objective of the Bank's gender and development policy is to assist member countries to reduce poverty and enhance economic growth, human well-being, and development effectiveness by addressing the gender disparities and inequalities that are barriers to development, and by assisting member countries in formulating and implementing their gender and development goals. In view of applicability of this policy the BESP is designed to achieve gender parity by up-gradation of 100 girls' schools in the province through construction of additional rooms in these schools, functionalization through rehabilitation/refurbishment of rooms in 900 girls' schools, provision of transport for one school in an administrative division for girls and teachers and employment of female teachers.</p> <p>At community level women would be encouraged to become members of Parent Teacher School Management Committees (PTSMCs). Additionally, boys and men would be engaged for formation of local community groups as protection mechanism to ensure that enrolment and retention of the girls particularly at the middle level and teacher turnover and absenteeism can be kept at minimal level.</p>
OP 4.36	Forests	<p>The objective of this OP is to assist the WB's borrowers to harness the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests.</p> <p>The rehabilitation and construction work under BESP will be carried out in the existing School, which are in the rural and urban areas and therefore, designated forest area is not likely to be affected. Minor cutting of trees, if any, will be compensated through tree plantation in the school premises. Hence, this OP does not trigger</p>

OP 4.37	Safety of Dams	<p>This policy seeks to ensure that appropriate measures are taken and sufficient resources provided for the safety of dams the World Bank finances.</p> <p>This OP is not applicable since the project does not involve any work relating to the dam construction.</p>
OP 7.50	Project on International Waterways	<p>This OP defines the procedure to be followed for the WB financed projects that are located on any water body that forms a boundary between, or flows through two or more States. This OP is not applicable since the BESP does not involve any works on international waterways.</p>
OP 7.60	Project in Disputed Areas	<p>Projects in disputed areas may raise a number of delicate problems affecting relations not only between the Bank and its member countries, but also between the borrower and one or more neighboring countries. In order not to prejudice the position of either the Bank or the countries concerned, any dispute over an area in which a proposed project is located is dealt with at the earliest possible stage.</p> <p>The BESP interventions and schools are not located in any disputed areas. Hence, this OP does not trigger.</p>
-	Policy on Access to Information	<p>The World Bank recognizes that transparency and accountability are of fundamental importance to the development process and to achieving its mission to end extreme poverty and promote shared prosperity. This policy sets out Banks' Policy to access to any information in its possession, except for information whose disclosure could cause harm to specific parties or interest. This policy is applicable to the BESP and the Education Department; Government of Balochistan will provide access of public to this ESIA and other project related documents.</p> <p>In compliance of Policy, this ESIA will be publicized and disclosed on the website of Education Department, Government of Balochistan and the Infoshop of the World Bank. Hard copies of ESIA will also be shared with all the project staff and all the District Education Officers (DEO) and DFPS.</p>

	World Bank Guidelines on Environment	<p>The principal World Bank publications that were reviewed in the preparation of this ESIA study contain the following environmental guidelines:</p> <ul style="list-style-type: none"> ➤ Pollution Prevention and Abatement Handbook 1998: Towards Cleaner Production (World Bank, 1999) ➤ Environmental Assessment Sourcebook, Volume I: Policies, Procedures, and Cross-Sectoral Issues (World Bank, 1991) ➤ Environment Assessment Sourcebook, (World Bank, 1999)

2.3 Environmental Institutional Framework

2.3.1 Pakistan Environmental Protection Agency

Pak-EPA is the Federal environmental institution responsible for administering the provisions of the Pakistan Environmental Protection Act, 1997. The Pak-EPA is required to ensure compliance with the NEQS, establish monitoring and evaluation systems, and both identify the need to, as well as initiate legislation whenever necessary. It is thus the primary implementing agency in the hierarchy of environmental management. The provincial EPAs are the provincial arms of the federal EPA. Federal EPA has delegated powers to its provincial agencies to administer and implement the provision of the Act in its jurisdiction. One of the functions delegated by the Pak-EPA to the provincial EPAs is the review and approval of environmental assessment reports.

2.3.2 Environmental Protection Agency, Balochistan

Environment after 18th Constitutional amendment has become provincial subject. Therefore, EPA Balochistan is the relevant Agency to review and grant environmental approval to the ESIA studies conducted in the province. The provincial EPA is responsible and legally authorized Agency to monitor and implement the ESIA recommendation and conduct public hearing on the ESIA report.

2.3.3 Forest and Wildlife Department, Balochistan

Wildlife conservation and forest management is also a provincial subject. In Balochistan, the implementation of Balochistan Wildlife (Protection, Preservation, Conservation and Management) Act, 2014 and formulation of policy decisions are the responsibility of the Balochistan Wildlife Management Board.

2.3.4 Directorate of Archaeology, Balochistan

Archaeology Department Balochistan is a provincial department responsible for protection and conservation of archaeological sites, monuments, and other sites protected under the Federal Antiquities Act, 1975.

The Project Management Unit, GPE-BEP/BESP project will be obligated to ensure that no construction activity is undertaken in the proximity of a protected antiquity, and if during the course of the project an archeological discovery is made, it will be reported to the Department of Archeology, Balochistan.

2.3.5 Procedure for “Chance Find” Management of Cultural and Archaeological Sites

Under BESP the only construction work that has been planned is that of additional rooms in only 100 girls’ schools. Such construction would may involve excavation in the ground for laying foundations. In case during excavation of foundations or plinth, historical remains, antiquity or any other object of cultural or archaeological importance are unexpectedly discovered during at the selected site of construction under the **BES** project, the following procedures shall be adopted:

1. Stop excavation or construction activities.
2. Delineate the discovered site area.
3. Secure the site to prevent any damage or loss of removable objects. In case of removable antiquity or sensitive remains, a night guard shall be deployed at the site until a responsible authority take over the site for protection and preservation.
4. Inform the Project Management Unit, BESP immediately which in turn will inform the Directorate of Archaeology Department, Balochistan or Federal Directorate of Antiquities whichever is nearer and approachable within 24 hours.
5. Responsible authorities would take over the charge of protecting and preserving the site further before deciding on the proper procedures to be carried out
6. The Directorate of Archaeology Department or Antiquities will perform an evaluation of the finding. The significance and importance of the findings will be assessed according to various criteria and laws relevant to cultural and archaeological heritage including historic, social, cultural and economic values.
7. Decision on how to handle the finding will be reached based on the above assessment and could include changes in the project site, relocation, layout (in case of finding an irrevocable remain of cultural or archaeological importance), conservation, preservation, restoration or salvage.
8. Implementation of the concerned authority decision concerning the management of the finding.
9. Excavation and construction work on the site shall be resumed after permission is given from the Directorate of Archaeology Department Baluchistan.
10. In case of relocation of the school site, the Project Management Unit, **BESP** will decide acquiring alternate location as per site selection guidelines in (**chapter 7 section 7.2**)

FIRST DRAFT

3 Project Description

3.1 Projects' Development Objective.

The overall objective of Balochistan Education Support Project (BESP) is “to accelerate and further increase the number of children, in particular girls, enrolling in and completing quality elementary education in Balochistan”.

3.1.1 Specific Objectives of the Project

- 1) To increase access to and retention in elementary education, particularly for girls, through community mobilization and awareness-raising, the construction and refurbishment of primary, middle and High school classrooms, including basic facilities, and recruitment and deployment of female teachers.
- 2) To enhance the quality of elementary education by reinforcing and retooling the system for the continuous professional development of teachers and;
- 3) To improve governance and management within the sector by improving the provincial data management, monitoring and planning systems.

3.2 Project Beneficiaries

The project will benefit five groups. First, the children mostly girl student, from grade K to 10 who will after the execution of project activities shall benefit from improved school environments and access to teaching / learning materials. Second girls who did not have the opportunity to enroll in higher classes will get an opportunity through upgradation of schools to complete their education. Third, educated females for whom employment opportunities will increase such that they will be able to start their career in education department, provided they are meritorious and clears all hiring stages successfully. Fourth again teachers and girls who live long distances from school will be facilitated through provision of transport for too and fro movement from home to school. Finally, the communities who receive project interventions, especially the parents of the children enrolled in schools are expected to benefit through access to better quality education for their children.

3.3 Project Component and associated activities

The project is designed to execute a single component viz. Access and Equity; under which following activities shall be implemented for reaching the higher level objectives: -

- ❖ Activity I -- Advocating education for girls by providing access to existing schools through provision of transport
- ❖ Activity II -- Classrooms functionalized to increase school access and support transition to higher levels of education.
- ❖ Activity III -- Mobilizing and engaging communities in siting and supporting primary schools and selection of female teachers through test-based recruitment.

The activities are further elaborated in the following paragraphs: -

3.3.1 Advocating Education for Girls by providing access to existing Schools through Transport:
The province of Balochistan comprises of 44% (percent) of the country's landmass, with a relatively small population, scattered across Thirty-three (33) districts, resulting in high cost of education service delivery to the school age children in the province. To address this issue, innovative outreach solutions are proposed which can include provision of transport facility to female teachers and students to nearby schools. A large proportion of female students drop out of school each year due to long distances from their home to schools and many female teachers face problems in attending the schools due to similar reason. As part of this initiative, a criterion for selection of female students/teachers will be devised, based on the distances of their house/residence from their respective schools and other ground realities and need, by the Project Management Unit (PMU).

3.3.2 Classrooms functionalized to increase School Access and support transition to higher levels of Education:

The Government of Balochistan has completed a comprehensive school census with GIS coordinates, this census provides a very clear baseline of existing school needs and also identifies gaps in school access based on a student teacher ratio as well as student classroom ratio. Using this information, and in close consultation with district education officials and community members, thousand (1,000) classrooms will be functionalized at selected primary, Middle and high school. The school sites where the classrooms are to be provided will be determined through an established criterion, notified by the Department of Education. The department will ensure that the classroom provision takes into account the availability of children, teachers.

3.3.3 Mobilizing and engaging communities in siting, and supporting Primary schools and Selection of Female teachers through test based recruitment:

Considering the need to efficiently use financial resources to improve school access, the Education Department will actively involve the Parent Teacher School Management Committees (PTSMCs) to identify viable school sites for enhancement and expansion. The PTSMCs will play an active role in ensuring teacher presence and availability and providing the necessary safe and secure environment for girls and female teachers. Additionally, the schools to be expanded and upgraded will also have additional teacher requirement.

This Project will institute transparent criteria based on selection of schools to be upgraded, including, upgrading where teacher availability is ensured, especially for teaching of science and mathematics. PMU will assist to recruit two (2) elementary school teachers (EST) in hundred (100) upgraded school which will be regularized by the Government of Baluchistan during or latest by the end of the Project.

3.4 Project Financing

The project is planned to be financed by European Union (EU). An amount to the tune of Euro 10 million has been committed by EU as additional support to GPE-BEP component No.1.

3.5 Description of Physical Activities

3.5.1 Site Selection and Designing

This stage would include activities relating to the selection of an appropriate site for construction of new class room, one in each of 100 selected schools. The schools for construction of the said rooms have already been identified by the PMU of GPE-BEP. Once the site is identified design of the new room shall be prepared followed by prepared of estimates, drawings, layout plan and bidding documents. The contract shall then be awarded through issuance of work order, to the successful bidder/contractor after completing the due processes of procurement.

With regard to rehabilitation works required for functionalization of the 900 class rooms in 300 schools throughout Balochistan, the estimates shall be prepared along with construction / repair drawings including specifications for missing facilities. Following approval of the estimates procurement documents shall be prepared for award of contract to the contractors after seeking approval of competent authorities.

3.5.2 Construction of Class Rooms and rehabilitation of Existing Class rooms

The activities under this stage would comprise of construction of new class room construction and repair and rehabilitation of existing class rooms for their functionalization. The construction activity would entail and onsite stockpiling of construction materials but in very limited quantities, excavations for foundations, construction of superstructures, removal of unspent materials and debris, finishing and external development such as landscaping and beautification etc.

3.5.3 Procurement of Transport for Girls and Teachers

The project after defining the specification of vehicles for to and fro transportation of girls and female teachers shall prepare bidding document for procurement of vehicles. Once completion of the bidding process the work order shall be issued to the supplier for supply of vehicles that too after seeking approval of the competent authorities(s).

3.5.4 School Operation Stage

The activities during this stage would relate to usage of the school buildings for education and learning, use of drinking water, collection and disposal of wastewater and solid waste, annual repair and maintenance of the civil structures and equipment and operation of transport vehicle for girls and teachers.

3.6 Project Implementation Arrangements

The Secondary Education Department, Government of Balochistan will implement the project. The existing PMU GEP-BEP will execute the BEP under the overall supervision of Secretary Education Department, Government of Balochistan

3.7 Project Coordination Committee (PCC)

A Project Coordination Committee (PCC) has been constituted under the overall supervision of Secretary Government of Balochistan Education Department (In Chair), to monitor the implementation of the project. The PCC has representation from the Secondary Education Department, Planning and Development Department, Finance Department, Government of Balochistan, Project Director of GPE-BEP and BESP, representative from UNICEP as well as the World Bank and Implementing Partners. The PCC

will meet quarterly and shall review the progress of the project and when required provide guidance to the project team.

3.8 Project Steering Committee

A Project Steering Committee (PSC) will be constituted and notified by the competent authority with Additional Chief Secretary as chairperson. The committee will include members from the Finance Department, Education Department, P&D Education and foreign aids sections and Project Director GPE-BEP. The PSC will be the highest forum to approve yearly work plan and budget and also translate the vision and strategies into action plan and to approve re-appropriation as and when required. PSC will meet at least twice a year to monitor the PMU businesses and as needed address any other issues as and when arise.

3.9 Project Management Unit (PMU)

The existing PMU of GPE-BEP as detailed below, will execute the BES project activities through Implementing Partners, Parent Teachers School Management Committees (PTSMCs), Engineering, Design, Supervision and Quality Assurance Partners (EDSQA). PMU will be sufficiently staffed with management and Sectoral experts such as below:

Project Director

Deputy Project Director

Manager Education

1. Education Specialist
2. Senior Education Officer
3. Region wise Education Officers

Manager M&E

1. Senior Monitoring Officer
2. Region wise Monitoring Officers

Manager Finance

1. Senior Finance Officer
2. Finance Officers

Manager Development

1. Infrastructure and development specialist
2. Environment and Social Safeguard Officer
3. Development Coordinator
4. Region Wise SDEs

Procurement Specialist

1. Contract Management Officer
2. Procurement Officer

Senior Admin Officer

1. Admin Officer

Senior HR Officer

HR Officer

Media and communication Officer

3.10 Parent Teacher School Management Committee (PTSMCs)

Parent Teacher School Management Committees will ensure community participation in the implementation of the project right from the site selection to the school management and operation. The PTSMCs will coordinate with community and Education Department; the construction/rehabilitation activities of schools, hiring of local teacher, monitoring the affairs of school, and shall submit reports to Education Department accordingly.

3.11 Engineering Design Supervision and Quality Assurance Partners

The EDSQA partners currently engaged in the GPE-BEP project will be assessed for immediate onboarding, and will be rehired through variation/addendum in contract for implementing project constructional/rehabilitation activities. However, provision has been made for engaging a firm as through competitive process once the project completes its offering stage.

4 Baseline Environmental Conditions

This chapter provides an overview of the baseline environmental conditions including physical, biological and socio-economic profiles of the project areas.

4.1 Project Area

The project area spreads over all 33 districts of Balochistan covering the entire 347190, sq. km of provincial area. **Exhibit 1** present district boundaries of the province, whereby, **Table -4** shows the list of the districts including the new districts for which geographical boundaries have still not been notified.

4.1 Geography

Balochistan province is the largest in size and the smallest in population with about 12.344 million people⁴ in 2017 and 12.782 million people as projected for 2018⁵ The province covers 347,190 km², almost 44% of the country's land mass. The province is located in south-western side of Pakistan at 32.12°N 67.01°E coordinates bordering by Iran to the west, Afghanistan to the north-west, Khyber Pakhtunkhwa and FATA to the north and Punjab to the northeast and Sindh to the southeast of the province. The district wise area and population of 33 districts is shown in **Table 4**. It is pertinent to mention here that data regarding 1 newly created districts namely, Sikandarabad which have been carved out of Districts Kalat has not been cleared by the government as yet.

Table 4- District wise Area and Population of Balochistan

S.No	District	Area in Sq. Km	Population 2017 Census	Projected Population 2018
1	Awaran	29,510	121,680	121,863
2	Barkhan	3,514	171,556	176,171
3	Chagai	50,545	226,008	235,342
4	Dera Bugti	10,160	312,603	321,668
5	Gwadar	12,637	263,514	268,415
6	Harnai	NC	97,017	98,220

⁴Pakistan Bureau of Statistic: Provisional Results of Census 2017.

⁵ Ibid

S.No	District	Area in Sq. Km	Population 2017 Census	Projected Population 2018
7	Jaffarabad	2,445	513,813	529,330
8	Jhal Magsi	3,615	149,225	151,642
9	Kachhi	7,499	237,030	239,187
10	Kalat	6,622	412,232	424,310
11	Kech	22,539	909,116	947,572
12	Kharan	48,051	156,152	160,118
13	Khuzdar	35,380	802,207	830,204
14	Killa Abdullah	3,293	757,578	787,654
15	Killa Saifullah	6,831	342,814	353,270
16	Kohlu	7,610	214,350	223,117
17	Lasbela	15,153	574,292	592,899
18	Lehri		118,046	119,840
19	Loralai	9,830	397,400	407,176
20	Mastung	5,896	266,461	274,561
21	Musakhel	5,728	167,017	168,954
22	Naseerabad	3,387	490,538	508,639
23	Nushki	NC	178,796	184,535
24	Panjgur	16,891	316,385	321,447
25	Pishin	7,819	736,481	762,847
26	Quetta	2,653	2,275,699	2,408,372
27	Sherani	NC	153,116	158,245
28	Sibi	7,796	135,572	137,484
29	Sikandarabad	NC	NC	NC
30	Sohbatpur	NC	200,538	204,248
31	Washuk	NC	176,206	180,611
32	Zhob	20,297	310,544	318,370
33	Ziarat	1,489	160,422	166,309
Total Balochistan		347,190	12,344,408	12,782,620

❖ NC information regarding district has not been clarified

4.2 Topography and climate

About 80 percent of the area of the province is inter-mountainous. The remaining 20 percent consists of flood plains and coastal plains. Due to dominated mountainous terrain, only 15 percent of the landscape is available for landforms on which most human settlements, farms, and roads are developed. The important mountains ranges are Suleiman Range, Kirthar Range, Central Brahui Range, Toba-Kakar, Kakar-Khorasan Range, Marri-Bugti Hills, Chagai Hills, Ras Koh Range and Makran Coastal Range. The climate of Balochistan is continental semiarid Mediterranean, with annual precipitation varying from 200 to 350 mm and a variable proportion of this total fall as moisture of snow and rain in the mid-winter period or as intense showers in summer. The uniform aridity (average annual rainfall not exceeding

400 mm anywhere, but in many parts as low as 50 mm annually) makes un-irrigated agriculture impossible⁶.

Altitude determines the temperature regime in Balochistan to a large extent. The cool temperature regime is associated with high altitudinal belt (>2000m) and indicated by the juniper, conifers and pines in the NNCS range of the Central Mountains Range. Coastal temperature regime is moderate having lower annual precipitation range and therefore implies lower heat and cold for natural vegetation, crops and animals. The continental climate has more extreme temperatures with high annual and daily precipitation range. Humidity is low for most of the year except for the rainy seasons.

4.3 Geology

Geologically, the province is divided into four main geological regions (**Exhibit-2**). Central Mountains Range, Chagai Hills and Ras Koh Range, Makran Mountains Range and Chagai – Kharan Basin. The hills and mountains ranges consist predominantly of folded and faulted Mesozoic to middle Tertiary limestone. Mesozoic and tertiary sedimentary rocks, mostly inter bedded limestone, sandstone, shale and marls make up the bulk of the Central Mountains Range. Similar sedimentary rocks in addition to the Calcalkaline and ultramafic intrusions are found together with young quaternary volcanic rocks in the Ras Koh Range. This range is favorable for copper, iron and Sulfur deposits (Saindak)⁷. The Makran Mountains Range includes central and coastal ranges and is mainly made up of uniform sequence of tertiary and quaternary sedimentary rocks. The Chagai-Kharan Basin is mostly desert basin partly filled with younger sedimentary rocks derived from surrounding mountains ranges.

4.4 Land Use and Soil Erosion

In Balochistan, mountains dominate the terrain, and valley floors and piedmont plains make up only 15 percent of the landscape⁸. The relief⁹ or “physiographic unit” is of utmost importance in Balochistan since this collects and concentrates the scarce rainfall. Relief is categorized into mountains, hills, basin and piedmont plains. Under the prevailing arid conditions, relief determines largely the availability of land for crops and vegetation potential. Balochistan comprises of the following relief or physiographic units.

- High and low mountains (51.7 percent)
- Gravelly fans and terraces (21.5 percent)
- Piedmont plains (11.6 percent)
- Saline basin (2 percent)
- Loess plains (0.4 percent)
- sand plains (7.5 percent)

- river plains (2.8 percent) and
- tidal plains (0.8 percent)

These reliefs represent the Micro-Land Management System in Balochistan. In east central and northern part of the province are the high mountains reaching an elevation above 2300 meters and the valleys situated at around 1500 meters above the sea level. The lowest mountains ranges are generally below 2300

⁶ Environmental Profile, Balochistan (LARUS-IT, Enschede: Netherland, 1992)

⁷ Environmental Profile, Balochistan (LARUS-IT, Enschede: Netherland, 1992)

⁸ Balochistan Conservation Strategy (May 19, 2000)

⁹Environmental Profile, Balochistan (LARUS-IT, Enschede: Netherland, 1992)

meters and their valleys go down to 76 meters above the sea level.

According to the Development Statistics of Balochistan, the reported area of the province is about 51.2% of the total area. The variation from district to district is also considerable. However, it is assumed that all agricultural and forestry uses are reported, and that there are no significant areas of cultivated land in the unreported area.

The principal land uses¹⁰ in the province are agriculture which is about 2.5 million hectare (7.2 percent), forests about 1.71 million hectare (4.94 percent), rangelands about 15.4 million hectares (44.45 percent) and area not available for cultivation is about 9.83 million hectares (28.3 percent). Out of the total cultivated area, 43.54 percent is irrigated land while 56.45 percent is rain-fed area or flood irrigated area. Land use in the urban centers is predominantly of fixed and permanent structures, it is of mixed disposition in the suburbs and along outer rim of the cities, where agricultural lands interpose with new constructions, inhabitations, and farmhouses¹¹. **Table 5** describes district wise land utilization in the project area.

Table 5- Land Utilization Statistics of Balochistan

PROVINCE/DISTRICT	GEOGRAPHICAL AREA	REPORTED AREA	CULTIVATED AREA	Un-Cultivated Area		
				Cultivable Waste	Forest	Not-Available for Cultivation
BALUCHISTAN	34719000	17945394	2512404	3881583	1716808	9834599
Quetta	168800	161558	11390	30365	97950	21853
Pishin	787400	293868	155189	30664	25865	82150
Killa Abdullah	323800	15735	15122	0	613	0
Chagai	4474800	3261148	141777	380202	306649	2432520
Nushki	579700	90519	15127	0	75392	0
Loralai	801800	318523	130155	61904	58391	68073
Musakhel	572800	48316	12436	11857	4173	19850
Barkhan	351400	122650	42749	40686	0	39215
Zhob	1749700	227341	58355	73991	7383	87612
Sherani	280000	12320	6795	0	5525	0
Killa-Saifullah	683100	416780	150512	104671	20287	141310
Sibi	551700	393847	302602	45341	8920	36984
Harnai	409600	23962	6552	0	17410	0
Ziarat	330100	87968	6978	0	72530	8460
Kohlu	761000	54324	31887	0	0	22437
Dera Bugti	1016000	69090	29043	47	0	40000
Naseerabad	338700	234304	218856	778	5	14665
Jaffarabad	244500	243862	217448	4454	0	21960
Kachhi	568200	324707	78267	94439	4	151997
Jhal Magsi	361500	333251	129360	99897	0	103994
Kalat	662200	631452	124906	27013	51935	427598
Mastung	686100	324075	201342	48405	26817	47511

¹⁰ Agriculture Statistics of Balochistan 14-15.

¹¹ Arid steppes of Balochistan (Pakistan), Scientific article published in Secheresse (2006), 17(1-2)203-9

PROVINCE/DISTRICT	GEOGRAPHICAL AREA	REPORTED AREA	CULTIVATED AREA	Un-Cultivated Area		
				Cultivable Waste	Forest	Not-Available for Cultivation
Khuzdar	3538000	3304749	135992	1059502	17353	2091902
Awaran	2951000	210425	22725	0	187700	0
Kharan	1854100	3593379	101340	756995	97139	2637905
Washuk	2951000	8422	8422	0	0	0
Lasbela	1515300	1513761	51949	886107	453136	122569
Kech	2253900	554336	65597	51583	104	437052
Punjgoor	1689100	673228	35870	42481	0	594877
Gwadar	1263700	397494	3661	30201	181527	182105
Sikandarabad	-	-	-	-	-	-

Source: Agriculture Statics of Balochistan 2014-15

Soil degradation is one of the major environmental problems in the province. Salinity and soil erosion are the major environmental issues. Given the climate, both natural and man-made soil salinity is component of desertification. Natural salinity occurs throughout the province in the playas where run on water evaporate and consequently dissolved solids accumulate. About three quarter of the piedmont basin soils is naturally saline¹². Man-made salinity occurs on the piedmont plain in the command area of Kirthar Canal which is caused due to unsustainable design of irrigation practices, lack of proper drainage structures leading to water logging and salt accumulation. About 30 to 40 percent of Kirthar Canal command area is affected by man-made salinization. However, fortunately both the natural and man-made salinity in Balochistan is self-reclaimable but requires some years of ample irrigation to leach the salts¹³. Soil erosion continues throughout the province particularly on the rangeland and leads to increased sediment loads in the rivers, loss of top soil containing most of the nutrients and organic matter on arable land and barren mountain slopes reducing moisture storage capacity resulting into large-scale flash floods during monsoon¹⁴.

Rangeland degradation is another issue usually associated with grazing. However, a major factor causing range degradation in Balochistan is the cutting and uprooting of native trees and shrubs by peoples for fuel wood. Cutting of trees and shrubs is more severe in about 5 km radius of villages and towns, particularly refugee's camps in Balochistan. This has also contributed toward desertification and degradation of environment¹⁵.

4.5 Soil Morphology

Most soil in Balochistan has a homogenous porous structure invariably calcareous in nature. The lime content of soil varies from five to 30 percent. Lime is uniformly distributed in most soil texture. Where having a high lime content (> 15 percent), the soil is hard when dry and friable when moist. The organic matter content is generally low as 0.3 to 0.5 percent. Most of the surface of mountains and hills slopes is bare rock without soil cover (about 70 percent). Small patches contain shallow, strongly calcareous, gravelly and stony loams. Soil in the piedmont plains is very deep, well drained, homogeneous, silty and strongly calcareous with an 18-20 percent lime content uniformly distributed¹⁶.

¹²Environmental Profile, Balochistan (LARUS-IT, Enschede: Netherland, 1992)

¹³ Ibid

¹⁴ Ibid

¹⁵ Land and Range Resource Management Issues and Food Security in Balochistan – AZRI, Quetta, (1994)

¹⁶ Environmental Profile, Balochistan (LARUS-IT, Enschede: Netherland, 1992)

Soil of the saline basin (playas) is characterized by being strongly hygroscopic, gypsiferous and saline with local sodicity and pH value of 8.6 – 10.0. The loess plains have brown silt loams or very fine sandy loams and are strongly calcareous containing about 22 percent calcium carbonate. While sandy plains are extremely homogeneous in soil. The lime content ranges between 5 and 10 percent¹⁷.

4.2 Seismology

Pakistan have been divided into four main Seismic zones in term of major, moderate, minor and negligible zones with respect to ground acceleration values. A seismic map showing different seismic zones is given in **Exhibit 3** According to this map, most parts of the Baluchistan province lie in the Earthquake Zones Classification of the Uniform Building Code (UBC – 1997) of the United States. Southern Balochistan lies in Zone-4. The Central Brahui range, Siahan range, Kirthar range and the Central Makran mountain ranges run through this zone. Northern part of Balochistan lies in Zone-2 while Quetta – Sibi belt lies in Zone-3. The geological and seismological features of this zone are almost similar to those of Zone 2¹⁸. Earthquakes and tsunamis have shaped the history of the province and have had a profound effect on people and property. An earthquake of magnitude 4.8 rector scale was recorded at 13:28 hours midnight in Kalat and Quetta on 26th May 2012 while the field assessment was underway for this study.

4.6 Surface and Groundwater Resources

Balochistan is water scarce and land rich area of Pakistan. Surface water mainly comes from precipitation in the form of surface runoff and its share of water from the Indus River. Surface water resources are very limited, except Naseerabad and Jaffarabad and Sohbatpur, which are fed by the pat Feeder, the Desert and Kirthar Canals emanating from Guddu and Sukkur Barrages on the Indus River. Remaining part of the province depends on rainfalls, tube-wells, Karez, flows, flood flows, hill torrent and diversions from non-perennials streams, which bring substantial runoff during the rainy seasons¹⁹. The main River basins are given along with their water balance is given in **Table-6**. Whereas, **Exhibit-4** Shows annual mean precipitations of different areas of Balochistan.

Table 6 Major River basins of Balochistan and Ground Water Availability (Billion Meter Cube (BCM))

Major Basins	Average Recharge	People	Livestock	Agriculture	Total Utilization	Balance
Dasht River Basins	0.100	0.013	0.012	0.069	0.094	0.006
Gaj River Basin	0.070	0.001	0.001	0.070	0.072	-0.002
Gwadar Ormara	0.040	0.004	0.003	0.017	0.025	0.015
Hamun-e-Lora Basin	0.040	0.001	0.001	0.139	0.141	-0.101
Hamun-e-Mashkel	0.300	0.008	0.007	0.012	0.027	0.273
Hingol River Basin	0.200	0.550	0.007	0.156	0.168	0.032

¹⁷ Ibid

¹⁸ <http://allaboutgeology.blogspot.com/2011/04/seismicity-with-reference-to-pakistan.html>

¹⁹ Water Resources Management Research Issues in the Highlands of Balochistan, Report No. R92, Pakistan National Program, IWMI (July 1999)

Major Basins	Average Recharge	People	Livestock	Agriculture	Total Utilization	Balance
Hub River	0.080	0.001	0.001	0.086	0.088	-0.008
Kachhi Plain	0.180	0.017	0.012	0.140	0.169	0.011
Kandal River	0.030	0.000	0.005	0.110	0.115	-0.085
Kaha	0.190	0.000	0.004	0.315	0.319	-0.129
Kand River	0.010	0.000	0.000	0.018	0.019	-0.009
Kunner River	0.050	0.000	0.000	0.048	0.048	0.002
Mula River Basin	0.012	0.002	0.001	0.126	0.129	0.009
Nari River Basin	0.270	0.006	0.004	0.171	0.180	0.090
Pishin Lora Basin	0.170	0.024	0.029	0.513	0.513	-0.396
Porali River Basin	0.140	0.002	0.003	0.142	0.146	-0.006
Rakshan River	0.050	0.003	0.003	0.075	0.081	-0.031
Zhob River Basin	0.160	0.002	0.001	0.267	0.270	-0.110
Balochistan	2.210	0.091	0.054	2.474	2.659	-0.459

Source: Basin-wide water resources availability and use in Balochistan. Balochistan Irrigation Department supporting public resource management TA-4560 (PAK), Halcrow Pakistan and Cameos Consultant, 2008.

Ground water resources divide into three hydrological regions; the Indus Basin, the Kharan closed Basin and the Makran Coastal basin, which constitute approximately 73 small or large rivers and streams. According to an estimate the total water potential of the province are 22.116 million acre feet (MAF) originating from the following sources²⁰:

- | | |
|--|--|
| <p>A. Indus Water as per Indus Accord</p> <p>a. Perennial Flows= 3.87 MAF</p> <p>c. Flood Share = 4.620 MAF</p> | <p>B. Non-Indus Basin Waters</p> <p>b. Ground Water = 0.87 MAF</p> <p>d. Flood Runoff = 12.75 MAF</p> |
|--|--|

The groundwater occurs in the unconsolidated deposits in Balochistan. Layers of gravel with sand, slit and clay constitute the aquifers. Gravel aquifers occur in the hydrologic basin of mountainous areas of the province. Fissured aquifers exist in hard rocks, which permit storage and movement of water. These aquifers are widely spread in Balochistan. The groundwater in fissured aquifers in carbonate rocks of Quetta and Kalat has locally been developed through tube wells. The sedimentary rocks in northern areas of the province bear water due to fissures or faults exposed to the surface.

Water quality tests of all the 845 sites in GPE-BEP project focused areas have been conducted by PCRWR during the years 2017-2018. The water quality data of few districts have been provided in the **Tables 7-14** below. According to the results of 24 sites in 8 different project focused sites biological contamination was evident in almost all the samples. The results of report indicate that at majority of the sites physical parameters such as Color, Odor, were unobjectionable whereas there was a minor increase in the permissible limit of PH in the results at few sites. The level of conductivity at majority of the sites falls in the range of permissible limit and just 9 sites were reported where conductivity was exceeding the allowable limit. While looking into the results of Chemical parameters is noticeable that the turbidity is a common factor in most of the all the water quality test results. The excessive quantity of TDS is observed a few sites in district Chagai, Nushki

²⁰ <http://siteresources.worldbank.org/PAKISTANEXTN/Resources/293051-1114424648263/Session-VII-Nadir.pdf>

and even in district Pishin. It is noticed that at maximum sites the limit of potassium, sodium, manganese, chloride, nitrate and fluoride were reported to be blow than the allowable limit.

Table 7 Water quality test results of District Pishin

Water Parameters	Permissible limit	Result
Color (TCU)	Colorless	Objectionable
Odor	Odorless	Unobjectionable
Taste	Tasteless	Unobjectionable
PH	6.5-8.6	8.15
Conductivity	NGVS	1900
Microbiological contamination	0/positive	Positive
Turbidity(NTU)	5 WHO	9.3
TDS(mg/i)	1000 WHO	1216
Bicarbonate(mg/l)	NGVS	140
Alkalinity(mg/i)	NGVS	2.8
Carbonate (mg(mi)	NGVS	0
Potassium (mg/l)	12(EC)	4
Sodium	200 (WHO)	240
Calcium	NGVS	48
Magnesium (mg/l)	150 (WHO)	78
Hardness (mg/i)	500 (WHO)	440
Chloride (mg/l)	250 (WHO)	330
Sulfate (mg/l)	250 (WHO)	410
Nitrate-N(mg/l)	10 (WHO)	0.9
Fluoride	1.5 (WHO)	0.11

Table 8 Water quality test results of District Killa Abdullah

Water Parameters	Permissible limit	Result
Color (TCU)	Colorless	Objectionable
Odor	Odorless	Unobjectionable
Taste	Tasteless	Unobjectionable
PH	6.5-8.6	8.06
Conductivity	NGVS	1714
Microbiological contamination	0/positive	Positive
Turbidity(NTU)	5 WHO	9.0
TDS(mg/i)	1000 WHO	990
Bicarbonate(mg/l)	NGVS	240
Alkalinity(mg/i)	NGVS	4.8
Carbonate (mg(mi)	NGVS	0

Water Parameters	Permissible limit	Result
Potassium (mg/l)	12(EC)	2
Sodium	200 (WHO)	184
Calcium	NGVS	44
Magnesium (mg/l)	150 (WHO)	851
Hardness (mg/i)	500 (WHO)	460
Chloride (mg/l)	250 (WHO)	220
Sulfate (mg/l)	250 (WHO)	309
Nitrate-N(mg/l)	10 (WHO)	4.6
Fluoride	1.5 (WHO)	0.61

Table 9 Water quality test results of District Zhob

Water Parameters	Permissible limit	Result
Color (TCU)	Colorless	Objectionable
Odor	Odorless	Unobjectionable
Taste	Tasteless	Unobjectionable
PH	6.5-8.6	7.18
Conductivity	NGVS	390
Microbiological contamination	0/positive	Positive
Turbidity(NTU)	5 WHO	13
TDS(mg/i)	1000 WHO	232
Bicarbonate(mg/l)	NGVS	110
Alkalinity(mg/i)	NGVS	2.2
Carbonate (mg(mi)	NGVS	0
Potassium (mg/l)	12(EC)	1
Sodium	200 (WHO)	26
Calcium	NGVS	32
Magnesium (mg/l)	150 (WHO)	18.5
Hardness (mg/i)	500 (WHO)	156
Chloride (mg/l)	250 (WHO)	36
Sulfate (mg/l)	250 (WHO)	51
Nitrate-N(mg/l)	10 (WHO)	0.4
Fluoride	1.5 (WHO)	0

Table 10 Water quality test results of District Killa Saifullah

Water Parameters	Permissible limit	Result
Color (TCU)	Colorless	Unobjectionable
Odor	Odorless	Unobjectionable
Taste	Tasteless	Unobjectionable
PH	6.5-8.6	7.08
Conductivity	NGVS	508
Microbiological contamination	0/positive	Positive
Turbidity(NTU)	5 WHO	8.3
TDS(mg/i)	1000 WHO	282
Bicarbonate(mg/l)	NGVS	165
Alkalinity(mg/i)	NGVS	3.3
Carbonate (mg(mi)	NGVS	0
Potassium (mg/l)	12(EC)	1
Sodium	200 (WHO)	23
Calcium	NGVS	24
Magnesium (mg/l)	150 (WHO)	41.3
Hardness (mg/i)	500 (WHO)	230
Chloride (mg/l)	250 (WHO)	50
Sulfate (mg/l)	250 (WHO)	38
Nitrate-N(mg/l)	10 (WHO)	1.5
Fluoride	1.5 (WHO)	0.41

Table 11 Water quality test results of District Sherani

Water Parameters	Permissible limit	Result
Color (TCU)	Colorless	Objectionable
Odor	Odorless	Unobjectionable
Taste	Tasteless	unobjectionable
PH	6.5-8.6	7.9
Conductivity	NGVS	496
Microbiological contamination	0/positive	Positive
Turbidity(NTU)	5 WHO	9.5
TDS(mg/i)	1000 WHO	316
Bicarbonate(mg/l)	NGVS	150

Water Parameters	Permissible limit	Result
Alkalinity(mg/i)	NGVS	3.0
Carbonate (mg(mi)	NGVS	0
Potassium (mg/l)	12(EC)	2
Sodium	200 (WHO)	48
Calcium	NGVS	64
Magnesium (mg/l)	150 (WHO)	10
Hardness (mg/i)	500 (WHO)	200
Chloride (mg/l)	250 (WHO)	54
Sulfate (mg/l)	250 (WHO)	709
Nitrate-N(mg/l)	10 (WHO)	2.1
Fluoride	1.5 (WHO)	0.96

Table 12 Water quality test results of District Mastung

Water Parameters	Permissible limit	Result
Color (TCU)	Colorless	Objectionable
Odor	Odorless	Unobjectionable
Taste	Tasteless	Unobjectionable
PH	6.5-8.6	7.8
Conductivity	NGVS	460
Microbiological contamination	0/positive	Positive
Turbidity(NTU)	5 WHO	10.7
TDS(mg/i)	1000 WHO	294
Bicarbonate(mg/l)	NGVS	140
Alkalinity(mg/i)	NGVS	2.8
Carbonate (mg(mi)	NGVS	0
Potassium (mg/l)	12(EC)	1
Sodium	200 (WHO)	32
Calcium	NGVS	28
Magnesium (mg/l)	150 (WHO)	32
Hardness (mg/i)	500 (WHO)	200
Chloride (mg/l)	250 (WHO)	12.3
Sulfate (mg/l)	250 (WHO)	110
Nitrate-N(mg/l)	10 (WHO)	1.1
Fluoride	1.5 (WHO)	1.32

Table 13 Water quality test results of District Nushki

Water Parameters	Permissible limit	Result
Color (TCU)	Colorless	Objectionable
Odor	Odorless	Unobjectionable
Taste	Tasteless	Unobjectionable
PH	6.5-8.6	8.14
Conductivity	NGVS	855
Microbiological contamination	0/positive	Positive
Turbidity(NTU)	5 WHO	8.9
TDS(mg/i)	1000 WHO	532
Bicarbonate(mg/l)	NGVS	179
Alkalinity(mg/i)	NGVS	3.6
Carbonate (mg(mi)	NGVS	0
Potassium (mg/l)	12(EC)	3
Sodium	200 (WHO)	131
Calcium	NGVS	36
Magnesium (mg/l)	150 (WHO)	21.9
Hardness (mg/i)	500 (WHO)	180
Chloride (mg/l)	250 (WHO)	129
Sulfate (mg/l)	250 (WHO)	96
Nitrate-N(mg/l)	10 (WHO)	1.7
Fluoride	1.5 (WHO)	0.79

Table 14 Water quality test results of District Chagai

Water Parameters	Permissible limit	Result
Color (TCU)	Colorless	Objectionable
Odor	Odorless	Unobjectionable
Taste	Tasteless	Unobjectionable
PH	6.5-8.6	7.59
Conductivity	NGVS	1421
Microbiological contamination	0/positive	Positive
Turbidity(NTU)	5 WHO	5.7
TDS(mg/i)	1000 WHO	4289
Bicarbonate(mg/l)	NGVS	190
Alkalinity(mg/i)	NGVS	3.8
Carbonate (mg(mi)	NGVS	0
Potassium (mg/l)	12(EC)	5
Sodium	200 (WHO)	190

Water Parameters	Permissible limit	Result
Calcium	NGVS	88
Magnesium (mg/l)	150 (WHO)	19.4
Hardness (mg/i)	500 (WHO)	300
Chloride (mg/l)	250 (WHO)	221
Sulfate (mg/l)	250 (WHO)	213
Nitrate-N(mg/l)	10 (WHO)	1.3
Fluoride	1.5 (WHO)	1.21

Water availability is the ultimate issue all over the province. It is also a major cause of social disputes among the tribes. Customary tribal law determines water use rights in Balochistan. These rights are mostly linked with the land rights. Among the tribes, water can be used freely for drinking, animal watering, and domestic purposes such as bathing, washing and cleaning by everybody. Universal domestic use rights apply only to water on the spot or fetched in buckets and pitchers, but do not allow the construction of channels or pipes to homes for this purpose²¹.

With the changing climatic conditions and the drought prevailing over the past several years has created acute water shortage and endangered the sustainability of this precious resource. The over exploitation of ground water resources poses a major threat to environment, health, food security and a threat to the welfare of poor. The focus of the groundwater exploitation in the province had been the three hydrological basins being densely populated and having greater potential for development. These are Pishin Lora Basin (PLB), Nari River Basin (NRB), and Zhob River Basin (ZRB). Due to unplanned tube-wells installation and subsequent indiscriminate pumping of water for the last two and a half decades, the area is now facing problem of depleting groundwater table at the rate of more than four to five meters annually in many of its aquifers and hence tube-wells drying is a common phenomenon²².

4.7 Meteorology, Climate, and Air Quality

Balochistan is generally an arid region with scanty rainfall varying from 12 inches in the North to 4 inches per annum in the South. According to the rainfall²³, data collected over a period of 1961 – 2004 the province divides into different climatic zones with varying level of annual precipitation. Zone I includes Gwadar, Kech, and Panjgur districts with annual rainfall varies from 36-110 mm and increases with increase in altitude. Maximum rainfall occurs in the months from January to March (45 to 73 percent) and minimum during monsoon. Zone II consists of Chagai and Kharan districts with annual rainfall varying from 30-160 mm. Maximum rainfall occurs in the months from January to March (30 to 50 percent). Zone III includes the districts of Lasbela and Awaran and southern part of Khuzdar district with annual rainfall varies from 110-250 mm. Zone IV consists of Kalat and northern tip of Khuzdar district. Average annual rainfall was between 90 - 200 mm. Quetta, Pishin, Mastung, Killa Abdullah, Killa Saifullah (60 percent west) and Ziarat districts are included in Zone V. The rainfall in this zone varies from 200-280 mm/year. The maximum rainfall occurs in the months from January to April (70 percent) and is out of the monsoonal belt. Zone VI consists of the northern part of the province including Musakhel, Loralai,

²¹ Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992

²² The causes of groundwater decline in upland Balochistan: Paper presented at the 39th Australian Conference of Economists in Sydney, Australia 27-29 September 2010.

²³ The IUNC-Balochistan Program, water requirement of major crops in different agro-climatic zones of Balochistan.

Kohlu, Barkhan, Zhob and Killa Saifullah (40 percent east). The average rainfall varies from 200-400 mm/year in this area.

Air quality study of the capital city (Quetta) of the province indicates that the pollutants of various kinds are affecting the city badly²⁴. The lead and Sulphur dioxide pollutants are higher than other pollutants. Motor vehicles/ automobiles constitute the main source of air pollution in Quetta city. Domestic industries, power plants and biological contents in Quetta city are the dominant sources of air pollution. Authentic air quality data for other cities and districts could not be found. However, generally observed during field visit, air pollution situation in other cities such as Pishin, Loralai and Khuzdar was comparatively less than the capital city of Quetta.

Ambient concentration of carbon monoxide (CO) and dust particles (TSP) in Quetta was recorded (1981) as 10 ppm, and 200 -300 $\mu\text{g}/\text{cm}^3$ respectively²⁵. Pak EPA also carried out monitoring of ambient air quality in Quetta in May 2011 and reported daily mean value for SO₂, NO, NO₂, CO and O₃ satisfied the standards value of WHO limits, while PM_{2.5} values mostly exceeded standard²⁶. Air pollution in other urban centers has not been measured and reported. However, it is presumed that the same level of air quality prevails in rest of the cities as well. Although, neither industrial pollution nor agro-chemical pollution have been reported in Balochistan but several sources of chemical pollution of air, water and soil are suspected. Around 100 or so industries with about 20, 000 total employees operating in Hub Industrial and Trading Estate discharge their untreated effluents in the estate sewerage, which outflows to a dry riverbed, a tributary of the Hub River downstream of the Hub Reservoir²⁷. The use of agro chemicals, both fertilizers and pesticides also requires attention especially in the ground water irrigated vegetables and fruit cultivation. Persistent pesticides with human and environmental health hazards are probably used in the orchards, which could find back into the aquifers, used for drinking purposes. Therefore, monitoring of water quality is important in such locations²⁸.

4.8 Habitat, and Ecologically Sensitive Areas

Balochistan has a total area of 34 million hectares, of which only 4 percent (1.41 million hectare) is under cultivation, while 51.1 percent of the cultivated area is rain-fed. Approximately, 93 percent of this area is rangelands. Arid and semi-arid areas are falling within the rainfall zones of 50-200 mm and 250-400 mm, respectively. Rainfall patterns are unpredictable due to great fluctuations in its pattern. The rangelands provide a diversity of uses, including forage for livestock, wildlife habitat, medicinal plants, water storage and distribution, energy, minerals, fuel-wood, recreational activity, wilderness and natural beauty²⁹.

4.9 Forests

Major types of natural forests found in Balochistan are coniferous forests, scrub forests, sub-tropical

²⁴Air Pollution Problems and Diseases Caused by Hazardous Gases in Quetta, Pakistan, J. Appl. Sci. Environ. Manage. March, 2008, Vol 12(1), 123-126

²⁵ Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992

²⁶Comprehensive Environmental Monitoring Report For Selected Pilot Areas in Pakistan (www.environment.gov.pk)

²⁷ Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992

²⁸ Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992

²⁹ Rangeland improvement by community participation in highland, Balochistan, Quarterly SCIENCE VISION, vol.14 (January to December 2008)

desert and riverine forests³⁰. Coniferous forests occur at elevations of 1,500–3,500 meters and include *Chilghoza* (*Pinus gerardiana*) and Dry Juniper Forest (*Juniperus excelsa*). *Chilghoza* are confined to the Suleiman Mountains, in the Shirani tribal area (Zhub District), ranging from 2,700 to 3,400 meters in elevation. The main chilghoza areas are found at Shinghar, Kaisaghar, Takht-e-Suleiman and Torghar. In Shinghar, 2,562 hectares are included in state forests, while the Shirani tribe owns the remainder. Chilghoza is the dominant species, with the sporadic occurrence of kail (*Pinus wallichiana*) in the upper reaches of Takht-e- Suleiman and Torghar.

Balochistan has one of the largest areas of juniper forests in the world. They cover approximately 141,000 hectares. The most extensive (86,000 hectares) and best-known examples are Ziarat and Zarghoon hills. Scrub forests are found at elevations of 500–1,500 meters in the province including the following three categories:

- Dry Temperate Scrub - Quetta, Mastung, Kalat, Killa Abdullah, Pishin, Killa Saifullah
- Dry Sub-tropical broad-leaved Forests – Suleiman Mountains
- Tropical Thorn Forests – Sibi Plains and Nok-Kundi

Sub-tropical desert forests are found in Kharan and Chagai districts at elevation of 480 -1220 meters and in dry salt lakes such as Hamun-e-Lora and Hamun-e- Mashkel at elevation 610 – 860 meters. Riverine and Mangrove forests spread over an area of about 20,000 hectares³¹ as per Forestry Sector Master Plan of Balochistan, including private forests in district Sibi and Lasbela. These forests have been severely damaged. Remnants of mangroves occur along the coast in districts Lasbela and Gwadar. District wise distribution of forests in the project area is given in **Table-15**³².

Cultivated forests by Forest and Wildlife Department of Balochistan on road and canal side plantations in Naseerabad, Jaffer Abad, Sibi, Quetta, Bolan, Kalat, Khuzdar, Zhub and Pishin districts cover a length of 700 Average Kilometer. Sand dunes in Mastung, Musakhel, Pasni, Gwadar, Pishukan and Nushki areas have been planted. Cultivated plantation spread over an area of 5000 acres, and are well protected³³. Plantation is also raised by community in irrigated plantations and on farm- land. Irrigated plantations are limited to about 298 hectares in Lasbela, Sibi, Zhub, Pishin and Quetta districts. In Naseerabad and Sibi districts, plantations are irrigated with water from the Pat Feeder and Kirthar canals and from Nari River. In other areas, they depend on water from tube-wells³⁴.

Table 15 District Wise Distribution of Forest Area (Acres)

Districts	Coniferous	Irrigated Plantation	Riverine Bela Forest	Scrub Forest	Coastal Forest	Range Lands	Total
Quetta	43029	-	-	42518	-	-	85547
Pishin	41500	-	-	138971	-	-	180471
Chagai	-	-	-	186300	-	757760	944060
Killa Abdullah	-	-	-	-	-	-	0
Loralai	45763	-	-	47910	-	55551	149224
Zhub	2560	-	-	37590	-	14080	54230

³⁰ Balochistan Conservation Strategy (May 19, 2000)

³¹ Balochistan Conservation Strategy (May 19, 2000)

³² Development Statistics of Balochistan (2016-17)

³³ Development Statistics of Balochistan (2016-17)

³⁴ Balochistan Conservation Strategy (May 19, 2000)

Districts	Coniferous	Irrigated Plantation	Riverine Bela Forest	Scrub Forest	Coastal Forest	Range Lands	Total
Killa Saifullah	-	-	-	28051	-	-	28051
Barkhan	-	-	-	-	-	-	0
Musakhel	-	-	-	10311	-	-	10311
Sibi	43658	-	4158	63876	-	-	111692
Ziarat	126797	-	-	-	-	-	126797
Kohlu	-	-	-	-	-	-	0
Dera Bugti	-	-	-	-	-	-	0
Naseerabad	-	-	-	-	-	-	0
Jaffarabad	-	150	-	-	-	-	150
Bolan	-	135	-	-	-	-	135
Jhal Magsi	-	-	-	80353	-	-	80353
Kalat	55260	-	-	112947	-	-	168177
Khuzdar	-	-	1280	-	-	1280	
Kharan	-	-	25020	289720	-	-	314740
Lasbela	-	-	2000	301252	1494	87040	391786
Mastung	-	-	-	42720	-	12000	54720
Awaran	-	-	-	-	-	-	0
Kech	-	-	2560	-	-	-	2560
Panjgur	-	-	-	-	-	-	0
Gwadar	-	-	-	35840	40840	-	76680
Total in Acres	358567	285	35018	1420919	42334	926431	2783554
Total in Ha	145107	115	14171	575025	17132	374927	1126464

Source: Balochistan Development Statistics 2016-17

4.10 Deforestation

About three percent of Balochistan has been gazette state forests³⁵. Major parts (70-80 percent) of the state forests are grass and shrubs. The remaining state forests are sparse to open coniferous wood, riverine forests in the Sibi – Kachhi Plain and widely scattered shrubs. In state forests, green trees and wildlife are protected under the forests and wildlife regulations³⁶. Exploitation rights (fuel-wood, grazing, fruit collection) as well as employment rights are specifically included in the notification of each state forest area. Several state forests have been destroyed due to settlement of Afghan Refugees, e.g. Popalzai Jungle. In Kalat district partly juniper, partly Pistachio and Olive wood forests are under degradation. Juniper forests in Ziarat are in very poor conditions. Many trees show signs of lopping for fodder and debarking for roofing. The juniper woods are often the only source of fuel-wood in the cold winter and timber supply for house construction over vast areas in the province with poor and rapidly growing population³⁷. Mangroves in the coastal area are exploited for fuel wood and forage due to scarcity of other trees in coastal belt.

³⁵ Balochistan Forest Regulations, 1890

³⁶ Balochistan Forest Regulation (Amendment) Act, 1974 and Balochistan Wildlife Protection (Amendment) Act, 1980 and 2014

³⁷ Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992

4.3 Wetlands

Balochistan has few worlds' finest wetland habitats. They attract a variety of waterfowl, including swans, geese, ducks, grebes, herons and several species of waders. Zangi Nawar Lake in Chagai District is a wetland of international importance. More than 60,000 birds counted there in the mid-1980s³⁸. However, it dries during drought years such as 1987, 1999 and 2000. Spin Karez, wetland near Quetta, is a site for migratory, breeding and watering waterfowl species. Hanna Lake was developed as recreational sites in Quetta district, also attract some waterfowl in winter. Siranda Lake in Lasbela district is famous for attracting a large number of common shelduck. The Biroon Kirthar Canal in Jaffer Abad district is habitat to large number of mallards, pintails, widgeons and coots. Grey herons and egrets are abundant on this site. Other important wetlands include mangrove forests in sheltered bays on the coast, Pasni Bay and Hab Reservoir.

Diversions of surface runoff for agriculture have an impact on the functioning of wetlands. Without an adequate input of fresh water, the quality of wetlands and associated habitats deteriorate, as well as the mangrove forests that fringe three estuaries along the coast. Reservoirs and canals have greatly enriched the habitat and wildlife populations of the province. Some of these lost most of their storage capacity over time, due to siltation. Presently, there is no sufficient water to irrigate hardly 200 hectares³⁹. Once an important breeding and staying area for birds, the reservoir is dry for most of the year and is being encroached by orchards and settlements.

4.11 Biodiversity degradation

Game animals in the province have been on decline because of unsustainable hunting, food and furs. Universal netting and capitulating of birds has led to sharp decline of some species or even some of these became extinct. Habitat destruction due to land use changes is another cause of decline in wildlife. Amongst migratory birds the Hobart Bustard, Cranes and falcons have suffered to great extent⁴⁰. Some of the animals found in Balochistan such as Leopard, Asiatic Cheetah, Wolf, Balochistan Black Bear, Chiltan Markhor and Straight Horned Markhor are listed in the International Red Data Book of IUCN.

The proposed project activities in the project area may not pose any direct threats to the wildlife habitat; however, biodiversity is generally recognized as conservation target all over the world. **Annex-B**, list the ecologically protected areas⁴¹ comprising wildlife sanctuaries, national parks, and game reserves as conservation targets in Balochistan province. The total area protected and conserved is approximately 44,500.23 hectares.

4.4 Demographic Profile

Balochistan has clustered population and is smallest in proportion as compared to that of other provinces. Its estimated current population is 9.162 million (population projected for 2011) whereby in 2017 it was recorded as 12.344 Million⁴², having a density of 23.8 persons per square kilometer (based on 1998 census) with an average growth rate of 2.47 percent per annum. The fertility rate is approximately 4.08

³⁸ Balochistan Conservation Strategy (May 19, 2000)

³⁹ Balochistan Conservation Strategy (May 19, 2000)

⁴⁰ Environmental Profile Balochistan, LARUS-IT, Enscheda: Netherland, 1992

⁴¹ Wildlife Department, Balochistan (May 2012)

⁴² Pakistan Bureau of Statistic: Provisional Results of Census 2017.

percent. With the existing growth rate, the population is expected to double in 30 years. The Preliminary Census Report 2012 indicates that the population of province has increased up to 13.162 million⁴³ (yet to be officially verified). The main languages in the province are [Balochi](#) (40 percent), [Pashto](#) (40 percent) and [Brahui](#) (20 percent). Additionally, there are a small number of Persian speakers (in the capital Quetta) and [Sindhi](#) (in [Lasbela](#) Naseerabad and Jaffarabad Districts)⁴⁴. The population density⁴⁵ in the project districts is given **Table-16**.

Table 16- District Wise Population Density

Province /District	Population Density
Balochistan	114.6
Quetta Division	118.1
Chagai	115.9
K. Abdullah	121.8
Pishin	114.9
Quetta	118.5
Zhob Division	117.2
Barkhan	110.5
K. Saifullah	119.0
Loralai	113.5
Musakhel	123.7
Zhob	119.5
Sibi Division	117.0
Dera Bugti	115.9
Kohlu	122.1
Sibi	117.2
Ziarat	107.9
Naseerabad Division	112.0
Bolan	117.3
Jaffarabad	108.3
Jhal Magsi	115.3
Naseerabad	111.1
Kalat Division	111.1
Awaran	110.8
Kalat	107.0
Kharan	107.6
Khuzdar	111.4
Lasbela	115.3
Mastung	113.0

⁴³ (http://en.wikipedia.org/wiki/Balochistan,_Pakistan#Demographics)

⁴⁴ http://en.wikipedia.org/wiki/Balochistan,_Pakistan#Demographics

⁴⁵ Censuses Report, 1998(http://en.wikipedia.org/wiki/Districts_of_Pakistan)

Province /District	Population Density
Makran Division	112.9
Gwadar	115.5
Kech	110.1
Panjgur	115.9

Source: Socio-Economic Indicators of Balochistan (2016-17)

4.12 Agricultural and Livestock's Production

About 6 percent of the available land is currently being cultivated in Balochistan, mostly in small landholdings. Agriculture is the mainstay of the economy and employs 67 percent of the total workforce. Approximately 60 percent of cultivated land is under dry land farming. Orchards in the upland valleys produce the highest returns. The production of orchards per unit of land fetches three to four times the income of grain or vegetable crops⁴⁶. At intermediate elevations (500–1,500 meters) where there is perennial water and a marketing infrastructure, farmers can produce off-season vegetable crops that command a premium price in major urban areas. In valleys above 1,500 meters, farmers can obtain significant returns from fruit production if irrigation water is available⁴⁷.

Wheat is the most important crop grown in highlands of the province, followed by barley and rapeseed. In spite of potentially high yield of barley, wheat predominates because it provides food security. In addition, the local wheat varieties used in Balochistan yields good quantity of straw and stubble; livestock's mostly small ruminants graze the latter⁴⁸. Onion, potato, Fodder, Gram and Cotton are also grown in some areas depending upon the availability of water for irrigation purposes.

Balochistan is the major producer of deciduous fruits and contribute about 70 percent of the total deciduous fruit production of the country. The varied nature and aridity of climate enables the province to produce a wide range of temperate and tropical fruits & vegetables in a comparatively disease free environment. A large number of people are engaged in Fruit Farming in the province. Agriculture contributes 52 percent to GDP and employs 65 percent (either full or part-time) of the labor force. Balochistan's diverse climate and topography create unique opportunities for agriculture (e.g., horticulture), but access to water is a key constraint. Rainfall is generally very low and uncertain, particularly in the upland areas that dominate the province. The rugged landscape and lack of water render much of Balochistan's land area unsuitable for agriculture. Only about 17 percent is arable and a majority of that is not cultivated, primarily because of a lack of water. Even the huge uncultivable area is largely unproductive with only about 30 percent offering good grazing for livestock⁴⁹.

Livestock is also an important component of Balochistan agriculture system. The province's rangelands support as many as 22 million sheep and goats, although the exact number is difficult to determine because of the nomadic lifestyle of many herders. Livestock is an important source of income for many

⁴⁶ Balochistan Conservation Strategy (May 19, 2000)

⁴⁷ Ibid

⁴⁸ Land and Range Resource Management Issues and Food Security in Balochistan – AZRI, Quetta (1994)

⁴⁹ USAID (March 2008) "Evaluation of Food Security, Poverty Alleviation in Arid Agriculture Balochistan Project Report

households in rural Balochistan. Livestock accounts for as much as 36 percent of the value of agricultural products and contributes substantially to livelihoods⁵⁰.

The rangelands of the province provide as much as 85 to 95 percent of the feed for its numerous livestock. The range is controlled by the tribes and suffers from the degradation typical of common property resources. The recent drought has exacerbated the problem, reducing the yield of range forage from 60 kg per hectare to 18 kg per hectare and putting additional pressure on households⁵¹.

4.13 Drought

Balochistan has suffered from a prolonged drought that has significantly affected agriculture, environment and livelihoods. Rainfall has been below normal in the past several years. A survey conducted by the International Water Management Institute (IWMI) in 2001 identified a number of consequences of the drought in Balochistan. These included a reduction in household income, greater dependence on other income sources, migration to other areas for work, and an increased burden on women to provide income and to fetch water and food from greater distances. The survey concluded that the drought had reduced yields on an average of 78 percent of farmers' rain-fed lands and 38 percent of their irrigated lands. In addition to crops; the survey estimated a 76 percent reduction in livestock numbers in the province between 1997 and 2001⁵². Non availability of water is the ultimate problem throughout the province.

4.14 Healthcare Facilities

Balochistan has a very scattered population where the health facilities are limited and sanitation facilities are inadequate. The far-flung rural and the semi-urbanized slums face the dilemma of the usual infections and viral attacks, which causes fatality for them. Balochistan has been rated high for the infant and mother mortality during the pregnancies. The health services are highly concentrated and centralized at the capital of the province, all the professional physicians, surgeons and specialists are gathered in Quetta, while there exists no reasonable human resource at the outskirts of the province.

Due to lack of social and physical infrastructures, the province is suffering from severe backwardness. Every sector of economy is undeveloped and under-developed including the health sector and primary health care services are minimal. The main reason for scarcity of health care services are; lack of qualified doctors and nurses, lack of hospitals and referral health services, lack of equipment in hospitals and non-availability of preventive and curative medicines in public health facilities. The availability of qualified doctors in hospitals is a very serious issue in all districts except major hospitals. The total number of public sector hospitals in Balochistan⁵³ are 49 with bed strength of 4146, Dispensaries are 548 Rural Health Centre (RHC) are 95 with bed strength of 970 and Basic Health Units are 670 and 90 MCH Centers. A number of hospitals working in private sectors especially in Quetta fulfill the health care demands of the middle and higher middle class families⁵⁴.

⁵⁰ USAID (March 2008) "Evaluation of Food Security, Poverty Alleviation in Arid Agriculture Balochistan Project Rep

⁵¹ Ibid

⁵² Ibid

⁵³ Development Statistics of Balochistan (2016-17)

⁵⁴ Comparative Statistics by Province (2009), Bureau of Statistics, P&D Department, Government of Sindh

Balochistan province lacks the required health care facilities and trained professionals. There are total 2272 qualified doctors and 742 nurses, 360 pharmacists, 674 Lady Health Visitors, and 1628 Midwives in public sector hospitals in the province⁵⁵. About 328 private medical practitioners and 97 female private medical practitioners are also providing health care services mostly in the capital city. Details of district wise health facilities in the project area are given in **Table-17**.

Table 17 District Wise Government and Private Health Facilities

Province/Districts	Hospital		Dispensary		RHC
	Public	Private	Public	Private	
Balochistan	49	83	548	19	970
Quetta	8	56	7	8	30
Awaran	1	0	15	0	20
Barkhan	1	0	13	0	0
Chagai	1	0	12	2	30
Dera Bugti	1	1	27	0	10
Gwadar	2	1	15	0	58
Harnai	1	0	8	1	10
Jaffarabad	3	0	35	0	20
Jhal Magsi	1	0	16	0	54
Kacchi/Bolan	3	1	17	1	62
Kalat	2	0	42	1	30
Kech	2	7	42	0	98
Kharan	1	1	12	0	0
Khuzdar	1	2	30	0	100
Killa Abdullah	1	2	9	1	50
Killa Saifullah	2	5	15	0	30
Kohlu	1	0	33	0	30
Lasbela	3	1	26	1	40
Loralai	2	0	46	1	20
Mastung	2	0	6	0	30
Musakhel	1	0	15	0	10
Naseerabad	1	0	9	1	30
Nushki	1	1	16	0	0
Panjgur	1	1	13	0	10
Pishin	2	2	10	1	50
Sherani	0	0	7	0	32
Sibi	1	1	16	1	30
Washuk	1	0	12	0	20
Zhob	1	10	17	0	26

⁵⁵ Development Statistics of Balochistan (2016-17)

Province/Districts	Hospital		Dispensary		RHC
	Public	Private	Public	Private	
Ziarat	1	0	8	0	40

Source: Development Statistics Balochistan (2016-17)

The infant mortality rates recorded in the province ranges from 78 to 121 is generally higher than accepted international standards and health indicators present a dismal status of the province⁵⁶. Awareness about personal hygiene is very low. According to the MICS⁵⁷ survey only 41 percent household's use soap to wash their hands before eating and only 55 percent wash their hands adequately after attending toilet. Only 52 percent households are aware of the need for iodized salt.

4.15 Education and Social Issues:

Balochistan has the worst education outcomes among the four provinces in Pakistan. Girls education is a particular challenge due to a combination of deficiencies in education service provision and demand side failures. The supply side challenges consist of lack of adequate schools for girls at each level of schooling, poor facilities in schools, lower rate of enrolment and lack of teaching staff. These factors hinder access to education for girls feeding into a lower literacy rate for girls.

On the demand side, social issues and challenges exert an influence on girls' access to education. Foremost among these are patriarchal structure of society and the prevailing conflict situation. Patriarchal structures place restrictions on the mobility of girls, confine them to specific household related roles at an early stage of life and place lower value on their education. The impact of these factors is evident from a lower NER for girls indicating a larger number of out-of-school girls, higher drop-out rate for girls especially at primary level and lower number of girls completing school education. The situation is further influenced by the prevailing conflict that places further hindrances in both school operation and girls access to schools.

Given this situation, the Project will need to work in close collaboration with local communities to ensure that the establishment of schools does not contribute to any environmental and other social issues that can alienate it. It is essential to build a solid foundation with communities and eliminate and possible sources of conflict, nuisance and hazard to ensure that acceptance for girls schooling is promoted.

4.16 Education Facilities

Education system in Balochistan does not show an affirmative picture as it lacks standout opportunities. Almost every school is underprivileged of all the basic facilities needed for development. The total number of schools in Balochistan are 13674⁵⁸. Out of total 8195⁵⁹ primary schools are for boys and just 3077 are girls school. Similarly, the province has total 1395⁶⁰ middle schools in which 830 are

⁵⁶ Health Indicators of Pakistan, Gateway Paper II (www.heartfile.org/gwhiop.htm)

⁵⁷ MICS Survey (2010), P&D Department, Government of Balochistan

⁵⁸ EMIS Report 2016-17

⁵⁹ Ibid

⁶⁰ Ibid

boys and 565 are for the girls. Total number of high schools in province are 1007⁶¹ out of which 675 are for boys and 332 are for girls. **Table-18** presents district wise list of schools in Balochistan. Whereby, **Table 19** presents district wise collages in Balochistan.

Table 18 District Wise Government Schools in Balochistan

District	Total	Primary		Middle		High/H. Secondary	
		Boys	Girls	Boys	Girls	Boys	Girls
Pishin	998	623	203	63	51	39	19
Loralai	747	477	178	42	22	19	9
Khuzdar	743	451	172	35	43	29	13
Kech	678	308	204	57	32	46	31
Quetta	637	307	132	46	54	41	57
Killa Saifullah	614	419	121	27	17	22	8
Lasbela	606	375	133	38	21	29	10
Barkhan	597	390	151	16	17	17	6
Kalat	594	322	158	34	27	37	16
Jaffarabad	566	348	143	33	13	21	8
Killa Abdullah	557	404	65	37	11	31	9
Naseerabad	510	292	150	23	18	23	4
Kacchi	456	317	74	21	11	23	10
Kohlu	451	327	72	17	15	14	6
Sohbatpur	418	237	121	20	14	20	6
Panjgur	401	181	138	28	18	22	14
Mastung	387	205	98	26	25	18	15
Zhob	360	242	56	25	9	21	7
Dera Bugti	351	232	52	30	7	26	4
Musakhel	311	202	65	16	9	15	4
Jhal Magsi	294	161	81	19	13	16	4
Gwadar	277	148	71	23	9	16	10
Sibi	273	135	75	17	15	17	14
Ziarat	268	151	64	11	19	17	6
Chagai	267	160	53	20	15	13	6
Awaran	266	164	50	19	9	19	5
Nushki	245	115	54	18	24	21	13
Kharan	240	136	46	28	9	13	8
Washuk	194	121	33	16	6	14	4
Sherani	192	152	18	13	2	6	1
Harnai	176	93	46	12	10	10	5
Total	13674	8195	3077	830	565	675	332

Source Balochistan Education Management Information System (EMIS) Report 2016-2017

⁶¹ Ibid

Table 19 District wise Government Colleges

DISTRICT	DEGREE COLLEGES			INTER COLLEGES			COMMERCIAL COLLEGES	PHYSICAL COLLEGES	TOTAL COLLEGES
	BOYS	GIRLS	TOTAL	BOYS	GIRLS	TOTAL			
AWARAN	0	0	0	2	0	2			2
BARKHAN	1	0	1	0	1	1			2
CHAGHI	0	0	0	1	1	2			2
DERA BUGTI		0	0	2	0	2			2
GAWADAR	1	0	1	2	2	4			5
HARNAI	1	0	1	0	0	0			1
JAFAR ABAD	1	1	2	3	2	5			7
JHAL MAGSI	0	0	0	1	0	1			1
KACHHI	0	0	0	4	1	5			5
KALAT	1	0	1	2	2	4			5
KECH	1	1	2	3	0	3			5
KHARAN	1	0	1	0	1	1			2
KHUZDAR	1	1	2	3	0	3			5
KILLA	1	0	1	3	2	5			6
KILLA	2	0	2	0	2	2			4
KOHLU	0	0	0	1	0	1			1
LASBELA	1	0	1	2	1	3			4
LORALAI	1	1	2	2	0	2			4
MASTUNG	1	1	2	2	0	2			4
MUSAKHEL	1	0	1	2	1	3			4
NASEER ABAD	1	0	1	1	0	1			2
NUSHKI	1	1	2	0	0	0			2
PANJGUR	1	1	2	0	1	1			3

Source Balochistan Education Management Information System (EMIS) Report 2016-2017

The detail data gender wise enrollment is also furnished in EMIS 2016-2017 report. According to the information of report total number of school students in Balochistan from primary to higher secondary school are 884405. In Kacchi total number of enrollment is 232240 which is comprised of 134996 boys and 97244 girls.

In primary schools 466785 students are enrolled which make 273193 boys and 193592 girls respectively. In middle schools 123877 show a clear decline in school enrollment. Out of 123877 the number of boys that are reported in middle schools are 76337 and the girls' enrollment is just 47540. The total enrollment in high school is further decreasing with just 61275 students which include 38544 boys and 22731 girls. At higher secondary level the total enrollment is reported to be 228. In higher secondary schools surprisingly the ratio of girls is more than the boys. According to the reports the

enrollment of boys in high secondary school is just 75 and the girls is 153. District wise enrolment in schools is given in **Table-20**.

Table 20 District wise enrolment in Schools

District	Total	Kachhi	Primary	Middle	High	H.Secondary
Quetta	116000	20024	59111	23594	13271	0
Kech	69481	17872	33379	11702	6492	36
Pishin	60556	15780	34972	7030	2774	0
Jaffarabad	48975	13894	25328	6884	2869	0
Lasbela	45452	10478	25028	7192	2632	122
Khuzdar	40098	12137	22326	3758	1877	0
Naseerabad	36341	12153	17624	4256	2308	0
Gwadar	33759	6695	18095	5914	3055	0
Kalat	32124	6530	20031	3799	1764	0
Killa Abdullah	30690	9610	16439	3046	1595	0
Mastung	28784	7846	15845	3350	1743	0
Killa Saifullah	28442	8765	15321	3153	1203	0
Sohbatpur	28290	7525	14600	4356	1809	0
Punjgoor	28257	6449	15386	4046	2317	59
Zhob	26653	6726	13947	3882	2098	0
Loralai	23785	9081	11359	2160	1185	0
Kachhi	22303	6678	11775	2740	1110	0
Nushki	22135	4154	11932	4181	1868	0
Sibi	21621	4429	10692	4172	2328	0
Awaran	19150	4632	11651	2094	773	0
Chagai	18607	4762	9883	2544	1418	0
Barkhan	16516	5740	8853	1252	671	0
Jhal Magsi	15826	6932	6749	1548	597	0
Kharan	13571	4144	6917	1804	886	0
Ziarat	10866	2942	5787	1452	684	1
Musakhel	10317	3075	5268	1197	777	0
Harnai	9070	2784	4868	1069	349	0
Dera Bugti	7699	2663	4211	547	277	1
Kohlu	7004	3755	2703	310	227	9
Sherani	6289	2308	3579	295	107	0
Washuk	5564	1677	3126	550	211	0
Total	884405	232240	466785	123877	61275	228

Source Balochistan Education Management Information System (EMIS) Report 2016-2017

The combined literacy rate in the province is 37 percent. While male literacy rate is 52 percent and female literacy rate is 19 percent in Balochistan⁶². Findings of the Multiple Indicator Cluster Survey (MICS) on “literacy among young women of age 15-24 years”, show that around 33 percent of young women in the province were found literate on the basis of “ability to read a short simple statement”. Further, women in the younger cohort had higher literacy levels at 35 percent than those in the next age bracket (30 percent) meaning that literacy rate has improved by 4 percent in the recent past⁶³. Young women in urban areas had a much higher literacy rate to the tune of 59 percent than those residing in the rural areas at 23 percent.

Literacy rate by regions show variation ranging from as low as 16 percent in Zhob region to as high as 69 percent in Makran region; understanding the dynamics of these variations in terms of access to schools, institutional arrangements, and poverty levels in various regions. The relationship between literacy and poverty in terms of wealth quintiles is also very alarming; only 7.5 percent women in the poorest wealth quintile and 16.6 percent in next upper quintile were literate compared to 67 percent in the richest quintile⁶⁴. This finding indicates that public sector expenditure on education is poorly targeted on poorest of the poor.

4.17 Infrastructure Profile

The infrastructure in Balochistan varies from urban to rural areas as well as in different regions of the province. The roads networks in the province comprise of approximately 41779 km including 21404 km black topped roads and 20375 km shingle roads⁶⁵ reflecting poor connectivity in the province. The largest expansion in roads network was that of farm-to-markets roads. The length of the national highways remained largely constant at 2,371 km. Poor connectivity and access continue to be a major problem, which particularly affect the poor, who live mostly in the rural areas. Shingle or gravel roads representing 77 percent of the network is in very poor condition and deteriorating rapidly owing to increased traffic and insufficient maintenance⁶⁶. The length of road network (in kilometers) in the project districts is given in **Table-21**.

Table 21 District wise Roads in Balochistan

District	Black Topped	Shingle	Total
Balochistan	21404	20375	41779
Awaran	524	1282	1806
Barkhan	432	334	766
Chagai/ Nushki	1001	1162	2163
Dera Bugti	489	602	1091
Gwadar	391	934	1325
Jaffarabad	1787	21	1808
Jhal Magsi	995	99	1094
Kachhi	931	280	1211
Kalat	926	1286	2212

⁶² UNESCO (2009): Paper Commissioned for Education for All (EFA) Global Monitoring Report

⁶³ MICS Survey (2010), Government of Balochistan

⁶⁴ Ibid

⁶⁵ Development Statistics Balochistan (2016-17)

⁶⁶ ADB (October, 2003), Balochistan Road Sector Development Project

Kharan/ Washuk	1069	1326	2395
Khuzdar	1353	1514	2867
Killa Abdullah	857	1065	1922
Killa Saifullah	779	947	1726
Kohlu	158	1192	1350
Lasbela	1277	1232	2509
Loralai	723	603	1326
Mastung	1133	307	1440
Musakhel	184	306	490
Naseerabad	949	252	1201
Panjgur	394	1492	1886
Pishin	1292	648	1940
Quetta	1556	402	1958
Sibi/ Harnai	695	282	977
Sohbatpur	18	-	18
Kech	413	1554	1967
Zhob/ Sherani	589	916	1505
Ziarat	490	337	827

4.18 Socio-economic Conditions

Balochistan is relatively scarce in its endowments of human capital, agricultural growth and industrial investment comparing with rest of the provinces. For the last fifteen years, the overall share of Balochistan in the national GDP has remained constant at 4 percent. In the service sectors Balochistan's growth potential appears to be closely connected to its integration with the national economy and other regional economies⁶⁷. Agriculture, both crops and livestock, is the main income generator as well as employment sector in Balochistan. Agriculture accounts for about 65 percent of GDP and employ about 65 percent of the workforce full or part time⁶⁸.

While agriculture continues a source of growth, its relative potential in Balochistan is circumscribed by the chronic scarcity of water over much of the province. The irrigated Kachhi plains account for a high proportion of all crop production. Livestock and horticulture dominate the agricultural sector in the rest of the province. Persistent droughts and chronic water scarcity has meant the loss of grazing land, and hence reduction in livestock's sector. Only one third of the total land of the province can be deemed reasonably productive grazing land⁶⁹.

Conditions for manufacturing growth are relatively unfavorable compared with the rest of Pakistan. Mineral sector is a potentially significant but as yet under-developed sector in Balochistan's economy. Currently 5 percent of GDP is earned through mining and employs only about 1.3 per cent of the employed persons in the province. Extraction of thirty-nine out of the fifty recorded mineral resources present in Balochistan generates annual revenue of close to Rs.3.4 billion.

⁶⁷ <http://www.researchcollective.org/documents/balochistan-economic-report.pdf>

⁶⁸ Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992

⁶⁹ Ibid

Fisheries are significant in the economy of the small coastal towns, but not so far the GDP. Fisheries sector contributed to 9 percent of the national fisheries sector in 2004-2005. The catch is supplied to domestic and international markets through Karachi and Kech. The fisheries sector is also a source of employment for many in the coastal areas. Nearly 70 percent of the total employed persons in the coastal districts are associated with the fisheries sector⁷⁰.

Human Development Index (HDI) ranking of districts for the province indicate highest for Panjgur to the lowest for Musakhel. Districts Panjgur (0.553), Gwadar (0.543), Kech (0.521), Ziarat (0.467), Sibi (0.459), Chagai (0.416), Quetta Zarghoon (0.410), Pishin (0.408) and Jaffarabad (0.405) fall in the highest (first) category. On the contrary, districts with terribly low HDI values include; Bolan (0.289), Kalat (0.282), Awaran (0.278), Zhob (0.271), Kharan (0.267), Washuk (0.265), Khuzdar (0.259), Sherani (0.255), Loralai (0.243) and Musakhel (0.193)⁷¹.

4.19 Culture, Religion, and Customs

Balochistan has a very rich cultural heritage of ancient times reflected through specimens of art and craft, literature, and architect. The population is predominantly of Muslims but minorities populations of Hindu's, Sikh and Christian lives in urban and rural areas. Pashto, Balochi and Brahvi are the native languages spoken widely, particularly in rural areas. However, in Kachhi and Sibi districts, people speak Seraiki and Sindhi. Quetta city, the confluence point of all linguistic groups accommodates not only Urdu, Balochi, Pashto, Brahvi and Sindhi speaking people but Punjabi, Darri and Persian speaking people as well. Majority of the population understand and speak Urdu, the national language.

A strong tribal system exists with number of tribes constitute to make people of Balochistan. Three major tribes are Baloch, Pashtoon and Brahvi. The Balochi speaking tribes include Rind, Lashar, Marri, Jamot, Ahmedzai, Bugti Domki, Magsi, Khosa, Rakhashani, Dashti, Umrani, Noshervani, Gichki, Buledi, Sanjarani and Khidai. Each tribe is further sub-divided into various branches. The tribal chief is called Sardar while head of sub-tribe is known as Malik, Takari or Mir. Sardars and Maliks are members of district and other local Jirga's according to their status. The Balochi, are further divided in to two branches: The Sulemani and Mekrani as distinct from the Brahvis who mostly concentrate in central Balochistan. Among the eighteen major Balochi tribes, Bugtis and Marris are the principal ones who are settled in the buttresses of the Sulemania. Brahvi speaking tribes include Raisani, Shahwani, Sumulani, Bangulzai, Mohammad Shahi, Lehri, Bezenjo, Mohammad Hasni, Zehri, Mengal and Lango, most of these tribes are bi-lingual and are quite fluent both in the Balochi and Brahvi Languages. The Pashtoon tribes include Kakar, Ghilzai Tareen, Mandokhel, Sherani, Luni, Kasi and Achakzai⁷²

Cultural landscape of Balochistan⁷³ portrays various ethnic groups. Though people speak different languages, there is a similarity in their literature, beliefs, moral order and customs. The cementing factor is religion which provides a base for unity and common social order. Brahvi, Balochi and Pashtoon tribes are known for their hospitality. Another adorable feature of Balochistan culture is faithfulness and

⁷⁰ Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992

⁷¹ Govt. of Balochistan (November 28, 2011), Strengthening PRS Monitoring Project, P&D Department,

⁷² <http://www.balochistan.gov.pk/menu-culture-and-heritage.html>

⁷³ <http://www.balochistan.gov.pk/menu-culture-and-heritage.html>

sincerity in all relationships. There is no place or respect for unfaithful people in prevalent moral order. If fidelity is reciprocated with disloyalty or betrayal it is never forgotten.

Peoples dress among the Balochi, Pashtoon and Brahvi tribes is very similar having a few minor dissimilarities. Turban is the common headwear of the men. Wide loose shalwar and knee-long shirts are worn by all. The dress of the woman consists of the typical shirt having embroidery work with embedded small round mirror pieces. Big 'Dopatta' or 'Chaddar', a long rectangular piece of cloth cascading down the shoulders and used to cover head, are used by the women.

The religious and social festivals are celebrated by the people of Balochistan. Besides, major religious festivals, colorful social festivals are also source of jubilation. Sibi festival that traces its roots to Mehergar, an archeological site of ancient human civilization, attracts people from across the country. It is attended by common folks, ministers and other government officials. Folk music performance, cultural dances, handicrafts stalls, cattle shows and a number of other amusing activities present a perfect riot of color. Buzkashi is a peculiar festival showing velour of Balochistan people. It is celebrated on horse-back by two teams that use their skills to snatch a goat from the each other.

4.20 Global Climate Change and GHG

Global Climate Change and the deteriorating quality of urban air are major issues affecting the atmospheric ecosystem of Pakistan. Urban air quality has deteriorated in the country in the water of fast increasing traffic, increased energy consumption, growing industrialization, increase in number of and type of industries and enhanced use of chemicals. Increase emissions from vehicles, power plants and industrial facilities impose health and resource cost both close to and at a distance for the sources of pollution and may have global impacts as is being witnessed in climate change⁷⁴.

Pakistan's GHG profile is dominated by emissions from the energy and agriculture sectors, whose combined emissions total 87% of national GHG emissions. According to the World Resources Institute's Climate Analysis Indicator Tool (WRI CAIT), energy contributes 46% of Pakistan's total annual GHG emissions, of which 26% is attributed to electricity consumption, 25% to manufacturing, 23% to transportation and the remaining 25% to other energy subsectors. Agriculture accounts for 41% of total GHG emissions, of which enteric fermentation is the primary contributor (46%). The land use change and forestry (LUCF) sector contributes 6%, dominated almost entirely by changes in forest land.1 Industrial processes (IP) and waste contribute 5% and 2%, respectively⁷⁵.

Unfortunately, data on urban air quality in Pakistan is scarce. According to the information available the main air pollutants in the cities are particulate matter (PM with a diameter of 10 microns or smaller: PM₁₀ or PM_{2.5}), 102.5 nitrogen oxides, Sulphur dioxide (SO₂), carbon monoxide (CO), ozone O₃, volatile organic compounds 2 (VOCs) and lead (Pb).

The Environmental Protection Agency (EPA) Conducted an initial investigation of the air pollution in the three major cities of country viz. Karachi, Lahore and Islamabad, with the assistance of Japan International Cooperation Agency (JICA) in 2001. The investigation revealed that PM₁₀ were exceeding the World Health Organization (WHO) guideline limits set at 50 µg/m³(24-hour mean), 20 µg/m³ (annual mean) greatly. The average Suspended Particulate Matter for three cities were 2000 µg/m³, while PM₁₀ averaged 700

⁷⁴ Environment and Climate Change Outlook Report: Climate Change Division Pakistan (2014)

⁷⁵ GHG Emissions Fact Sheet Pakistan USAID 2016.

$\mu\text{g}/\text{m}^3$ ⁷⁶). Whereby, ambient concentrations of SO, NOx and CO were on average found to be within the limits of WHO guidelines of 2001.

In another study on air quality conducted by Fuel Efficiency in Road Transport Sector (FERTS) (2003-04)⁷⁷ program in six cities viz. Karachi, Lahore, Peshawar, Quetta, Rawalpindi and Islamabad. The data revealed that average Suspended Particulate Matter (SPM) concentration in Pakistan exceeded 3.8 times from the Japanese standard of $200 \mu\text{g}/\text{m}^3$ and 6.4 times the limit set by WHO guideline $120 \mu\text{g}/\text{m}^3$. In the same study it was also observed that NOx and SO₂ are also on higher side in all except Islamabad⁷⁸.

In another investigation conducted by Pak EPA in Quetta⁷⁹ on ambient air particulate matter revealed that the Imdad Chowk is the most polluted location compared to other locations in the city. The Total Suspended Particulate Matter on Imdad Chowk was more than $1760 \mu\text{g}/\text{m}^3$.

The reason for such a high levels of particulate matter in cities may be attributed to the heavy traffic in the cities and the way the vehicles consumes petroleum products. It was reported that road transport consumes 47.2% of the total petroleum products produced and imported⁸⁰. Lead compounds are added to petrol to increase the efficiency of car engines and to reduce engine knock. The high lead content in petrol is released into the environment⁸¹. On average, it measures about 0.35 gram/liter, which is relatively very high as compared to the United States and many European standards (0.00–0.15 gram/liter)⁸². Two other factors contributing to high emissions are the predominant use of diesel (in about 72% of the vehicles driven) and fuel use inefficiency⁸³.

⁷⁶ Cities Investigation of Air and Water Quality (Lahore, Rawalpindi & Islamabad). JICA–Pak-EPA 2001

⁷⁷ Fuel Efficiency in the Road Transport Sector (FERTS) UNDP/GEF (2003-2004)

⁷⁸ Ibid

⁷⁹ Ambient Air Particulate Matter and Water Quality Investigation in Quetta, May 2006 Pak-EPA

⁸⁰ Air Pollution: Key Environmental Issues in Pakistan Working Paper Series # 99 (2005)

⁸¹ Ibid

⁸² Ibid

⁸³ Khan, Shaheen Rafi and Iqbal, Fareeha. A Climate of Trust Report: Domestic Actions in Developing Countries to Advance Development Priorities While Slowing Climate Changes. Sustainable Development Policy Institute. Islamabad (2001)

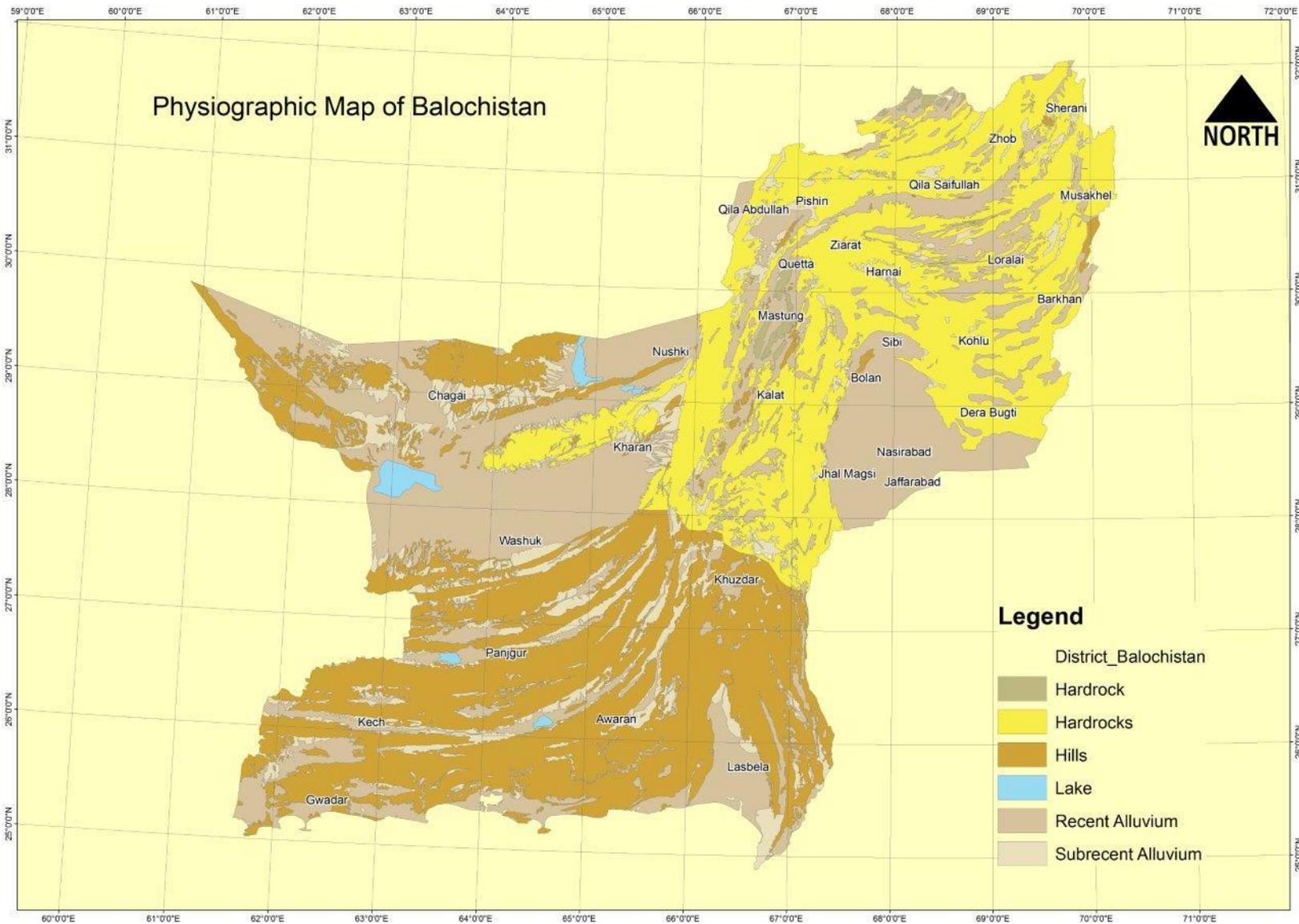


Exhibit 2 Geophysical Features of Balochistan (Source IUCN)

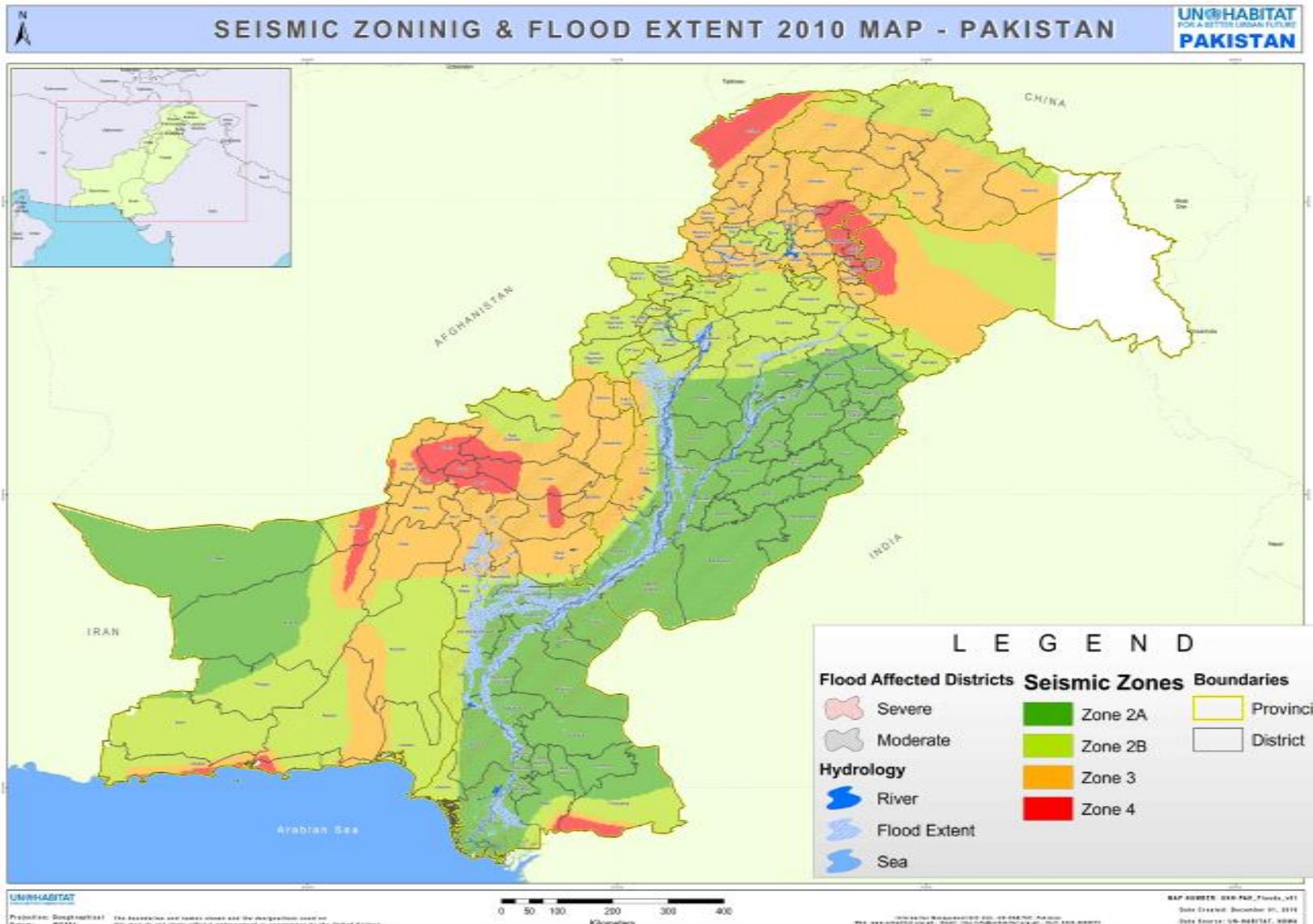


Exhibit 3 Seismic Zones of Pakistan (Source UN Habitat)

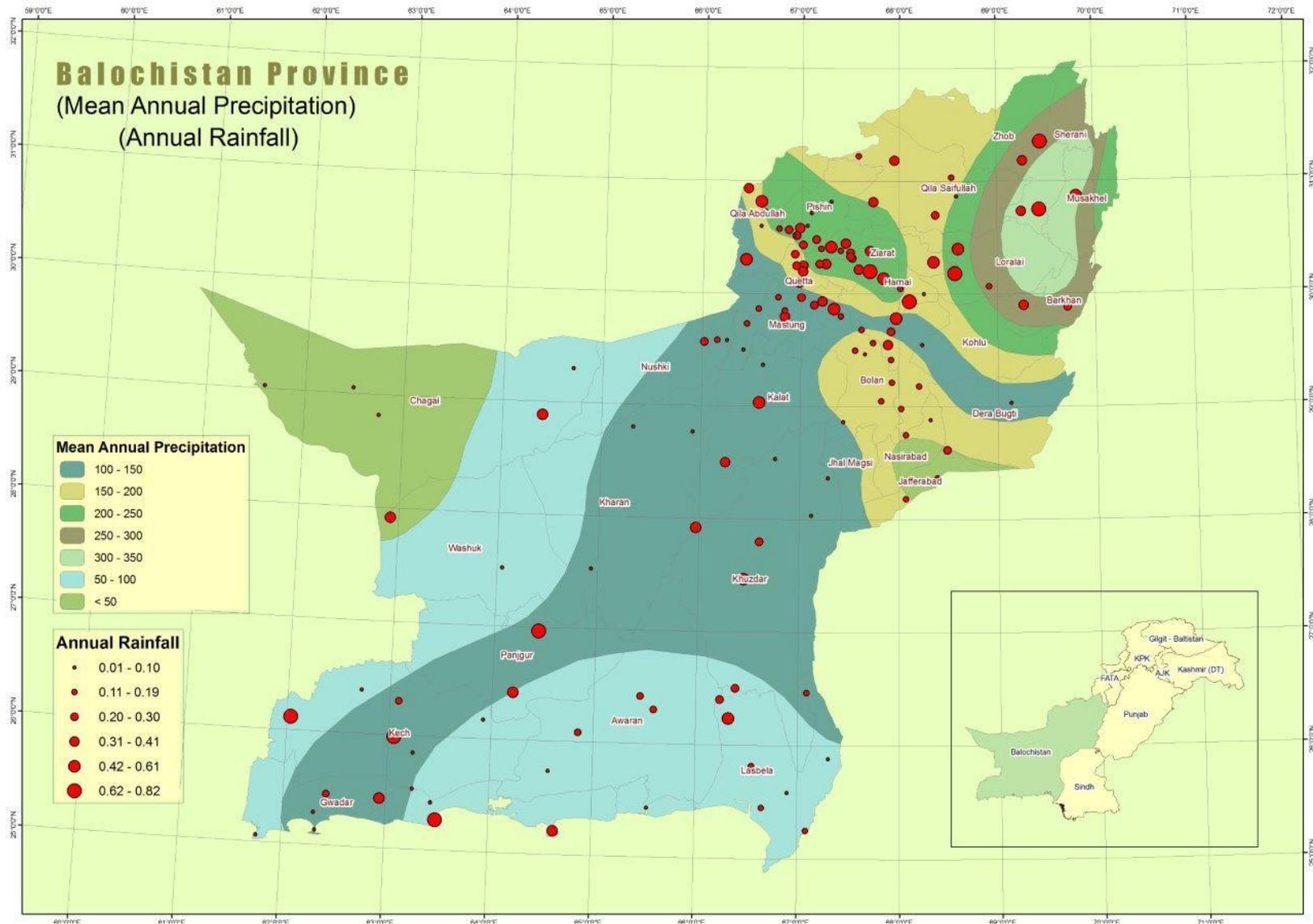


Exhibit 4 Annual Precipitation Balochistan (Source IUCN)

5 Review of Implementation of ESIA/ ESMP in GPE-Balochistan Education Project

Pursuant to the requirement of the Terms of Reference (TOR) of the assignment a thorough review of the implementation of ESIA and ESMP of the GPE-BEP was carried out a view to determine level of compliance of during execution of project activities. The process included, review of available ESIA/ESMP, meeting with staff directly involved in implementation and monitoring of ESMP, available record viz. impacts identification report, Grievance Redressal Mechanism (GRM), progress report and monitoring reports. The review lead to the following conclusions: -

a. **Review of ESIA/ESMP GPE-BEP (Addendum)**

The complete ESIA of PGEB and associated addendum pertaining to GPE-BEP was reviewed and an understanding was arrived at that both the documents are well defined and cover almost in all respect and requirements of a prudent ESIA and ESMP.

The ESIA was also found robust as it logically anticipated all possible environmental & social impacts, health and safety issues related to execution of project activities. However, some issues were observed by the project while during suggesting/anticipating mitigation measures related to impacts associated with siting of school locations which though were address properly by the Social Safeguard Officer and the technical team of the project. The following key features of ESIA-GPE-BEP (addendum) was noted: -

- ❖ The institution arrangement was clearly defined in the document because of which all concerned staff clearly understood their roles and responsibilities; thereby, the ESMP was smoothly implemented.
- ❖ The mechanism for Environmental reporting was well defined therefore, the all reports pertaining to ESMP were timely prepared without any difficulty.
- ❖ The ESMP provided capacity building opportunity for key stakeholders and designated staff of the project.
- ❖ The ESMP by virtue of its design ensured pro-active participation of the Parents Teachers School Management Committees (PTSMCs).

b. **Institutional arrangement**

The discussion with the staff regarding ESMP implementation of ESMP concluded that the proper institutional arrangement was defined in the ESMP. Inclusion of the Positon of Environmental and Social Safeguard Officer in the PMU made a clear difference and was central in successful implementation of ESMP during project execution. However, following flowing observations were made while reviewing the institutional arrangement of ESMP: -

- ❖ In the ESMP the compilation of field data, monitoring and reporting of ESMP was entrusted to the District Focal Person (DFP) that being the District Education Officer (DEO). These officers already being undulated with the assignments of their regular position, were unable to comply with the tasks of ESMP compliance and monitoring in time. It was therefore, that the project assigned the responsibility of the ESMP compliance and monitoring to the SEs, who completed these assignments meticulously.

- ❖ It was reported by the project staff that no cost has been reflected in the ESMP for implementation of mitigation measures as when encountered. The point was well noted and recorded for inclusion in the current ESMP.

c. Environmental Training and Capacity Building: -

Training and capacity building of stakeholders is central to effective implementation and compliance of ESMP. The detailed discussion with different stakeholders of the project including PTSMC and School Teachers, it was revealed that a very comprehensive training and capacity building of the stakeholders including School Teachers, were carried out during the offing stage of the project. Teachers of 120 upgraded schools were given training on Environmental awareness education, social safeguard related issues, Water Sanitation and Hygiene (WASH), Disaster Risk Reduction (DRR) and child rights. These teachers after receiving trainings went back to their respective schools and imparted training to their students. Additionally, all PTSMC members of 845 schools were imparted training on basics of environment and ESMP, DRR and Water Sanitation and Hygiene (WASH).

d. Monitoring and Reporting

Pursuant to the review of the monitoring and reporting processes of the ESMP during execution of GPE-BEP it was noted that during the initial stages the District Focal Persons (DFPs) of the project, being the District Education Officers (DEOs) could not successfully comply with the assigned tasks of ESMP monitoring and reporting. However, when the project assigned the responsibility to the SEs the monitoring became effective and reporting streamlined.

It was also noted that tools were also prepared by the PMU GPE-BEP for collecting data, pertaining to ESMP implementation and monitoring, from the school sites. This practice not only increased the efficiency of the staff but also made the reporting process less cumbersome.

As part of Monitoring Process, it was also envisaged in the ESMP of GPE-BEP, to carry out third party validation through an independent monitoring agency on annual basis with a view to evaluate the overall ESMP implementation progress /compliance and to ensure that the mitigation measures are implemented as per mitigation plan. No such third party validation was carried out by the Project during implementation of GPE-BEP ESMP.

Good practices

The PMU of GPE-BEP took a couple of good initiatives while implementing ESMP which are produced hereunder for record: -

- ❖ Plantation of Trees and Shrubs were made integral part of school design and therefore, trees and plants have been planted in almost all schools constructed/established under GPE-BEP.
- ❖ Ramps and emergency exits were made a compulsory element of school design.
- ❖ After conducting a detailed survey in the GPE-BEP established schools; students with special needs were identified and they were provided wheel chairs, wash room chairs and walking stands with a view to ensure attendance in school.

6 Stakeholder Consultations

This section describes the stakeholder consultations, Focus discussions and stakeholder workshop which were carried out during preparation ESIA of GPE-BEP. Additionally, this section give detail of the consultations carried out during preparation of this ESIA and the proposed consultations which shall be carried out during the project implementation.

6.1 Objective of Consultations

The objectives of stakeholder consultations were to

- i) apprise the stakeholder about the BESP and the additional support being provided under this project to GPE-BEP and to inform them about its potential impacts,
- ii) to obtain views, concerns and suggestions of the stakeholders about the project and its design; and
- iii) address these concerns / suggestions in designing the mitigation measures.

6.2 Consultations Carried out for during preparation of ESIA of GEP-BEP

During preparation of ESIA consultations were held with relevant officials of the Education and Environmental Protection Departments of Government of Balochistan, functionaries, interest groups, beneficiaries, affected communities and NGOs working in the project area. These consultations were held through a series of individual meetings to ascertain their perceptions and views about the project. The outcome of these consultants have been reviewed while preparing this ESIA and outcome of the meetings were taken as reference point while designing the ESMF for the current project.

6.3 Consultation with the PMU Staff of GPE-BEP

A series of meetings were held with the concerned officials of PMU of GPE-BEP to get an understanding of the project and to inform the PMU staff regarding potential impacts of the project and possible mitigation measures. The meetings also focused on getting view of the PMU technical staff on alternate project options. The meetings were helpful as the PMU staff gave suggestions and recommendations for incorporating in the ESMF so as to ensure its smooth implementation and robust monitoring. The technical team of the PMU strongly recommended that specific and concise health and safety guidelines be made part of the ESMF instead of attaching then entire set of guidelines for ease and better understanding of the reader. The also suggested that the role of contractor may be very clearly defined in the ESMF so that the contractor should be bound to strictly follow the ESMP.

6.4 Consultation with the beneficiary representatives and PTSMC Members

A meeting with the key stakeholders was attended during the preparation of this ESMF with a view to apprise the community about the project and its possible social and environmental impacts, to obtain their suggestions regarding project and record their concerns. All the attendees appreciated the concept of the project and agreed in full that the activities of the project are well thought out and would definitely improve the enrolment and attendance of girls in schools. Their major concern was safety of school children and interruption of schooling process during construction phase. Similarly, they informed the meeting that since project activities shall mostly be carried out in the existing girls' schools therefore, the movement of the labor and other workmen not only distract the school children but also the female

teacher feel uncomfortable in such a situation. The unanimously suggested that contractors should be bound to install colored curtains around the construction sites.

6.5 Proposed Consultations during implementation of GPE-BEP

Since wee time was available for completing the ESIA processes and preparation of ESMF therefore, very few consultations were done. It is therefore, suggested that the following additional consultation be carried out with the stakeholders of the project, interest groups and beneficiaries in order to incorporate their suggestions and concerns during execution of project interventions; and also to manage a two-way communication between the project, its stake holders and the beneficiary communities.

1. Consultation with the Local administration department and local government representatives for ensuring their ownership of the project in their respective areas.
2. Consultation with the Local and International NGOs for obtaining their views on the environmental and social impacts of the interventions.
3. Consultation with the PTSMCs and Community members regarding O&M of Transport Vehicles.
4. Consultation with EPA regarding air pollution control.

7 Analysis of Project Alternatives

This chapter describes various project alternatives considered during the study in order to ensure that the best possible option in terms of environmental, social and economic has been included in the design. Following is the brief description of alternative options considered during this study.

7.1 No Project Option

Pakistan faces serious challenges in ensuring good quality education to all. Literacy rate is barely 50 per cent, with that for females being 35 per cent. About 6.8 million primary school age children are out of school. Primary education completion rate is 70 per cent for male and 53 per cent for females. The Primary Gender Parity Index rests at 0.78. The quality of education remains equally problematic (UNESCO 2009)⁸⁴.

The challenges to ensuring good quality education to all are compounded by the fact that disparities in access continue to be significant across the four provinces and across income, gender, and urban/rural divide. There are great disparities in access among the four provinces, plus there are high variations in rural-urban education indicators. A large proportion of the literate population is concentrated in the national and provincial capitals. The areas with low literacy are also backward in terms of economic development. Punjab being the most populated province hosts the largest number of state schools, while Balochistan hosts the smallest **Table-18**. Literacy rate is highest in Punjab at 62⁸⁵ per cent and lowest in Balochistan at 41 per cent. This inter-provincial difference is pronounced in literacy rates among females: as opposed to a female literacy rate of 54 per cent in Punjab, in Balochistan the rate is only 24 per cent⁸⁶. Further, there is great variation in performance across the rural and urban areas within each province and across males and females.

Similarly, another concerning issue is that not many higher level schools for girls are available in the province, therefore, girls after completing their primary schooling are not allowed further schooling since higher level schools are usually located quite far their dwellings.

Keeping in view the above presented facts it will be socially un-just to drop this project; rather it will be more desirable to increase the scope of the project by many fold.

7.2 Site Alternative

The current project is an additional support to the Component-I (Access and Equity) of the GPE-BEP; and does not involve any construction of new schools; rather the activities this project will be carried out within the already established education facilities, for which site alternative and site selection guidelines have already been described in ESMP of GPE-BEP. However, for selecting site for construction of new class rooms in the existing school, the existing guide line is given: -

- ❖ The selected site should be adjacent to the existing school building so that students may be able to use facilities of school without any difficulty.

⁸⁴ UNESCO (2009): Paper Commissioned for Education for All (EFA) Global Monitoring Report, Overcoming inequality: why governance matter.

⁸⁵ Pakistan Economic Survey 2017-18

⁸⁶ Ibid

- ❖ The site should not be selected in the playing area of student.
- ❖ As much as possible, the selected site should not result in cutting of tree and removal of vegetation.
- ❖ The selected site for class rooms should not be located in poorly drained location of school.
- ❖ The class room site selected may not be selected to the side of school which is prone to floods and/or heavy run-off during. If unavoidable, proper measure be taken to control erosion.
- ❖ The Site should not be selected where heavy earth moving is required which may result in destabilization of land/soil. If unavoidable, then economic design options may be utilized to avoid excessive earth moving.
- ❖ Parking Space should be far from surface or ground water source in order to avoid contamination of water source with the spills or leakages of oil and fuel from vehicle.

7.3 Design Alternative

As discussed earlier that this project does not involve construction of new schools; rather the project aims at rehabilitating/functionalizing of already established schools and in few cases single rooms following the already constructed design of school shall be constructed; hence consideration of design alternative is not required to be put forth for this project.

7.4 Technological Alternatives

The only construction involve in the BES Project is that of single class rooms and functionalization of class rooms rehabilitation and refurbishment. However, the following technological alternatives were considered for construction of class rooms.

- i) Cemented structure
- ii) Pre-fabricated structures
- iii) Kacha mud structures

Kacha mud structures are the cheapest available option for construction of buildings; however, such buildings are unsafe particularly in the flood plain and earthquake prone areas. Hence, this option was rejected on the basis of health and safety consideration of children.

Prefab structures have been used for schools in the earthquake affected area of Azad Jammu and Kashmir. However, prefabricated structures are not only a costly option but also climatically not suitable in the summer plain areas. These structures also create environmental issues such as low ventilation and lighting, vibration of prefab structure and the use of insulation materials (sometime asbestos) and painting may pose health hazards for the children. The social acceptability of pre-fabricated structures is another issues associated with this option. Hence this option was also rejected.

Cemented structures with reinforced concrete and stone or bricks masonry is the best alternative option for the construction of environmental friendly buildings. The environmental parameters such as ventilation, lighting and heating inside the building can be taken care off through appropriate designing.

Cemented structures with reinforced concrete are the most commonly used designs; climatically suitable, economically feasible and socially acceptable to the local communities and, therefore, recommended for the proposed project.

7.5 Options for Transport Vehicle

Different vehicle options are available in the market which uses different fuels such as Diesel, Petrol and Gas. Now there are vehicles which are known as hybrid and use both electricity and fuel for their operation. However, all the vehicles add to air and noise pollution and may cause traffic congestions. One cannot choose from a list of alternatives since alternatives vary in number depending upon the requirement. It is therefore, prudent to suggest that the project should only select that brand which is efficient in fuel combustion and emits gasses that are within the NESQ limits.

7.6 Management Option

The construction of new class rooms and rehabilitation of class rooms in existing schools under BESP is the major project. The following management options were considered for the construction of new class rooms and rehabilitation/functionalizing work while keeping in view the environmental and social considerations.

- a. Construction / Functionalizing through C&W Department
- b. Construction / Functionalizing through NGOs / Community
- c. Construction / Functionalizing through a Private Construction Company.

The Government carries out its construction work through the Communication and Works (C&W) Departments' attached Department B&R which is a mandated department for this purpose. The B&R Department hires private contractors through a competitive bidding process. Following are the main issues associated with this option:

- i) lengthy process leading to delays in the completion of work;
- ii) quality of work is usually not satisfactory due to weak monitoring by C&W;
- iii) the contractors usually do not care to implement environmental and social mitigation measures for profit maximization;
- iv) The low quality of buildings leads to compromising the health and safety of school children. On the basis of environmental and social considerations, Government construction is not a suitable option for the proposed project.

NGOs construction through community participation is another alternative considered for the project. However, the NGOs do not have any permanent infrastructure set up required for construction work and hence charge high overhead costs for hiring equipment and machinery from the local market on a project to project basis.

Construction through a certified private construction firm will ensure to:

- i) complete the construction work within the stipulated timelines;
- ii) ensure quality of work;

- iii) implement environmental and social mitigation measures across the board in all schools. The implementation of construction work through a qualified private construction firm is thus a recommended management option for the BES project.

FIRST DRAFT

8 Environmental and Social Impact Assessment and Mitigation Measures.

This chapter includes description regarding potential impacts of the project activities on physical, biological and socio-economic environment of the project area and put forth measures for their mitigation. The potentially adverse environmental impacts have been discussed with respect to the site/design, construction, operation stages of school and the operation of transport vehicles during school operation stage. Necessary mitigation measures have been proposed for avoiding or rectifying the adverse impacts.

8.1 Environmental and Social Impact Assessment and Mitigation Strategies.

The environmental and social impacts of project activities were assessed employing a simplified impact assessment matrix (**Table-22**) which was tailored according to the specific needs of the BES project. The project activities include construction of additional 100 classrooms, functionalization of 900 class rooms in 300 schools and Seven (7) provision of vehicle for to and fro transport of girls and teachers one in each division on pilot basis. The potential environmental impacts from these activities on physical, biological and socio-economic environment, thus anticipated were classed and quantitatively scaled as follows.

- Highly Negative (adverse) Impact (-2)
- Low Negative (Moderate) Impact (-1)
- Insignificant Impact / Negligible Impact (0)
- Highly positive (beneficial) Impact (+2)
- Low positive (less beneficial) Impact (+1)
- No Impact (N)

The main environmental and social negative impacts which are likely to occur during Site Selection, Design, Construction/ Rehabilitation and Operation Stages are listed hereunder:

Environmental impacts:

- Soil erosion
- Surface water contamination
- Soil contamination
- Air quality deterioration
- Loss of vegetation and trees

Social impacts:

- Noise and vibrations
- Health and hygiene problems
- Water resources depletion
- Loss to agriculture land
- Exclusion of differently abled student

In order to minimize these impacts mitigation measures have been proposed. The mitigation strategy adopted in this study follows the principle delineated hereunder: -

- i. Avoiding the impacts by appropriate site selection, eco-friendly designing and adopting environmental friendly construction practices
- ii. Reducing and rectifying the impacts by adopting and implementing the proposed mitigation measures and guidelines.
- iii. Enhancing the capacities of concerned PMU Staff to carry out monitoring and mid-course corrections to ensure long-term environmental and social sustainability of the project

8.2 Impact on physical environment

8.2.1 Land and Soil

The potential environmental impacts of Project activities on land and soil during, selection of site for construction of new class rooms within the vicinity of already established schools, Design stage, construction of new class rooms and rehabilitation of existing class rooms, operation of school and transport vehicles.

Site Selection and Design Stage

- ❖ Improper selection of site for construction of new class rooms may cause to de-stability of land leading to soil erosion especially in areas with steep slope and colluvium soils.
- ❖ Site requiring heavy earth moving (Cutting/filling), may results in destabilization of land and adjacent structure
- ❖ The class room site may not be selected to the side of school which is prone to floods and/or heavy run-off during rainy seasons as it will result in erosion of foundation soil thus damaging the structure.

Construction Stage

- ❖ Excavation for foundations of class rooms and removal of trees, particularly in hilly terrains like district Loralai, Ziarat, Kalat, Lasbella, Mastum, Killa-Abduallah, Killa-Saifullah may cause destabilization of the soil mass resulting in land sliding and soil erosion due to high velocity winds and run-off.
- ❖ Disposal of contaminated construction wastes such as left over concrete, paint, leftover oil and other such contaminated wastes may lead to soil contamination.
- ❖ Non-filling and leveling of borrow pits excavated for construction purpose may lead to destabilization of land slope and soil degradation/erosion

Operation Stage

- ❖ Open Discharge of Toilets' wastewater to the adjacent lands can contaminate the soil, result in soil erosion and degrade the quality of land.
- ❖ Parking, maintenance and washing of Transport Vehicles on non-paved land may lead to contamination of soils and degradation of quality of land.

8.2.2 Mitigation of Impacts on Land and Soil

Siting and Design

- ❖ The proper site for class rooms in the school premises be selected so as to avoid any damage to the soil. It is more prudent that the site selection may be done according to the guidelines provided in **(Chapter 7 section 7.2)** in order to entail minimal disturbance to the soil and land.
- ❖ If unavoidable, to select a site requiring earthmoving. Economical Design technique may be used for construction of class rooms so as to avoid excessive earth excavation and filling.
- ❖ If it is unavoidable to select site which is flood prone than proper soil erosion control structures may also be constructed so as to safeguard the newly constructed structure.

Construction Stage

- ❖ Removal of vegetation and trees will be avoided to the extent possible. In case of unavoidable circumstances, the exposed soil will be re-vegetated quickly and compensatory plantation, (five trees for each one removed), will be carried out after construction is over.
- ❖ Diggings, if required for foundation, will be carried out only in specified area, as per the engineering drawings and excavated earth material will be used for filling and compaction.
- ❖ The contractor will ensure the prevention of soil erosion and destabilization by employing batched excavation technique.
- ❖ Borrow pits will be restored and levelled back to control soil degradation
- ❖ Left over construction materials, excavated soil and waste material produced as a result of construction/ rehabilitation works, may be properly disposed-off in designated areas to avoid soil contamination.

Operation Stage

- ❖ In case of existing system, it will be ensured that toilets and associated systems are maintained in proper working conditions. If no sewage system is present than a secure sewer line from school building will be provided to the local sewerage system, if available. Alternately, an appropriately sized septic tank and soaking pit will be constructed for sewage disposal.
- ❖ The school administration, PTSMC will ensure parking of transport vehicle in a proper space so as to avoid soil contamination due to oil leakage etc. and transport vehicle will always be taken to service station for maintenance and washing.

8.2.3 Impacts of Surface Water Resources

Site Selection and Designing

- ❖ The site for class room in the school should not be such that it may result in diverting waste water from school into a stream or river located close to school.
- ❖ Site for parking of transport vehicle must be far from the surface water source to avoid drainage of contamination from the parking site to the water source.
- ❖ Excessive use of surface water may lead to depletion of water source.

Construction Stage

- ❖ Excessive use of water may lead to generate large quantity of wastewater.
- ❖ Disposal of Waste material, contaminated water and excavated soil near or in the water resource may result in pollution of water resource.

Operation Stage

- ❖ Open discharge of the waste water from school into a surface water resource (stream, river, canal, spring, Karez etc. without treatment, during operation phase can deteriorate water quality of resource.
- ❖ Dumping of school waste near water body and/or resource may result in pollution of the water resource in long run.
- ❖ Washing of transport vehicle on the banks of stream, river, spring or canal may result in draining of waste water back into the resource thereby, resulting in pollution of the source.

8.2.4 Mitigation for Impacts on Surface Water Resources

Site Selection and Design

- ❖ If it is inevitable to select site for class room construction at a location within premises of school, which consequent diversion of drainage/waste water into a surface water source; then proper sewer system may be installed to avoid contamination of surface water sources.
- ❖ In case parking place for vehicle is near surface water resource; then the parking lot may be provided with proper sewerage system to avoid contamination of surface water source.
- ❖ Rain Water Harvesting be included in the design of class room in the area where annual mean precipitation exceeds 400 mm.

Construction Stage

- ❖ Minimum quantity of water shall be used to meet the essential construction and rehabilitation requirements. The contract should ensure to avoid unnecessary use of water for washing of equipment and vehicles during construction.
- ❖ The contractor will dispose the construction wastewater from the work site through a soaking pit of appropriate capacity, which be levelled back after completion of construction work.

Operation Stage

- ❖ Regular maintenance of the septic tank and sewer line will be carried out for safe disposal of toilet wastewater during school operation.
- ❖ PTSMC will monitor the operation of sewerage system during schooling hours and ensure proper disposal of school waste into landfill or other designated areas.
- ❖ The local community will be sensitized through health and hygiene sessions to protect the water resources from contamination.
- ❖ The Transport vehicle should not be washed using surface water source, rather it should be sent to service stations which use gray water for washing and cleaning vehicles.

8.2.5 Impacts on groundwater resources

Site and design

- ❖ Site selection does not pose any direct threats to the groundwater contamination.
- ❖ Selection of Parking space for transport vehicle near ground water source, within vicinity of school, may increase vulnerability of contamination due to leakage of lubricants or fuel from vehicle.

Construction Stage

- ❖ The construction stage activities do not pose any direct threat to ground water contamination.

Operation Stage

- ❖ Stagnation of the spilled water around the base of hand pump or tube well can lead to its downward movement along the well and therefore likelihood of groundwater contamination during school operation.
- ❖ Parking and washing of vehicle near hand pump or tube well may result in stagnation of water resulting in seepage of water into ground water source.

8.2.6 Mitigation for Impacts on ground water resources

Siting and Design Stage

- ❖ The Parking point for vehicle should be away from the ground water source in order to avoid seepage/soaking of contaminants into ground water.

Operation stage

- ❖ The surrounding base of hand pump or tube-well will be sealed off from the exterior by grouting with cement mortar to control percolation and contamination of ground water source.
- ❖ Periodic testing of drinking water supply source at the schools will be carried out for timely detection of contamination.

8.2.7 Impacts on Air Quality

Site and design

- ❖ Site selection and design of class room do not have any significant impact on air quality. However, class room should not be established close to any existing source of air pollution.
- ❖ The parking of Transport vehicle should be away from the school so as to avoid air pollution due to emissions from vehicle.

Construction Stage

- ❖ The movement of vehicles, land excavations, structure demolitions, and onsite stacking of materials may lead to dust emissions and prolonged suspension of fine particulates (PM₁₀) in the ambient environment.
- ❖ Exhaust from vehicles and machinery during construction may deteriorate the local air quality.

Operation Stage

- ❖ Dust emissions from movement of vehicles especially transport vehicle in the surrounding of school can also create minor adverse impact on air quality in surroundings of the school.
- ❖ Exhaust from Transport vehicles may deteriorate the local air quality.

- ❖ Use of altered fuel in transport vehicle will deteriorate the air quality and damage the vehicle as well.

8.2.8 Mitigation for impacts on air quality

Siting and Design

- ❖ If it is un-avoidable to park vehicles near school premises or inside school than parking shed with wall and proper ventilation be constructed to avoid air pollution due to vehicular emissions.

Construction Stage:

- ❖ Stockpiled materials will be covered to control dust emissions
- ❖ Speed of vehicles will be reduced to avoid blowing of dust.
- ❖ Demolition and excavation will be carried in batches to minimize dust emissions
- ❖ Proper lubrication of vehicles and machinery will be ensured to reduce emissions
- ❖ Water sprinkling will be carried out to reduce dust emissions where necessary and feasible.

Operation stage

- ❖ The exposed soil in surrounding of school will be re-vegetated and landscaped with community participation to control dust blowing.
- ❖ Community will be mobilized to observe low speed limits in the school vicinity.
- ❖ Newly introduced vehicles that are manufactured with European emission standards will be procured for transportation purpose.
- ❖ The transport vehicle shall be switched off when parked near or inside school during school timings to avoid pollution of surround environment due to vehicular emissions.
- ❖ Proper lubrication of vehicles and machinery will be ensured to reduce emissions.
- ❖ Fuel for transport vehicle will be purchased from the authorized dealers to curb any possibility of adulterary

8.3 Impacts on Biological Environment

8.3.1 Impact on natural vegetation

Site and design

- ❖ Improper site selection could lead to removal of natural vegetation and cutting of trees for construction of class rooms.
- ❖ Selecting parking site for vehicle near vegetation may deteriorate the vegetative cover due to vehicular emission and dust.

Construction stage

- ❖ Improper excavation of foundation during construction may lead to removal of natural vegetative cover and trees cutting.

Operation stage

- ❖ The operation of schools does not pose any direct threats to the trees and vegetation.
- ❖ The vehicular operation near vegetative cover may deteriorate vegetative cover due to emission and dust.

8.3.2 Mitigation for Impacts on natural vegetation

Site and Design

- ❖ In case it is unavoidable to construct class room by removing vegetation and/or cutting of tree/plants than replantation guideline suggested in **(Chapter 8 Section 8.2.2)** may be followed
- ❖ In case it is unavoidable to park vehicles near vegetative cover than proper irrigation of vegetation may be carried out in consultation with Forest Officials.

Construction Stage

Cutting of trees will be avoided during construction. In case of unavoidable choice, compensatory tree plantation, (five saplings for each tree felled) will be carried out to reduce the impacts.

Operation Stage.

- ❖ Proper irrigation of the vegetative cover may avoid damage to the vegetation due to dust and emission.

8.3.3 Impact on wildlife

- ❖ The project activities will not be carried out in the designated wildlife sanctuaries, game reserves areas, and hence no significant threats to wildlife are expected to occur during site selection, construction and operation stages of the project.

8.3.4 Biological Impacts:

Siting and designing stage

- ❖ Siting and Designing of classrooms will have no biological impact.

Construction stage

- ❖ Construction of new classrooms may lead to removal of plants and trees.

Operational stage

- ❖ Movement of transport vehicle near sensitive areas may cause harm to flora and fauna

8.3.5 Mitigation for biological impacts

Siting and design

- ❖ Since class rooms are constructed in the vicinity of already established school therefore, there is no possibility of any negative impact on flora and fauna.

Construction stage

- ❖ Removal of mature trees will be avoided during construction. If unavoidable, compensatory tree plantation (five trees for each removed) will be carried out in consultation with Forest Department to reduce the impacts.

Operation Stage

- ❖ The vehicle operation near sensitive area will be avoided to ensure no negative impact on the flora and fauna during operation of vehicles

8.4 Socio-economic impacts

8.4.1 Noise and Vibration

Siting stage

- ❖ Siting and designing stage will have no negative impact

Construction stage

- ❖ During construction, the use of machinery and steel fabrication activities, particularly during school hours and at night times, can produce unpleasant noise.
- ❖ Moving construction vehicles and use of pressure horns around the schools could be a source of noise and vibrations.

Operation stage

- ❖ Movement of transport vehicle will cause noise and vibration in the school vicinity.

8.4.2 Mitigation for noise and vibrations impacts

Construction stage

- ❖ The contractor will ensure to avoid use of noise generating machinery, equipment's during school hours and sleeping time at night so that community disturbance is minimal.
- ❖ Compliance with NEQS and World Bank noise guidelines will be ensured.
- ❖ The contractor will maintain and tune up all the vehicles and equipment's during construction work.
- ❖ The community will be sensitized to observe silence zone in the school premises.
- ❖ Proper signboard will be installed indicating ban on use of pressure horns by moving vehicles around the school.
- ❖ Unnecessary use of pressure horn will be strictly prohibited.

Operation Stage

- ❖ Newly introduced vehicles that are manufactured with European emission and noise standards may be procured for use as transport vehicles.
- ❖ Timely maintenance of Transport vehicle may be ensured to curb any possibility of noise during vehicle operation.
- ❖ Unnecessary use of pressure horn will be strictly prohibited.

8.4.3 Health and safety impacts

The environmental impacts pertaining to health and safety at worksite in relation to the design, construction and operation of school and vehicle operation are:

Designing

- ❖ Improper class room design with poor ventilation and sunlight can lead to behavioral change and health impacts and create difficulties in learning.
- ❖ Improper class room design can lead to difficulties and safety issues for special children
- ❖ Improper class room designs without relevant building codes can lead to increased vulnerability to disasters.

- ❖ Sharp edges during designing phase can cause injury to school children.
- ❖ Unavailability of emergency exit in the classroom design can lead to an adversity.
- ❖ Improper class room design without sanitation facilities can lead to health and hygiene problems for children.

Construction stage

- ❖ Open dumping and stockpiling of construction materials, scattered demolition wastes, and placement of debris / materials on nearby open spaces and streets can result in blocking of route and inconvenience for passers-by, and residents.
- ❖ Haphazardly placed materials and debris presents higher risks of personal injury and inconvenience to schoolchildren and the staff.
- ❖ Construction activities pose safety risks to children, teachers, construction workers, and nearby communities.
- ❖ Ignorance about site specific hazards may pose a potential threat to the health and safety of workers.
- ❖ The construction work and equipment may lead to safety hazards for workers and nearby communities.
- ❖ The operation of construction machinery and equipment such as excavators, lifters and dumpers by untrained personals may leads to compromise the health and safety of workers at sites.
- ❖ Welding and cutting operation during construction poses a serious health and safety risk for workers

Operation stage

- ❖ Poor hygiene conditions and non-observance of health and hygiene guidelines during schools' operation can increase vulnerability to health and personal safety impacts.
- ❖ Choking of sewer line and contamination of drinking water source may negatively impact the health of school children.
- ❖ Non-availability of safe drinking water in school can lead to health hygiene problems in school children.
- ❖ Non-availability of soap in school toilets may lead to health and hygiene problems in children.
- ❖ Exposed electrical wiring and cables in the school building may pose health and safety risks for school children.
- ❖ Overcrowding of students in class rooms may leads to compromise the health of students and transmission of diseases.
- ❖ Non-availability of traffic signboards around the schools may lead to traffic accidents and pose serious threat to the safety of children.
- ❖ Nonfunctioning of sewage treatment facility in school may lead to contamination of drinking water supplies and results in health hazard.

Vehicle Operation

- ❖ Reckless driving of vehicle by the driver may pose life threat to the on board passengers, pedestrians and other passenger.
- ❖ Overloading of vehicle may lead to damage to vehicle and congestion of the passengers.

- ❖ Selecting road with heavy traffic may lead to traffic congestions may cause restlessness in the students
- ❖ Poor maintenance of vehicle may result in failure of its systems which may result in an untoward eventuality such as road accident.

8.4.4 Mitigation for health and safety impacts

Design stage

- ❖ Appropriate building codes as per guidelines in **(Chapter 9 Section 9.6.3)** will be followed to designs class rooms in the seismic prone areas and flood plains to avoid risks of damage to health and property.
- ❖ Proper designing of class rooms will be followed according to guidelines in **(Chapter 9 Section 9.6.4)** to provide ventilation and natural lighting in the class rooms.
- ❖ The class room design will cater to the needs of special children (such as ramps and hand rails will be provided where needed).
- ❖ Sharp edges in the class rooms, will be cared for to ensure safety of school children.
- ❖ Provision of emergency exits at an appropriate height and place can help safe evacuation of school of school children during emergency.

Construction stage

- ❖ The contractor will ensure safe and covered stockpiling of the construction materials in separate place or corner in the premises of school. Demolition debris if not utilized will be disposed-off in nearby safe places.
- ❖ The contractor will provide personal protective equipment such as gloves and boots to the laborers to avoid worksite hazards and accidents. Protective fencing will be used around the construction sites, excavated areas, and voids.
- ❖ Detail hazard assessment shall be carried out to identify all site specific hazards and labeled before starting construction work on the site.
- ❖ Protective fencing will be used around the construction sites, excavated areas, and voids.
- ❖ Health and safety training shall be provided to all staff working on the site.
- ❖ Properly trained staff shall be deployed to operate machinery and equipment at worksite
- ❖ Fire extinguishing equipment shall be within 6m (20ft) of all locations where welding and cutting equipment is used.
- ❖ Provision of first aid kit will be necessary for the safety of labor.

Operation stage

- ❖ Awareness about personal hygiene will be raised among the students and surrounding community through health and hygiene sessions.
- ❖ The PTSMCs will ensure cleanliness of schools and regular checking of drinking water availability and quality, and working of the sewer line and septic tanks to ensure timely repair.
- ❖ Availability of soap outside the toilets will be ensured.

- ❖ All exposed wiring and cables shall be covered with plastic and labeled as DANDEROUS to avoid contacts.
- ❖ The number of students in class rooms shall not exceeds 40. Proper ventilation and seating arrangements shall be observed in class rooms during school operation.
- ❖ Traffic signboards will be provided on the main road and access road leading to school.
- ❖ Proper functioning of sewage treatment facility such as septic tank will be ensured during school operation.

Vehicle Operation

- ❖ The drivers deployed for transport vehicles must hold a relevant and valid vehicle license.
- ❖ Before handing over the vehicles all the drivers of transport vehicle should be given a proper training pertaining to road safety and traffic signs and environmental awareness.
- ❖ Speed control device will be used to control the peril of over speeding.
- ❖ Remote monitoring of transport vehicle be carried out to ensure the obedience of safety rules.
- ❖ Anonymous and non-relevant persons should not be allowed in the transport vehicle.
- ❖ First aid kit be made available in the vehicle to help reduce fatalities.
- ❖ Dangerous routes will be avoided to ensure safety of on board passengers.
- ❖ Inside cleaning of transport vehicle will be confirmed to avoid unhygienic condition.
- ❖ Approved list of students and teachers availing the transportation facility will be provided to the transport vehicle operator.
- ❖ Driver will have the number of nearest police to tackle with the security issues.

Table 22 Simplified Environmental and Social Impact's Matrix

Environmental Components	Physical				Biological		Social and Socioeconomic aspects																
	Soil Erosion / Contamination	Surface Water Quality	Groundwater Quality	Air Quality	Natural Vegetation	Wildlife	Access to School	Noise and Vibrations	Agriculture / Farming	Livestock Grazing	Health and Safety	Public Property	Aesthetic Value	Wetlands Eco-system	Education / Learning	Gender Issues	Employment / Income	Community Empowerment	Price of Land	Archaeological Heritage	Cultural Issues	Impact on indigenous people	Impact on Livelihood
Site Selection	-1	-1	0	N	-1	0	-1	N	-1	0	0	0	0	N	N	0	N	N	N	N	0	N	N
Designing	N	-1	0	0	N	N	N	-1	N	N	-2	0	0	N	N	N	N	N	+1	N	0	N	N
Construction Activities	-1	-1	N	-1	-1	0	-1	-2	0	0	-2	0	0	N	-1	0	+2	N	N	0	0	N	+1
School Operation	-1	-2	-1	0	N	N	0	0	N	N	-1	N	N	N	+2	+2	+1	+1	N	N	0	N	+1
Vehicle Operation	-1	-1	0	-1	N	N	+2	-1	0	N	-1	N	N	N	+2	+2	+2	+1	N	N	0	N	0

Key:

-2 = High Negative Impact

-1= Low Negative Impact

0 = Insignificant / Negligible

+2= High Positive Impact

+1= Low Positive Impact

N = No Impact

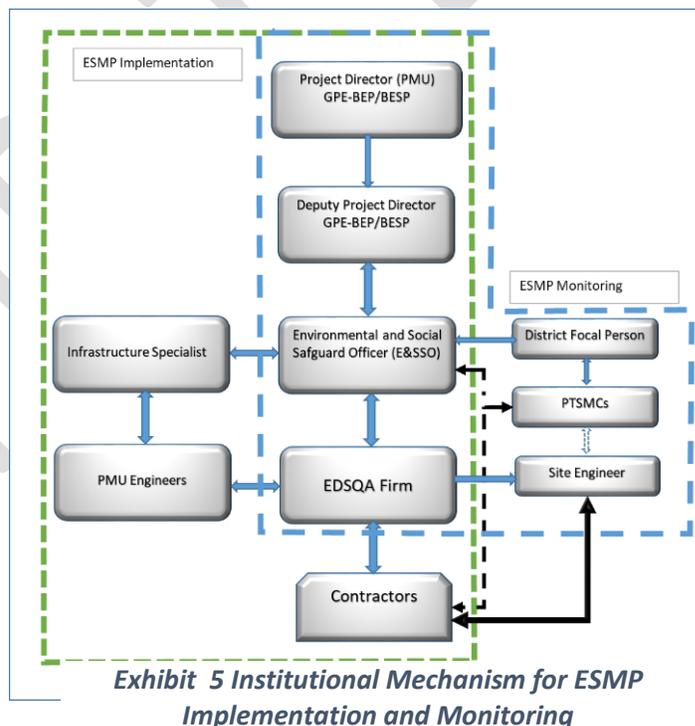
9 Environmental and Social Management Plan

This chapter describes the Environmental and Social Management Plan (ESMP) which has been prepared with the sole objective to avoid, mitigated as and when required, monitor and compensate for the negative environmental and social impacts resulting from different stages of execution of BEBP activities and operation phases of completed interventions, through implementation of this Plan. This ESMP is a frame work which puts forth, a) steps for mitigation of adverse impacts, b) institutional arrangement for implementation and monitoring of this plan, c) capacity building and training needs and d) procedure for documentation and reporting. This ESMP is planned to be executed by PMU and Field staff of BEBP in collaboration with Education Department and PTSMCs.

9.1 Institutional Setup for ESMP Implementation.

The captioned ESMP will be implemented under the overall supervision of Project Director (PMU) of GPE-BEP/BESP. The Project Director will be responsible for the overall implementation, monitoring and reporting of ESMP through Environmental and Social Safeguard Officer (E &SSO) of PMU. The Engineering Design Supervision and Quality Assurance (EDSQA) firms will supervise the construction works being carried out by civil work contractors contracted by the PMU. The E&SSO will be responsible to liaise with all the sections of the PMU viz. Education Section, Development Section, EDSQA Firms, contractors and the district education offices for timely compliance of ESMP. E&SSO will also be responsible for reporting to Project Coordination Committee (PCC) and the World Bank through Project Director.

At site implementation of ESMP and monitoring shall be carried out by the EDSQA and Contractors. PTSMCs will be motivated to take active part in the monitoring of contractors work on the site to ensure community participation in ESMP implementation. **Exhibit-5** shows the proposed institutional mechanism for ESMP implementation from top to bottom level contractor, with assigned role and responsibilities.



9.2 Roles and Responsibilities

The roles and responsibilities of the designated officers and other partners have been described in **Table-23**. However, in case of overlapping of roles by more than one officer or other administrative issue, the Project Director will be the authority to re-designate the roles and responsibilities of these officers to ensure effective and smooth implementation of ESMP.

Table 23 Role and Responsibility of Designated Officers

Organization	Position	Responsibility	Jurisdiction
PMU	Project Director,	Overall ESMP Supervision	Entire Project Area
PMU	Deputy Project Director	Coordination with all stakeholders in ESMP implementation	Entire Project Area
PMU	Safeguard Officer	ESMP Implementation, monitoring and reporting of ESMP at provincial level	Entire Project Area
Secondary Education Department, Balochistan	District Focal Person	Monitoring and Reporting of ESMP at district level During Operational Phase of School only.	District Concerned
PMU	Manager/Infrastructure Specialist/ Development Coordinator	Responsible for eco-friendly designing of class rooms	Entire Project Area
PMU	School Development Engineers (SDEs)	Monitoring the implementation of eco-friendly designs of Class rooms and functionalization work and Implementation of ESMP.	Respective Regions
Private Firm	Engineering Design Supervision and Quality Assurance Firm (EDSQA)	Supervision of construction work on sites, ESMP monitoring at sites; through their site engineer (SE)	Entire Project Area
PTSMC	Members	Partial Monitoring of ESMP during construction and full monitoring during operation of school	School level
Contractor	Contractor	Compliance with ESMP guidelines during construction and defect liability period	School level

The Safeguard Officer in the PMU at the provincial level will be responsible for ESMP implementation. He/she will liaise with all stakeholders including the District Education Officers, Infrastructure Specialist,

EDSQA and Contractors for implementation and compliance with ESMP guidelines and mitigation measures. Safeguard Officer will also be responsible for progress reporting to the Project Coordination Committee (PCC) and World Bank through the Project Director (PD).

The District Focal Person (DFP) being District /Deputy District Officer of Education will be responsible for coordinating and monitoring ESMP during operation stages. (S)he will be responsible to assist the school administration in resolving environmental and social issues if so arise once school is operational. (S)he shall maintain a good liaison with the PTSMCs.

Community will be organized in shape of Parent Teacher School Management Committee (PTSMC). PTSMCs will have a partial monitoring role at the time of construction but will have a vital role in trouble shooting during operational stage. PTSMC members will closely liaise with construction contractor at site and will report environment and social issues to PMU during project execution and after words with District Education Officer for resolution and reporting.

The Manager/Infrastructure Specialist will be responsible for ensuring eco-friendly designing of class rooms compatible with local climate and seismic zoning. S/He will maintain close liaise with ESDQA firm and contractors to ensure compliance with ESMP during construction activities.

The EDSQA Firms will be responsible to ensure compliance of ESMP by contractors and implementation of mitigation measures as and when required. They will also deploy their SE for supervising ESMP implementation and monitoring at construction sites.

The School Development Engineer of PMU shall be responsible for implementation of ESMP at in their respective regions whereby, SE of EDSQA Firms will be responsible for ensuring the monitoring and reporting of ESMP at work sites in their respective district. They will be responsible to ensure that the contractor follow and comply with the ESMP guidelines and take appropriate actions to mitigate the negative environmental and social impacts. They will maintain close liaison with contractor and E&SSO on Environmental and social issues, in addition to their own responsibilities as (SE).

9.3 Environmental Mitigation and Monitoring Plan

It is well established that owing to limited size of construction / rehabilitation activities involved in the BESP the environmental and social impacts of BESP shall be isolated in the vicinity of school building, of small scale, site specific in nature and of low to moderate in significance. These impacts described in detail in **Chapter 8** pertaining to site selection, design, construction and operation of school and operation of transport vehicle will be on soil stability and contamination, vegetative cover, surface and ground water quality, air quality, noise and vibrations, health and hygiene issues, in inconvenience to public from improper stock piling of construction material at construction sites and improper maintenance and operation of vehicles. Most of these impacts are low to medium and can be managed properly, during project implementation through adopting appropriate mitigation measures entitled in **Chapter 8**. The Environmental Mitigation and Monitoring mechanism is presented in the ESMP, with describes environmental and social impacts, proposed mitigation measures, monitoring parameters and responsibilities for implementation of the mitigation measures and monitoring during design, construction and operation stage of schools and transport vehicles of the project.

9.4 Environmental and Social Mitigation, Health and Safety Management Plan

The Environmental and Social and Health and safety Mitigation Plan describes environmental and social impacts, implementation of proposed mitigation measures and health and safety management measures for construction workers, during design, construction and operation stages of the project. It also describes the impact mitigation and health and safety management measures associated to operation of transport vehicle. The environmental and social mitigation and monitoring plans for BESP are given in **Table-27 &28**

9.5 Monitoring and Reporting

A comprehensive monitoring framework for carrying out monitoring of Environmental Mitigation and Health & Safety Management, Comprising monitoring parameters, frequency and responsibility of monitoring is outlined in **Table 27 & 28.**

9.5.1 Internal Monitoring

The internal monitoring mechanism of ESMP of GPE-BEP remained partially effective as the District Focal Person (DFP) would not perform his duties properly because of being over-worked. Later on PMU assigned the responsibility of monitoring of ESMP implementation to SE after which the monitoring system became more effective and responsive. It is therefore, the same administrative arrangement is replicated in this ESMP according to which the SEs of EDSQA will supervise and monitor implementation of the ESMP during siting, design and construction phases of project execution. The SEs will report to E&SSO regarding ESMP monitoring for compilation and evaluation. PTSMCs will also regularly check the observance of proposed mitigation measures and guidelines by the construction contractors at worksites. However, during operation phase District Focal Person (DFP) and PTSMCs will be responsible for ESMP compliance during school operation phase. The DFPs will make routine as well as surprise visits of the school in their respective areas during school operation phase.

The ESMP also has an inbuilt provision for capacity building of the different stake holder in ESMP implementation and monitoring. The Capacity building of the SEs, DFPs and PTSMCs will ensure effective monitoring and reporting of ESMP compliance. The Monitoring and Evaluation officer, PMU will also randomly conduct monitoring of work sites in the project areas, both during construction and school operation phases and submit their monitoring reports to the E&SSO in the PMU for taking necessary correction action if so required at any site. During operational stage PTSMCs members will closely observe the movement of transport vehicle. In case of an accident PTSMCs members will inform the DFP who will further prepare and submit accidental report and submit it to E&SSO for furtherance.

9.5.2 External Monitoring/Third Party Validation

A third party validation of ESMP implementation and compliance is suggested with a view to validate that activities under both construction and operational phases have been carried out in line with the ESMP Recommendations. Third Party Validation (TPV) through an independent monitoring agency is suggested to be on annual basis during execution period of BESP, to evaluate the overall ESMP implementation progress, and to ensure that the mitigation measures are implemented as per mitigation plan. In case of any deviation, corrective actions will be taken where necessary. A detailed Terms of Reference for hiring the services of TPV is given at **Annex-D.**

9.5.3 Reporting

The SE of EDSQA will compile monitoring reports and will send it to the E&SSO for evaluation and mid-course correction, if required. Similarly, E&SSO will process, analyze and forward the consolidated report of all districts to the Project Director, PCC and World Bank for usage and decision-making. The PMU may hire the services of environmental and social expert (consultant), if so required on any issue related to environmental and social impact mitigation or non-conformity surfaced up from monitoring activities.

9.6 Environmental Enhancement Guidelines

It is well understood that the current BES Project is an additional support to the existing GPE-BEP and the construction activities are limited to construction of class rooms and functionalization of class rooms within the existing established schools therefore, in this section only the necessary enhancement options are given to be followed under current ESMP. However, if the project intends to opt for environmental enhancement of schools being operated under the project the guidelines for environmental enhancement opportunities, referred in (Chapter 9 section 9.6.4).

9.6.1 Rain Water Harvesting

Balochistan is water scarce region and availability of water for drinking, washing and irrigation is not only an environmental issue of concern but also a major cause of social disputes among the communities and tribes. The construction and operation of school in most of the rural area may put an additional burden on the already scarce water resources. Rain water harvesting may be introduced in the schools on pilot basis by installing rain water harvesting gutters on the roofs of newly constructed class rooms or functionalized classed rooms coupled with storage tanks placed at the ground for collection of harnessed rain water. The water so collected may be used as an alternate source of water for hand washing, toilets use and irrigating the flowerbeds, plantations and lawns in and around the school. The cost implication, local climate conditions and acceptance by the local community may be considered in designing such facility in a particular school.

9.6.2 Use of Alternate Energy Sources

Pakistan in general and Balochistan province in particular is short in energy. Most of areas of Balochistan are still not connected with the national grid and the areas which are connected with national grid face prolong load shedding. Therefore, it will be very prudent designing if alternate energy source such as solar system is considered as an option during construction / functionalization of class rooms. The option should however, be decided while keeping in view its technical and economic viability, climatic conditions of the area and social acceptability of the system by locals of the area.

9.6.3 Earthquake and Flood Resistant Designing of New Class Rooms

According to the relative severity of hazards index⁸⁷ for earthquake, Killa-Saifullah, Killa-Abdullah, Loralai, Kalat and Khuzdar districts falls in the medium to high risk zone for earthquake while Pishin and Quetta district are in the high risk zone. In these districts earthquake resistant design should be considered for construction of new class rooms as per building codes of the area. Keck, Naseerabad, Lasbela and Kachhi (Bolan) districts are located in the flood plain area of the province. The structural designs in these districts

⁸⁷ Government of Balochistan (2006), Provincial Disaster Risk Management Plan

should address the flood risks. Appropriate site specific flood protection measures will be adopted in these districts.

9.6.4 Eco-Friendly Design Guidelines for Construction of School

Eco-friendly design of school is such that the students are provided with an atmosphere that is environmentally safe, healthy and conducive to learning. The main environmental parameters which needs to be considered during these constructional /rehabilitation activities within the already established schools are but not limited to protection, providing insulation and promoting natural ventilation for thermal comfort, health and hygiene, safe water supply and sanitation⁸⁸ (optional) and promoting environmental aesthetics to ensure healthy environment to the children's. Introducing eco-friendly designing does not require any extra costs but may rather reduce the cost of construction if proper designing is carried out. Following environmental guidelines will be followed in construction of Class Rooms

Table 24 Eco-Friendly Design Guidelines

Environmental aspect in design	Eco-friendly design guidelines
Structure design of Class Rooms	The class room is to be structurally stable, seismic proof, weatherproof according to the local environmental conditions, climatically comfortable, easily exited in case of emergency and well integrated with the environmental and cultural context of the area. The PGEB/GPE-BEP has developed comprehensive structural guidelines and manual for construction of community schools in Balochistan, which must be followed for the for this project as well. The designs will include facilities for special children (ramps, hand rails, and others).
Drinking water facility Optional-AS this aspect may have been covered during School Establishment under GPE-BEP	Fresh and safe drinking water will be provided to the students within the school with proper plumbing infrastructure for distribution of drinking water. A hand pump or a dug-well will be included in the school design, augmented with a rainwater harvesting system to recharge the ground water aquifer for the water drawn and to meet the watering requirements of plantation.
Toilets and sanitation Optional-AS this aspect may have been covered during School Establishment under GPE-BEP	Separate and appropriately sized toilets or latrines will be provided for girls and boys. Water efficient design of toilets shall be designed keeping in view the local topography and cultural context. Privacy, cleanliness and safety aspects will be considered during designing of toilets building. Proper sewage disposal arrangements such as septic tank with soaking pit will be provided.

⁸⁸ There is no provision currently in the project design for provision of missing facilities however, the rehabilitation work may include such interventions as special case therefore, this option is included again in this ESMP.

Environmental aspect in design	Eco-friendly design guidelines
Lighting, ventilation, humidity,	Classrooms need good fresh-air circulation to avoid heat and excessive humidity. To ensure adequate daylight and ventilation, sufficient windows must be provided in the building. The design of building will be done according to the local climate and weather conditions. Classrooms will be sufficiently shaded from direct sunlight and heat to maintain normal room temperature in summer plain areas. The PGEB construction manual for community schools will be used to design school buildings.
Electricity and fittings	Electricity or solar power is needed to provide light and to operate equipment. All rooms in the school shall be provided with a ceiling fan, lights and exhaust fans. In large classrooms, two fans are recommended.
Protection Optional-As this aspect may have been covered during School Establishment	Depending on location and context, protection will be provided either through boundary walls or fencing to keep children within the school premises and also protect the school gardening and orchards from animals grazing. In case of girls schools boundary wall of sufficient height is recommended to ensure Parda for female students and teachers.
Acoustics	The location of design of school building should be such that the surrounding noise caused by traffic, or any other source of sound have minimum effect on the classroom students to avoid disturbance in concentration and learning.
Access Ramps	Depending upon need basis, it is necessary to design access ramps at the entrance, yards and near toilets for physically handicapped children on wheelchairs, to allow him/her access to all school facilities.
Health and Safety	Health and safety of school children shall be considered in designing of school buildings and the facilities inside the school. It will be ensured that construction materials are free of elements that can be dangerous or hazardous to children health. Appropriate sized municipal wastes bin shall be provided outside the school premises for solid waste disposal which shall be regularly cleaned to ensure clean and healthy environment to the students.
Environmental Comfort	Various factors such as plants, vegetation and landscaping have a softening and calming effect on the learning and provide environmental comfort. While designing school buildings sufficient space shall be provided for plantation and landscape development.

9.6.5 Tree Plantation and Landscaping

Plantation in open spaces will be a permanent feature of all proposed schools. It will be highly desirable to include tree plantation plans in and around school, if no plants have been planted, while constructing new class rooms and/or functionalizing existing class rooms in a school under BESP. Community may also

be sensitized through PTSMCs to carry out landscaping and re-vegetation to match the natural topography and enhance environmental aesthetics of the schools' area. Fast growing indigenous species of trees, shrubs and flowers will be planted in the school compound through community participation to enhance the environmental aesthetics.

9.6.6 Health and Safety Guidelines

Preventive measures will be the main strategy for ensuring health and safety of school children during operation as well as workers at worksites during construction of phase. A detailed health and safety management plan (**Table-28**) has been prepared to ensure health and safety of workers at worksites and that of children during schooling hours. First aid box and fire extinguisher may be provided to each school to cope with accidental injuries and fires in emergency. Trainings on the use of first aid box and fire extinguisher will be part of the health and hygiene training to community, students and teachers in the schools. The contractor will be responsible to provide personal protective equipment to the workers during construction work at worksites. Additionally, the specific to this project, Environmental, Health and Safety guidelines have also been appended to this ESMF as **Annex-C**.

9.6.7 Ban on Child Labor

Child labor or bonded labor will not be allowed in the construction of proposed schools. The guidelines set forth by ILO Written Convention (C.138) on child labor and Employment of Children Act, 1991⁸⁹ will follow while employing workers. The stipulated age for hiring labor will not be below the age of fourteen (14) years.

9.6.8 Livelihood Improvement Opportunities

The construction activities in the poorest of the poor and rural areas will also provide an opportunity of work and income generation for un-employed workforce in the area. In the proposed construction / rehabilitation works, preference shall be given to the local people for employment on skilled and unskilled jobs during construction and operation to improve their livelihood. Equal opportunities of work will be provided to locals according to their suitability for jobs in all project activities.

9.6.9 Land Donations

Under BES nor land acquisition nor land donation will be required for construction of new class rooms because it is planned that under BESP, new class rooms will be constructed with in the vicinity and available space of already established schools. In a very un-usual case if additional land donation is required for construction of new class room than an agreement will be signed between the donor and the Secondary Education Department that among other to ensure that: -

- i. the donation is voluntary
- ii. the land/space is appropriate for the construction of class room.
- iii. The land/space does not belong to any other donor who is below the poverty line or whose remaining holdings would be reduced below the minimum acreage, as stipulated to be economically viable (2.5 acres).

⁸⁹ Employment of Children Act, Government of Pakistan (1991)

- iv. There is no encumbrance on the land
- v. it does not negatively impact on the livelihood of any vulnerable group.
- vi. no compensation will be paid for the land; and
- vii. the owner will give up all claims on the land and the title will be transferred to Secondary Education Department, as per prevailing laws of Government of Balochistan.

6.1 Capacity Building and Training Programme

It is indeed of prime importance that the key stakeholders and relevant staff of ESMF have comprehensive knowledge of environmental and social concerns of project. Incomplete knowledge regarding their deliverables and the misinformation of the key characteristics of ESMP that are to be implemented in field can lead to adversity. Similarly, the staff designated for the implementation of ESMF may lack the technical expertise to carry out the monitoring of social and environmental mitigation measures. Therefore, different training sessions and environmental and social mitigation plan and monitoring will be arranged to build the capacity of key stakeholders and designated staff for effectively carrying out their responsibilities during ESMP implementation. These training sessions will help the key stakeholders to perform their duties as per the guidelines of ESMF and will capacitate the designated staff and will enable them to take informed decisions in field. **Table-25** gives a tentative schedule of capacity building and trainings programme for BES Project. The prime objective of these trainings would be to enhance the technical capacity of the stakeholders especially project staff associated with the ESMP implementation and to keep project management team, staff of education department and PTSMCs aware of emerging environmental and social issues and enable them to resolve these issues through proposed mitigation measures.

Table 25 Capacity-building and Training Programme

Description of Training	Topics	Location	Frequency	Participation	Cost (Rs.)
One day Training Workshop	Objectives and need of ESIA study and preparation ESMF for BES Project Management of environmental issues and mitigation strategies Monitoring Mechanism	PMU Quetta	One training workshops in a project life	All the project staff (40 Participants)	100,000/-
One Days Training Workshop	ESMP with special focus on monitoring plan and implementation of mitigation	PMU, Quetta	Two workshops Once in a year	All EDSQA staff (33 Participants)	100,000/-

Description of Training	Topics	Location	Frequency	Participation	Cost (Rs.)
One Day Training Workshop	ESMP with special focus on monitoring plan and implementation of mitigation measures during different phases of project life.	PMU Quetta	Once in project Period	All the DFPs of 33 districts (33 Participants)	50,000/-
One day training workshop	All the environment and social safeguarding issues during construction stage.	PMU Quetta	Once in a project life	All the contractors (40 Participants)	100,000/-
33 One day training workshop	Importance of Environmental awareness, Disaster Risk Reduction and Water Sanitation and hygiene (WASH) related matters.	District Level	Once in a project life	All the PTSMCs members (2400 Percipients)	10,500,000/-
One day training workshop for SMIP members	ESMP with special focus on monitoring plan and implementation of mitigation measures during different phases of project life.	PMU Quetta	Once in a project life	All the SMIP members (40 Participants)	50,000/-
12 Two days training workshop	Importance of Environmental awareness, Disaster Risk Reduction and Water Sanitation and hygiene (WASH) related matters.	Divisional level	Once in a project life	One teacher from every project focused school. (300 Teachers) 12 Trainings	10,000,000/-
One Day Training of Drivers of Transport Vehicles	Vehicle Maintenance and Safety Issues and compliance of ESMP	PMU	Twice in a Project life	All the drivers 7	100,000/-
				Total	21,000,000/-

Fifty (50) training workshops viz. 5 at provincial level, 12 at divisional level and 33 at district level will be arranged during the entire project life. 37 Trainings will be imparted in the first year of the project whereby, one training for drivers and 12 two day trainings for teachers will be conducted in the 2nd year and 3rd year of the project respectively. The Provincial and District level officers, EDSQA staff, contractors, teachers, SMIP staff and PTSMC members involved in the ESMP implementation will primarily attend these training workshops. These workshops will focus on environmental as well as social issues, confronted during ESMP implementation. Besides, these will also focus on sensitizing the participants about environmental and social stakes of the project, managing the on-ground problems, and assuring implementation of the ESMP.

9.7 Disclosure

This ESMF be publicized and disclosed on the website of Education Department, Government of Baluchistan. It will also be disclosed on the project specific Info shop of the World Bank. Hard copies of this addendum will also be shared with the Provincial EPA, Implementing Partner NGOs and Construction Contractors, Civil Society Organizations. A copy of the ESMF will be placed in the Project Management Unit, GPE-BEP/BES project for public access. The key features of ESMF will also be translated into Urdu and other local languages such as Pashtu, Baluchi and distributed to all relevant stakeholders more particularly to the communities in the project areas. The purpose will be to inform them about the project activities, negative environmental and social impacts expected from the project and proposed mitigation measures.

9.8 ESMP Cost

The estimated cost of ESMP implementation include the capacity building training of staff including payments to the resource persons, training module and materials, internal monitoring costs, ESMP implementation cost and external monitoring/Third Party Validation (TPV). The cost of mitigation measures will be included in the tender documents of the project to be floated in the press and executed by the PMU through contractors. The total estimated cost for ESMP implementation and monitoring is **PKR 34.675** million for three-year project period.

Table 26 ESMP Training and Implementation Cost (Rs.)

S. No	Activity	Quantity	Unit cost	Total Cost (Rs.)
1	Training Cost	50 Trainings	-	21,000,000
2	Plantation	5 Plants per School	250	375,000
3	Printing of big book regarding environment and social safeguard , DRR, WASH and Child rights	300	4000	1,200,000
4	Printing of Module for the training of teachers	350	1000	350,000
5	Printing a brochure of health and safety guidelines for the labor.	300	500	150,000
6	Facilitation of Special Persons	Lumpsum		300,000
7	Cost of mitigation measures	Lumpsum		200,000
8	Rain water harvesting	20	30000	600,000
9	External Monitoring/ Third Party Validation	Independent Monitoring	3,000,000	600,000
Total				34,675,000

Table 27 Environmental and Social Management Plan

		Implementation Plan			Monitoring Plan		
S#	Environmental Impacts	Proposed Mitigation Measures	Responsibility	Monitoring Parameter (s)	Frequency	Responsibility	
Siting and Design Stage							
A	Impacts on soil and land						
1	Improper site selection for class room construction may lead to destability of land leading to soil erosion	Proper site for class room construction will be done as per guide lines provided in Section 7.2 , to ensure no or minimal disturbance to soil and land.	SDE /E&SSO	Implementati on of site selection as per guidelines are verified	Two times (First at the one at the time of site selection and second at design stage)	SE/E&SSO	
2	Site selected where heavy earth moving (Cutting/filling) is required may results in destabilization of land and adjacent structure	Economical Design may be used for construction of class rooms so as to avoid excessive earth excavation.	SDE /E&SSO	Verfication of impelmention of Site selection guidelines and design	Once at the time of site selection and then at design stage.	SE/E&SSO	
3	Site selected within school at a location with may be hit by floods my result erosion of foundation of soil damaging the structure.	The flood prone locations may be provided diversion and / or erosion control structures minimize possibility of soil erosion.	SDE /E&SSO	Verfication of impelmention of Site selection guidelines and design	Once at the time of site selection and then at design stage	SE/E&SSO	

B Impacts on surface water						
4	The site for class room in the school should not be such that it may result in diverting waste water from school into a stream or river located close to school.	<p>Site adjacent to river and stream will be avoided to prevent surface water contamination.</p> <p>If it is unavoidable; proper sewer system may be installed to avoid contamination of surface water sources.</p>	SDE /E&SSO	Verification of impelmention of Site selection guidelines and design	Once at the time of site selection and then at design stage	SE/E&SSO
5	Site Selection for parking of transport vehicle must be far from the surface water source to avoid drainage of contamination from the parking site to the water source.	The selection of Parking space near surface water source may be avoided. In case parking place for vehicle is near surface water resource; than the parking lot may be provided with proper sewerage system to avoid contamination of surface water source	SDE /E&SSO	Verification of impelmention of Site selection guidelines and design	Once at the time of site selection and then at design stage	SE/E&SSO
6	Excessive Water withdrawal may deplete the water source.	Rainwater harvesting facility, particularly in water scarce areas, may be provided to reduce impact on surface water resources.	SDE /E&SSO	Raainwater harvesting will be verified	Two times (one at construction stage and second at operational stage)	SE/E&SSO
C Impacts on ground water quality						

7	Selection of Parking space for transport vehicle near ground water source, within vicinity of school, may increase vulnerability of contamination due to leakage of lubricants or fuel from vehicle.	In unavoidable circumstances, the surrounding base of hand pump or tube-well may be sealed off from the exterior by grouting with cement mortar to control percolation and contamination of ground water source.	SDE /E&SSO	Verification of impelmention of Site selection guidelines and design	Two times (one at the desig stage and second at selection stage)	SE/E&SSO
D Impact on Air Quality						
8	The parking of Transport vehicle should be away from the main school v so as to avoid air pollution due to vehicular emission	Proper parking shed with closed wall and proper ventilation may be provided.	SDE /E&SSO	Verification of Parking Shed Design	One time at the design stage.	SE/E&SSO
Impact on biological environment						
E Impacts on natural vegetation						
9	Improper site selection could lead to removal of natural vegetation and cutting of trees for construction of class rooms.	In case it is unavoidable to construct class room by removing vegetation and/or cutting of tree/ plants than replantation guideline suggested in Section 8.2.2 may be followed.	SDE /E&SSO	Verification of impelmention of replantation guideline	One time at the site selection stage.	SE/E&SSO
10	Selecting parking site near vegetation may deteriorate the vegetative cover due to vehicular emission	In case it is inevitable to park vehicles near vegetation cover than proper irrigation of vegetation may be carried out in consultation with forest officials.	SDE/E&SSO	Verification of irrigation schedule of vegetation	One time at the design stage	SE/E&SSO

Construction Stage						
A	Impacts on soil and land					
11	Excavations and removal of trees can lead to soil erosion and landslides in hilly terrain.	Removal of vegetation and trees will be avoided to the extent possible. The exposed soil will be re-vegetated quickly and compensatory plantation, (five sapling for each tree felled), will be carried out after construction is over	Contractor	Tree plantation is monitored	Two times (one during excavation and second after plantation is done)	SE/ PTSMC/E&SSO
		The contractor will ensure prevention of soil erosion and destabilization by applying batched excavation technique.	Contractor	Soil erosion is monitored	Once (during excavation and digging of foundations)	SE/ PTSMC/E&SSO
		Excavation, if required for foundation, will only be carried out in specified area, as per the engineering drawings. The excavated earth will be used for filling and compaction.	Contractor	Exposed soil compaction is monitored	Once (after excavation and foundation work completed)	SE/ PTSMC/E&SSO
12	Disposal of contaminated construction wastes such as left over concrete, paint, left over oil and other such	Left over construction materials, excavated soil and waste material produced as a result of construction/ rehabilitation works, many be	Contractor	Disposal of construction wastes is monitored	During and Afer Completion of Works	SE/ PTSMC/E&SSO

	contaminated wastes may lead to soil contamination.	properly disposed-off in designated areas to avoid soil contamination.				
13	Non-filling and leveling of borrow pits excavated for construction purpose may lead to destabilization of land slope and soil degradation/erosion	Borrow pits will be restored and levelled back to control soil degradation	Contractor	Filling of Borrow Pits are verified at site	After Completion of Works	SE/PTSMC/E&SSO
14	The excavation and digging of earth for construction of Class Room may likely to discover sites and artefacts of cultural and archaeological importance	Unexpected discovery of cultural and archaeological artefacts shall be reported to the concerned authorities according to procedure given in Section 2.3.5	Contractor and SDE PMU	Procedure for chance find management is verified	Two times (one after discovery and then handing over of site to concerned authorities)	SE/E&SSO
B	Impacts on surface water					
15	Excessive use of water may lead to generate large quantity if wastewater	Minimum quantity of water shall be use to meet the essential construction requirements. The contractor will ensure to avoid unnecessary use of water for washing of equipment and vehicles during construction.	Contractor	Water consumption is monitored	One time (during middle of construction work)	SE/PTSMC/E&SSO
16	Disposal of Waste material, contaminated water and	The contractor will dispose the construction wastewater from the	Contractor	Monitor wastewater	One time (during	SE/E&SSO

	excavated soil near or in the water resource may result in pollution of water resource.	work site through a soaking pit of appropriate capacity, which be levelled back after completion of construction work.		disposal during construction	construction work is in progress at the site)	
C	Impacts on air quality					
17	The movement of vehicles, land excavations, structure demolitions, rehabilitation work and onsite stacking of materials may lead to dust emissions and prolonged suspension of fine particulates (PM ₁₀) in the ambient environment.	Stockpiled materials will be covered to avoid dust/particulate emission.	Contractor	Dust (SPM) and vehicles emissions monitored	Two times (at start of construction work and then in the middle of construction stage)	SE/E&SSO
		Vehicles speed will be kept to the minimum low to avoid blowing of dust and suspended particulate matter.				
		Demolition and excavation will be carried out in batches to avoid dust emissions. Water sprinkling will be carried out to reduce dust emissions where necessary and feasible.	Contractor	Excavation / Demolition / Rehabilitation work is monitored	Two times (during demolition and then excavation stage)	SE/PTSMC/E&SSO
18	Emissions from construction machinery and carriage vehicles exhaust can lead to increase air pollution	The contractor will ensure to keep vehicles and machinery tuned and lubricated to reduce air emissions.	Contractor	Monitor vehicles and machinery emissions	Monthly (Vehicle emission certificate verified)	SE/E&SSO

D	Impacts on Natural Vegetations (Flora and Fauna)					
19	Improper excavation of foundation during construction may lead to removal of natural vegetative cover and trees cutting.	Cutting of trees will be avoided during construction. In case of unavoidable choice, compensatory tree plantation, (five saplings for each tree felled) will be carried out to reduce the impacts	Contractor	Tree plantation is monitored	Two times (tree cutting during construction and plantation after construction is over)	SE/E&SSO
E	Noise and vibration impacts					
20	Construction activities can lead to unpleasant noise during school hours and at night times.	The contractor will avoid use of noise generating machinery, equipment during school hours and at night	Contractor	Use and timings of noisy equipment monitored	Twice a week (during construction)	SE/PTSMCs/E&SSO
		The contractor will use proper and good quality lubricants in machinery and equipment to minimize noise pollution.	Contractor	Use of lubricant checked randomly	Monthly 4 times (once in a week)	SE/PTSMC/E&SSO
21	Movement of vehicles and use of pressure horn can be a source of unpleasant noise	The contractor will maintain and tune up all the vehicles and equipment during construction work. The community will be sensitized to observe silence zone in the school premises. Proper signboard will be installed indicating ban on use of	Contractor	Noise level is monitored	Monthly (once in a month noise pollution is observed)	DFP/PTSMC/E&SSO

		pressure horns by moving vehicles around the school.				
Operation Stage						
A	Impacts on soil and lands					
22	Open Discharge of Toilets' wastewater to the adjacent lands can contaminate the soil, result in soil erosion and degrade the quality of land.	In case of existing system, it will be ensured that toilets and associated systems are maintained in proper working conditions. If no sewage system is present than a secure sewer line from school building will be provided to the local sewerage system, if available. Alternately, an appropriately sized septic tank and soaking pit will be constructed for sewage disposal. (This step may be carried out if not completed under ESMP of GPE-BEP)	PTSMC	Sewerage treatment is monitored	Quarterly (Wastewater sample is collected and analysed in laboratory)	DFP
		Tree plantation around the periphery of school building will be carried out to ensure soil stability and control erosion. (This step may be carried out if not completed under ESMP of GPE-BEP)	Local community	Tree plantation verified	One time (after plantation is completed by locals)	DFP
23	Parking, maintenance and washing of Transport Vehicles on non-paved land may lead to contamination	The school administration, PTSMC will ensure parking of transport vehicle in a proper space so as to avoid soil contamination due to oil leakage etc.	PTSMC	Vehicle maintenance	Monthly monitoring	DFP

	of soils and degradation of quality of land	and transport vehicle will always be taken to service station for maintenance and washing.		and Parking is monitored		
B	Impacts on surface water					
24	Open discharge of sewage and Dumping of School Waste; near or into nearby water bodies can contaminate water quality.	<p>Sewage will not be dispose directly to river and stream in surrounding area.</p> <p>Regular maintenance of Septic tank and sewer line be carried out for safe disposal of waste water. School Management and PTSMCs will ensure proper disposal of school waste.</p> <p>(Steps if not completed under ESMP GPE-BEP be completed under this ESMP)</p>	Contractor/ Education Department	Disposal of sewage and School waste monitored	Quarterly (sewage sample taken and analysed in laboratory)	DFP/PTSMC
		<p>The local community and PTSMC will be sensitized through health and hygiene sessions to protect water resources from contamination.</p> <p>(Steps if not completed under ESMP GPE-BEP be completed under this ESMP)</p>	PMU/Education Deptt	Training sessions are monitored	Randomly (once during the training session)	DFP/PTSMC
25	Washing of transport vehicle on the banks of stream, river, spring or canal me result draining of waste water back into the resource	Transport Vehicles will be sent to service stations for washing and cleaning.	Education Department	Log Book of Vehicle Verified	Every month	DFP/PTSMC

	thereby, resulting in pollution of the source.					
C	Impacts on groundwater					
26	Stagnation of spilled water around the base of hand pump or tube well can leads to groundwater contamination through percolation and seepage.	The surrounding base of hand pump or tube-well is sealed off from the exterior by grouting with cement mortar to control percolation and seepage. Periodic testing of drinking water supply source at the schools will be carried out for timely detection of contamination	Contractor Education Deptt/ PTSMC	Ground water sample analysed	Two times in year	DFP/EPA/PTSMC
27	Parking and washing vehicle near hand pump or tube well may result in stagnation of water resulting in seepage of water into ground water source.	The washing and/or cleaning of vehicles near ground water should not be allowed. Vehicles will be sent to Service stations for servicing.	Education Deptt/ PTSMC	Verificaiton of Log book of vehicle	Every Month	DFP/EPA/PTSMC
D	Impacts on air quality					
28	Dust emissions from movement of vehicles especially transport vehicle in the surrounding of school can also create minor adverse impact on air quality	The exposed soil in surrounding of school will be re-vegetated and landscaped with community participation to control dust blowing.	Education Deptt	Re-vegetation and Awareness session monitored	Randomly (once during project period) and Annual (during	DFP/PTSMC/E&SS O

	in surroundings of the school.	Community will be mobilized to observe low speed limits in the school vicinity.			school inspection	
29	Use of altered fuel in transportation vehicle may deteriorate the air quality	The transport vehicle shall be switched off when parked near or inside school during school timings to avoid pollution of surround environment due to vehicular emissions. Proper lubrication of vehicles and machinery will be ensured to reduce emissions, Vehicles manufactured on European Union standards may procured for transportation purpose. Fuel for transportation vehicle should be procured from authorized dealers.	Education Department	Log Book of Vehicle Monitored for lubrication. Vehicle Operation Monitored	Randomly after 2 months	DFP/PTSMC and E&SSO during project execution
E	Impact on natural vegetation and flora and fauna					
30	Vehicular operation near vegetative cover may deteriorate vegetative cover due to emissions and dust.	Proper irrigation of the vegetative cover may avoid damage to the vegetation cover.	Education Department	Vehicle Operation Monitored	Randomly after 2 months	DFP/PTSMC and E&SSO during project execution
31	Movement of transport vehicle near sensitive area may cause harm to flora and fauna	Vehicle operation near sensitive are will be avoided to ensure no negative impact on the flora and fauna.	Education Department	Vehicle Operation Monitored	Randomly after 2 months	DFP/PTSMC and E&SSO during project execution

F	Noise Pollution					
32	Moving transport vehicles and use of pressure horns around the schools could be source of unpleasant noise and vibrations	Transport vehicles in school vicinity will observe slow speed and avoid unnecessary use of pressure horn. Timely maintenance of Transport vehicle may be ensured to curb any possibility of noise during vehicle operation.	Contractor during project execution Education Deptt after project completion	Log of contractor Vehicles Verified Installation of sign board verified	Monthly Annual (during school inspection by education deptt)	SE/E&SSO DFP/PTSMC

Table 28 Health and Safety Management Implementation and Monitoring Plan for Construction Worksite

	Implementation Plan			Monitoring Plan		
S#	Health and Safety issue	Proposed Mitigation Measures	Responsibility	Monitoring Parameter (s)	Frequency	Responsibility
A	Siting and design stage					
1	Improper class room design with poor ventilation and sunlight can lead to behavioral change and health impacts and create difficulties in learning	Appropriate building codes as per guidelines in Section 9.6.3 will be followed to designs class rooms in the seismic prone areas and flood plains to avoid risks of damage to health and property.	PMU/SDE	Site and design of class rooms are inspected for compliance	One time (during site selection)	E&SSO
2	Improper class room design with poor ventilation and sunlight can affect the health and learning ability of childrens.	Proper designing of class rooms will be followed according to guidelines in Section 9.6.4 to provide ventilation and natural lighting in the class rooms.	PMU/SDE	Design is verified for ventilation & sunlight	Once (after design is completed)	E&SSO
3	Improper class room designs without sanitation facilities can lead to health and hygiene problems for children.	Proper designing of class rooms will be followed according to guidelines in Section 9.6.4 to provide ventilation and natural lighting in the class rooms.	PMU/SDE	Design is verified for ventilation & sunlight	Once (after design is completed)	E&SSO
4	In sufficient quantity of water in toilets can lead to health hygiene problems. (Optional: This aspect is	Water storage tank will be included in the design of school to ensure availability of water in toilets for hand wash.	PMU/SDE	Water storage tank verified in the designs	Once (after design is complete)	E&SSO

	presumed to have been complied with during GPE-BEP)	Eco-san toilet design mentioned in Section 6.5 will be followed for construction of toilets to minimise water consumption.	PMU/SDE	Eco-san design of toilet is verified in the design	Once (after design is complete)	E&SSO
		Rain-water harvesting guidelines in Section 8.4.1 ESIA-PGEB will be followed to provide alternate source of water for toilets and handwashing in water scarce areas to ensure personal hygiene	PMU/SDE	Rain-water harvesting facility is verified at design stage	Once (after design is complete)	E&SSO
5	Sharp edges and non-availability of emergency exit can lead to adversity.	Sharp edges during designing will be avoided. Provision of emergency exit will be ensured for safe evacuation of school children during emergency.	PMU/SDE	Classroom design is verified	Once (after design is complete)	E&SSO
6	Improper class room design can lead to difficulties and safety issues for special children.	The building designs will cater to the needs of special children (such as ramps and hand rails will be provided where needed)	PMU/SDE	School designs verified for ramps, hand rail	Once (after design is complete)	E&SSO
7	School design without safe drinking water facility may lead to compromise health and safety of children's	Facility for storage of safe drinking water will be provided in the school design	Education department	School design is verified safe water storage tank	Once (after design is complete)	SE/ E&SSO

	(Optional: this aspect is presumed to be completed during school establishment under GPE-BEP)					
B. Construction Stage						
8	Ill planned and haphazard excavation of foundation may lead to damaging underground pipes/utility lines and pose a risk to the health and life of workers	<p>Foundations areas for excavation will be properly marked with lime and physical barriers will be erected around the excavated areas to restrict access.</p> <p>All utilities supply lines present in the excavation area shall be closed from the manhole before starting excavation.</p> <p>Fire extinguisher and gas spill control equipment shall be provided at the site.</p>	Contractors	Marking of foundation area verified	Once (before excavation is started)	SE/E&SSO
9	Open dumping and stockpiling of construction materials in open spaces and streets can result in blocking of route and inconvenience for passersby, neighbors, and residents	Stockpiled construction materials will be covered in separate place or corner in the premises of school.	Contractor	Covering of stock materials checked	Randomly (during construction stage)	SE/E&SSO
10	Ignorance about site specific hazards may pose a potential threat to the health and safety of workers	Detail hazard assessment shall be carried out to identify all site specific hazards and labeled before starting construction work on the site	Contractors	Hazards mapping verified	Once (before starting construction work on the site)	SE/E&SSO

11	The construction work and equipment may lead to safety hazards for workers and nearby communities	The contractor will provide protective equipment such as gloves and boots to the labors to avoid worksite hazards and accidents	Contractor	Provision of safety equipments checked	Randomly (at least once during the construction stage)	SE/E&SSO
		Protective fencing will be used around the construction sites, excavated areas, and voids.	Contractor	Fencing around worksite is verified	Once (during construction stage)	SE/E&SSO
12	The operation of construction machinery and equipment such as excavators, lifters and dumpers by untrained personals may leads to compromise the health and safety of workers at sites.	Proper trained and certified staff shall be deployed to operate machinery and equipment at worksite. Health and safety training shall be provided to all staff working on the site.	Contractor	Health and safety trainings and certification of staff verified	Once (before starting construction work on the site)	SE
13	Welding and cutting operation during construction poses a serious health and safety risk for workers	<ul style="list-style-type: none"> i. Welding and cutting shall only be performed by authorized and properly trained persons. ii. Butane Lighters shall not be carried by welders or their helpers when engaged in welding or cutting operations. 	Contractor	Wearing of Personal Protective Equipments shall be verified	Randomly (during construction work on the site)	SE

		<p>iii. Welder shall wear an approved helmet or goggles, proper protective gloves, and clothing.</p> <p>iv. Fire extinguishing equipment shall be within 6m (20ft) of all locations where welding and cutting equipment is used.</p>				
C- Operation Stage						
14	Poor hygiene conditions during school operation can increase vulnerability of school children's to diseases.	Awareness about personal hygiene will be raised among the students and surrounding community through health and hygiene sessions.	Education Deptt and IP	Health Hygiene sessions monitored	Randomly (during training session)	DFP/PTSMC
15	Contamination of drinking water source can lead to health hazards for school children.	Cleanliness of schools and regular checking of drinking water quality will be ensured.	PTSMC	Cleanliness randomly checked	Weekly inspection of school childrens	DFP
		Working of the sewer line and septic tanks to ensure timely repair	PTSMC	Functioning of sewer line checked	Quartely (septic tank and sewer lines inspected)	DFP/PTSMC
		Supply of safe drinking water will be ensured.	PTSMC	water quality is checked	Biannual (Januray and July of the year)	DFP/PTSMC
		Awareness raising will be carried out on health and hygiene aspects	Education Department	Awareness sessions monitored	Once (during project period)	DFP/PTSMC

		including hand wash with soap after going to toilets				
16	Non-availability of soap in school toilets may lead to health and hygiene problems in children.	Availability of soap outside the toilets will be ensured	Education Department	Provision of soap is verified	Weekly (during inspection)	Teachers/ PTSMC
17	Exposed electrical wiring and cables in the school building may pose health and safety risks for school children.	All exposed wiring and cables shall be covered with plastic and labeled as DANDEROUS to avoid contacts.	Education Department	Checking of electrical installation is done regularly	Annual (during maintenance work)	DFP
18	Overcrowding of students in class rooms may leads to compromise the health of students and transmission of diseases	The number of students in class rooms shall not exceeds 40. Proper ventilation and seating arrangements shall be observed in class rooms during school operation	Teacher PTSMC/	Number of student roll verified	Biannual (April and November)	DFP
19	Non-availability of traffic signboard around the schools may lead to traffic accidents and pose serious threat to the safety of children.	Traffic signboard will be provided on the main road and access road leading to school	Education deptt and IP	Installation of traffic signals verified	Annual (during school inspection)	DFP
20	Nonfunctioning of sewage treatment facility in school may lead to contamination of drinking water supplies and results in health hazard problems.	Proper functioning of sewage treatment facility such as septic tank will be ensured during school operation.	Education Deptt/ IP	Functioning of septic tank monitored	Weekly (cleaning of septic tank checked by sweeper)	PTSMC
D Vehicle Operation						

21	Reckless driving of vehicle by the driver may pose life threat to the on board passengers, pedestrians and other passenger.	<p>The drivers deployed for transport vehicles must hold a relevant and valid vehicle license.</p> <p>Before handing over the vehicles all the drivers of transport vehicle should be given a proper training pertaining to road safety and traffic signs and environmental awareness.</p> <p>First aid kit will be place in all the transport vehicle.</p> <p>Speed control device will be used to control the peril of over speeding.</p>	Education Department	Driver Selection procdures and driver's driving test results be varified.	Once during hiring of driver	DFP/PTSMC/E &SSO
22	Overloading of vehicle may lead to damage to vehicle and congestion of the passengers.	<p>Approved list of students and teachers availing the transportation facility will be provided to the transport vehicle operator.</p> <p>Inside cleaning of transport vehicle will be confirmed to avoid unhygienic condition.</p> <p>Anonymous and non –relevant persons should not be allowed in the transport vehicle.</p> <p>Driver will have the number of nearest police to tackle with the security issues.</p>	Education Department	<p>Physical verificaiton of approved list of students and teacher</p> <p>Random Inspection of Vehicle</p>	<p>Every Year</p> <p>Quarterly</p>	<p>DFP/PTSMC</p> <p>DFP/PTSMC</p>

	Selecting road with heavy traffic may lead to traffic congestions may cause restless ness in the students	Dangerous / Rush routes will be avoided to ensure safety of on board passengers. Remote monitoring of transport vehicle be carried out to ensure the obedience of safety rules and routes.	Education Department	Physical inspecdtion of routes	At the handing over time	DFP/PTSMC
23	Poor maintenance of vehicle may result in failure of its systems which may result in an untoward eventuality such as road accident.	The vehicle should be properly maintained to avoid the chances of an accident.	Education Department	Verification of Log Book of Vehicle	Quartely	DFP/PTSMC

FIRST DRAFT

10 Grievance Redress Mechanism

10.1 Introduction.

A standardized Grievance/Complaint Redress Mechanism (GRM) has been established for the project. The Project Director (PD) is responsible for the compliance of GRM under the project, assisted by the PMU M&E Section and DFPs/SMIPs (at the field level). It will allow a complainant to address any disagreeable decision, practice or activity arising from and/or non-compliance of ESMP and other relevant safeguards concerns. A detailed description and step-by-step Grievance/Complaint Redress mechanism has been established by the PMU which is given in the following paras.

10.2 Objectives of Grievance Redress Mechanism

Effective grievance/complaint redress mechanism gives an opportunity to the organization to implement a set of specific measures to ensure good governance and accountability, by improving the effectiveness of the project activities, increasing transparency and managing/mitigating risks of fraud and corruption.

It includes measures to:

- Ensure effective implementation of the project elements directly relevant to Improving governance and accountability,
- Guard against and reduce fiduciary risks, especially those of fraud and corruption,
- Enable beneficiary and general citizen to receive and provide information about the project transactions and performance,
- Safeguard the credibility of implementing agencies

10.3 Definition of Grievance/Complaint

“A grievance/complaint can be defined as any sort of dissatisfaction, which needs to be redressed in order to bring about the smooth functioning of the organization and ensure transparent procurement/recruitment. Broadly, a grievance/complaint can be defined as any discontent or dissatisfaction of aggrieved with any procurement/recruitment procedure of the organization. It should be real, legitimate but not ridiculous or imaginary, it should be rated or unvoiced, and written; it must however, find expression in some form or the other”.

10.4 Assessment of Grievance/Complaint

Any grievance/complaint, before entering into the proceedings, must be assessed to examine whether the grievance/complaint qualifies or is rejected for the proceedings. The PMU cannot encourage any imaginary or ridiculous grievance until it is legitimate and logical to be proceeded.

The GRC/GRO will assess the grievance/complaint by all the possible means available on the ground/field for declaring its qualification to be proceeded or rejected. The grievance/complaint will only be proceeded if it is declared qualified.

The grievance/complaint rejected after the assessment process will be filed with the reason of disqualification or rejection into proceedings.

10.5 Duties of Grievance / Complaint Redress Committees

For effective and efficient redressal, the following may be observed

- One of the committees given in **section 10.8** to process the redress of the grievance/complaint
- Ensure the Grievances/Complaints are computerized and acknowledged promptly through a unique identification number for reference in future.
- Monitor the progress of disposal of the grievances/complaints.
- Fix time limit for disposal of the Grievances/Complaints.
- Deal with every Grievance/Complaint in a fair manner.
- Fix time and day for the meeting to review the Grievances/Complaints received.

10.6 Grievance/ Complaints Redress Mechanism/Complaint Handling System Procedure

Grievances/Complaints will be addressed through 2-different processes based on their types. The complaints/grievances will be categorized into two types.

10.6.1 Minor Complaints/Grievances.

Complaints/Grievances which could be resolved within a period of two working days by taking one to three immediate actions, and having low intensity of impact on the performance of the project activities or stake of the aggrieved persons/parties or do not involve any financial embezzlement.

10.6.2 Major Complaints/Grievances

Complaints/Grievances which would take more than five working days to resolve and having high intensity of impact on the performance of the project activities or stake of the aggrieved persons/parties or involve financial embezzlement.

10.7 Complaints/Grievances Handling Procedure

10.7.1 Minor Complains/Grievances

Step-1: Aggrieved communities/parties will launch written complaints/grievances to PTSMCs or directly to PMU. The PTSMCs will discuss the issues and their solution in the Larger Community Meeting (LCM). It will be a facilitating body towards resolution of grievances/complaints but not authorized to make any decision. It will help in exploring the options for solutions of the complaints/grievances. The PTSMCs may seek advice of the Representative from PMU in suggesting actions for resolving the issues. PTSMCs will pass on complaints/grievances to PMU with suggested actions if the grievance/complaint does not get redressed in the LCM even with the help of the PMU Representative.

Step-2: PMU M&E Section will pass on complaints/grievances to concerned provided committee pertaining to the issue for further process keeping in carbon copy the PD office. PMU can differ/agree on the actions suggested by the PTSMCs. The concerned committee, after assessing the complaint/grievance, will further direct a sub-committee or an officer to proceed the resolving of the grievance/complaint if it qualifies for the proceedings.

Step-3: In case the complaint/grievance qualifies, the responsible committee will appraise the complaints/complaints with the help of PTSMCs, PMU Representative and any other third party such as Supervision Consultants to ensure immediate actions to redress them within two weeks.

10.7.2 Major Complaints/Grievances

Step-1: In case of major complaints/grievances, aggrieved communities/parties will be encouraged to share their grievances/complaints with the PTSMCs in writing. The PTSMCs will discuss the issues and their solution in the Larger Community Meeting (LCM). PTSMC will be a facilitating body towards resolution of grievances/complaints but not authorized to make any decision. It will help in exploring the options for solutions of the complaints/grievances. The PTSMCs may seek advice of PMU Representative in suggesting actions for resolving the issues. PTSMCs will pass on complaints/grievances to PMU with suggested actions.

Step-2: PMU M&E Section will pass on complaints/grievances to PD office for further direction. PMU can differ/agree on the actions suggested by the PTSMCs. PD will further direct/convey concerned committee to assess the complaint/grievance and proceed the proceedings if the complaint/grievance qualifies or dismiss it in case the complaint/grievance is rejected.

Step-3: The responsible committee will appraise the qualified complaint within a possible minimum time period and will submit the report to the Project Director with their report mainly consists of findings and recommendations. The Project Director will have sole discretion to make the final decision.

10.8 Complaint/Grievance Redress Committees (GRCs)

10.8.1 Committee One

Committee one will be evaluating and assigning the task to the concerned section for resolving/addressing all the cases related to the “services” which will comprise of the following members:

i-	Add. Secretary (Dev) Secondary Education	Chairman
ii-	Manager M&E, PMU	Secretary /Member
iii-	Manager Education, PMU	Member
iv-	Manager Finance, PMU	Member

The grievance/complaint can be launched by the party which has direct stake in the procurement processes/competition of “services” and has grievance/complaint against the authority at PMU. The grievance/complaint shall be launched within one week of the procurement activity process initiation. The grievance/complaint submitted after a week of the activity completion shall be considered void.

10.8.2 Committee Two

Committee two will be evaluating and assigning the task to the concerned section for resolving/addressing all the cases related to the “goods & works” which will comprise of the following members:

i-	Project Director BEPGPE	Chairman
ii-	Manager M&E, PMU	Member
iii-	Finance Manager, PMU	Member
iv-	Any other co-opted member	

The grievance/complaint can be launched by the party which has direct stake in the procurement processes/competition in “goods & works” and has grievance against the competent authority at PMU. The grievance shall be launched within one week of the procurement activity process initiation. The grievance submitted after a week of the activity completion shall be considered void.

10.8.3 Committee Three (Complaint Redressal Cell (CRC))

Secondary Education Department has notified District Recruitment Committee- DRC for the recruitment of the teachers with a provided composition of the members (Annex-A).

Committee three will be evaluating and disposing of all the complaints related to teacher’s recruitments through abovementioned notified District Recruitment Committee. This Complaint Redressal Cell at Divisional level is constituted to redress genuine complaints with following composition:

i- Commissioner	Chairman
ii- Divisional Director of Education	Member
iii- Principals of the College for Male And Female at Div HQ	Member

The above complaints cell is bound to dispose of the complaints within 60 Days of a decision of the recruitment Committee. The proceeding of recruitment will not be stopped at any stage just because of a complaint pending directions from the Committee.

10.8.4 General Complaints/Grievances at Public Affairs Cell

All the general complaints/grievances in regard to the field activities will be handled by the Education Section. The complaints will be submitted in the complaint box at public affairs cell at PMU and will be forwarded to Education Section for the response.

The public affairs cell will be supervised by media and communication officer/legal officer with assistance of program associate from admin section.

Steps to handle general complaints

Step 1: Program Associate will receive the complaints via snail mail

Step 2: Program Associate will log the complaint/query into the MIS mentioning the priority of the complaint to determine the Turnaround Time (TaT) for the resolution of the problem.

Step 3: The Education and M&E sections will be alerted automatically and given the timeline to resolve the issue.

Step 4: Once the issue is resolved, the Program Associate will communicate the information provided by the relevant departments to the complainant.

10.9 Procedure for Registering Complaint/Grievance and Redressing Complaint/Grievance

Any citizen can make a complaint regarding implementation of PMU project by making an application to the PTSMC, in writing or verbal in English or Urdu. Through following means:

10.9.1 Complaint/ Grievance Registering Means

- Written (application / form) through Letters, SMS's, Phone Calls, Emails
- Complaints on phone calls can only be entertained between 9am to 5pm on working days of the week.
- Email: complaints.bep@gmail.com
- Landline Phone Number for calls: **+92 81 2864293**
- Cellphone Number for SMS: **+92 333 2335339**
- Office Address for letters: GPE-BEP PMU Chaman Housing Scheme, Quetta.

10.9.2 Complaint/Grievance registration method.

- Name, address and contact number of the complainant/aggrieved
- Date of receipt
- Details of the Grievance-Complaint/subject/issue
- What redress the aggrieved/complainants wants?

10.9.3 Dissemination of information regarding GRM

Complete information right to complainant/aggrieved will be disseminated to community through community meeting.

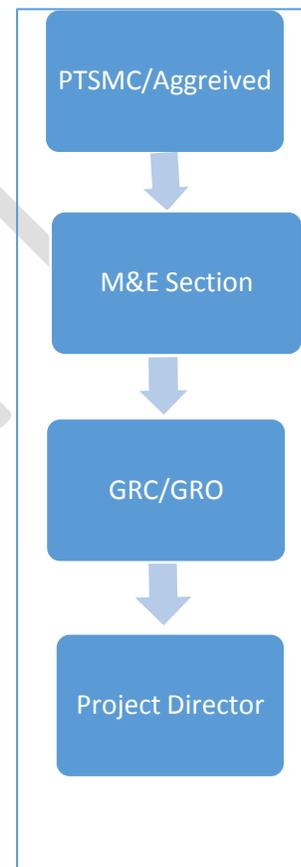
10.9.4 Record Keeping and Status of the Field Complaint/Grievance

Soon after receiving the application, the PMU should check thoroughly regarding applicant name, address of the applicant and contents of the application. A unique code will be given to each complaint/grievance with help of the unique code the complainant/aggrieved party can easily monitor the status of its complaint through project office or telephone inquiry

10.9.5 Complain/Grievance Record and Registration Tool

#	Name	Address with Phone Number	Gist of Complaint	Time Fixed for Disposal	Whether Complaint/Grievance Redressed or No (Y/N)	If Yes give Gist	If Rejected Give Reason

GRIEVANCE REDRESS
PROCESS FLOW Chart



Reference

1. Agriculture Statistics of Balochistan 14-15
2. Air Pollution: Key Environmental Issues in Pakistan Working Paper Series # 99 (2005)
3. Ambient Air Particulate Matter and Water Quality Investigation in Quetta, May 2006 Pak-EPA
4. Strategy Study on Home Based Girls Schools in Balochistan, Save the Children USA Pakistan (2000).
5. An Article on Rangeland Improvement by Community Participation in Highland, Balochistan, Quarterly Science Vision, Vol.14 (January-December 2008).
6. Arid steppes of Balochistan (Pakistan), Secheresse (2006), 17 (1-2), 203-9.
7. A Report on the Evaluation of Food Security, Poverty Alleviation in Arid Agriculture Balochistan Project, USAID (March 2008).
8. A Report on Population, Socio-economic and Development Profile of Pakistan: (<http://www.pap.org.pk/population/pdf/population.pdf>).
9. A Report on the Water Requirement of Major Crops in Different Agro-Climatic Zones of Balochistan, IUCN Balochistan Program: (www.waterinfo.net.pk).
10. Air Pollution Problems and Diseases Caused by Hazardous Gases in Quetta, Pakistan, Journal of Applied Science. Environ. Manage. March, 2008, Vol 12(1), 123-126.
11. Balochistan Road Sector Development Project, ADB (October, 2003).
12. Balochistan Conservation Strategy, IUCN (May 19, 2000).
13. Balochistan Education Sector Plan 2013-2018
14. Balochistan Forest Regulation (Amendment) Act, 1974.
15. Balochistan Drinking Water Policy /Strategy 2017.
16. Balochistan Wildlife Protection (Amendment) Act, 1980.
17. The Balochistan Wildlife (Protection, Preservation, Conservation and Management) Act 2014, Act No.14 of 2014
18. Basin-wide water resources availability and use in Balochistan. Balochistan Irrigation Department supporting public resource management TA-4560 (PAK), Halcrow Pakistan and Cameos Consultant, 2008.
19. Comparative Statistics by Province, Bureau of Statistics (2009).
20. Causes of Groundwater Decline in Upland Balochistan Region of Pakistan, Paper presented at 39th Australian Conference of Economists in Sydney, Australia (September 2010).
21. Censes Report, 1998:(http://en.wikipedia.org/wiki/Districts_of_Pakistan).
22. Child Friendly Schools Manual by UNICEF (2006).
23. Cities Investigation of Air and Water Quality (Lahore, Rawalpindi & Islamabad). JICA–Pak-EPA 2001
24. Comprehensive Environmental Monitoring Report For Selected Pilot Areas in Pakistan :(www.environment.gov.pk).
25. Development Statistics of Balochistan (2016-17).
26. Draft Provincial Disaster Risk Management Plan, Provincial Disaster Management Authority, Government of Balochistan (2006).
27. Economic Survey Report, Pakistan 2017-18.
28. Environment and Climate Change Outlook Report: Climate Change Division Pakistan (2014)
29. Environmental Guidelines, Environment Department World Bank (1988).
30. Environmental Profile Balochistan, LARUS-ITC Netherlands and Ecology Unit, Soil Survey of Pakistan by Dr. Hein van Gils and M. Shabir Baig (1992).
31. Environmental and Social Impact Assessment and Management Framework of Sindh Education Reform Program (SERP) by Government of Sindh (2009).

32. Environmental Impact Assessment of Wind Power Potential in Pakistan, Hagler Bialy Pakistan (2003)
33. Environmental Assessment and The Environmental and Social Management Framework, Punjab Education Sector Reform Program-II: Education Department, Government of Punjab (February 2012).
34. Fuel Efficiency in the Road Transport Sector (FERTS) UNDP/GEF (2003-2004)
35. GHG Emissions Fact Sheet Pakistan USAID 2016.
36. Guidelines for Environmentally Sensitive and Critical Area, Pakistan Environmental Protection Agency (1997).
37. Health Indicators of Pakistan, Gateway Paper II:(www.heartfile.org/gwhiop.htm).
38. Initial Environmental Examination Reports of Balochistan Rural Development and Drought Mitigation Project, ADB TA-4367 Pak (2005).
39. Interim Evaluation of Balochistan Area Development Project, Report No. 391-0479, USAID (1987).
40. Pakistan Employment of Children's Act, 1991.
41. Land and Range Resource Management Issues and Food Security in Balochistan, Arid Zone Research Institute, PARC, Quetta (1994).
42. Multiple Indicators Cluster Survey (MICS), Government of Balochistan (2010).
43. National Water Quality Monitoring Program (NWQMP) – Fifth Monitoring Report, Pakistan Council of Research on Water Resources (2007).
44. Pakistan Environmental Protection Act, 1997.
45. Pakistan Antiquities Act, 1975.
46. Pakistan Environmental Protection Agency (Review of IEE and EIA) Regulations (2000).
47. Paper Commissioned for Education for All (EFA) Global Monitoring Report on overcoming inequality: why governance matter by UNESCO (2009).
48. Provincial Provisional Population of Pakistan Bureau of Statistic 2017 (Net Sources)

Annex A List of Archaeological Sites and Monuments in Balochistan Protected under Federal Antiquities Act, 1975

District	Name of Site and Location
Kachhi	1. Pirak mound, Village Kolachi, Kachhi.
Kalat	2. Nindo Damb, Ornach Valley, Tehsil Wadh, Kalat.
Kharan	3. Fort wall of Jalawar Pass, Jhalawar, Kharn
	4. Fort of Azad Khan (Kharan Fort), Kharan twon, Kharan.
	5. Pally Kalat, Washbohi, Kharan
	6. Nauroze fort, Nauroze Kharan
	7. Aneient tomb, Jhalawar, Kharan.
	8. Har-o-Goke, Garuk, Kharan
Lasbella	9. Ancestral graveyard of Jam of Lasbella, Babrs, Lasbella
	10. Tomb of General Muhammad Ibn-e-Haroon, Bela town, Lasbella
	11. Tombs at Hinidan, Pir Mubarakm Lasbella.
	12. Chowkhundi (Rumi) graves, Bhawani Sarai, 5 miles from Hub Chowki, Lasella
Loralai	13. Tordheri site, Tordheri, Loralai.
	14. High cound, Dabarkot, Loralai.
	15. Pre-historie mound, Harian Haider Zai, Loralai.
Naseer Abad	16. Damb Judeir or Judeir-jo-daro, Deh Jodher No.2 between Jhatpat and Dera MuradJamali, Naseerabad.
Quetta	17. Mound No. 2, Village Samangali, west side of Airport, Quetta.
	18. Mound No.1, Village Kotwal Near Killi Gul Muhammad, Quetta
	19. Mound No. 3, Damb Sadat, 14 miles from Quetta, Quetta
	20. Mound No. 5, Ahmad Khan Zai, Quetta
	21. Mound No. 6, Shahi Khan, near Pir Ballo or Sariab Road, Quetta.
	22. Mound No. 7, Kachlak on Chaman Road, Quetta.
	23. Mound NO. 8, Village Samali (Dosak-i-Khasyan), Quetta
	24. Mound No. 9, Village Metar Zai, Quetta
	25. Mound No. 10, Shaikh Manda on Chaman Road, Quetta
	26. Mound No. 11, Village Vauhisar, Quetta
Sibi	27. Quaid-i-Azam Residency Building, Ziarat, Sibi.(National Monument)

Annex B Ecologically Protected Areas in Balochistan

Description	District	Location	Area (ha)
National Parks			
Hazargangi – Chiltan	Quetta- Mastung	29°59'N, 66°24' E	27,421
Hingol	Lasbela-Gwadar,	25°30'N, 65°30' E	619,043
Wildlife Sanctuaries			
Khurkhera	Lasbela	26°03'N, 66°44' E	18,345
Buzi Makola	Gwadar	25°53'N, 64°12' E	145,101
Chorani	Khuzdar	27°42'N, 66°45' E	19,433
Kachau	Khuzdar		21,660
Shaahan	Khuzdar	27°50'N, 66°35' E	29,555
Raghai Rakshan	Kharan	27°20'N, 65°20' E	125,425
Kolwah Kap	Kech	26°02'N, 64°39' E	33,198
Maslakh	Pishin	29°55'N, 66°30' E	46,559
Ziarat	Ziarat	30°24'N, 67°44' E	37,247
Sasnamana	Ziarat		6,607
Gut	Chagai		165,992
Koh-e- Gishk	Kalat		24,356
Ras Koh	Kharan	28°50'N, 65°06' E	99,498
Chhapar Kohan	Khuzdar		194,616
Game Reserves			
Dureji	Lasbela		178,259
Band Khushdil Khan	Pishin	30°36'N, 66°45' E	1,296
Zabgi Nawar	Chagai	29°27'N, 65°47' E	1,069
Gogi	Ziarat		10,364
Wam	Ziarat	30°27'N, 67°43' E	3,887
Zawakhan	Chagai		1,060
Kambran	Chagai		211,433
Duzdara - Koh-e- Surko	Quetta		2,351
Private Game Reserve			

Hapursi	Kalat	NA	Area Un-known
Dher	Kachhi	NA	Area Un-known
Gaj Kolachi	Khuzdar	NA	Area Un-known
Lohindo	Khuzdar	NA	Area Un-known
Torghar	Kila Saifullah	NA	Area Un-known

FIRST DRAFT

IFC Workers Occupational health and community health and safety guidelines

Workers health and safety guidelines

Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers. This section provides guidance and examples of reasonable precautions to implement in managing principal risks to occupational health and safety. Although the focus is placed on the operational phase of projects, much of the guidance also applies to construction and decommissioning activities.

Companies should hire contractors that have the technical capability to manage the occupational health and safety issues of their employees, extending the application of the hazard management activities through formal procurement agreements.

Preventive and protective measures should be introduced according to the following order of priority:

- *Providing appropriate personal protective equipment (PPE)* in conjunction with training, use, and maintenance of the PPE.
- The application of prevention and control measures to occupational hazards should be based on comprehensive job safety or job hazard analyses.

General Facility Design and Operation

Integrity of Workplace Structures

Permanent and recurrent places of work should be designed and equipped to protect OHS:

- Surfaces, structures and installations should be easy to clean and maintain, and not allow for accumulation of hazardous compounds.
- Buildings should be structurally safe, provide appropriate protection against the climate, and have acceptable light and noise conditions.
- Fire resistant, noise-absorbing materials should, to the extent feasible, be used for cladding on ceilings and walls.
- Floors should be level, even, and non-skid.
- Heavy oscillating, rotating or alternating equipment should be located in dedicated buildings or structurally isolated sections.

Severe Weather and Facility Shutdown

- Work place structures should be designed and constructed to withstand the expected elements for the region and have an area designated for safe refuge, if appropriate.

Workspace and Exit

- The space provided for each worker, and in total, should be adequate for safe execution of all activities, including transport and interim storage of materials and products.
- Passages to emergency exits should be unobstructed at all times.

- Exits should be clearly marked to be visible in total darkness. The number and capacity of emergency exits should be sufficient for safe and orderly evacuation of the greatest number of people present at any time, and there should be a minimum two exits from any work area.
- Facilities also should be designed and built taking into account the needs of disabled persons.

Fire Precautions

The workplace should be designed to prevent the start of fires through the implementation of fire codes applicable to industrial settings. Other essential measures include:

- Equipping facilities with fire detectors, alarm systems, and fire-fighting equipment. The equipment should be maintained in good working order and be readily accessible. It should be adequate for the dimensions and use of the premises, equipment installed, physical and chemical properties of substances present, and the maximum number of people present.
- Provision of manual firefighting equipment that is easily accessible and simple to use
- Fire and emergency alarm systems that are both audible and visible

The IFC Life and Fire Safety Guideline should apply to buildings accessible to the public.

Lavatories and Showers and laundry

- Adequate lavatory facilities (toilets and washing areas) should be provided for the number of people expected to work in the facility and allowances made for segregated facilities, or for indicating whether the toilet facility is “In Use” or “Vacant”. Toilet facilities should also be provided with adequate supplies of hot and cold running water, soap, and hand drying devices.
- Where workers may be exposed to substances poisonous by ingestion and skin contamination may occur, facilities for showering and changing into and out of street and work clothes should be provided.
- Adequate laundry facilities should be provided.

Potable Water Supply

- Adequate supplies of potable drinking water should be provided from a fountain with an upward jet or with a sanitary means of collecting the water for the purposes of drinking.
- Water supplied to areas of food preparation or for the purpose of personal hygiene (washing or bathing) should meet drinking water quality standards

Clean Eating Area

- Where there is potential for exposure to substances poisonous by ingestion, suitable arrangements are to be made for provision of clean eating areas where workers are not exposed to the hazardous or noxious substances

Lighting

- Workplaces should, to the degree feasible, receive natural light and be supplemented with sufficient artificial illumination to promote workers’ safety and health, and enable safe

equipment operation. Supplemental 'task lighting' may be required where specific visual acuity requirements should be met.

- Emergency lighting of adequate intensity should be installed and automatically activated upon failure of the principal artificial light source to ensure safe shut-down, evacuation, etc.

Safe Access

- Passageways for pedestrians and vehicles within and outside buildings should be segregated and provide for easy, safe, and appropriate access
- Equipment and installations requiring servicing, inspection, and/or cleaning should have unobstructed, unrestricted, and ready access
- Openings should be sealed by gates or removable chains
- Covers should, if feasible, be installed to protect against falling items
- Measures to prevent unauthorized access to dangerous areas should be in place

First Aid

- The employer should ensure that qualified first-aid can be provided at all times. Appropriately equipped first-aid stations should be easily accessible throughout the place of work.
- Eye-wash stations and/or emergency showers should be provided close to all workstations where immediate flushing with water is the recommended first-aid response.
- Where the scale of work or the type of activity being carried out so requires, dedicated and appropriately equipped first-aid room(s) should be provided. First aid stations and rooms should be equipped with gloves, gowns, and masks for protection against direct contact with blood and other body fluids
- Remote sites should have written emergency procedures in place for dealing with cases of trauma or serious illness up to the point at which patient care can be transferred to an appropriate medical facility.

Air Supply

- Sufficient fresh air should be supplied for indoor and confined work spaces. Air distribution systems should be designed so as not to expose workers to draughts
- Mechanical ventilation systems should be maintained in good working order. Point-source exhaust systems required for maintaining a safe ambient environment should have local indicators of correct functioning.
- Re-circulation of contaminated air is not acceptable. Air inlet filters should be kept clean and free of dust.

Work Environment Temperature

- The temperature in work, rest room and other welfare facilities should, during service hours, be maintained at a level appropriate for the purpose of the facility.

Communication and Training

Occupational Health and Safety (OHS) Training

- Provisions should be made to provide OHS orientation training to all new employees to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow employees.
- Training should consist of basic hazard awareness, site-specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. Any site-specific hazard or color coding in use should be thoroughly reviewed as part of orientation training.

New Task Employee and Contractor Training

The employer should ensure that workers and contractors, prior to commencement of new assignments, have received adequate training and information enabling them to understand work hazards and to protect their health from hazardous ambient factors that may be present. The training should adequately cover:

- Knowledge of materials, equipment, and tools
- Known hazards in the operations and how they are controlled
- Potential risks to health
- Precautions to prevent exposure
- Hygiene requirements
- Wearing and use of protective equipment and clothing
- Appropriate response to operation extremes, incidents and accidents

Prevention and Protection Measure

Prevention and protection measures should be implemented whenever a worker is exposed to the hazard of falling more than two meters; into operating machinery; into water or other liquid; into hazardous substances; or through an opening in a work surface. Fall prevention / protection measures may also be warranted on a case-specific basis when there are risks of falling from lesser heights. Fall prevention may include:

- Proper use of ladders and scaffolds by trained employees.
- Use of fall prevention devices, including safety belt and lanyard travel limiting devices to prevent access to fall hazard area, or fall protection devices such as full body harnesses used in conjunction with shock absorbing lanyards.
- Appropriate training in use, serviceability, and integrity of the necessary PPE
- Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall.

Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) provides additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems. PPE is considered to be a last resort that is above and beyond the other facility controls and provides the worker with an extra level of personal protection. Table 2.7.1 presents general examples of

occupational hazards and types of PPE available for different purposes. Recommended measures for use of PPE in the workplace include:

- Active use of PPE if alternative technologies, work plans or procedures cannot eliminate, or sufficiently reduce, a hazard or exposure.
- Identification and provision of appropriate PPE that offers adequate protection to the worker, co-workers, and occasional visitors, without incurring unnecessary inconvenience to the individual.
- Proper maintenance of PPE, including cleaning when dirty and replacement when damaged or worn out. Proper use of PPE should be part of the recurrent training programs for employees. Selection of PPE should be based on the hazard and risk ranking.

Accidents and Diseases monitoring

The employer should establish procedures and systems for reporting and recording:

- Occupational accidents and diseases
- Dangerous occurrences and incidents

These systems should enable workers to report immediately to their immediate supervisor any situation they believe presents a serious danger to life or health. The systems and the employer should further enable and encourage workers to report to management all:

- Occupational injuries and near misses
- Suspected cases of occupational disease
- Dangerous occurrences and incidents

All reported occupational accidents, occupational diseases, dangerous occurrences, and incidents together with near misses should be investigated with the assistance of a person knowledgeable/competent in occupational safety.

The investigation should:

- Establish what happened
- Determine the cause of what happened
- Identify measures necessary to prevent a recurrence

Community Health and Safety

This section complements the guidance provided in the preceding environmental and occupational health and safety sections, specifically addressing some aspects of project activities taking place outside of the traditional project boundaries, but nonetheless related to the project operations, as may be applicable on a project basis. These issues may arise at any stage of a project life cycle and can have an impact beyond the life of the project.

Water Quality and Availability

Project activities involving wastewater discharges, water extraction, diversion or impoundment should prevent adverse impacts to the quality and availability of groundwater and surface water resources.

Water Quality

Drinking water sources, whether public or private, should at all times be protected so that they meet or exceed applicable national acceptability standards or in their absence the current edition of WHO

Guidelines for Drinking-Water Quality. Air emissions, wastewater effluents, oil and hazardous materials must not degrade soil and water resources.

Where the project includes the delivery of water to the community or to users of facility infrastructure (such as hotel hosts and hospital patients), where water may be used for drinking, cooking, washing, and bathing, water quality should comply with national acceptability standards or in their absence the current edition of with WHO Drinking Water Guidelines.

Any dependency factors associated with the delivery of water to the local community should be planned for and managed to ensure the sustainability of the water supply by involving the community in its management to minimize the dependency in the long-term.

Structural Safety of Project Infrastructure

Reduction of potential hazards is best accomplished during the design phase when the structural design, layout and site modifications can be adapted more easily. The following issues should be considered and incorporated as appropriate into the planning, siting, and design phases of a project:

- Incorporation of siting and safety engineering criteria to prevent failures due to natural risks posed by earthquakes, tsunamis, wind, flooding, landslides and fire.
- All project structures should be designed in accordance with engineering and design criteria mandated by site-specific risks, including but not limited to seismic activity, slope stability, wind loading, and other dynamic loads
- Application of locally regulated building codes to ensure structures are designed and constructed in accordance with sound architectural and engineering practice, including aspects of fire prevention and response
- Engineers and architects responsible for designing and constructing facilities, building, plants and other structures should certify the applicability and appropriateness of the structural criteria employed.

Although major design changes may not be feasible during the operation phase of a project, hazard analysis can be undertaken to identify opportunities to reduce the consequences of a failure or accident.

Emergency Response Plan

An Emergency Response Plan is a set of scenario-based procedures to assist staff and emergency response teams during real life emergency and training exercises. This chapter of the Fire and Life Safety Master Plan should include an assessment of local fire prevention and suppression capabilities.

Specific Requirements for Existing Buildings

All life and fire safety guideline requirements for new buildings apply to existing buildings programmed for renovation.

- A suitably qualified professional conducts a complete life and fire safety review of existing buildings slated for renovation.
- The findings and recommendations of the review are used as the basis to establish the scope of work of a Corrective Action Plan and a time frame for implementing the changes.
- If it becomes apparent that life and fire safety conditions are deficient in an existing building that is not part of the project or that has not been programmed for renovation, a life and fire safety review of the building may be conducted by a suitably qualified professional. The findings and

recommendations of the review are used as the basis to establish the scope of work of a Corrective Action Plan and a time frame for implementing the changes.

- All such structures should be designed in accordance with the criteria mandated by situation-, climatic-, and geology-specific location risks (e.g. seismic activity, wind loading, and other dynamic loads).
- Structural engineers and architects responsible for facilities, buildings, plants and structures should certify the applicability and appropriateness of the design criteria employed.

Traffic Safety:

Traffic accidents have become one of the most significant causes of injuries and fatalities among members of the public worldwide. Traffic safety should be promoted by all project personnel during displacement to and from the workplace, and during operation of project equipment on private or public roads. Prevention and control of traffic related injuries and fatalities should include the adoption of safety measures that are protective of project workers and of road users, including those who are most vulnerable to road traffic accidents.

Road safety initiatives proportional to the scope and nature of project activities should include:

- Adoption of best transport safety practices across all aspects of project operations with the goal of preventing traffic accidents and minimizing injuries suffered by project personnel and the public.
- Emphasizing safety aspects among drivers
- Improving driving skills and requiring licensing of drivers
- Adopting limits for trip duration and arranging driver rosters to avoid overtiredness
- Avoiding dangerous routes and times of day to reduce the risk of accidents
- Use of speed control devices (governors) on trucks, and remote monitoring of driver actions
- Regular maintenance of vehicles and use of manufacturer approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.

Where the project may contribute to a significant increase in traffic along existing roads, or where road transport is a significant component of a project, recommended measures include:

- Minimizing pedestrian interaction with construction vehicles
- Collaboration with local communities and responsible authorities to improve signage, visibility and overall safety of roads, particularly along stretches located near schools or other locations where children may be present.
- Collaborating with local communities on education about traffic and pedestrian safety (e.g. school education campaigns)
- Coordination with emergency responders to ensure that appropriate first aid is provided in the event of accidents
- Using locally sourced materials, whenever possible, to minimize transport distances. Locating associated facilities such as worker camps close to project sites and arranging worker bus transport to minimizing external traffic.

Incident Investigation:

Incidents can provide valuable information about transportation hazards and the steps needed to prevent accidental releases. The implementation of incident investigation procedures should ensure that:

- Investigations are initiated promptly
- Summaries of investigations are included in a report
- Report findings and recommendations are addressed

Employee Participation:

There should be a written plan of action regarding the implementation of active employee participation in the prevention of accidents.

Contractors: The plan should include procedures to ensure that:

- The contractor is provided with safety performance
- procedures and safety and hazard information
- Contractors observe safety practices
- Verify that the contractor acts responsibly

The plan should also include additional procedures to ensure the contractors will:

- Ensure appropriate training for their employees
- Ensure their employees know process hazards and applicable emergency actions
- Prepare and submit training records
- Inform employees about the hazards presented by their work

Training:

• Good training programs on operating procedures will provide the employees with the necessary information to understand how to operate safely and why safe operations are needed. The training program should include:

- The list of employees to be trained
- Specific training objectives
- Mechanisms to achieve objectives (i.e. hands-on workshops, videos, etc.)
- Means to determine the effectiveness of the training program
- Training procedures for new hires and refresher programs

Disease Prevention

Communicable Diseases

Communicable diseases pose a significant public health threat worldwide. Health hazards typically associated with large development projects are those relating to poor sanitation and living conditions, sexual transmission and vector-borne infections. Communicable diseases of most concern during the construction phase due to labor mobility are sexually-transmitted diseases (STDs), such as HIV/AIDS. Recognizing that no single measure is likely to be effective in the long term, successful initiatives typically involve a combination of behavioral and environmental modifications.

Recommended interventions at the project level include providing surveillance and active screening and treatment of workers

Preventing illness among workers in local communities by:

- Undertaking health awareness and education initiatives.
- Training health workers in disease treatment
- Conducting immunization programs for workers in local communities to improve health and guard against infection
- Providing health services
- Providing treatment through standard case management in on-site or community health care facilities.
- Ensuring ready access to medical treatment, confidentiality and appropriate care, particularly with respect to migrant workers
- Promoting collaboration with local authorities to enhance access of worker's families and the community to public health services and promote immunization

Vector-Borne Diseases

Reducing the impact of vector-borne disease on the long-term health of workers is best accomplished through implementation of diverse interventions aimed at eliminating the factors that lead to disease. Project sponsors, in close collaboration with community health authorities, can implement an integrated control strategy for mosquito and other arthropod-borne diseases that might involve:

- Prevention of larval and adult propagation through sanitary improvements and elimination of breeding habitats close to human settlements
- Elimination of unusable impounded water
- Considering the application of residual insecticide to dormitory walls
- Implementation of integrated vector control programs
- Promoting use of repellents, clothing, netting, and other barriers to prevent insect bites
- Monitoring and treatment of circulating and migrating populations to prevent disease reservoir spread
- Collaboration and exchange of in-kind services with other control programs in the project area to maximize beneficial effects
- Educating project personnel and area residents on risks, prevention, and available treatment
- Monitoring communities during high-risk seasons to detect and treat cases
- Following safety guidelines for the storage, transport, and distribution of pesticides to minimize the potential for misuse, spills, and accidental human exposure

Annex D Terms of Reference for Third Party Validation

1. Introduction

The Education Department, Government of Baluchistan has received funds from the World Bank under a project titled “Balochistan Education Support Project”. Under this project 100 new Class rooms shall be construct whereby 900 class rooms shall be functionalized in 300 schools in 33 districts of Balochistan.

An environmental and social impact framework (ESMF) has been prepared to evaluate the potentially adverse environmental and social impacts of the project activities specifically the constructed related activities and operation of schools. The report outlines a detailed environmental and social management plan (ESMP) including monitoring plan for reducing or mitigating the significant adverse impacts. The Environmental Mitigation and Monitoring Plan describes the environmental and social impacts, proposed mitigations measures to be implemented, monitoring parameters and role & responsibilities for implementation of the mitigation measures, monitoring during design, construction and operation stage of the project.

In view of the need to assess the adequacy and effectiveness of the ESMP third party validation by a suitably qualified firms or individual consultant having desired qualification and experience of monitoring is proposed. The TPV for monitoring the ESMP implementation will also ensure that an in-depth and objective assessment would be done based on sound monitoring parameters and using standard tools. The findings of TPV shall be used to improve and modify the implementation of environmental and social safeguard policies in the future.

2. Objectives

The overall objective of third party validation is to facilitate the project management in the objective analysis of environmental and social safeguards policies implementation, its effectiveness, gaps in implementation and monitoring and to validate the reported data regarding status of implementation of proposed mitigation plan outlined in the ESMP documents. The TPV will also provide inputs for future ESMP formulation and implementation for similar projects.

3. Scope of work

The scope and extent of the Third Party Validation (TPV) is limited to monitor & validate the Environmental and Social Mitigation Plan (ESMP) implementation of on-going project activities up to period

The selected firm/consultant shall carry out random sampling of appropriate sites of schools constructed under the GPE-BEP.

4. Specific tasks and Deliverables

The selected consultant/firm shall carry out the following tasks:

- i. The assignment requires proper planning of the activities against a predetermined timeframe involving a detailed desk review of the ESMP documents, all monitoring reports followed by field verification, thorough objective analysis of the data gathered from field pertaining to implementation of environmental and social mitigation measures.
- ii. Validation of data through visual inspection of mitigation measures already implemented and quantitative sampling and analysis of air, water and noise if required to validate the effectiveness of mitigation actions adopted during construction and operational phases of project execution.
- iii. Validation of adopted procedures/SOPs for implementation of mitigation measures and monitoring methods adopted for addressing different environmental and social issues during project execution.
- iv. Identify gaps and weaknesses in the implementation and monitoring mechanism with plausible reasons mentioned thereof for non-compliance and recommend immediate and long terms actions to overcome these gaps to achieve the objectives of ESMP.
- v. The consultant shall thoroughly assess/analyze & report specific environmental and social issues that were not address as per ESMP document, identify defects, delays, management issues and recommend rectification/remedial measures along with time frame for achievement of requisite standards for the executing agency compliance
- vi. The consultant team shall pay a detailed visit of schools already constructed and on-going schemes for physical verification and visual inspection to assess the impact of implementation of mitigation actions for addressing environmental and social issues, highlighting key achievements viz-a-viz physical status of executed work done up to (date to be mentioned) and submit final report about the findings.

Qualification and experience:

- i. The firm/consultant shall deploy suitable professionals having qualification and experience in (i) environmental and social safeguard management; (ii) sound knowledge and experience in monitoring of environmental and social impacts assessment & ESMP (iii) understanding of overall design of the project (iv) familiar with use of relevant monitoring tools and data analysis software's (v) having more than 7 years of work experience in monitoring environmental and social impact parameters as envisaged in the ESMP and Contract Documents (vi) having good presentation and report writing skills.