E4605

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

Promoting Girls Education in Balochistan (PGEB) Project

(AUGUST 2012)

Project Director

PROMOTING GIRLS EDUCATION IN BALOCHISTAN PROJECT

SECONDARY EDUCATION DEPARTMENT

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EXECUTIVE SUMMARY

1. The present environmental and social impact assessment (ESIA) study of the Promoting Girls Education in Balochistan (PGEB) project has been carried out in compliance with the national environmental laws of Pakistan and the World Bank Operational Policies (OPs). The ESIA delineates the environmental and social issues emerging from the PGEB project, identifies the potentially adverse environmental and social impacts of the project activities, and suggests appropriate mitigation measures to offset or reduce these impacts. The report also suggests guidelines for environmental enhancement opportunities available during various phases of project implementation to maximize the benefit to environment. The mitigation measures and 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 the PGEB project for avoiding or mitigating the significant environment and social impacts.

2. The scope of the study entails assessment of the environmental and social impacts of PGEB project activities in the selected 12 districts of the province including Kachhi, Loralai, Jhal Magsi, Khuzdar, Kalat, Lasbela, Jaferabad, Kech, Panjgur, Kila Saifullah, Pishin and Naseerabad districts. The project area spreads over from north to south of the province covering almost 138,011 square kilometers (40%) area of the province. The environmental and social assessment covers physical, biological and social impacts of project activities during various implementation stages from site selection and designing to construction and operational phase of the school buildings.

3. The study is based on primary and secondary data sources. Primary sources of information include site visits, soliciting information from key persons like Government functionaries, line department's briefs, focused group discussions with communities and visual photographs taken from the field. Scoping sessions were held with relevant ministries, departments and agencies to understand their perspectives of the project respectively and improvise the terms of reference of the study accordingly. 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 PGEB project, websites of the Government and World Bank and other indirect sources of information collected from literature review and desk analysis.

4. Most of the environmental impacts of project activities are isolated small-scale and site specific in nature and are of low to moderate in significance. Majority of the impacts pertaining to construction and operation are on surface water quality, air quality, noise and vibrations, soil erosion and land contamination, health and hygiene issues and inconvenience to public from improper stockpiling of the materials at the schools. Most of these impacts are of low to medium level and manageable by adopting appropriate mitigation measures during project implementation.

5. The ESIA proposes mitigation measures for each stage of project activity. The siting and design stage measures include implementation of site selection guidelines, adopting eco-friendly designing and applying appropriate building codes in the designing of school buildings located in the earthquake prone areas and flood plains. Appropriate water efficient design of toilets with septic tank and soaking pit, sewerage connection and provision of proper ventilation for lighting in classrooms are some of the cardinal mitigation measures. The construction stage measures include preemptive actions by the construction contractor to avoid the adverse impacts, for example, covering the stockpiled materials, limiting excavation activities after schooling hours, and ensuring worksite safety. The mitigation measures relating to school operation include proper disposal of the solid waste, proper maintenance of water supply and sanitation system and ensuring the supply of safe drinking water. The application of rainwater harvesting techniques and installation of solar powered appliances are some of the environmental enhancement opportunities available in the area for which guidelines has been incorporated in the report.

6**.** The Environmental and Social Management Plan (ESMP) 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, supervision firm 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.

7. 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 focal persons will ensure upward and downward coordination, removal of bottlenecks, and maintaining a consolidated database. The District Environmental Focal Persons will ensure compliance of the ESMP mitigation measures and guidelines and carry out internal monitoring through his team with community participation in the form of Parent Teacher School Management Committee (PTSMCs) at each school site.

8. The ESMP also provides internal and external monitoring mechanism to ensure observance 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 offer recommendations for keeping the project compatible with local context and changing conditions.

9. 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. One- to two-days training workshops will be held at PMU Quetta and 12 one-day workshops (one in each district) during the project implementation phase. These workshops will be geared towards enhancing understanding of the environmental and social issues and apprising and

sensitizing the participants about environmental and social importance of managing the on-ground problems associated with project activities. Total 18 trainings will be held in the first year to train the project directors, managers, engineering team, M&E Officer and Environmental Focal Persons at provincial and district level. Refresher trainings will be arranged during subsequent years of project duration.

10. The estimated cost of ESMP implementation is Rs. 7.02 million for three years project duration which includes the costs of capacity building trainings and external monitoring or third party validation. The cost to be incurred on implementation of proposed mitigation measures and guidelines will be included in the bidding documents for individual school during tendering and selection/award of contract to suitable construction firm.

List of Acronyms

ADB	Asian Development Bank
AZRI	Arid Zone Research Institute
BHU	Basic Health Unit
BOQ	Bill of Quantity
C&W	Communication and Works
CSFP	Construction, Supervision and Facilitation Partner
CMR	Central Mountains Range
CO	Carbon Monoxide
DEFP	District Environmental Focal Person
DPD	Deputy Project Director
EA	Environmental Assessment
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impacts Assessment
EPA	Environmental Protection Agency
EFA	Education For All
EDO	Executive District Officer
EFP	Environmental Focal Person
ESMP	Environmental and Social Management Plan
FGD	Focussed Group Discussion
FATA	Federally Administered Tribal Areas
GDP	Gross Domestic Product
GER	Gross Enrolment Rate
GoB	Government of Balochistan
GGPS	Government Girls Primary School
GBPS	Government Boys Middle School
GMS	Government Middle School
GBHS	Government Boys High School
GPS	Government Primary School
HDI	Human Development Index
IEE	Initial Environmental Examination
IUCN	Internal Union for Conservation of Nature
IPs	Implementing Partners
IWMI	International Water Management Institute
ILO	International Labour Organisation
Km	Kilometer
KP	Khyber Pakhtunkhwa
MAF	Million Acre Feet
MCH	Maternal Care Health
MICS	Multiple Indicator Cluster Survey
NEQS	National Environmental Quality Standards
NOC	No Objection Certificate
NWQMP	National Water Quality Monitoring Program
NRB	Nari River Basin
NGO	Non Governmental Organisation
OP	Operational Policy
O&M	Operation and Maintenance
PD	Project Director
PEPA	Pakistan Environmental Protection Act
PGEB	Promoting Girls Education in Balochistan

PMU	Project Management Unit
PCRWR	Pakistan Council of Research in Water Resources
PM	Particulate Matter
PPE	Personal protective equipment
PTSMC	Parent Teacher School Management Committee
PCC	Project Coordination Committee
PLB	Pishin Lora Basin
SED	Secondary Education Department
Sq- km	Square Kilometer
SMC	Site Monitoring Committee
SDO	Sub-Divisional Officer
TSP	Total Suspended Particulate
TDS	Total Dissolved Solids
TPV	Third Party Validation
TA	Technical Assistance
UBC	Uniform Building Code
UNESCO	United Nation Educational, Scientific and Cultural Organisation
USAID	United States Agency for International Development
WB	World Bank
WHO	World Health Organization
ZRB	Zhob River Basin

C O N T E N T S

1. INTRODUCTION

This environmental and social impact assessment (ESIA) report evaluates the potentially adverse environmental and social impacts of the Promoting Girls Education in Balochistan (PGEB) project and provides an environmental and social management plan (ESMP) for reducing or mitigating the significant adverse impacts.

1.1 Objectives of study

The primary objective of this study is to address the significantly adverse environmental and social impacts of the project interventions, and propose mitigation measures in order to ensure compliance with the World Bank's Operational Policy (OP 4.01) and the national and provincial legislation/regulations on environment.

The study also identifies and proposes environmental enhancement opportunities at the educational facilities supported by the project, recommends institutional arrangements to manage the environmental and social aspects of the project, identifies environmental and social monitoring requirements for effective implementation of the mitigation measures and describes the environmental and social training and reporting requirements during project execution.

1.2 Scope of study

The project area spreads over twelve (12) districts of Balochistan covering almost 138, 011 square kilometres (40%) area of the province in terms of geographical coverage. **Exibit-1** shows the geographical locations of 12 districts included in the project. The districts included in the project are:

1)	Kachhi	2)	Loralai
3)	Jhal Magsi	4)	Khuzdar
5)	Kalat	6)	Lasbela
7)	Jaferabad	8)	Kech
9)	Panjgur	10)	Kila Saifullah
11)	Pishin	12)	Naseerabad

This study has evaluated the environmental and social impacts of the proposed project activities during site selection and designing, construction and operational stage of the proposed schools and mitigation measures proposed to reduce or minimize the adverse impacts related to the project activities.

1.3 Methodology

This study was conducted according to the Environmental Impact Assessment (EIA) Guidelines and rules/regulations of the Government of Pakistan and World Bank Safeguard Policy. The following methodology was adopted:

1.3.1 Preliminary Screening

A preliminary screening of the project activities was carried out and potential environmental issues associated with proposed project identified; and important environmental issues were that merit were further assessed in detail in the subsequent phases; issues that were not relevant were screened out. The key activities undertaken during this stage included:

1.3.1.1 Understanding Project Activities

A generic description of the proposed activities such as construction of shelter less schools, establishment of new schools with community participation and provision of missing facilities in existing schools within the project area relevant to the environmental assessment was obtained from the Education Department, Government of Balochistan. Meetings were also held with Environment Specialists and Team Leader of PGEB project in the World Bank, Education Department Officials and in depth discussions were held about the proposed project area, activities, and associated environmental and social issues.

1.3.1.2 Literature Review

Secondary data on weather, soil, water resources, wildlife, and vegetation was collected, reviewed and compiled from similar studies conducted in the past and published reports of the Government of Balochistan.

1.3.1.3 Legislative Review

Information on relevant legislation, regulations, guidelines, and standards relevant to the project was reviewed and compiled.

1.3.1.4 Identification of Potential Impacts

The information collected in the previous steps was reviewed, and potential environmental issues identified.

1.3.2 Baseline Study

1.3.2.1 Primary Data Collection

Primary data was gathered from sample survey of schools in the project area, site observation, visual photographs and meetings with communities. An impacts assessment matrix was filled to identify the potential environmental and social issues relating to site selection, construction and operation. Photographs **(Fig. 1 to 36)** taken during field survey also provided qualitative information about the physical and biological conditions in the area and associated environmental issues. About 32 schools were surveyed and data pertaining to environmental and social issues was collected. List of the school surveyed is given at **Annex-A**. Meetings and focussed group discussions held with community in the surrounding areas also provided useful qualitative information on solid waste, water quality; health hygiene issues. Quantitative and analytical data on air, water and land was collected from the relevant departments and recent studies conducted by various organisation.

1.3.2.2 Secondary Data Collection

Secondary data collected from similar studies conducted in the past and published documents, reports of the Government of Baluchistan. The following documents have been reviewed for secondary data collection:

i. Development Statistics Balochistan, 2010
ii. Balochistan Conservation Strategy
iii. ESMF of Balochistan Education Support Program
iv. ESMF of Sindh Education Reform Program (2009)
v. Environmental Profile of Baluchistan
vi. Balochistan Education Support Project, World Bank Appraisal Report (2006)
vii. Multiple Indicator Cluster Survey, Balochistan (2010)

viii. Institutional Analysis of Air Quality Management in urban Pakistan Draft Report (2009)
ix. Balochistan Investment Guide (2009)
x. Comparative Statistics, By Province, Bureau of Statistics (2009)
xi. Introduction to Special and Local Laws in Balochistan, by Mazhar Ilyas Nagi, University Law College, Quetta.
xii. Official Website of Balochistan Government
xiii. PC-I of PGEB Project, Education Department, Balochistan

1.3.3 Impact Assessment

Impacts assessment of the environmental and social issues likely to arise from the Promoting Girls Education in Balochistan (PGEB) project was carried out through impacts assessment matrix method. The impact assessment examined the interaction of project activities with various components of environment and its adverse impact on physical, biological and socioeconomic conditions and suggested appropriate mitigation measures.

1.3.4 Documentation

This report was prepared according to the EIA guidelines of the Pakistan Environmental Protection Agency and the World Bank Operational Policies for Environment and Social Safeguards. The report includes the findings of the assessment, project impact, and mitigation measures to be implemented during the execution of the proposed activities.

1.4 Limitation of the study

Owing to security situation in Balochistan, field visit/access to the whole project area was not possible and, therefore, greater reliance was made on local informant and secondary sources of information gathered from consultations with functionaries involved in the program implementation and focus group discussions with communities in selected districts.

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 proposed schools.

1.5 Overview of the project activities

PGEB project aims to improve availability and accessibility of education facilities for all children, with a special emphasis on girls, in the province of Balochistan. The project has the following four major components:

- Component- A: Construction of shelter less girls' schools
- Component- B: Provision of missing facilities for girl's schools
- Component-C: Establishment of new primary schools with community participation
- Component-D: Technical Assistance to Education Department for implementation and monitoring of PGEB

The developmental activities under the project include site selection and designing for proposed schools, construction of shelter less schools, running and operation of schools on sustainable basis to improve enrolments and girl's education in the province. In order to implement these project activities, capacity of the education department will be enhanced through training and human resource development interventions.

1.6 Document Structure

The first chapter describes the objectives; scope and methodology of the ESIA study, and briefly outlines the project activities.

Chapter 2 reviews the legislative and regulatory and policy frameworks of government of Pakistan as well as WB pertaining to environment and social aspects of the project and their applicability to the PGEB project activities.

Chapter 3 gives a detail account of the physical activities and project management organization of the PGEB project

Chapter 4 presents the baseline environmental conditions covering the physical-chemical, biological and socio-economic conditions prevailing in the project area.

Chapter 5 present a summary of the stakeholder consultations carried out during this study, issues discussed and concerns raised by stakeholders in the implementation of PGEB project activities. While chapter 6 present various project alternatives such as site alternative, design alternatives and technological alternatives for implementation of PGEB project activities and recommends options that are economically viable, environmental sound and socially acceptable to the project beneficiaries.

Chapter 7 describes the environmental and social impacts of the PGEB project during the site selection, construction and operational stage of schools and proposed mitigation measures to reduce and minimize the impacts on environment.

An environmental and social management plan has been described and presented in **Chapter 8** to address the environmental and social issues of the project

Exhibit-1: **District Map of Baluchistan Province** (source: www.balochistan.gov.pk)

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 PGEB project. These legislations and policies, and their relevance to the proposed project are briefly described in this chapter.

2.1 The Pakistan Environmental Protection Act, 1997

The Pakistan Environmental Protection Act (PEPA), 1997 is the main environmental law providing a legal framework for the management of environmental issues in the Country. The main objective of PEPA, 1997 is protection, conservation and improvement of the environment, prevention and control of pollution, and promotion of sustainable development. The Act empowers the Pakistan Environmental Protection Agency (Pak-EPA) and provincial EPAs for implementing various provisions of the Act and regulations framed under this Act. Under Section 12 of this Act, no development project can be undertaken unless an initial environmental examination (IEE) or an environmental impact assessment (EIA) has been conducted and environmental approval obtained from the Federal EPA or the respective provincial EPA if the development project area falls in the jurisdiction of the province. Failure to conduct IEE or EIA is an offence punishable with fine, or imprisonment, or both under Section 17 of the Act. The present environmental and social impact assessment has been conducted in consonance with the provisions of section 12 of this Act.

2.2 The IEE/EIA Regulations, 2000

The Pakistan Environmental Protection Agency (Review of IEE/EIA Regulations), 2000 categorises the projects requiring an IEE or an EIA in Schedules I and II, respectively. Those projects enlisted in Schedule-I require an IEE and those in Schedule-II requires a full-scale EIA study. The Regulations-2000 describes the procedures concerning filing and review of IEE and EIA reports, holding of public consultation and issuance of environmental approvals. The Regulations-2000 also prescribe the IEE/EIA review fee to be paid by the proponent upon filing the report with EPA, time limits for completing the review, and conditions of environmental approval. The Regulations authorize 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.

The construction of schools or educational facilities is not listed in either schedule I or II of the IEE/EIA Regulation-2000.

2.3 The Balochistan Wildlife Act, 1974

The Baluchistan Wildlife Act, 1974 caters for protection of wildlife resources in the province. Besides ensuring an environment conducive for their rearing and propagation of wildlife, the Act also regulates hunting, poaching, possession, and trade in birds and animals. The Act also prescribes penalties for its contraventions. Government can notify and amend lists of protected ecosystems, national parks, wildlife sanctuaries, safari parks, and game reserves. The lists of protected area such as National Parks, Wildlife Sanctuaries, Game Reserves and wildlife species, protected under the Balochistan Wildlife Act, 1996 are given at **Annex-B** and **Annex-C.** Any sort of development activities including schools construction and operation under the proposed PGEB project are not allowed in the protected areas. The Education Department Balochistan will ensure that lands donated by community for

establishment of new community schools is not located in any notified game reserve or protected areas regulated under the Balochistan Wildlife Act, 1974.

2.4 The Federal Antiquities Act, 1975

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, 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 applicable to the new construction of school buildings and O&M activities of the proposed project.

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-D**). No activity will be carried out at or in the immediate vicinity of these sites under the proposed PGEB project.

2.5 Pak EPA Environmental Guidelines

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:

- 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)

This ESIA has been prepared in line with the above guidelines

2.6 National Environmental Quality Standards (NEQS) of Pakistan

The Government of Pakistan has notified the National Environmental Quality Standards of Pakistan under Section 11 of PEPA, 1997. According to Section 11 of the Act, all the industrial and municipal effluents discharges and emissions from industrial and vehicular exhausts will comply with the National Environmental Quality Standards (NEQS) of Pakistan. The NEQS **(Annex-E)** include standard for noise, drinking water quality, and vehicular exhaust emissions. The PGEB project activities shall comply with these standards.

2.7 Pakistan Employment of Children's 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 labour 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 labours in the PGEB project **(Section 8.3.8),** which will be implemented during project execution.

2.8 Land Acquisition (Balochistan Amendment) Act, 1985

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 PGEB project operations do not involve any land acquisition under this Act. The community will provide land by mutation in the name of the Government, and the project will construct the shelter less school buildings already in operation. Hence, the Act is not applicable to the PGEB project activities.

2.9 World Bank Operational Policy Framework:

2.9.1 World Bank OP 4.01- Environmental Assessment

This Operational Policy (OP) requires Environmental Assessment to be conducted of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable with an objective to improve decision-making process. The OP 4.01 also categorizes projects in one of the following categories based on type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

The PGEB project activities are likely to have low to medium level of adverse impacts on environment and human population and therefore the project is classified as Category B. This ESIA study has been prepared in response to the Operational Policy 4.01 considering the cumulative potential environmental and social impacts arising from PGEB project operations.

2.9.2 World Bank OP 4.04 – Natural Habitat

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 their functions.

PGEB project activities include limited amount of construction work related to expansion of existing school buildings, provision of missing facilities in the existing schools and construction of buildings for the existing shelter-less schools. None of these activities are likely to affect any of the natural habitats. Moreover, construction or excavation activities will not be carried out in the areas listed in **Annex-B** and **Annex-C**. Hence, this OP does not trigger.

2.9.3 World Bank OP 4.09 – Pest Management

Through this OP, the WB supports a strategy that promotes use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides.

The PGEB project does not involve any activity relating to agriculture production such as use of pesticides, fertilizer or other chemical inputs except painting of doors and windows. Hence, this OP is not applicable to the PGEB project and the OP does not trigger.

2.9.4 World Bank OP 4.10 – Indigenous Peoples

This OP defines the process to follow if the project activities affect the indigenous people. Indigenous people are those having:

- 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
- Speak indigenous language, often different from the rest of the country or region.

This OP is not applicable to the PGEB project since there are no reported indigenous peoples in the project area.

2.9.5 World Bank OP 4.11 – Cultural Property

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 of shelter less schools and provision of missing facilities to the existing schools under the PGEB project 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 laws[1] and guidelines[2]. Detailed procedure for "chance find" management of archaeological site or artefacts is given in Section 2.10.5. Moreover, construction activities under the project will not be carried out in areas listed in **Annex-D**.

2.9.6 World Bank OP 4.12 - Involuntary Resettlement

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. The PGEB project operations such as construction of shelter less schools, provision of missing facilities in existing schools and establishment of new primary schools through community participation does not envisage any land acquisition. Most of the new construction as part of the project will be carried out on existing school premises or the community will voluntarily donate a vacant land; thus, it will not cause any involuntary resettlement. Hence, this OP does not trigger.

2.9.7 World Bank OP 4.36 - Forestry

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.

[1] The Federal Antiquities Act, 1975

[2] Guidelines for Environmentally Sensitive and Critical Area (October, 1997)

The rehabilitation and construction work under PGEB project will be carried out in the existing facilities, 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 schools premises. Hence, this OP does not trigger.

2.9.8 World Bank OP 4.37 – Safety of Dams

This OP is not applicable since the project does not involve any work relating to the dam construction

2.9.9 World Bank OP 4.50 - Projects in International Waters

This OP is not applicable since the project does not involve any works on international waterways.

2.9.10 World Bank OP 4.60 – Projects in Disputed Areas:

The PGEB project interventions and schools are not located in any disputed areas. Hence, this OP does not trigger.

2.9.11 World Bank Policy on Information Disclosure

This policy sets out the Bank's policy for disclosing and sharing information. The policy reaffirms the Bank's commitment to transparency and accountability in its activities for promoting development effectiveness and poverty reduction. This policy is applicable to the PGEP project and the Education Department; Government of Balochistan will provide access of public to the ESIA and other project related documents.

2.9.12 World Bank Guidelines on Environment

The principal World Bank publications that were reviewed in the preparation of this ESIA study contain the following environmental guidelines:

- 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)

2.10 Environmental Institutional Framework in Pakistan

2.10.1 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.

2.10.2 Environmental Protection Agency, Balochistan

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 authorised Agency to monitor and implement the ESIA recommendation and conduct public

hearing on the ESIA report.

2.10.3 Forest and Wildlife Department, Balochistan

Wildlife conservation and forest management is also a provincial subject. In Balochistan, the implementation of the provisions of the Balochistan Wildlife Act, 1996 and formulation of policy decisions are the responsibility of the Balochistan Wildlife Management Board.

2.10.4 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, PGEB project is 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.

2.10.5 Procedure for "Chance Find" Management of Cultural and Archaeological Sites

Where historical remains, antiquity or any other object of cultural or archaeological importance are unexpectedly discovered during excavation and construction at the selected site for school construction under the PGEB 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, PGEB 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, PGEB will decide acquiring alternate location as per site selection guidelines in Section 6.2.1.

3. BRIEF DESCRIPTION OF PROJECT

3.1 Objectives of Project

PGEB project aims to improve availability and accessibility of education facilities for all children, with a special emphasis on promotion of girl's education, in the province of Balochistan.

3.2 Project Components

The PGEB project has the following four major components:

- Construction of shelter less girls' schools
- Provision of missing facilities for girl's schools
- Establishment of new primary schools with community participation
- Technical Assistance to Education Department for PGEB implementation

For construction of shelter less schools and missing facilities, Secondary Education Department (SED) of Balochistan has done an initial short listing of districts. The short listing took into account the districts with highest frequency of shelter less schools and highest average enrolments. The shortlisted districts are:

S.No	District	Number of proposed shelter less schools	Total Enrolment	Average Enrolment Per School
1	Kachhi	15	1,773	118
2	Loralai	42	3,188	76
3	Jhal Magsi	32	1,627	51
4	Khuzdar	39	1,864	48
5	Kalat	58	2,704	47
6	Lasbela	22	904	41
7	Jaffer Abad	116	4,595	40
8	Kech	67	2,590	39
9	Panjgur	30	1,132	38
10	Killa Saifullah	30	1,104	37
11	Pishin	62	1,964	32
12	Naseer Abad	60	1,855	31

3.2.1 Construction of Shelter less Girls schools

Under this component of the project, shelter less schools, currently running in tents, community houses, mosques or wooden and grass made temporary structures, will be constructed with the support from the local community. About 120 primary and 10 middle level shelter less schools will be constructed in selected 12 districts. The list of schools will be finalized after a physical verification of the site and confirmation of availability of teachers and enrollment. The project will focus only on girl's school. For construction work a registered firm/organization will be contracted to carry out the construction activities in coordination with stakeholders instead of C&W department. The communities around the newly constructed schools will be organized by the Education Department as Parent Teachers School Management Committee (PTSMC) to ensure the local support for effective implementation.

No land acquisition is involved in this component, since these are existing schools and the education department has already procured land for the school sites. Prioritization of the schools for construction will rely on the availability of land. The construction firm hired for the project will use the approved design. The design will cater for locally available material and skilled labour to support local economy as a spin-off of the project. An Infrastructure Specialist will be appointed by the project to monitor all the construction activities on the ground. Site location, construction and operational stages of such schools will be the focus for environmental and social impact assessment and mitigation.

3.2.2 Provision of Missing Facilities for Girls Schools

The constructional activities under this component relate to the construction of boundary walls, provision of toilets, provision of drinking water etc. Exact number of schools for provision of missing facilities is not yet available. The education department Baluchistan is conducting an exercise to collect information about such schools and final list of schools shall be determined after the survey is completed. The list of facilities will be finalized after verification and prioritized based needs on established criteria.

Depending on specific needs and other determining factors, the number, size, and extent of facilities to be provided under this component will vary from school to school. Physical activities under this component of project include the following:

- Repair, rehabilitation, and reinforcement of existing structures;
- Construction of boundary walls;
- Construction of additional classrooms;
- Construction of toilets and lavatories;
- Provision of electricity;
- Provision of drinking water etc

The PTSMC establishment and involvement in the rehabilitation work will be an important aspect of the project and will be carried out with coordination of outsourced firm, local communities and stake holders**.** Environmental issues associated with construction and operation of these schools will be the main focus in impact assessment.

3.2.3 Establishment of Mix Gender Primary Schools

Under this component of project new primary schools (mixed gender) will be established with community participation in the rural areas of Balochistan, where community is able to enroll at least 20 students in school, there is no school within a 2-km radius and the community is able to temporarily provide space for the school. No construction is envisioned in the project period as it is important to stabilize the school and ensure its functionality before embarking on construction.

The site selection for establishment of the school with community support will be prioritized based on established criteria ensuring outreach to maximum number of out of school children and confirmed availability of local teachers. The community will actively be involved in the management of schools to ensure local support and protection for the facility, children and teachers. The established demand and support from the community is an essential need in a conflict and insecure environment, where government outreach is limited. About 150 new (mixed gender) community schools will be established in the second year of the project. These will be formal primary schools which will be financed under the project in mostly rural

areas. The project will also monitor performance of the schools and; arrange for capacity building of the community.

The project will invite applications from the communities through advertisements in the news papers and also procure the services of a capacity building firm to work with the communities to support the schools.

The PTSMC would support the education department to supervise the community school. The government schools will be funded by the regular budget of the government, however some support is also expected from the project in the form of teaching material and capacity building. If the school successfully maintains enrolment for two years and community donates land by formally transferring ownership of land by mutation to the Government, the Government will provide adequate funding for a new permanent school building.

3.2.4 Technical Assistance to Education Department

This component will support the establishment of systems and procedures for effective planning and implementation of construction and rehabilitation activities, introduction of new/innovative approaches for community-government partnerships, establishment of robust monitoring systems, third party monitoring, and the development of a communications strategy. A Project Management Unit (PMU) will be establish in the Secondary Education Department (SED), which will be responsible for the day-to-day management and implementation of project activities in close coordination with contracted firms, District officials, PTSMCs and the relevant provincial offices

3.3 Description of Physical Activities

3.3.1 Site Selection and Designing

This stage would include activities relating to the selection of an appropriate site for new schools construction, identification of existing schools to be supported under the project, preparation of project documents, layout plans, and structural drawings for new construction, need assessment for missing facilities, preparation of bidding document, obtaining approvals from relevant agencies and departments, and award of contracts/work orders to the contractor.

3.3.2 School Construction Stage

The activities at this stage would comprise of mobilization of machinery and materials to the sites for new construction and repair works, procurement and onsite stockpiling of construction materials, excavations for foundations, construction of superstructures, removal of unspent materials and debris, and external development comprising of landscaping, beautification and tree plantation.

3.3.3 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, and annual repair and maintenance of the civil structures and equipment.

3.4 Project Implementation Arrangements

The Secondary Education Department, Government of Balochistan will implement the project. A Project Management Unit (PMU) will be establish in the Education Department under the overall supervision of Secretary Education Department, Government of Balochistan

3.4.1 Project Coordination Committee (PCC)

A Project Coordination Committee (PCC) has been constituted under the overall supervision of Secretary Education Department, Government of Balochistan 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 as well as the World Bank and Implementing Partners. The PCC will meet quarterly to review the progress of the project.

3.4.2 Project Management Unit (PMU)

The PMU will execute the project activities through Implementing Partners, Parent Teachers School Management Committees (PTSMCs), Construction Supervision, and Facilitation Partner (CSFP). PMU will be sufficiently staffed with management and sectoral experts such as below:

1. Project Director
2. Deputy Project Director
3. Education Specialist
4. Infrastructure Specialist
5. Safeguard Officer
6. Procurement Manager
7. Finance Manager
8. Two Sub-Division Officer (Engineer)
9. Internal Auditor
10. Two Monitoring Officers

3.4.3 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 of schools, hiring of local teacher, monitoring the affairs of school, and submit reports to Education Department accordingly.

3.4.4 Construction, Supervision and Facilitation Partners (CSFP)

PMU will hire the services of an implementing partner called as Construction, Supervision and Facilitation Partner (CSFP) to implement the following project activities as given below. CSFP will be selected according to transparent eligibility criteria and selection procedures consistent with World Bank guidelines.

i. Construction, supervision and facilitation work of schools in project area.
ii. Social mobilisation, monitoring and support to community schools
iii. Capacity building of PTSMCs

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 PGEB project area spreads over 12 districts including Kachhi, Loralai, Jhal Magsi, Khuzdar, Kalat, Lasbella, Jaffer Abad, Kech, Panjgur, Killa Saifulla, Pishin and Naseer Abad districts, covering almost 40 percent area (138, 011 square kilometer) of Balochistan. The geographical distribution of project area spread over from Kech district in south to Killa Saifullah district in the north of the province. This chapter describes baseline environmental conditions of the province with district variations, where applicable in the project area. Exhibit-2 present a map showing the geophysical features of the province.

4.2 Geography

Balochistan province is the largest in size and the smallest in population with about 8.912 million people[3]. However, according to preliminary censes report 2012, the population of the province has increased to 13.162 million[4] peoples. The province covers 347,200 km^2, almost 44% of the country's land area. 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 selected 12 districts are given in **Table-1.**

4.3 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-Kakarkhurasan Range, Marri-Bugti Hills, Chagai-Hills, Ras Koh Range and Makran Coastal Range. The climate of Balochistan is continental semi-arid 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 impossible[5].

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 N-S 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.

4.4 Geology

[3]Development Statistics of Balochistan (2010) – (projected population in 2010).
[4] Preliminary Censes Report, 2012 (http://en.wikipedia.org/wiki/Balochistan,_Pakistan#Demographics)
[5] Environmental Profile, Balochistan (LARUS-IT, Enschede: Netherland, 1992)

Geologically, the province is divided into four main geological regions. 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 Calc-alkaline and ultramafic intrusions are found together with young quaternary volcanic rocks in the Ras Koh Range. This range is favourable for copper, iron and sulphur deposits (Saindak)[6]. 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.

4.5 **Land Use and Soil Erosion**

In Balochistan, mountains dominate the terrain, and valley floors and piedmont plains make up only 15 percent of the landscape[7]. The relief[8] 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 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 half 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 uses[9] in the province are agriculture which is about 1.5 to 1.6 million hectare (4 percent), forests about 1.1 million hectare (3 percent), rangelands about 21 million hectares (60 percent) and area not available for cultivation is about 11.1 million hectares (32 percent). Out of the total cultivated area, 40 percent is irrigated land while 60 percent is rain-fed area. Land uses in the province have been exhibiting change from agricultural to residential and built-up

[6] Environmental Profile, Balochistan (LARUS-IT, Enschede: Netherland, 1992)
[7] Balochistan Conservation Strategy (May 19, 2000)
[8] Environmental Profile, Balochistan (LARUS-IT, Enschede: Netherland, 1992)
[9] Arid steppes of Balochistan (Pakistan), Scientific article published in Secheresse (2006), 17(1-2)203-9

structures. Whereas, land use in the urban centres 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 farmhouses[10]. **Table-2,** describes district wise land utilisation in the project area.

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 saline[11]. 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 salinisation. However, fortunately both the natural and man-made salinity in Balochistan is self reclaimable but requires some years of ample irrigation to leach the salts[12]. 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 monsoon[13].

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 environment[14].

4.6 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 distributed[15].

Soil of the saline basin (playas) is characterised 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 percent[16].

[10] Arid steppes of Balochistan (Pakistan), Scientific article published in Secheresse (2006), 17(1-2)203-9
[11] Environmental Profile, Balochistan (LARUS-IT, Enschede: Netherland, 1992)
[12] Ibid
[13] Ibid
[14] Land and Range Resource Management Issues and Food Security in Balochistan – AZRI, Quetta, (1994)
[15] Environmental Profile, Balochistan (LARUS-IT, Enschede: Netherland, 1992
[16] Ibid

4.7 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 2[17]. 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.

4.8 Surface and Groundwater Resources

Balochistan is water starved 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 Naseer Abad and Jaffer Abad districts, 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, Kareeze, flows, flood flows, hill torrent and diversions from non-perennials streams, which bring substantial runoff during the rainy seasons[18]. The main non-perennials rivers and streams in the province and project area are given in **Table-3.**

Ground water resources divide into three hydrological regions: the Nari Basin, the Kharan closed Basin and the Makran Coast, 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 sources[19]:

A. Indus Water as per Indus Accord
   a. Perennial Flow = 3.87 MAF
   b. Flood flow = 4.620 MAF

B. Non-Indus Basin Water Potential
   a. Flood Runoff =12.756MAF
   b. Ground Water = 0.87 MAF

The groundwater occurs in the unconsolidated deposits in Balochistan. Layers of gravel with sand, slit and clay constitute the aquifers. Generally, groundwater occurs under water table conditions but water is also found under cartesian and semi-cartesian conditions at few places in Quetta, Kuchlak, Mastung, Panjgur and Kachhi plain[20]. 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.

[17] http://allaboutgeology.blogspot.com/2011/04/seismicity-with-reference-to-pakistan.html
[18] Water Resources Management Research Issues in the Highlands of Balochistan, Report No. R92, Pakistan National Program, IWMI (July 1999)
[19] http://siteresources.worldbank.org/PAKISTANEXTN/Resources/293051-1114424648263/Session-VII-Nadir.pdf
[20] http://waterinfo.net.pk/cms/?q=node/77

The ground water potential of the province has estimated[21] in terms of flow at 1,116 cusecs (cubic feet per second), while 687 cusecs were already utilised, which leaves 429 cusecs for future development. Ground water is the essential renewable natural resource in most part of Balochistan. The most important income generating activities, irrigated horticulture and pastoralism, depend mainly on ground water. **Exhibit-4** shows the ground water potential of hydrological basin of the province.

Water quality analysis of four major cities i.e. Quetta, Khuzdar, Loralai and Ziarat were carried out by National Water Quality Monitoring Program (NWQMP)[22] in which total 66 water sources were monitored. In Khuzdar and Loralai 91 percent of water, samples were found unsafe due to bacteriological contamination. In Quetta, 76 percent samples were unsafe, mainly due to bacteriological contaminants, excessive iron, fluoride and nitrate content. Only eight sources out of 34 were supplying safe drinking water in Quetta. The worst water quality situation was recorded in Ziarat, where all the 10 selected sources were contaminated. Analysis report of these cities is given in **Table-4, 5, 6 and 7.**

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 purpose[23].

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 phenomenon[24].

4.9 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 rainfall[25], 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

[21] http://waterinfo.net.pk/cms/?q=node/77
[22] Pakistan Council of Research in Water Resources, NWQMP, Fifth Monitoring Report (2007)
[23] Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992
[24] The causes of groundwater decline in upland Balochistan: Paper presented at the 39th Australian Conference of Economists in Sydney, Australia 27-29 September 2010.
[25] The IUNC-Balochistan Program, water requirement of major crops in different agro-climatic zones of Balochistan.

the months from January to March (45 to 73 percent) and minimum during monsoon. Zone II consists of Chagi 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, Qila 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, Kohlu, Barkhan, Zhob and Kila 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 badly[26]. 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 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 ug/cm^3 respectively[27]. Pak EPA also carried out monitoring of ambient air quality in Quetta in May 2011 and reported daily mean value for SO_2, NO, NO_2, CO and O_3 satisfied the standards value of WHO limits, while $PM_{2.5}$ values mostly exceeded standard[28]. Air pollution in other urban centres has not been measured and reported. However, it is presumed that the same level of air quality prevail 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 Reservoir[29]. 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 locations[30].

4.10 Forests, Habitat, and Ecologically Sensitive Areas

Balochistan has a total area of 34 million hectare, of which only 4 percent (1.47 million hectare) is under cultivation, while 60 percent of the cultivated area is rain-fed. Approximately, 93 percent of this area is rangelands. Arid and semi-arid areas are falling

[26] Air Pollution Problems and Diseases Caused by Hazardous Gases in Quetta, Pakistan, J. Appl. Sci. Environ. Manage. March,2008, Vol 12(1), 123-126
[27] Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992
[28] Comprehensive Environmental Monitoring Report For Selected Pilot Areas in Pakistan (www.environment.gov.pk)
[29] Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992
[30] Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992

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 beauty[31].

Forests

Major types of natural forests found in Balochistan are coniferous forests, scrub forests, sub- tropical desert and riverain forests[32]. Coniferous forests occur at elevations of 1,500–3,500 metres and include chilghoza (Pinus gerardiana) and Dry Juniper Forest (Juniperus excelsa). Chilghoza are confined to the Suleiman Mountains, in the Shirani tribal area (Zhob District), ranging from 2,700 to 3,400 metres 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 metres in the province including the following three categories:

- Dry Temperate Scrub - Quetta, Mastung, Kalat, Qila Abdullah, Pishin, Kila 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. Riverain and Mangrove forests spread over an area of about 20,000 hectares[33] 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-8**[34].

Cultivated forests by Forest and Wildlife Department of Balochistan on road and canal side plantations in Naseer Abad, Jaffer Abad, Sibi, Quetta, Bolan, Kalat, Khuzdar, Zhob and Pishin districts cover a length of 700 Average Kilometer. Sand dunes in Mastung, Mashkhel, Pasni, Gwadar, Pishukan and Nushki areas have been planted. Cultivated plantation spread over an area of 5000 acres, and are well protected[35]. Plantation is also raised by community in irrigated plantations and on farm- land. Irrigated plantations are limited to about 298 hectares in Lasbela, Sibi, Zhob, Pishin and Quetta districts. In Naseer Abad and Sibi districts, plantations irrigates with water from the Pat Feeder and Kirthar canals and from Nari River. In other areas, they depend on water from tube-wells[36].

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

[32] Balochistan Conservation Strategy (May 19, 2000)

[33] Balochistan Conservation Strategy (May 19, 2000)

[34] Development Statistics of Balochistan (2010)

[35] Development Statistics of Balochistan (2010)

[36] Balochistan Conservation Strategy (May 19, 2000)

Deforestation

About three percent of Balochistan has been gazetted state forests[37]. Major parts (70-80 percent) of the state forests are grass and shrubs. The remaining state forests are sparse to open coniferous wood, riverain forests in the Sibi – Kachhi Plain and widely scattered shrubs. In state forests, green trees and wildlife are protected under the forests and wildlife regulations[38]. 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 Pistacia 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 population[39]. Mangroves in the coastal area are exploited for fuel wood and forage due to scarcity of other trees in coastal belt.

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-1980s[40]. 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 hectares[41]. 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.

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 lead to sharp decline of some

[37] Balochistan Forest Regulations, 1890
[38] Balochistan Forest Regulation (Amendment) Act, 1974 and Balochistan Wildlife Protection (Amendment) Act, 1980
[39] Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992
[40] Balochistan Conservation Strategy (May 19, 2000)
[41] Balochistan Conservation Strategy (May 19, 2000)

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 extent[42]. 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 areas[43] 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.

4.11 Demographic Profile

Balochistan has clustered population and is smallest in proportion as compared to that of other provinces. Its estimated current population is 8.912 million, having a density of 23 persons per square kilometer with an average growth rate of 2.47 percent per annum. The fertility rate is approximately 4.08 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 million[44] (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 (mostly in parts of Lasbela)[45]. The population density[46] in the project area including 12 districts is given **Table-9.** Jaferabad district followed by Naseerabad, Pishin, Bolan and Kalat district is comparatively densely populated than other districts of the project area. Overall gender ratio in these districts (males per 100 females) ranges 107 to 119.[47]

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 work- force. 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 crops[48]. At intermediate elevations (500–1,500 metres) 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 metres, farmers can obtain significant returns from fruit production if irrigation water is available[49].

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

[42] Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992
[43] Wildlife Department, Balochistan (May 2012)
[44] (http://en.wikipedia.org/wiki/Balochistan,_Pakistan#Demographics)
[45] http://en.wikipedia.org/wiki/Balochistan,_Pakistan#Demographics
[46] Censes Report, 1998(http://en.wikipedia.org/wiki/Districts_of_Pakistan)
[47] http://www.pap.org.pk/population/pdf/population.pdf - Population, Socio-economic and Development Profile of Pakistan
[48] Balochistan Conservation Strategy (May 19, 2000)
[49] Ibid

straw and stubble; livestock's mostly small ruminants graze the latter[50]. 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 livestock[51].

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 households in rural Balochistan. Livestock accounts for as much as 36 percent of the value of agricultural products and contributes substantially to livelihoods[52].

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 households[53].

Drought

Balochistan is suffering 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 2001[54]. Availability of water is the ultimate problem throughout the province including the project area of the proposed PGEB project.

[50] Land and Range Resource Management Issues and Food Security in Balochistan – AZRI, Quetta (1994)
[51] USAID (March 2008) "Evaluation of Food Security, Poverty Alleviation in Arid Agriculture Balochistan Project Report
[52] USAID (March 2008) "Evaluation of Food Security, Poverty Alleviation in Arid Agriculture Balochistan Project Rep
[53] Ibid
[54] Ibid

4.13 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 faces 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 out skirts 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 equipments 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 Balochistan[55] are 122 with bed strength of 5822, Dispensaries are 584 with bed strength of 45, Rural Health Centre (RHC) are 85 with bed strength of 974 and Basic Health Units are 551 and 92 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 families[56].

Balochistan province lacks the required health care facilities and trained professionals. There are total 3211 qualified doctors and 662 nurses, 139 pharmacists, 410 Lady Health Visitors, and 1304 Midwives in public sector hospitals in the province[57]. 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-10.**

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 province[58]. Awareness about personal hygiene is very low. According to the MICS[59] 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.

4.14 Education Facilities

The educational facilities in the province range from primary level schools up-to universities and specialized institutions such as technical and vocational institutions. The province has total 12281 schools out of which 10637 are primary schools, 953 middle schools and 594 high schools, and 97 inter and degree colleges[60]. Out of the total educational facilities, 8886 are male and 3395 are female. Public sector enrolments at primary level are 822596, at

[55] Development Statistics of Balochistan (2010)
[56] Comparative Statistics by Province (2009), Bureau of Statistics, P&D Department, Government of Sindh
[57] Development Statistics of Balochistan (2010)
[58] Health Indicators of Pakistan, Gateway Paper II (www.heartfile.org/gwhiop.htm)
[59] MICS Survey (2010), P&D Department, Government of Balochistan
[60] Development Statistics Balochistan (2010)

middle level 118304, at high school level 15184, and at higher secondary school level 1672. Enrolments by gender in public sector schools in the province stand at 60 percent for boys and 40 percent for girls. The number of school in selected 12 districts of the project are 6775, out of which 5929 are primary level schools, 529 middle level schools and 286 are high level schools and 31 are inter & degree schools. The percentage share of boys and girls schools in the project area stands at 71 percent for boys and 29 percent for girls. Details of the schools in the project districts are listed in **Table-11.**

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 Balochistan[61]. 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 past[62]. 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 quintile[63]. This finding indicates that public sector expenditure on education is poorly targeted on poorest of the poor.

4.15 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 32046 km including 11826 km black topped roads and 20220 km shingle roads[64]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 maintenance[65]. The length of road network (in kilometres) in the project districts is given in **Table-12.**

4.16 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

[61] UNESCO (2009): Paper Commissioned for Education for All (EFA) Global Monitoring Report
[62] MICS Survey (2010), Government of Balochistan
[63] Ibid
[64] Development Statistics Balochistan (2010)
[65] ADB (October, 2003), Balochistan Road Sector Development Project

service sectors Balochistan's growth potential appears to be closely connected to its integration with the national economy and other regional economies[66]. 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 time[67].

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 land[68].

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.

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 Turbat. 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 sector[69].

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 Jafar Abad (0.405) fall in the highest (first) category. On the contrary, districts with terribly low HDI values include; Kachhi (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)[70].

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.

[66] http://www.researchcollective.org/documents/balochistan-economic-report.pdf
[67] Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992
[68] Ibid
[69] Environmental Profile Balochistan, LARUS-IT, Enschede: Netherland, 1992
[70] Govt. of Balochistan (November 28, 2011), Strengthening PRS Monitoring Project, P&D Department,

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

4.17 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 Brahui 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 exist 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, Nosherwani, 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 Achakzai[71]

Cultural landscape of Balochistan[72] 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.

[71] http://www.balochistan.gov.pk/menu-culture-and-heritage.html
[72] http://www.balochistan.gov.pk/menu-culture-and-heritage.html

Brahvi, Balochi and Pashtoon tribes are known for their hospitality. Another adorable feature of Balochistan culture is faithfulness and 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.

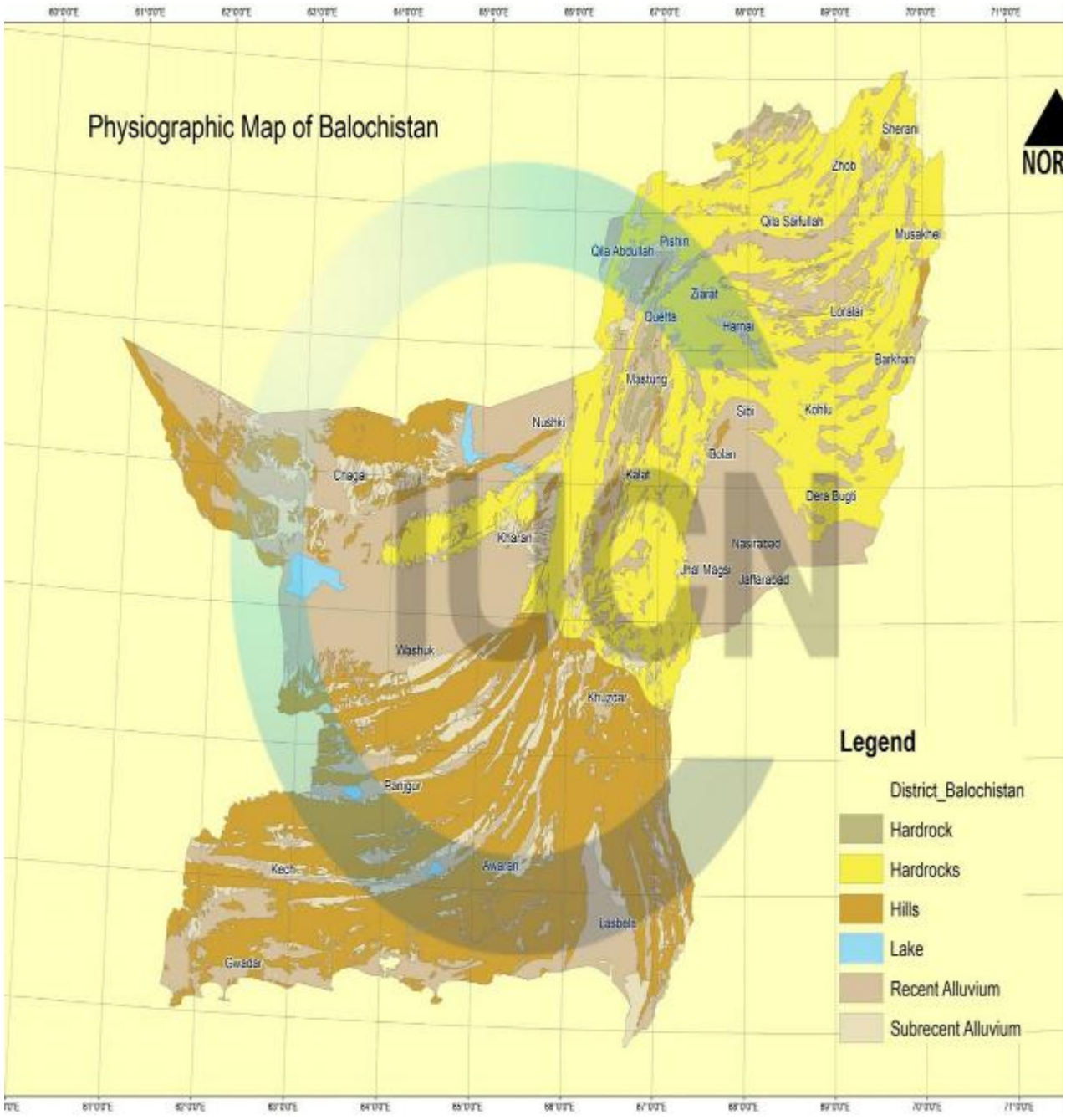


Exhibit-2: Geophysical Features of Balochistan (Source: www.iucn.org.pk)

Table-1: District Wise Area and Population in Project Area

S.No	District	Areas (Sq.Km)	Population 1998 Census		
			Total	Male	Female
1	Kachhi	7499	288056	155488	132588
2	Loralai	9830	297555	158168	139387
3	Jhal Magsi	3615	109941	58868	51073
4	Khuzdar	35380	417466	220023	197443
5	Kalat	6622	237834	122935	114899
6	Lasbella	15153	312695	167470	145225
7	Jaffer Abad	2445	432817	225028	207789
8	Kech	22539	413204	216566	196638
9	Panjgur	16891	234051	125648	108403
10	Killa Saifullah	6831	193553	105174	88379
11	Pishin	7819	367183	196330	170853
12	Naseer Abad	3387	245894	129412	116482
		138011	3559200	1879110	1680090

Source: Development Statistics Balochistan 2010

Table-2: District W**ise Land Utilisation in Project Area (Hectares)**

S.No	District	Geographical Area	Reported Area	Cultivated Area	Un-cultivated Area		
					Cult: Wastes	Forests	Area not available for cultivation
1	Kachhi	568200	324707	75273	97437	0	151997
2	Loralai	801800	318523	125469	64585	60396	68073
3	Jhal Magsi	3615000	333251	95166	101717	32374	103994
4	Khuzdar	3538000	3304749	132049	1063445	17353	2091902
5	Kalat	662200	631452	109346	29736	64772	427598
6	Lasbella	1515300	1255390	83356	893190	156275	122569
7	Jaffer Abad	244500	241981	214300	5721	0	21960
8	Kech	2253900	554336	61132	56048	104	437052
9	Panjgur	1689100	673228	33893	44458	0	594877
10	Killa Saifullah	683100	416780	147872	107311	20287	141310
11	Pishin	787400	293868	152434	32846	26438	82150
12	Naseer Abad	338700	230393	213191	2537	0	14665

Source: Development Statistics Balochistan 2010

Table-3: Major Stream and Rivers Basins in Balochistan

S. No	River basin	Project district	Available potential (cusecs)	Extracted (Cusecs)	Balance potential (Cusecs)
1	Hamun-e-lora		28	10	11
2	Kachhi plain	Kachhi, Naseer Abad	95	53	10
3	Nari River	Loralai	120	110	42
4	Pishin lora	Pishin	145	145	00
5	Porali	Lasbela	155	65	11
6	Zhob River	Kila Saifullah	125	114	13
7	Dasht River	Kech	51	20	90
8	Rakhshan River		27	10	143
9	Hamun-e-Mashkhel	Panjgur	168	60	18
10	Hangol River	Kalat, Khuzdar	168	25	31
11	Gaj River		38	25	17
12	Mula River		26	15	08
13	Other Areas		70	35	35

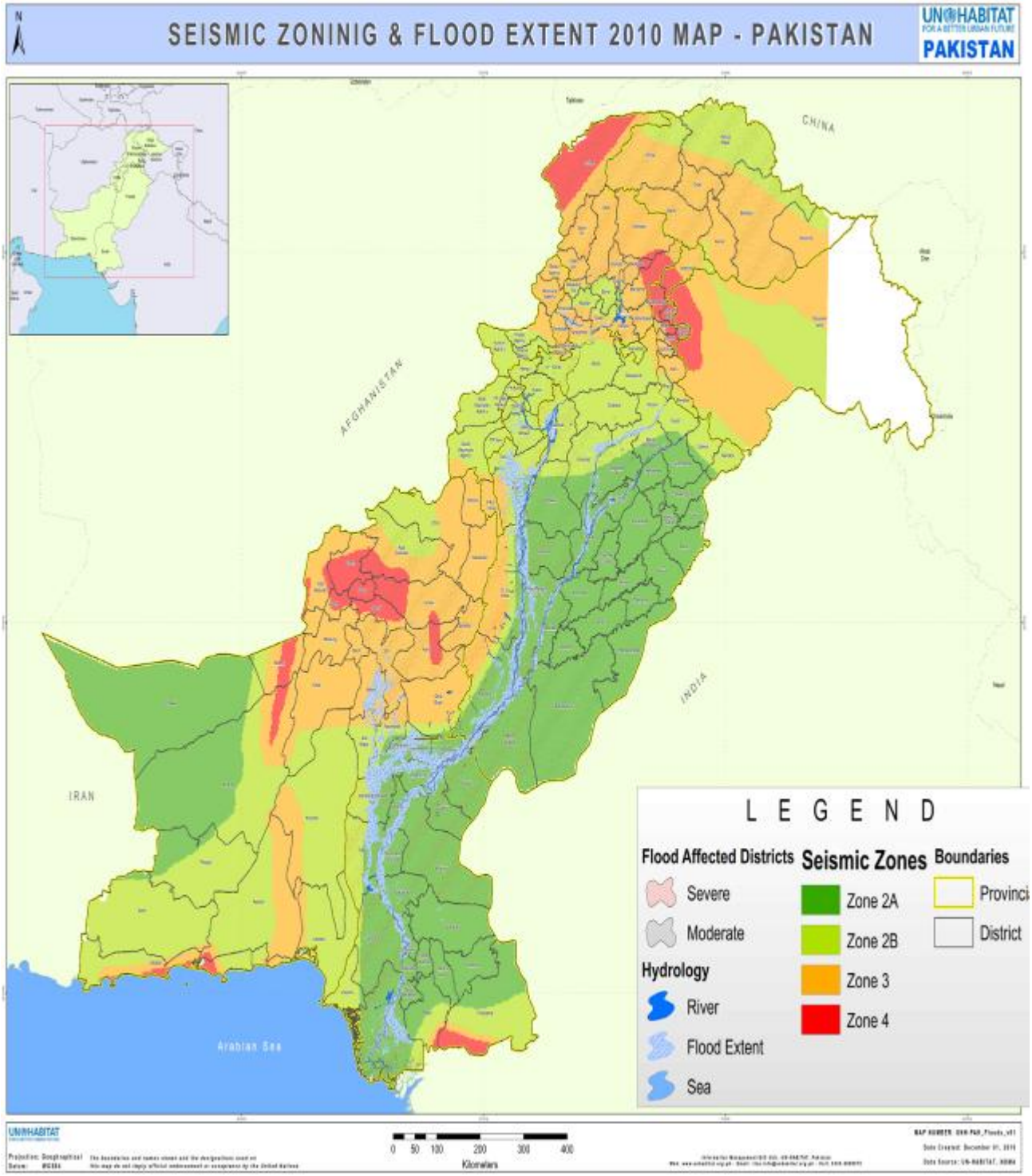


Exhibit-3: Seismic Zones of Pakistan (Source: UN Habitat, Pakistan)

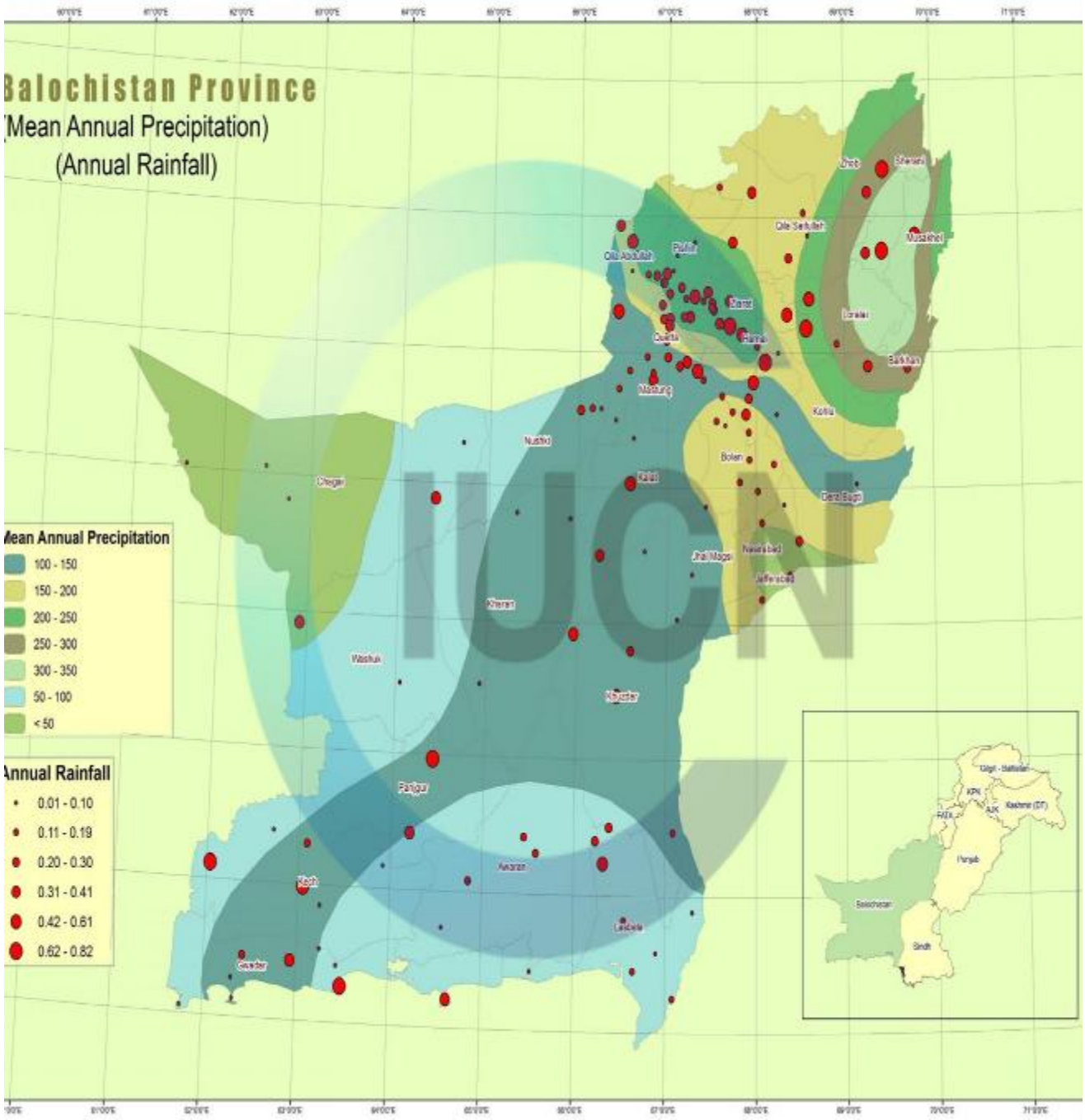


Exhibit-4: Map Showing Ground Water Potential and Hydrological Basins of Balochistan (Source: www.iucn.org.pk)

Table-4: Water Quality Parameters of Quetta (2002-06)

Parameter(s)	Year of Monitoring				
	2002	2003	2004	2005	2006
	No. of Samples Collected				
	38	35	34	32	34
	% Samples Beyond Permissible Limits				
Turbidity	16	9	15	19	9
Magnesium	3	3	3	3	3
Hardness	13	9	9	6	6
Sodium	5	3	3	3	6
Sulphate	8	6	6	6	3
Nitrate (N)	0	0	24	25	24
Chloride	3	3	0	0	3
Fluoride	42	31	24	22	24
Total Dissolved Solids (TDS)	13	8	9	6	9
Iron	8	0	24	34	26
Bacteriological Contamination	50	48	50	56	68

Source: PCRWR - Fifth Monitoring Report (2007)

Table-5: Water Quality Parameters of Loralai (2002-06)

Parameter(s)	Year of Monitoring				
	2002	2003	2004	2005	2006
	No. of Sample Collected				
	11	10	11	11	11
	% Samples Beyond Permissible Limits				
Turbidity	18	30	18	18	9
Hardness	9	10	9	9	9
Nitrate (N)	0	0	9	9	9
Fluoride	55	10	9	9	9
Total Dissolved Solids (TDS)	10	10	9	9	9
Bacteriological Contamination	100	80	73	82	91

Source: PCRWR - Fifth Monitoring Report (2007)

Table-6: Water Quality Parameters of Khuzdar (2002-06)

Parameter(s)	Year of Monitoring				
	2002	2003	2004	2005	2006
	No. of Sample Collected				
	8	8	11	9	11
	% Samples Beyond Permissible Limits				
Nitrate (N)	0	0	18	11	18
Bacteriological Contamination	100	62	91	67	91

Source: PCRWR - Fifth Monitoring Report (2007)

Table-7: Water Quality Parameters of Ziarat (2002-06)

Parameter(s)	Year of Monitoring				
	2002	2003	2004	2005	2006
	No. of Samples Collected				
	8	7	10	10	10
	% Samples Beyond Permissible Limits				
Turbidity	25	43	20	20	10
Nitrate (N)	0	0	20	50	50
Bacteriological	100	100	100	100	100

Source: PCRWR - Fifth Monitoring Report (2007)

Table-8: District Wise Distribution of Forests in Project Area (in Acres)

District	**Coniferous forest**	**Riverain forest**	**Scrub forest**	**Coastal forest**	**Range lands**	**Irrigated plantation**	**Total (Acres)**
Kachhi/ Bolan	-	-	-	-	-	135	135
Loralai	45763	-	47910	-	55551	-	149224
Jhal Magsi	-	-	80353	-	-	-	80353
Khuzdar	-	1280	-	-	-	-	1280
Kalat	55230	-	112947	-	-	-	168177
Lasbella	-	2000	301252	733.5	87040	-	391026
Jaffer Abad	-	-	-	-	-	150	150
Kech/turbat	-	2560	-	-	-	-	2560
Panjgur	-	-	-	-	-	-	0
Killa Saifullah	-	-	28051	-	-	-	28051
Pishin	41500	-	138971	-	-	-	180471
Naseer Abad	-	-	-	-	-	-	0
Total	**142493**	**5840**	**709484**	**733.5**	**142591**	**285**	**1001427**

Source: Development Statistics of Balochistan (2010)

Table-9: District Wise Population Density in Project Area

District	Area (per square kilometer)	Population (1998 Censes)	Density (person/square kilometer)	Sex Ratio (M/F)
Kachhi (Bolan)	7499	288056	38	117
Loralai	9830	295,555	30	114
Jhal Magsi	3615	109941	30	115
Khuzdar	35380	417466	12	111
Kalat	6622	237834	36	107
Lasbela	15153	312695	21	115
Jaffer Abad	2445	432817	177	108
Kech (Turbat)	22539	413204	18	110
Panjgur	16891	234051	14	116
Killa Saifullah	6831	193553	28	119
Pishin	7819	367183	47	115
Naseer Abad	3387	245894	73	111

Source: Development Statistics of Balochistan (2010)

Table-10: District Wise Government and Private Health Facilities

Districts	Hospitals	Dispensaries	RHCs	BHUs	M.C.H	T.B.C CLINIC
Kachhi (Bolan)	04	19	03	12	03	01
Loralai	02	46	02	30	04	01
Jhal Magsi	01	16	03	11	02	00
Khuzdar	03	31	06	34	01	01
Kalat	02	44	02	12	03	01
Lasbela	04	27	04	42	04	01
Jaffer Abad	03	38	01	31	07	01
Kech (Turbat)	09	43	11	36	04	01
Panjgur	02	14	01	15	04	01
Killa Saifullah	07	16	03	15	03	01
Pishin	03	14	07	33	04	01
Naseer Abad	01	10	03	15	03	01

Source: Development Statistics Balochistan (2010)

Table-11: District Wise Government Schools & Colleges

Districts	Primary		Middle		High		Inter & Degree	
	Male	Female	Male	Female	Male	Female	Male	Female
Kachhi	304	65	15	06	16	06	03	01
Loralai	458	159	35	14	13	04	02	00
Jhal Magsi	156	70	18	05	09	02	01	00
Khuzdar	418	157	18	29	19	03	02	00
Kalat	249	128	20	20	18	05	02	02
Lasbela	366	118	35	19	18	04	02	01
Jaffer Abad	574	250	31	12	28	06	02	03
Kech	313	175	40	25	38	07	03	00
Panjgur	168	115	22	11	15	09	00	01
Killa Saifullah	408	113	22	06	14	05	00	01
Pishin	577	189	53	51	28	05	03	02
Naseer Abad	270	129	15	06	13	01	00	00
	4261	1668	324	204	229	57	20	11
Total	5929		528		286		31	

Source: Development Statistics of Balochistan (2010)

Table-12: District Wise Road Network in the Project Area (in Kilometres)

District	Black Topped Road (km)	Shingle Road (km)	Total (Km)
Kachhi (Bolan)	496	280	776
Loralai	553	603	1134
Jhal Magsi	522	97	619
Khuzdar	522	1452	1974
Kalat	601	1286	1892
Lasbela	973	1232	2205
Jaffer Abad	1101	-	1101
Kech (Turbat)	285	1515	1800
Panjgur	204	1492	1696
Killa Saifullah	464	947	1411
Pishin	605	648	1253
Naseer Abad	1101	-	1101
Total	**7427**	**9552**	**16979**

Source: Development Statistics of Balochistan (2010)

5. STAKEHOLDER CONSULTATIONS AND ANALYSIS

5.1 Objectives of Consultations

The objectives of stakeholder consultations are to: i) inform the stakeholders about the project and 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 project/mitigation measures. The stakeholder consultations were also used as tool for collecting first hand information about the project area and the prevailing social and environmental conditions.

5.2 Mode of Consultations

Consultations were held with relevant officials of the Government departments and 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. A consultative workshop was also arranged in Quetta on 24th May 2012, to discuss the project objectives, activities, its likely social and environmental aspects were discussed, and views/concerns of potential stakeholders were noted. The workshop played a vital role in analysing the environmental and social impacts of the project activities. FGDs was conducted **(See Fig. 2, 10, 15, 30, 33 and 36)** with affected and beneficiary communities during field investigation in the project area to know their specific concerns relating to environmental and social issues. A list of stakeholders consulted during the study is appended as **Annex-E.**

5.3 Main Issues discussed

The stakeholder were informed about the overall objectives of the project, activities to be undertaken and the potential environmental and social impacts expected during project execution. Stakeholders were informed about the purpose of the ESIA study and its importance in addressing the environmental and social issues by adopting appropriate mitigation measures.

The following issues were discussed during individual meetings, consultative workshop and focus group discussion with communities in the selected districts of project area:

i) Land donation for school
ii) Design of school buildings
iii) Quality and standard of construction
iv) Water supply and sanitation facilities in schools
v) Capacity of education department for implementing PGEB project
vi) Community led school management
vii) Associated environmental and social issues from the project
viii) Geographical coverage of project intervention

The stakeholders expressed the following concerns and suggestions about the project activities:

- Low pace of infrastructure development for education in the province;
- Land donation in the flood zones, steep slope areas for schools;
- Dominance influence by lands donors;
- Non availability of fund for O&M of schools;
- Lack of capacity of institution for delivering the desired results

- Likely adverse impacts of the project on environment and its importance in the opinion of the stakeholders;
- Non-availability of proper water storage facilities in schools;
- Proper designing of schools for future extension;
- Extension of project to other districts of the province;
- Up gradation of existing primary schools to middle level;
- Uniform standard for construction and quality of education;
- Local labour employment for livelihood improvement;
- Role and Responsibilities of PTSMCs to be strengthened;
- Local Committees for troubleshooting and dispute resolution;
- Health and hygiene issues from open defecation;
- Monitoring and Evaluation Mechanism;
- Community led designs and construction;

5.3.1 Addressing Public Concerns

The concerns rose by community and other stakeholders have been addressed in the ESMP. Details of action taken to address these concerns are summarised below:

Summary of Actions Taken to Address Public Concerns

Date	Place of consultation	Names of participants	Main concerns raised by public	Action taken to address concerns
29/5/2012	Kachi	Haq Nawaz M. Ramzan Barozai M. Ayub Rind M. Nasrula Bangulzai	i) Land for school is provided in flood plan.	Site selection guidelines proposed in section 6.2.1
			ii) Maintenance of school is poor	Missing facilities will be provided in existing schools
			iii) Education development is slow in province	Education department to address the concern of public
			Environmental issues usually not considered in construction	ESMP has been proposed in Table-18 & 19.
30/5/2012	Jaffer Abad	Hazoor Bux M. Tariq Jhakro Haji Dani Bux Tariq Rind Amir Muhammad Haji Tayab Akhtar Hussain	i) Dominance influence of land donors on the school	PTSMCs have been given role in monitoring of ESMP to reduce the influence
			ii) Lack of capacity of education	Capacity building trainings have been proposed

		Khadim Hussain Javed Bugtti	department to monitor schools	for education department & project staff to address the concern
			Non-availability of water storage facilities in schools creating problems	Guidelines for rain-water harvesting and storage have been proposed in Section 8.4.1.
03/6/2012	Lasbella	Babo Sheedi Muhammad Aslam Mano Shah Ashoq Kumar Wedey Kumar Babo lal	i) No proper design and safety measures taken in schools.	Guidelines have been proposed in Section 8.4.3 & Section 8.4.4 to address the concern
			ii) Project extension to other backward districts of province.	The education department will address this concern.
			iii) Existing schools need up-gradation to middle level for continuation of children education	The education department will address this concern
05/6/2012	Killa Saifullah	Molvi Amanullah Kaleem Ullah Malik Abdul Bari Sher Muhammad Abdul Sattar	i) Uniform design standard and quality of school be constructed	Detailed guidelines have been proposed in Section 8.4.4 for designing.
			ii) Preference be given to locals in employment in schools	Guidelines have been proposed in Section 8.4.8 and to address the issue
			iii) PTSMCs should be empowered and their capacity enhanced	Capacity building training have been proposed for PTSMCs
07/6/2012	Loralai	Aziz Khan Abdul Manan	i) Local jirga system/committe	PTSMCs have been given

		Nizam Sahib Saifullah Nasir Haji Abdul Ali Aziz Ullah Nooruddin Tahir Shah Dilawar Dost Muhammad Zia ur Rehman	e should be empowered for trouble shooting & dispute resolution	monitoring and supervision role in ESMP which address the concern
			ii) No toilet facilities in schools	Eco-san toilets have been proposed in Section 6.5
			iii) Open defecation create health hygiene problems	Provision of eco-san toilets will address this concern.
09/6/2012	Pishin	Salah uddin Abdullah Malik Murtaza Haji Raz Muhammad Ubaid Ullah Molvi Paidin Fida Muhammad Akram Sb Hashim Khan Panezai Sami Ullah Khan	i) Strong monitoring and accountability system be introduced in schools	Monitoring mechanism and institution set up has been proposed for ESMP in section….
			ii) Community be involved in designing and construction of schools	The project design includes construction of community run schools. PTSMC will be play an oversight role in construction
			iii) Capacity of education department need to be enhanced	Capacity building trainings have been proposed in ESMP.

5.4 Outcome of Consultations:

A brief summary of the outcomes of stakeholder consultations is given below:

Education Department

The Education Department Officials were briefed on the purpose and scope of ESIA study. Necessary information about the project, project areas and organisational set up of PGEB project was provided by the Education Department. The Additional Secretary Education Department Government of Balochistan gave detailed briefing on the project and modus operandi of PGEB and institutional set up for implementation of project activities. The Director Education Department expressed concern over the issue of lake of resources and capacity of education department for monitoring of the environmental and social aspects of the project.

EPA Balochistan

The Director (EIA), Balochistan EPA was apprised of the project, its scope and the purpose of ESIA study. He appreciated that Environmental and social assessment of the project is being conducted which is legal obligation under the Pakistan Environmental Protection Act, 1997 and said that EPA will facilitate the project in achieving the objective of environment protection in the province.

The Deputy Director (legal), EPA Balochistan informed that all projects are being scrutinised for EIA requirement and action are taken against those who do not comply with PEPA, 1997. He also shared the progress of cases referred to Environmental Courts and Tribunal in Balochistan.

Stakeholder Workshop and FGDs

Majority of the stakeholders appreciated the PGEB project initiatives and said that education infrastructure facilities are not sufficient in province and the project should be extended to other areas and districts as well. However, some showed concern over the execution of project activities in southern districts because of security consideration in the area

Some of the education department officials expressed concern and resentment for having not been involved in the project designing stage and decision-making process, wherein they could have offered workable options. Majority of the stakeholder interviewed suggested having strong monitoring and evaluation mechanism to ensure that the benefits of project reach to the poor and vulnerable communities

The stakeholders agreed that unsuitable land sites such as flood prone area and steep slopes land shall be avoided because it would leads to increase vulnerability of children's to disasters. They also stress the need for standard quality construction to avoid such risks e.g. earthquake and floods;

In the opinion of majority stakeholders, open defecation in and around the school causes health hygiene problem in the area, preventive, and mitigation measures should be taken to address the problem. They agreed that proper site selection and designing of school should be done to accommodate future expansion and easy access to schools. Some persons showed concerns over inadequate arrangements for water supply and wastewater drainage in schools that lead to health hygiene problems;

Provision of proper waste disposal/dumping facility is required in all schools to avoid health hygiene problems. The health and hygiene issues are more dependent on schoolteachers and, therefore, schoolteacher training on health hygiene is necessary to implement in schools.

Most of the stakeholder expressed concern over the non-availability of drinking water in schools and suggested that proper storage of water is necessary in all schools for drinking as well as plantation and cleanliness.

The local community stress the need to strengthen the roles and responsibilities of PTSMCs in school management and operation and to strengthen the capacity of Education

Department for more proactive role in the project implementation and monitoring. The NGOs working on education in the project area expressed concern over the non- availability of authentic data regarding the number of schools and enrolments of students and suggested that Education Department should develop a databank all schools in each district to avoid duplication of efforts.

6. 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.

6.1 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's 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)[73].

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-13**). Literacy rate is highest in Sindh at 56 per cent and lowest in Balochistan at 37 per cent. This inter-provincial difference is pronounced in literacy rates among females: as opposed to a female literacy rate of 44 per cent in Punjab, in Balochistan the rate is only 19 per cent (**Table-14**)[74]. Further, there is great variation in performance across the rural and urban areas within each province and across males and females. The Gross Enrolment Rate (GER) is as high as 111 per cent in urban areas of Punjab while it is as low as 41 per cent in the rural areas of Balochistan (**Table-15**)[75].

During stakeholder consultations, the people expressed a sense of deprivation in socio-economic development while comparing themselves with other provinces. Realising this genuine concern of the people of Balochistan, the Federal Government announced a special package called "Balochistan Development Package". Keeping in view the aforementioned situation, no project option neither is in line with the Government policy nor will be feasible alternatives given the socio-economic profile of the province. No project option will further add insult to the injury by depriving the local populace of this tremendous opportunity, particularly female segment of the society from education with grave consequences in terms of social, environmental and economic impacts.

6.2 Sites Alternatives

The best environmental management measure for construction of schools is to select the site in such location that the students are provided with an atmosphere that is environmentally safe, healthy and conducive for learning. For 130 shelter less schools and about 200 schools proposed for construction, rehabilitation and provision of missing facilities

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

[74] Ibid

[75] Ibid

sites have already been selected and in case of missing facilities a basic building structure is already constructed. Therefore, the site alternative option is not relevant for these schools. For the 150 gender free government schools with community participation construction is not envisaged during the project duration. In prioritizing of school selection shelter less and community schools in rural areas the following options are suggested:

a) Land located on hilly terrain
b) Land located in flood plain
c) Waste or communal land in remote area.
d) Readymade building donated by community.

The adverse environmental and social impacts likely to arise from the site selection are given below:

a) Sites located on hilly terrain and steep slopes could lead to soil erosion, land-sliding during construction, excavation and accessibility problems for schools kids.
b) Sites located in flood plains increases the risk of health and safety issues for schools kids and damage to properties.
c) Site location on waste or communal land in remote area could lead to social disputes among the community and accessibility issues for schools kids.
d) The readymade buildings provided by community usually does not have the required water storage arrangement, toilets and sanitation facilities which leads to water pollution, health and hygiene problems in the surrounding areas.

The identification and selection of sites for schools will be undertaken when the project starts and the Education Department, Balochistan invites applications from interested communities for space availability for running a school till the time the school is stable. Assessment and selection of proper siting will be carried out by the Education Department.

In order to select environmentally feasible sites for the prioritizing schools for construction following site selection guidelines have been proposed which will be followed by the Education Department for the construction of shelter less schools.

6.2.1 Site Selection guidelines

The proposed project will construct about 130 shelters less schools. The following guidelines will be followed to select environmental friendly sites and locations for the proposed schools.

1. Sites for the schools will not be located on the edge of main roads and highways. While selecting site at least 50 meters distance will be maintained between the boundary wall of the proposed school and the edge of the carriageway to reduce the risks of accidents.
2. Un-drained and saline soils will be avoided as much as possible in selection of sites. If no alternate site is available, in such cases appropriate construction techniques will be applied to ensure that the building structure is protected from corrosion, moisture and salinity.
3. Sites close to stream and rivers, critical wildlife habitats, forested area will not be selected for the schools.
4. Sites close to any high voltage power line or large wastes dumps or sites prone to landslides and natural disasters will be avoided.

5. Sites for girls schools shall not be located in difficult terrain ad very far away from the population to ensure easy access and easement to the girls students and teachers.

6.3 Design Alternatives

The following designs alternatives were considered based on social, environmental and economic impacts.

a) Introducing second shift in schools
b) Changing existing design of buildings
c) Improving existing design of buildings
d) Introducing eco-friendly designs in new construction

Introducing second shift in the existing schools is an environmentally sound alternative for increasing student enrollment rate. However, this alternative restricts the right of education to certain segment of population where schools already exist and will culminate in to increased social disparities and de-fragmentation amongst the people. The advantageous groups (where schools exist) will get more advantage while the dis-advantaged peoples (without access to schools) living in the poorest and remote areas will be deprived from their basic right of education and hence the project will not achieve the desired objectives in terms of social equity and justice.

Changing the existing design of schools involves demolition and dismantling of existing schools which will create not only environmental issues such as soil and water contamination from disposal of demolition wastes but will also lead to social issues such as disruption in studies of students. Also the reconstruction of existing buildings would require additional funding and hence not an economically feasible option.

Improvement and modification of the existing designs will not have any major environmental and social impacts as the schools are already operational in the existing buildings. Minor environmental issues such as dust emission, wastewater discharge and construction wastes generated from construction of additional class rooms, toilets, boundary walls, water storage tanks etc in the existing buildings are easily manageable by adopting appropriate mitigation measures, beside, being an economically feasible alternative.

The construction of new eco-friendly building designs for shelter less schools is another design alternative. The construction of new buildings could provide an opportunity to create a building facility that meet the needs of the students in a more efficient and effective manner. The new buildings will also provide opportunity for future expansion and would be more energy efficient building with minimum operational costs.

6.4 Technological alternatives

The following technological alternatives were considered for construction of new eco-friendly buildings.

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.

The construction of prefabricated structures with cemented foundation was also considered for shelter less school in the project area. 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.

6.5 Technological Options for Toilets

The following technological options were considered for the construction of toilets in the existing as well as new buildings for the schools in the project area:

i. Pour Flush Toilet
ii. Dry Pit Toilets
iii. Compost Toilets;
iv. Eco-San Toilets

Pour flush toilets with septic tank require large quantity of water for cleaning and generate wastewater. Proper sanitation and drainage facility is required for wastewater discharge from these toilets. The design is not suitable for water scarce areas because it requires sufficient quantity of water for flushing and cleaning the human excreta.

In dry pit toilets tissue paper is used for anal cleaning and no water is required for flushing. The human excreta go down into a dry pit constructed below the pan. Dry pit toilets are suitable for water scarce areas, however, the availability of tissue/toilet paper must be ensured all the time otherwise, these toilets could be source of health problem. During stakeholder consultations the local community also expressed their reservations about the education department capability to provide tissue paper to the school children and, therefore, this design was not recommended for school.

Compost Toilet is another alternative considered for the proposed project. The compost toilet comprises a raised slab over two chambers. The chambers are built on the ground and are plastered with cement internally in order to waterproof them and make compost removal

tidier. The chambers are designed to have an accumulation time of about nine months to allow thorough composting of the contents and elimination of pathogens. The compost produced is an almost dry, crumbly, black product having a light, earthy odour. The compose toilet require removal of finished product frequently which is an unpleasant job. Compost toilet does not require water for flushing, and thus, reduce water consumption.

Eco-San toilet is a more advanced version of the compost toilet in which urine is diverted at source by a specially designed pedestal and led into a shallow soak pit. Faeces are deposited in a shallow vault and covered with a sprinkling of ash or dry soil, which absorbs most of the moisture. They are further subjected to a dehydration process inside the vault, which hastens pathogen die-off. Depending on the temperature and degree of desiccation attained in the vault, the residue can then be easily removed from the vault biannually or annually and either disposed of or re-used as soil conditioner. These toilets are suitable for water scarce, coastal and rocky areas. A schematic diagram of the UD-type toilet is given in **Exhibit-5**

The initial cost of investment is comparatively higher (double) than the other alternatives. However, due to water scarcity in the project area, Eco-san toilet is an environmentally suitable design for the proposed new schools building, although the initial capital cost may be slightly higher than other available options. Eco-San toilets are widely used in water scarce areas of Bangladesh, Nepal, China, India and in the earthquake affected areas of Pakistan.

6.6 Management Options

The construction of new buildings and provision of missing facilities in the existing buildings for schools under the PGEB project is a major project activity. Following management options were considered for the construction of new school buildings keeping in view its environmental and social considerations:

i. Construction through Government
ii. Construction through NGOs/Community
iii. Construction through a Private Engineering Firm.

The Government carries out construction work through the Construction and Works (C&W) Department which is a mandated department for this purpose. The C&W Department hires private contractors through competitive bidding process. Following are main issues associated with this option are: 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 contractor 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 consideration, 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 does not have any permanent infrastructure set up required for construction work and hence charge high overhead costs for hiring equipments and machinery from the local market on 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 PGEB project.

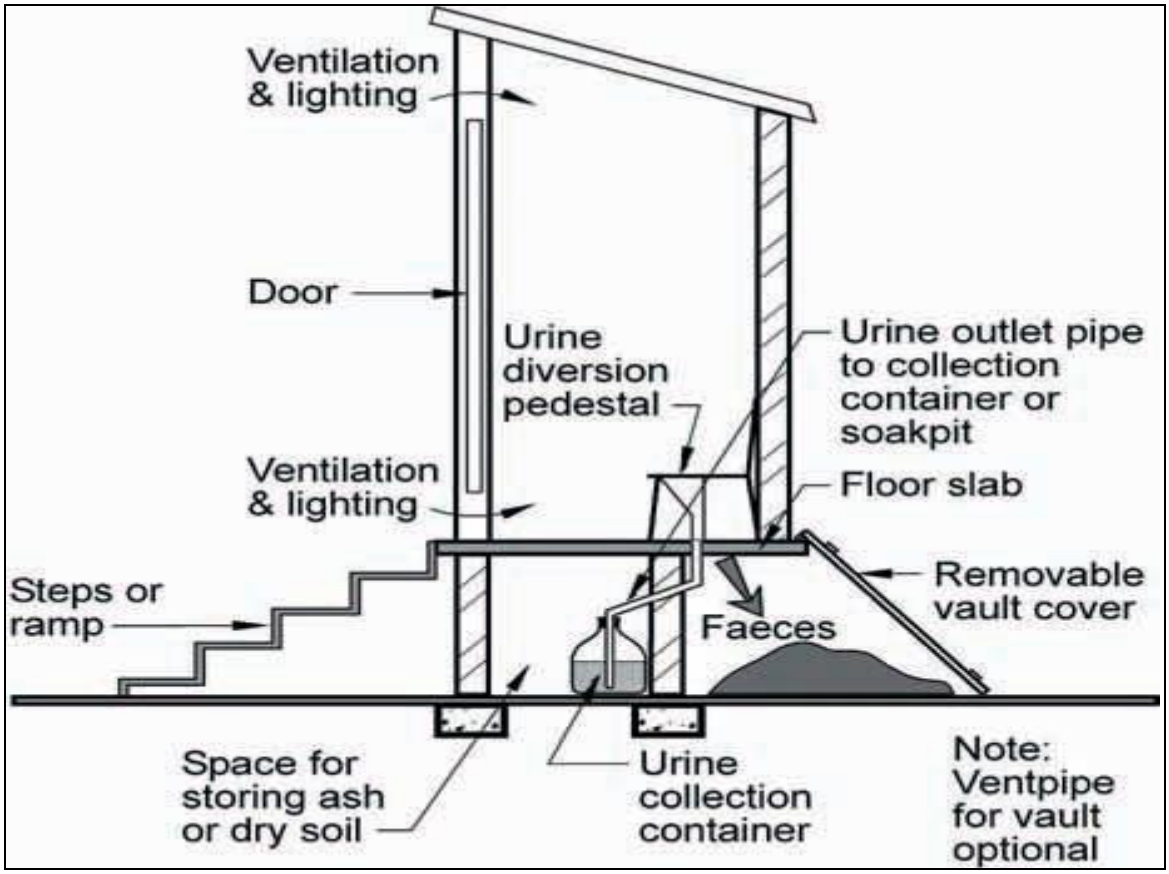


Exhibit-5: Eco-San (Urine-diversion) Toilet

Table-13: Province Wise Status of Primary School and Enrolments Data

Provinces	**Government schools**	**Enrollment in Government schools**
Punjab	42736	4,759,510
Sindh	28,854	2,590,230
KP	18,712	2,391,909
Balochistan	7,866	452,403

(Source: UNESCO, EFA Global Monitoring Report, 2009)

Table-14: Province Wise Literacy Rates (10 years and above) for 2004-05

Province	Total (percent)	Male (percent)	Female (percent)
Pakistan	53	65	40
Punjab	55	65	44
Sindh	56	68	41
KP	45	64	26
Balochistan	37	52	19

(Source: UNESCO, EFA Global Monitoring Report, 2009)

Table -15: Gross Enrolment Rate at Primary Level by Province and Region

Province/region	**2001-02**		**2004-05**	
Punjab	Male	Female	Male	Female
Urban	95	93	111	108
Rural	80	61	96	82
Sindh				
Urban	91	78	103	94
Rural	69	37	70	44
KP				
Urban	100	86	100	84
Rural	96	52	92	62
Balochistan				
Urban	98	75	101	86
Rural	73	38	79	41

(Source: UNESCO, EFA Global Monitoring Report, 2009)

7. ENVIRONMENTAL IMPACT ASSESSMENT AND MITIGATION MEASURES

This section describes the potential impacts of the project activities on physical, biological, and socio-economic environment and measures for their mitigations. The potentially adverse environmental impacts have been discussed with respect to the site/design, construction, and operation stage of schools. Necessary mitigation measures have been proposed for avoiding or rectifying the adverse impacts.

7.1 Impact Assessment and Mitigation Strategy

The environmental and social impacts of project activities were assessed employing a simplified impact assessment matrix (**Table-16)** which was tailored according to the specific needs of the PGEB project. The project activities included construction of shelter less school, establishment of new schools with community participation and providing missing facilities such as room and boundary wall construction, toilets, water supply facilities, operation and maintenance. The potential environmental impacts from these activities on physical, biological, and socio-economic environment, thus predicted were characterised as following:

- High negative (adverse) impact (-2),
- Low negative impact (-1)
- Insignificant impact,(0)
- High positive (beneficial) impact (+2),
- Low positive impact (+1), and
- No impact (N)

Some of the key environmental and social impacts likely to occur during site selection, construction and operation stages are listed below;

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

In order to minimize these impacts, mitigation measures have been proposed. The mitigation strategy adopted in this study follow the following principles:

- Firstly, avoiding the impacts by appropriate site selection, eco-friendly designing and adopting environmental friendly construction practices

- Secondly reducing and rectifying the impacts by adopting and implementing the proposed mitigation measures and guidelines

- Thirdly, enhancing the capacities of concerned department and officers to carry out monitoring and mid-course corrections to ensure long-term environmental and social sustainability of the project

7.2 Impacts on physical environment

7.2.1 Soil and lands

The potential environmental impacts of project activities on soil and land during site selection, designing, construction and operation stages are following:

Site selection stage

- Improper site selection of schools can lead to soil erosion.

Construction stage

- Excavations for construction particularly in the hilly terrain of district Loralai, Khuzdar, Panjgur, Kalat Lasbela and Pishin, can destabilize the land and may lead to soil erosion and land sliding.
- Disposal of contaminated construction wastes can lead to soil contamination.
- The borrow pits may lead to soil degradation and erosion.
- Disposal of left over construction material and excavated soil can lead to soil contamination.

Operation stage

- Open discharge of toilet wastewater to the adjacent lands can contaminate the soil and degrade the quality of land.

7.2.2 Mitigation for impacts on soil and land

Siting and design

- Appropriate site selection and designing for school will be done according to the guidelines provided in Section 6.2.1 in order to entail no or minimal disturbance to the soil and land.

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.
- The contractor will ensure the prevention of soil erosion and destabilization by employing batched excavation technique.
- 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.
- Tree plantation will be carried out, around the periphery of school building, through community participation to enhance soil stability and control erosion
- Borrow pits will be restored and levelled back to control soil degradation
- Left over construction materials and excavated soil will be disposed off in designated areas to avoid soil contamination/land degradation.

Operation Stage

- 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.

7.2.3 Impacts on surface water resources

Site and designing

- Site selection of schools close to the streams and rivers can cause water quality degradation and contamination of surface water resources (**Fig. 32).**

- Improper design of schools without toilets and sewage disposal system or septic tank can lead to degradation of surface water quality in the surrounding areas.

Construction Stage

- Water withdrawal may deplete the water source. Disposal of contaminated water can pollute a water source

Operation Stage

- Open discharge of toilet wastewater into a surface water body (stream, river, and canal) without treatment, during operation phase can deteriorate recipient body's water quality.

7.2.4 Mitigation for surface water resources impacts

Siting and design

- Site close to stream and river will not be selected for the proposed school. In case of unavoidable choice, the school design will include wastewater treatment and disposal arrangements.
- Particularly in water scarce areas, low water-consumption designs will be employed for toilets. Rainwater harvesting will also be included in the design.

Construction Stage

- 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 equipments 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. For toilet waste, appropriate arrangements such as septic tanks with soaking pits will be arranged.

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.
- The local community will be sensitised through health and hygiene sessions to protect the water resources from contamination.

7.2.5 Impacts on groundwater resources

Site and design

- Site selection does not pose any direct threats to the groundwater contamination.
- The location of toilet close to hand pump or tube well may increase vulnerability of contamination.

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.

7.2.6 Mitigation for groundwater resources impacts

Design stage

- The location of toilet will not be close to the hand pump or tube well or any other ground water source to avoid seepage and contamination of well 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.

7.2.7 Impacts on Air Quality

Site and design

- Site selection and design of school do not have any significant impact on air quality. However, schools should not be established close to any existing source of air pollution

Construction Stage

- The movement of vehicles, land excavations, structure demolitions, and onsite stacking of materials can leads to dust emissions and prolonged suspension of fine particulates (PM_{10}) in the ambient environment.
- Exhaust from vehicles and machinery during construction may deteriorate the local air quality.

Operation Stage

- Dust emissions from vehicles movement in the surrounding of school can also create minor adverse impact on air quality in surroundings of the school.

7.2.8 Mitigation for air quality impacts

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 mobilised to observe low speed limits in the school vicinity.

7.3 Impacts on biological environment

7.3.1 Impact on natural vegetation

Site and design

- Improper site selection could lead to removal of natural vegetation and cutting of trees for construction of school building**.**

Construction stage

- 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.

7.3.2 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.

7.3.3 Mitigation for biological impacts

Siting and design

- Sites located in ecologically sensitive areas (**Annex-2)** will not be selected for school to avoid 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.

7.4 Socio-economic impacts

7.4.1 Noise and vibration

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

7.4.2 Mitigation for noise and vibrations impacts

Construction stage

- The contractor will ensure to avoid use of noise generating machinery, equipments 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 equipments during construction work.
- The community will be sensitised 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.

7.4.3 Health and safety impacts

The environmental impacts pertaining to health and safety at worksite relating to the design, construction and operation stage of school are:

Designing

- Improper building design with poor ventilation and sunlight can lead to behavioural change and health impacts and create difficulties in learning.

- Improper building designs in flood plain or seismic prone areas can lead to increased vulnerability to disasters.
- Improper building designs 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 passersby, and residents.
- Haphazardly placed materials and debris presents higher risks of personal injury and inconvenience to schoolchildren and the staff **(Fig. 26).**
- Construction activities pose safety risks to children, teachers, construction workers, and nearby communities.

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 **(Fig. 13, 24, and 35).**
- Choking of sewer line and contamination of drinking water source can lead to occupational health impacts on school children
- Non-availability of safe drinking water in school can lead to health hygiene problems in schoolchildren.

7.4.4 Mitigation for health and safety impacts

Design stage

- Proper designing of school building will be followed according to guidelines in Section 8.4.4 to provide ventilation and natural lighting in the class rooms.
- Appropriate building codes as per guidelines in Section 8.4.3 will be followed to designs buildings in the seismic prone areas and flood plains to avoid risks of damage to health and property.

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 equipments 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

Operation stage

- Awareness about personal hygiene will be raised among the students and surrounding community through health and hygiene sessions by the IPs
- 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.

Table-16: Simplified Environmental and Social Impact Matrix

Environmental Components	Physical				Biological		Social and Socioeconomic aspects															
Physical Activities	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
Site Selection	-1	-1	0	N	-1	0	-1	N	-1	0	0	0	0	N	N	0	+1	+1	N	N	0	N
School Designing	N	-1	0	0	N	N	N	-1	N	N	-2	0	0	N	N	N	N	N	+1	N	-1	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
School Operation	-1	-2	-1	0	N	N	0	0	N	N	-1	N	N	N	+2	+2	+1	+1	N	N	0	N

Key: -2=High Negative Impact -1=Low Negative Impact 0=insignificant/Negligible impact
+2=High Positive Impact +1=Low Positive Impact N=No Impact

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This chapter describes the environmental and social management plan and guidelines for the construction of schools under the PGEB project. The Education Department, Balochistan will implement the ESMP to ensure that the adverse environmental and social impacts of the program are minimized. The institutional setup for implementing the ESMP has also been given and the roles and responsibilities of concerned persons, monitoring mechanisms and capacity building trainings needs have been described.

8.1 Institutional Setup for ESMP Implementation

The ESMP will be implemented under the overall supervision of Project Director, Project Management Unit (PMU), Education Department, Balochistan. The Project Director PGEB project is responsible for the implementation, monitoring and reporting of ESMP through the Safeguard Officer to be appointed by the project. The Construction, Supervision and Facilitation Partner (CSFP) will be carrying out construction work through contractors. CSFP will also be responsible for supervision of the contractors work on the sites.

The Safeguard Officer will act as focal person at the provincial level to coordinate with all stakeholders and at district level, the ESMP implementation responsibility will rest with the District Education Officer of the concerned district. 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-6** shows the proposed institutional mechanism for ESMP implementation from top to bottom level contractor, with assigned role and responsibilities.

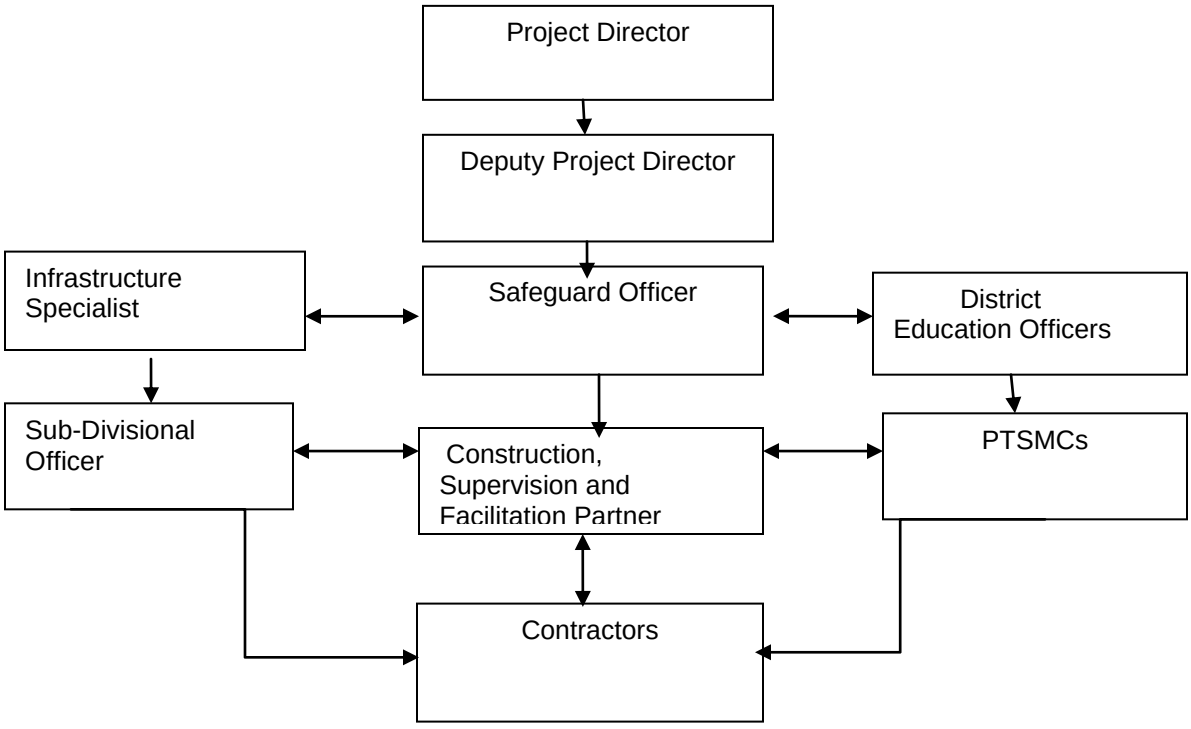
8.2 Roles and Responsibilities of Designated Officers

The role and responsibilities of the designated officers and other partners have been described in **Table-17**. However, in cases of overlapping roles by more than one officer, the higher officer will have the authority to re-designate the roles and responsibilities of those officers in the best interest of the project and to ensure clarity of responsibilities for ESMP implementation.

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, CSFP 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 Education Officer will be responsible for coordinating and monitoring activities at the district level and maintaining upward and downward linkages with the PMU and the field staff including contractor for ensuring smooth implementation of the ESMP and timely reporting of the environment and social issues arising in the wake of implementation. Coordination with other stakeholders including PTSMCs in the district and troubleshooting resolution will also fall in his/her responsibilities.

Exhibit.6: <u>Proposed Institutional Mechanism for ESMP</u>



Community will be organised in shape of Parent Teacher School Management Committee (PTSMC). The PTSMC will have a monitoring oversight role in the ESMP implementation during construction and operation of the schools. PTSMC will closely liaison with construction contractor at the site and report environment related issues to the District Education Officer for resolution and reporting.

The Infrastructure Specialist will be responsible for ensuring eco-friendly designing of school buildings compatible with local climate and seismic zoning. S/He will maintain close liaise with Construction, Supervision and Facilitation Partner and contractors to ensure compliance with ESMP during construction activities.

The Sub-Divisional Officer will be responsible for ensuring the implementation and monitoring of eco-friendly designs of school buildings during construction stage by the contractors. S/He will be responsible to ensure that the contractor follow and comply with appropriate buildings codes for seismic zoning during construction of buildings. S/He will maintain close liaison with contractor and Safeguard Officer on design related issues.

Construction, Supervision and Facilitation Partner (CSFP) will be responsible for construction work through contractors. CSFP will also be responsible for supervision of the contractors and

construction work on the sites. CSFP will work under the guidance of Infrastructure Specialist and Safeguard Officer in the PMU.

8.3 Environmental Mitigation and Monitoring Plan

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 and monitoring during design, construction and operation stage of the project. The proposed environmental mitigation and monitoring plan for PGEB project is given in **Table-18.**

8.4 Guidelines for Environmental Enhancement Opportunities

Balochistan province has different climatic regions and seismic zones. This diversity not only exposes the regions to variety of environmental threats but at the same time provide opportunities for developer to exploit this unique feature of the province for improvement of environmental conditions and minimize the risk factors. The following environmental and social guidelines have been developed to utilize such opportunities to protect the environment and conserve natural resources in the province. These guidelines will be translated into Urdu in the form of a manual or guidebook on “Environmental code of practices for construction of schools” by the Project Management Unit which will be followed during site selection, designing, construction and operation stages of project implementation, keeping in view the site specific strengths and opportunities to avoid or lessen the likely damage to environment. These manual or guidebook shall be printed in Urdu or local language and distributed among all stakeholders including education department officials, Implementing Partner, Contractors, PTSMC members, Teachers and Project Management Unit staff. The guidebook shall include the following:

1. Site selection guidelines
2. Eco-friendly design guidelines
3. Design for construction of Eco-san toilets
4. Design for rain-water harvesting facility
5. Earthquake proof and flood resistant design guidelines
6. Installation of solar powered lights and fans
7. Tree plantation and landscape development guidelines
8. Health and hygiene promotion in schools

8.4.1 Rain-Water Harvesting Facilities

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 will be introduced in the new school building at designing stage were feasible and used as an alternate source of water for hand washing, toilets use and irrigating the orchards and vegetable gardens in and around the school building to reduce pressure on the existing resources. The cost implication, local climatic condition and acceptance by the local community will be considered in designing such facilities in a particular school. Special design of toilets will also be employed to minimize water consumption.

8.4.2 Using Alternate Energy Sources

Pakistan is facing severe energy crisis. Prolong load shedding and non availability of electricity is a common issue of concern today all over the country, Balochistan is not an exception rather the energy crisis is worst in most of the province comparing to the rest of Pakistan. Introducing alternative energy sources such as solar powered lighting, fans and other appliances will be considered as an option in the new schools. The option will be decided keeping in view the site characteristics and local climatic conditions, beside its economics and social acceptability. The introduction of solar powered schools will minimize the additional load expected on local energy supplies.

8.4.3 Earthquake and Flood Resistant Designing of Buildings

According to the relative severity of hazards index[76] for earthquake, Kila Saifullah, 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 buildings will be constructed for new schools with proper designing and building codes followed as per the seismic zoning classification of the area. Keck, Lasbela and Kachhi (Bolan) districts are located in the flood plain area of the province. The structural designs of buildings in these districts will address the flood risks. Appropriate site specific flood protection measures will be adopted in the construction of proposed schools in these districts.

8.4.4 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. Under the PGEB project 110 primary and 20 middle level shelter less schools will be constructed. The main environmental parameters to be considered during construction of new building are protection, providing insulation and promoting natural ventilation for thermal comfort, health and hygiene, safe water supply and sanitation 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 the designing to construct 130 shelter less schools in the project area (12 districts).

Environmental aspect in design	Eco-friendly design guidelines
Structure design of schools	The building 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 Balochistan Education Foundation has developed comprehensive structural guidelines and manual for construction of community schools in Balochistan, which must be followed for the PGEB project.

[76] Government of Balochistan (2006), Provincial Disaster Risk Management Plan

	The designs will include facilities for special children (ramps, hand rails, and others).
Drinking water facility	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	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.
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 BESP 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	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 affect 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's 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.

8.4.5 Tree Plantation and Landscaping

Plantation in open spaces will be a permanent feature of all proposed schools. The designs of new buildings will have provision for tree plantation in, around the compound walls, and inside the premises, where applicable. Community will also be sensitised through PTSMCs to carry out landscaping and re-vegetation to match the natural topography and enhance environmental aesthetics of the schools area. Fast growing iindigenous species of trees, shrubs and flowers will be planted in the school compound through community participation to enhance the environmental aesthetics

8.4.6 Health and Safety Guidelines

Preventive measures will be the main strategy for ensuring health and safety of schools children's during operation as well as workers at worksites during construction of buildings. A detailed health and safety management plan (Table-19) has been prepared to ensure health and safety of workers at worksites and children's during schooling hours. First aid box and fire extinguisher will 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 equipments to the workers during construction work at worksites.

8.4.7 Ban on Child Labour

Child labour or bonded labour will not be allowed in the construction of proposed schools. The guidelines set forth by ILO Written Convention (C.138) on child labour and Employment of Children Act, 1991[77] will follow while employing workers. The stipulated age for hiring labour will not be below the age of fourteen (14) years.

8.4.8 Livelihood Improvement Opportunities

The construction of schools 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 schools construction, 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.

[77] Employment of Children Act, Government of Pakistan (1991)

8.5 Monitoring and Reporting

A comprehensive monitoring plan, comprising monitoring parameters, frequency and responsibility of monitoring is outlined in **Table-18.** Compliance to the proposed monitoring plan will be affected through the following monitoring mechanism:

8.5.1 Internal Monitoring

District Education Officer (DEO) will monitor the implementation of mitigation plan at the district level with community participation. PTSMCs will regularly check the observance of proposed mitigation measures and guidelines by the construction contractor at worksites. PTSMCs will also be responsible for ESMP compliance during school operation phase. DEOs will make routine as well as surprise visits of the schools in their operational areas, both during construction and operation phases to ensure ESMP compliance. He/she will closely liaise with PTSMCs to get regular feedback from each school regarding ESMP. He/she will send monthly reports to the Safeguard Officer at PMU for evaluation and compliance.

Repair, rehabilitation and minor construction activities, if any, involved in providing missing facilities to the existing schools shall also follow the mitigation plan proposed in Table-18 and health and safety management plan proposed in Table-19. Guidelines given in Section 8.4 and 6.5 will be followed for electricity provision, toilets, water supply and construction of additional classrooms. Compliance monitoring of these activities will be carried out by the DEO and PTSMCs at the community level to ensure the implementation of mitigation measures and guidelines for environmental enhancement opportunities.

Capacity building training for DEOs and PTSMCs will ensure effective monitoring and reporting of ESMP compliance. Necessary resources such as vehicle and fuel will be provided to the DEOs for monitoring. The Monitoring and Evaluation Officer, PMU will also randomly conduct monitoring of the school sites in the project areas, both during construction and school operation phases and submit their monitoring reports to the Safeguard Officer in the PMU for necessary corrective action.

The DEO will compile monitoring reports of the district and send to the Safeguard Officer for evaluation and mid course correction, if required. The Safeguard Officer will process, analyse 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.

8.5.2 External Monitoring/Third Party Validation

The primary purpose of the external monitoring will be to see that both construction and the operational phase activities have been undertaken in line with the ESMP recommendations. Third Party Validation (TPV) through an independent monitoring agency will be carried out on annual basis 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. For TPV, environmental and social specialists having

relevant expertise and previous experience will be engaged. A detailed Terms of Reference for hiring the services of TPV is given at Annex-F.

8.6 Capacity Building and Training Plan

Capacity building and training of the staff associated with ESMP implementation play an important role towards achieving its objectives. The staff designated for ESMP implementation at the PMU and district level may not have the desired technical expertise to carry out monitoring of the proposed environmental and social mitigation measures without capacity building and trainings. Specific training on environmental and social mitigation plan will be arranged for the Safeguard Officer, District Education Officers, PTSMC members and Project Management Unit team to deliver their monitoring responsibilities in an organized and effective manner as per requirement of the monitoring plan.

Table-20 gives a tentative schedule of capacity building and trainings program for PGEB project. The prime objective of the trainings is to enhance the technical capacity of staff associated with ESMP implementation and to keep the Project Management Team, Implementing Staff of Education Department, and PTSMCs aware of the emerging environmental and social issues, and enabled them to resolve those issues through proposed mitigation measures.

Fourteen (14) training workshops, two at provincial level and 12 at district level, are proposed in the first year of the project. In second and third year, four refreshers, trainings at provincial level would be arranged on annual basis. The Provincial and District level officers involved in the ESMP implementation will primarily attend these 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 guidelines.

In order to fetch the best quality resource persons for these trainings it is proposed to outsource these trainings to an environmental consultancy firm or an NGO of national repute and standing. **Table-21**, indicate the approximate cost of the proposed capacity building trainings for the project duration. The first phase of PGEB project is three years and the training cost has estimated for the first phase of the project.

8.7 ESMP Disclosure

The Environmental and Social Mitigation Plan (ESMP) will be publicized and disclosed on the website of Education Department, Government of Baluchistan. It will also be disclosed on the project specific Infoshop of the World Bank. Hard copies of ESMP will also be shared with the Provincial EPA, Implementing Partner NGOs and Construction Contractors, Civil Society Organizations. A copy of the ESMP will be placed in the Project Management Unit, PGEB project for public access. Executive summary of ESMP will 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

8.8 ESMP Costs

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 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 Education Department through contractors. The total estimated cost for ESMP implementation and monitoring is **PKR 7.02** million for a three year project period. **Table-22**, indicate the details of cost estimates for implementation of the ESMP during the three year project period.

Table-17: Role and Responsibility of Designated Officer

Organisation	Position	Responsibility	Jurisdiction
PMU	Project Director,	Ensure ESMP implementation	Entire Project Area
PMU	Deputy Project Director	Coordination with all stakeholders in ESMP implementation	Entire Project Area
PMU	Safeguard Officer	Monitoring and reporting of ESMP at provincial level	Entire Project Area
Secondary Education Department, Balochistan	District Education Officer	Monitoring and Reporting of ESMP at district level	District Concerned
PMU	Infrastructure Specialist	Responsible for eco-friendly designing of buildings	Entire Project Area
PMU	Sub-Divisional Officer	Monitoring the implementation of eco-friendly designs in the school buildings	Entire Project Area
Private Firm	Construction, Supervision and Facilitation Partner	Supervision of construction work on sites	Entire Project Area
PTSMC	Members	Monitoring on site construction and operation of school	School level
Contractor	Contractor	Compliance with ESMP guidelines	School level

TABLE-18: ENVIRONMENTAL AND SOCIAL MITIGATION AND 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 siting can lead to loss of vegetative cover, removal of trees, erosion and loss of useful agricultural land	Appropriate site selection and designing for school will be done according to the guidelines provided in **Section 6.2.1 and 8.4.4** in order to entail no or minimal disturbance to the soil and land.	Education Deptt/PMU	Implementation of site selection guidelines are verified	Two times (one at the time of site selection and second at design stage)	SDO/ Safeguard Officer
2	The location and siting of school in difficult terrain and far away from the population may lead to accessibility and easement problem for girls	Primary school particularly girls school shall not be located in difficult terrain and very far away from the population to ensure easy and equal access for all girls students and teachers. Site selection of school will be done according to guidelines provided in **Section 6.2.1** to ensure minimum disturbance to environment.	Education Deptt/PMU	Implementation of site selection guidelines are verified	Once at the time of site selection	Safeguard Officer/SDO
B	**Impacts on surface water**					
3	Siting close to river and streams can cause surface water quality degradation and contamination of water resources	Site adjacent to river and stream will be avoided to prevent surface water contamination.	Education Deptt	Site location is verified	Once at the time of site selection	DEO/ PTSMC
4	Improper design without tolilets and sewage treatment and disposal system can lead to surface water contamination.	The design of school building will include sewage treatment (such as septic tank with soaking pit).	DFP (PMU)	Design of school for sewerage treatment system is verified	One time (at the design stage)	Safeguard Officer/SDO
5	Excessive use of water can lead to depletion of surface water resources in the area.	Water efficient design of toilets will be provided to reduce impact on the surface water resources.	DFP (PMU)	Water efficient toilet design will be verified	Two times (one at design and then at	Safeguard Officer/SDO

					operation stage)	
		Rainwater harvesting facility, particularly in water scarce areas, will be provided in schools building to reduce impact on surface water resources.	DFP/CSFP	Raainwater harvesting will be verified	Two times (one at construction stage and second at operational stage)	DEO/SDO
C	**Impacts on ground water quality**					
6	Design of toilets close to hand pump or tube well base can increase risk of ground water contamination through natural percolation and downward seepage of contaminated water	The toilet will not be located close to the hand pump, tube well or any other ground water source to avoid seepage and contamination of ground water.	DFP (PMU)	Design & location of toilets in school building is verified	Two times (one at the design stage and second at construction stage)	Safeguard Officer/SDO
D	**Impacts on natural vegetation**					
7	Improper site selection and design can leads to removal of vegetation and cutting of trees for school construction.	Sites located in ecologically sensitive areas (**Annex-3)** will not be approved for schools to avoid impact on flora and fauna.	DFP (PMU)	Site is checked against Annex-3 to ensure compliance.	One time (during site selection stage)	Safeguard Officer/SDO
		Tree plantation plan will be included in the school design to reduce the impact.	DFP (PMU)	Tree plantation is verified	Once (design of school is checked for open spaces)	DEO/SDO
Construction Stage						
A	**Impacts on soil and land**					
8	Excavations and removal of trees can lead to soil erosion and landslides in	Removal of vegetation and trees will be avoided to the extent	Contractor	Tree plantation is monitored	Two times (one during	DEO/ PTSMC

	hilly terrain.	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			excavation and second after plantation is done)	
		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)	DEO/ PTSMC
		Diggings, if required for foundation, will only be carried out in specified area, as per the engineering drawings and excavated earth material will be used for filling and compaction.	Contractor	Exposed soil compaction is monitored	Once (after excavation and foundation work completed)	DEO/ PTSMC
9	The excavation and digging of earth for construction of school 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 2.10.5.	Contractor and PMU	Procedure for chance find management is verified	Two times (one after discovery and then handing over of site to concerned authorities)	PMU/ Safeguard Officer
10	Disposal of contaminated construction wastes can lead to soil contamination	Construction wastes will be collected and disposed off in designated landfill areas	Contractor	Disposal of construction wastes monitored	One time (during construction stage)	DEO/PTSMC
11	Disposal of left over construction material and excavated soil can lead to soil contamination	Left over construction and excavated materials will be disposed off in designated landfill to avoid soil contamination.	Contractor	Disposal of construction wastes monitored	Once (at completion of construction work)	DEO/PTSMC
12	The used borrow pits may lead to soil	Used borrow pits will be restored	Contractor	Restoration of	Once (after	DEO/PTSMC

	degradation and erosion.	and levelled back to control soil degradation.		borrow area checked	construction work is over)	
B	**Impacts on surface water**					
13	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 equipments and vehicles during construction.	Contractor	Water consumption is monitored	One time (during middle of construction work)	PTSMC
14	Disposal of large quantity of wastewater during construction into a nearby water body can pollute the waters source.	The contractor will dispose the construction wastewater and toilet wastewater through a soaking pit of appropriate capacity, which be levelled back after completion of construction work.	Contractor	Monitor wastewater disposal during construction	One time (during construction work is in progress at the site)	DEO/ PTSMC
		Appropriate sewage disposal arrangements (such as septic tank with soaking pit) will be made for temporary toilets if built at the site.	Contractor	Septic tank and soaking pit is verified	Once (during middle of construction work)	DEO/ PTSMC
C	**Impacts on air quality**					
15	Dust emission from construction work can lead to deterioration of local ambient air quality	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)	DEO/PTSMC
		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.	Contractor	Excavation work is monitored	Two times (during demolition and	DEO/PTSMC

					then excavation stage)	
16	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 emssions	Monthly (Vehicle emission certificate verified)	DEO/PTSMC
D	**Impacts on flora and fauna**					
17	Excavation work can lead to removal of trees and vegetation	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 cuting during construction and plantation after construction is over)	DEO/PTSMC
E	**Noise and vibration impacts**					
18	Construction activities can lead to unpleasant noise during school hours and at nighttimes.	The contractor will avoid use of noise generating machinery, equipments during school hours and at night	Contractor	Use and timimgs of noisy equipment monitored	Twice a week (during construction)	DEO/PTSMC
		The contractor will use proper and good quality lubricants in machinery and equipments to minimise noise pollution.	Contractor	Use of lubricant checked randomly	Monthly 4 times (once in a week)	DEO/PTSMC
19	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 equipments during construction work. The community will be sensitised to observe silence zone in the school premises. Proper signboard will be installed indicating ban on	Contractor	Noise level is monitored	Monthly (once in a month noise pollution is observed)	DEO/PTSMC

		use of pressure horns by moving vehicles around the school.				
Operation Stage						
A	**Impacts on soil and lands**					
20	Disposal of municipal wastes and toilet wastewater can contaminate the land.	It will be ensured that toilets and associated sewage treatment systems are maintained in proper working condition.	PTSMC	Sewerage treatment is monitored	Quarterly (Wastewater sample is collected and anamysed in laboratory)	DEO
		Municipal wastes are disposed off in designated landfill area.	PTSMC	Waste disposal is monitored	Quarterly (landfill site is inspected)	DEO
		Tree plantation around the periphery of school building will be carried out to ensure soil stability and control erosion	Local community	Tree plantation verified	One time (after plantation is completed by locals)	DEO
B	**Impacts on surface water**					
21	Open discharge of sewage into nearby water bodies can contaminate water quality.	Sewage will not be dispose directly to river and stream in surrounding area.	Contractor	Disposal of sewage monitored	Quarterly (sewage sample taken and analysed in laboratory)	DEO/PTSMC
		The local community and PTSMC will be sensitised through health and hygiene sessions to protect water resources from contamination.	Education Deptt and IPs	Training sessions are monitored	Randomly (once during the training session)	Safeguard Officer/DEO
C	**Impacts on groundwater**					

22	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	Ground water sample analysed	Two times in year (one in January and then in July)	TPV/EPA
D	**Impacts on air quality**					
23	Dust from vehicles movement around the school premises can create minor adverse impact on air quality in surroundings of the school.	Community will be sensitized to observe low speed limits in premises of school	Education Deptt and IP	Awareness session monitored	Randomly (once during project period)	DEFP/PTSMC
		The exposed soil in/around school premises will be re-vegetated and landscaped with community participation to control dust blowing.	Local Community and PTSMC	Plantation and re-vegetation verified	Annual (during school inspection by education)	DEFP
E	**Noise Pollution**					
24	Moving vehicles and use of pressure horns around the schools could be source of unpleasant noise	Community will be sensitized to observe silence zone in the school premises and proper signboard will be installed indicating ban on use of pressure horns by moving vehicles around the school	Education Deptt and IP	Installation of sign board verified	Annual (during school inspection by education deptt)	DEFP/PTSMC

TABLE-19: HEALTH AND SAFETY MANAGEMENT PLAN FOR CONSTRUCTION WORKSITES

S#	Health and Safety issue	Proposed Mitigation Measures	Responsibility	Monitoring Parameter (s)	Frequency	Responsibility
A	**Siting and design stage**					
1	Improper siting can lead to accessibility problems for school childrens	Site selection guidelines in **Section 6.2.1** will be followed for construction of new school buildings.	Education Department	Site is inspected for compliance	One time (during site selection)	Safeguard Officer
2	Improper building design with poor ventilation and sunlight can affect the health and learning ability of childrens	Guidelines for eco-friendly designing of building in **Section 8.4.4** will be followed to provide ventilation and natural lighting in the class rooms.	DFP	Design is verified for ventilation & sunlight	Once (after design is completed)	Safeguard Officer
3	Improper building design in earthquake zone or flood plain can lead to increase vulnerability to disasters, health and safety risks.	School designs will follow guidelines in **Section 8.4.3** for seismic zoning and flood resistant buildings to avoid risks to life, health and property.	DFP	Design is verified for seismic codes and flood proof buildings	Once (after design is complete)	Safeguard Officer
4	In sufficient quantity of water in toilets can lead to health hygiene problems.	Water storage tank will be included in the design of school to ensure availability of water in toilets for hand wash.	DFP	Water storage tank verified in the designs	Once (after design is complete)	Safeguard Officer
		Eco-san toilet design mentioned in Section 6.5 will be followed for construction of toilets to minimise water consumption.	DFP	Eco-san design of toilet is verified in the design	Once (after design is complete)	Safeguard Officer
		Rain-water harvesting guidelines in Section 8.4.1 will be followed to provide alternate source of water for toilets and handwashing in water scarce areas to ensure personal hygiene	DFP	Rain-water harvesting facility is verified at design stage	Once (after design is complete)	Safeguard Officer
5	Improper building design can lead to difficulties and safety issues for	The building designs will cater to the needs of special children (such as	DFP	School designs verified for	Once (after design is	Safeguard Officer/DEO

	special children.	ramps and hand rails will be provided where needed)		ramps, hand rail	complete)	
6	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)	SDO/ Safeguard Officer
B. Construction Stage						
7	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	Foundations areas for excavation will be properly marked with lime and physical barriers will be erected around the excavated areas to restrict access. All utilities supply lines present in the excavation area shall be closed from the manhole before starting excavation. Fire extinguisher and gas spill control equipments shall be provided at the site.	Contractors	Marking of foundation area verified	Once (before excavation is started)	DEO/PTSMC
8	Open dumping and stockpiling of construction materials in open spaces and streets can result in blocking of route and inconvenience for passersby, neighbours, 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)	DEO/PTSMC

9	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)	DEO
10	The construction work and equipment may lead to safety hazards for workers and nearby communities	The contractor will provide protective equipments 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)	DEO/PTSMC
		Protective fencing will be used around the construction sites, excavated areas, and voids.	Contractor	Fencing around worksite is verified	Once (during construction stage)	DEO/PTSMC
11	The operation of construction machinery and equipments 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)	DEO
12	Welding and cutting operation during construction poses a serious health and safety risk for workers	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. iii. Welder shall wear an approved helmet or goggles, proper protective gloves, and clothing. iv. Fire extinguishing equipment shall be within 6m (20ft) of all	Contractor	Wearing of Personal Protective Equipments shall be verified	Randomly (during construction work on the site)	DEO

		locations where welding and cutting equipment is used.				
Operation Stage						
13	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)	DEO/PTSMC
14	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	DEO
		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)	DEO/PTSMC
		Supply of safe drinking water will be ensured	PTSMC	water quality is checked	Biannual (Januray and July of the year)	DEO/PTSMC
		Awareness raising will be carried out on health and hygiene aspects including hand wash with soap after going to toilets	Education Deptt and IP	Awareness sessions monitored	Once (during project period)	DEO/PTSMC
15	Non-availability of soap in school toilets may lead to health and hygiene problems in children's	Availability of soap outside the toilets will be ensured	Education Department and IPs	Provision of soap is verified	Weekly (during inspection)	Teachers/ PTSMC
16	Exposed electrical wiring and cables in the school building may pose health and safety risks for school children's	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)	DEO
17	Overcrowding of students in class rooms may leads to compromise the health of students and transmission	The number of students in class rooms shall not exceeds 40. Proper ventilation and seating	Teacher PTSMC/	Number of student roll verified	Biannual (April and November)	DEO

	of diseases	arrangements shall be observed in class rooms during school operation				
18	Non-availability of traffic signals around the schools may lead to traffic accidents and pose serious threat to the safety of children's.	Traffic signals 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)	DEO
19	Non functioning 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

Table -20: Tentative Schedule of Capacity Building and Training Plan

Description of Training	Training module	Location	Frequency	Participation
Two-day Training Workshop	▪ Objectives and need of ESIA study ▪ Management of environmental issues and mitigation strategies ▪ Legal requirements of the ESMP ▪ Monitoring Mechanism ▪ Documentation and reporting procedures	PMU Quetta	One training workshops in a year	About 20 participants including PD, DPD, Safeguard Officer, DEOs, Infrastructure Specialist, SDO and Management of Education Department, Balochistan
One Days Training Workshop	▪ ESMP with special focus on mitigation measures during construction stage	PMU, Quetta	One training workshops in a year	All contractors, sub-contractors, and supervision consultants
One Day Training Workshop	▪ ESMP with special focus on mitigation measures during operational phase of schools and health hygiene issues	12 training sessions at district level (one session each in district)	Once in project period	PTSMCs members and local community activists

Table -21: Estimated Costs of Capacity Building Trainings

Training Component	Cost (Rs.)	
	One-day W/shop	Two-day W/shop
Training Design / Module Development	25,000	50,000
Training Manual and Reading Material	50,000	100,000
Resource Person Fee	20,000	40,000
Miscellanées (refreshments, venue arrangement, audio-visuel)	25,000	50,000
Total (for a single training)	120,000	240,000
Annual cost for 13 one-day and 01 two-days trainings in the first year	1,800,000	
Total Cost for three year project period (18 training workshops)	2,520,000	

Table-22: ESMP Implementation Cost

Type of input	Description	Annual Cost (PKR)	Total Cost for project duration (PKR)
Capacity Building Trainings	Training of project staff	1,800,000	2,520,000
External Monitoring/ Third Party Validation	Independent Monitoring Consultants	1,500,000	4,500,000
Mitigation Costs	Built in BOQ/Bidding Document	Part of project costs	Part of project costs
Total		3,300,000	7,020,000
Total (PKR in Millions)			**7.02**

Figure 1 to 36: Photographs of the Schools Surveyed During Study

Figure-1: Shelter less School GBPS/ Killi Urmazh, District Pishin (operating in mosque)

Figure-2: Community meeting in Rudh Mulazai, (killi Urmazh District Pishin

Figure-3: GBMS /Sakhobi Amir Khan, UC Rudh Mulazai, Dist Pishin

Figure-4: Kacha latrine near hand pump in GBMS Skhobi Amir Khan, Pishin

Figure-5: GGPS/Sakhobi Amir Khan, UC Rudh Mulazai, District Pishin (Toilet without flush)

Figure-6: Water Storage Facility in GBMS Cant Loralai bazaar

Figure-7: GGPS Sakhobi Amir Khan, District Pishin (Septic tank used as solid wastes dump)


Figure-8: Site for Shelter less School in Kach Killi, Matherzai, District Pishin (near mosque)

Figure-9: Shelter less School Kach Metherzai, District Pishin (operating in *Bramda of mo*sque)

Figure-10: Consultation with local community (Nizamudin and Alla Bux), Loralai

Figure-11: GBPS of Uryagai kudezai (Shelter less UC-Uryagai, District, Loralai (under trees)

Figure-12: Furniture of Shelter less School Uryagai dumped in this room

Figure-13: GGPS/Arbasin UC-Ward #4, District Loralai (waste dumps near School)

Figure-14: An Overview of Dried Puraly River District Lasbela

Figure-15: Consultation meeting with community in Lasbela District

Fugure-16: Children Playing in GGPS Hindu Mohalla Uthal District Lasbela

Figure-17: Overview of newly constructed GGPS Morand Colony Uthal, District,Lasbela

Figure-18: DEO Lasbela Mohammad Ayoub Gungo is aware of trees importance

Figure-19: GGPS/Bandat Amandzai UC-Town, District Killasaifullah

Figure-20: GGPS/Bandat Amandzai, District Killasaifullah (damage sokage pit of laterine)

Figure-21: GBPS/Bandat Amandzai, District Killasaifullah (insufficient furniture in class room)

Figure-22: GBPS/Shabozai, District Killasaifullah (un-hygienic latrine without water connection)

Figure-23: Future leaders study in an unsafe and unhealthy school building (GBPS/Shabozai UC-town Dist Killa Saifullah)

Figure-24: GGPS Baharwala, District Killa Saifullah (water storage tank and laterine)

Figure-25: Natural Vegetation around GGPS Bandat Amandzai, District Killa Saifullah

Figure-26: Girls sitting on the floor in GGPS Bandat Amandzai, District Killa Saifulla

Figure-27: GBPS/Faiz Abad (without latrine and boundary wall), Kachhi District

Figure-28: GGPS/ Mohala Zargar UC Dahdar Distt Kachhi
(Small effort can turn around the school into a healthy place)

Figure-29: Waste dump in front of School (GGPS/Molalla Zargar), District Kachhi

Figure-30: Meeting with Community in Lehri Abad, District Kachhi

Figure-31: Tomb Bagan Baba in between GGMS/GBPS Bagan Baba, District Jaffer Abad

Figure-32: GGPS /Nasrullah Rind, UC-4, District, Jaffer Abad (under construction)

Figure-33: Consultation meeting with community in Dara Allah Yar, Jaffer Abad District

Figure-34: Latrine close to Water Storage Tank
(GGPS Shaeed Murad Colony, District Jaffer Abad)

Figure-35: Animal Waste in front of GGPS/ Shaeed Murad, Colony, District Jaffer Abad

Figure-36: Community Meeting in Javaid Buggti House, Shaeed Murad Colony, Jaffer Abad

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Annex-A: List of Schools Visited During Field Study

S#	District	Name of School	UC	Proposed Construction Work			
				Rooms	Toilets	B/Wall	WS Connection
1	Kachhi	GGPS Kalo Khan	Mushkaf	0	2	1	Connection + storage tank
2	Kachhi	GBMS Lehri Abad	Saleh Abad	2	4	Repair	0
3	Kachhi	GGPS Mohalla Zargar	Dahdar	0	0	0	0
4	Kachhi	GGPS Faiz Abad	Saleh Abad	0	0	0	0
5	Kachhi	GBPS Faiz Abad	Saleh Abad	0	2	1	Connection + storage tank
6	Jaffer Abad	GGMS Bagan Baba	UC-3	0	0	0	0
7	Jaffer Abad	GGPS Nasrullah Rind	UC-4	2	2	1	Connection + storage tank
8	Jaffer Abad	GGPS Jammot Abad	UC-4	2	1	0	Water storage tank
9	Jaffer Abad	GGPS Sheed Murad Colony	UC-4	0	0		0
10	Lasbela	GBPS Morand Colony	Uthal	1	1	0	0
11	Lasbela	GGPS,Morand Colony	Uthal	1	0	0	Connection + storage tank
12	Lasbela	GGPS Dura Goth	Uthal	0	0		0
13	Lasbela	GBPS Dura Goth	Uthal	2	2	1	Connection + storage tank
14	Lasbela	GGPS Hindu Mohallah	Uthal	0	0	0	0
15	Killa Saifullah	GBPS Shobozai	Town	Repair	2	1	Connection + storage tank
16	Killa Saifullah	GGPS Baharwala	Town	0	0	0	0
17	Killa Saifullah	GGPS Bandat Amandzai	Town	2	2	1	Connection + storage tank
18	Killa Saifullah	GBPS Bandat Amandzai	Town	1	0	0	Connection + storage tank
19	Killa Saifullah	GBPS Baharwala	Town	0	0	0	Connection + storage tank
20	Loralai	GGPS Zagharloon	Saddar	0	0	0	0
21	Loralai	GGPS Spin Pan	Lahore	2	2	1	Connection + storage tank
22	Loralai	GGPS Nizam Abad	Lahore	2	2	0	0
23	Loralai	GGPS Arbasin	Ward No 4	1	2	1	Connection + storage tank
24	Loralai	GBMS Cantt	Cantt	0	0	1	0
25	Loralai	GBPS Uryagai Kudezai	Uryagi Kudezai	2	2	1	Connection + storage tank
26	Loralai	GGPS Dhobi Ghat	Ward # 2	3	3	1	Connection + storage tank
27	Pishin	GBPS Kach Mehterzai	Rodh Mulazai	2	2	1	Connection + storage tank
28	Pishin	GGPS Skhobi Amir khan	Rodh Mulazai	2	2	1	Hand pump
29	Pishin	GBMS Skhobi Amir khan	Rodh Mulazai	4	4	1	Hand pump
30	Pishin	GBPS Killi urmazh	Rodh Mulazai	2	2	1	Hand pump
31	Pishin	GGPS Killi Mehterzai	Bostan	2	2	1	Connection + storage tank
32	Pishin	GBHS Bostan	Bostan	0	4	1	Small Bore + Tank

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

Annex-C: Wild Birds and Animals Protected under the Balochistan Wildlife Act, 1974

(Included in Schedule-III: animals which shall not be hunted, killed or captured)

A. BIRDS

1. Following species of Ducks:
   1) Marbled teal, *Anas angustirostris*
   2) Spot bill duck, *Anas poecilorhynchus*
   3) Cotton teal, *Nettapus cormondelica*
   4) White headed stifftailed duck, *Oxyura leucocephala*
   5) White winged wood duck, *Cairina scutulata*
   6) Pink headed duck, *Rhodonessa caryophyllacea*

2. All members of the family:

a)	Ardeidae	Herons, night herons, paddy birds, egrets or bitterns.
b)	Pelicanidae	Pelicans
c)	Ciconiidae	Storks
d)	Threskiornithidae	Ibises and spoonbill
e)	Phoenicopteridae	Flamingoes
f)	Accipitridae	Hawks, vultures, kites, buzzards, hawk-eagle, eagles, harriers and ospreys
g)	Falconidae	Falcons, kestrels and hobbies
h)	Phasianidae	Pheasants, partridges and quails (other than specified in 1st schedule)*
i)	Gruidae	Cranes
j)	Otididae	Bustards

3. All members of the genera *Anser* and *Branta* (all geese including the grey lag and the barheaded goose)
   a) Cygnus all swans
   b) Ducula Imperial pigeons

4.*Pterocles alchata* (Large pintailed sandgrouse)

B. MAMMALS

1. Sind Wild Goat
2. Markhor (Including Chiltan Markhor and Straight Horned Markhor)
3. Urial or Gad
4. Himalayan Rhesus Monkey*
5. Blandford Fox
6. Balochistan Black Bear
7. Common Otter*
8. Smooth coated Indian Otter
9. Caracal
10. Pallas's Cat
11. Lynx*
12. Sand Cat
13. Snow Leopard*
14. Leopard
15. Cheetah**
16. Wild Ass**
17. Spotted Deer*
18. Hog Deer*
19. Indian Gazelle
20. Goitred or Persian Gazelle-

(*, Does not occur in Balochistan; **, Now extinct in Balochistan.)

Annex-D: 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, Nasirabad.
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-E: List of Stakeholders Consulted During Study

a) Institutions and Government Line Departments

Sr.	Name	Designation & Department
1.	Umbreen Arif	Team Leader Promoting Girl Education Project, Balochistan The World Bank, Islamabad
2.	Dr. Javaid Afzal,	Environment Specialist, The World Bank, Islamabad
3	Mr. Muhammad Omar Khalid,	Environment Specialist, The World Bank, Islamabad
4	Rashid Razaq,	Additional Secretary, Education Department, Government of Balochistan
5	Nizam Mengal ,	Director, Secondary Education, Government of Balochistan
6	Abdul Waheed Khan	Deputy Secretary (Dev)/ Focal Person PGEB Project Education Dep't, Government of Balochistan
7	Mohammad Zulfiqar Jatoi	Deputy Focal Person, Policy Planning and Implementation Unit (PPIU) Education Department, Government of Balochistan
8	Tahir Durrani	Director, Environmental Protection Agency (EPA) Government of Balochistan
9	Yousaf Khan Kakar	Chief Conservator (Forest & Wildlife) Government of Balochistan
10	Zabardast Khan Bangash	Manager Balochistan Program IUCN – The World Conservation Union, Balochistan
11	Gulam Nabi	Deputy Director (Legal), Environmental Protection Agency, Government of the Balochistan
12	Pervaiz Iqbal Safi	Chief Executive, Water, Environment & Sanitation Society (WESS) Airport Road, Quetta, Balochistan
13	G.N. Marri	Provincial Project Manager Strengthening PRS Monitoring Project P&D Department, Government of Balochistan
14	Nasseb Ullah Khan .	Program Officer, Balochistan Education Foundation Quetta
15	Asad Ullah Khan	Managing Partner CAMEOS Consultant Chaman Housing scheme Quetta, Balochistan
16	Abdul Nabi Sasoli	District Education Officer, Kachhi District. Cell: 03452223334/0832415225
17	Abdul Wahid Kakar	District Education Officer,Jaffer Abad District. Tel: 0838510802

18	Mohammad Ayoub Gungo	District Education Officer, Lasbella District, Tel: 0853610462_540/Cell: 03333096743/03058060551
19	Khan Mohammad	District Education Officer, Killa Saifullah District. Cell: 03343888861
20	Gulab Khan	District Education Officer, Loralai District. Cell: 03023824447
21	Abdul Rashid	District Education Officer, Pishin District. Cell: 03128056405

b) Community Consultation during Survey of Schools in Project Area

S#	District	Union Council	Name of Schools	Name of Participants	Contact No's
1	Kachhi	Saleh Abad	GGPS Faiz Abad	Malik Nasrullah	
				Nisar Ahamad	
				Mohammad Nawaz	03133420584
2	Kachi	Saleh Abad	GBMS Lehri Abad	Haq Nawaz	03003703406
				Jamil Ahamad	
				Haji Hussain Lehri	
				Abdul Samad	
3	Kachi	Mushkaf	GGPS kalo Khan	Mohammad Ramazan barozai	03078701907
				Mohammad Sharif	
4	Kachi	Dahdar	GGPS Mohalla Zargar	Mohammad Yousaf Rind	
				Haji Riaz	
5	Jaffer Abad	UC-4	GGPS Shaeed Murad colony	Haji Amir Mohammad	
				Mohammad Tayab	
				Javaid Buggti	03463417631
6	Jaffer Abad	UC-4	GGPS Jammot Abad	Hazoor Bux	03443177944
				Mohammad Tariq	03453835333
				Haji Dani Bux	
7	Jaffer Abad	UC-4	GGPS Nasrullah Rind	Tariq Rind	03339222903
8	Jaffer Abad	UC-3	GGMS Bagan Baba	Jbraim Sb	03473438371
9	Jaffer Abad	UC-3	GBPS Bagan Baba	Khadim Hussain Jatoi	03003845685
10	Lasbela	Uthal	GGPS Morand Colony	Zafar Khan TMO	
				Wadera Rahim Bux	
11	Lasbela	Uthal	GBPS Morand colony	Babo Sheedi	
				M. Ali Mundra	
12	Lasbela	Uthal	GGPS Dura Goth	Mohammad Aslam	03453397741
13	Lasbela	Uthal	GBPS Dura Goth	Mano Shah	
14	Lasbela	Uthal	GGPS Hindu Mohalla	Ashoq Kummar	
				Wedhey Kummar	

				Babo Lal	
15	Killasaifullah	Town	GGPS Baharwala	Sher Mohammad/Shero	03333868481
16	Killasaifullah	Town	GBPS Baharwala	Abdul Satar	03337781496
17	Killasaifullah	Town	GBPS Shabozai	Molvi Amanullah	03218071287
				Mohammad Yousaf	03218070475
				Kaleemullah	03053598006
18	Killasaifullah	Town	GBPS Bandat Amandzai	Malik Abdul Bari	03033845124
				Mohammad Tahir	03337780744
19	Killasaifullah	Town	GGPS Bandat Amandzai	Malik Abdul Bari	03033845124
20	Loralai	Ward # 4	GGPS Arbasin	Saifullah Nasir	03068381984
21	Loralai	Ward # 2	GGPS Dhobi Got	Malik Dost Mohammad	03327927549
				Zia U rahman	03013782278
22	Loralai	Uryagi	GBPS Uryagi	Doulat Khan kakar	03013738050
				Thair Shah sab	03342323477
23	Loralai	Lahore	GGPS Nizam Abad Durgai	Nizam Sb	03448044922
24	Loralai	Lahore	GGPS Spin Pan Durgai	Addul Manan Sb	03458373917
25	Loralai	Cantt	GBMS Cantt	Haji Abdul Ali	03342325016
				Aziz Ullah	03318001983
26	Loralai	Saddar	GGPS Zagharloon	Aziz khan	03003863969
27	Pishin	Rudh Mulazai	GBMS Sakhobi Amir Khan	Abdullah	0826519774
				Malik Murtaza	0826519774
				Mulla Mohammad Khan	
				Abdul Ali	
28	Pishin	Rudh Mulazai	GGPS Rudh Mulazai	Abdullah	0826519774
				Malik Murtaza	0826519774
29	Pishin	Rudh Mulazai	GBPS Killi urmazh	Haji Raz Mohammad	
				Abdullah	0826519774
30	Pishin	Rudh Mulazai	GBPS Killi Malik Mohammad Ghous	Mastar Hamdullah	03138424922
				Salah-u-Din	03327851435
31	Pishin	Bostan	GBHS Bostan	Mohammad Akram	03063872488
				Hasham khan Panizai	03003871147
				Samiullah	03013747572
32	Pishin	Bostan	GGPS killi Matherzai Bostan	Pida Mohammad	03003891201
				Abdul Ghafoor	

ANNEX-F: 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 “Promotion of Girls Education in Baluchistan”. Under this project 120 primary and 10 middle level shelter less schools will be constructed and 150 new (mixed gender) community schools will be established in selected 12 districts including Kachhi, Loralai, Jhal Magsi, Khuzdar, Kalat, Lasbela, Jaferabad, Kech, Panjgur, Kila Saifullah, Pishin and Naseerabad.

An environmental and social impact assessment (ESIA) study 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 PGEB project from the 12 districts including Kachhi, Loralai, Jhal Magsi, Khuzdar, Kalat, Lasbela, Jaferabad, Kech, Panjgur, Kila Saifullah, Pishin and

Naseerabad to cover the entire project area.

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.