

**GOVERNMENT OF PUNJAB
PLANNING & DEVELOPMENT DEPARTMENT**

**GUIDELINES FOR CONDUCTING ENVIRONMENTAL
ASSESSMENTS
FOR PPP INFRASTRUCTURE PROJECTS**

FEBRUARY 2011

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IMPORTANT DEFINITIONS

| | |
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| Consultants | Individual consultants, or a consulting firm, or a financial institution, which will provide the services required for the preparation and transaction execution of a PPP project. Given the importance of the transaction execution phase in the life cycle of PPP projects, the consultants are frequently called transaction advisors, and the project development services are referred to as transaction advisory. |
| Environmental Assessment | Process to determine the environmental impacts of a project in its area of influence, and to evaluate and design mitigation measures. Depending on the significance of project impacts and risks, the process includes an Initial Environmental Examination or a full-scale Environmental Impact Assessment. |
| Government Agency | Department, attached department, body corporate, autonomous body of the Government, local government or any organization or corporation owned or controlled by the Government. |
| PPP Steering Committee | High-level committee established by the Government and chaired by the Minister of Planning & Development to promote, coordinate, approve and facilitate PPP projects. |
| Government | Government of Punjab. |
| Infrastructure | Both traditional infrastructure (transport networks, water supply, energy generation, etc.) and social infrastructure (education and health facilities, etc.). |
| Public-private partnership (PPP) | Partnership between the public sector represented by a Government Agency and a private party for the provision of an infrastructure facility and/or service with a clear allocation of risks between the two parties. The PPP modalities range from service contracts to management contracts to leases to concessions to build-operate-transfer contracts and their variants. |
| PPP project | Project implemented on a PPP basis in any of the eligible infrastructure sectors. |

ENVIRONMENTAL ASSESSMENT GUIDELINES

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| PPP Cell | Entity established in the Planning & Development Department to assist Government Agencies in preparing and executing high-quality PPP projects, and act as a PPP catalyst and advocate, knowledge manager, and policy and project advisor to the PPP Steering Committee. |
| Project Development Facility | Pool of funds available for consulting services required for the preparation and transaction execution of PPP projects. |
| Project Inception Guidelines | Methodology for Government Agencies on how to identify, screen and register potential PPP projects, draft terms of reference and request for proposals for their preparation and transaction execution, and select consultants. |
| Project Preparation Guidelines | Methodology for Government Agencies on how to prepare a feasibility study for a PPP project and seek approval by the PPP Steering Committee. |
| Risk Management Unit | Entity established in the Finance Department to review requests for direct and/or contingent government support for PPP projects and ensure its fiscal sustainability. |
| RAMSAR | The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources |
| Transaction Execution Guidelines | Methodology for Government Agencies on how to select the transaction advisory services and Private Party for undertaking a PPP project and seek approval by the PPP Steering Committee. |

ABBREVIATIONS

| | | |
|------|---|--|
| ADB | – | Asian Development Bank |
| EA | – | Environmental Assessment |
| EIA | – | Environmental Impact Assessment |
| EMP | – | Environmental Management Plan |
| NCS | – | National Conservation Strategy |
| PDF | – | Project Development Facility |
| PPP | – | Public-Private Partnership |
| PEPA | – | Pakistan Environmental Protection Agency |
| P&DD | – | Planning and Development Department |
| PSIR | – | Pressure, State, Impact & Responce |
| TOR | – | Terms of Reference |

1.0 INTRODUCTION

1.1 BRIEF OF PPP INITIATIVES IN PUNJAB

The Government of Punjab is committed to sustainable economic growth and inclusive social development. Global experience has shown that there is a close relationship between these objectives and infrastructure development. The correlation works in both ways – investments in infrastructure are a major driver for economic growth and economic growth requires well functioning infrastructure facilities and services. If infrastructure investments are not kept at a sufficient level, economic growth becomes constrained by power shortages, traffic congestion, high transport costs, and other infrastructure bottlenecks. As to the impact on social development, it is the low-income groups who are most affected by an inadequate access to and poor quality of infrastructure services.

The Government has, therefore, decided to significantly increase infrastructure investments and has made provisions in the provincial budget to this effect. The Government is also the beneficiary of financial assistance for infrastructure projects from multilateral and bilateral development partners. In addition to projects funded by its budget and development loans, the Government is committed to engaging the private sector in the provision of infrastructure. The preferred mode is public-private partnerships (PPPs) where the private and public sectors enter into mutually beneficial contractual agreements for the provision of public infrastructure services.

The Government recognizes the need for and importance and benefits of private sector participation in infrastructure development. Punjab accounts for more than half of Pakistan's population and economic output. However, it is estimated that less than 50% of its infrastructure investment requirements can be met by public sector funds. The Government wants to fill the gap through PPPs and other forms of private sector participation. PPPs have been recognized worldwide as an essential mode of public service delivery. They attract private capital investment, increase efficiency through the profit motivation of the private sector, and help reform sectors through the reallocation of roles and risks

1.2 PUNJAB PUBLIC-PRIVATE PARTNERSHIP FRAMEWORK

1.2.1 POLICY DOCUMENTS

PPP for Infrastructure Act 2010: For the private investments in infrastructure to materialize, a comprehensive and consistent cross-sector legal framework is essential that establishes a clear and predictable environment within which investors will finance, implement and operate PPP projects. A well-drafted PPP law protecting rights of all the parties is a key component of such a framework as it will develop confidence of private investors in making investment in infrastructure development. The PPP law should describe the overall framework for undertaking PPP projects from beginning until the end. It should also outline the overall process for undertaking projects under PPP mode including all important issues, such as project identification and preparation, method of competitive bidding, and roles and responsibilities of each party involved. To provide a firm legal framework, the Punjab PPP for Infrastructure Act 2010 was enacted by Punjab Provincial Assembly on 12th July 2010. The Act is based on an inter-country comparison, incorporates international best practices, and is consistent with the other components of the enabling PPP framework.

PPP Policy: The PPP Policy aims at reinforcing the considerable enthusiasm for PPPs in various sectors, addressing the lack of trust between the public and private sectors to collaborate in infrastructure projects, and facilitating the creation of effective partnerships. The Government hopes to fully utilize the potential of PPPs for Punjab by strategizing and standardizing the PPP development. To ensure this, the PPP Policy states the objectives to be achieved through PPPs, provides guidance to the public sector on initiating, evaluating and executing PPP projects, and communicates the Government's position on PPPs to other stakeholders, including potential private sector partners and the public at large. The PPP Policy was approved by the Provincial Cabinet in September 2009.

PDF Guidelines: The Government has established a fund titled Project Development Facility (PDF) for the preparation of PPP projects including feasibility studies and to meet the cost of transaction advisors. The objective of the PDF is to help the line departments, local governments

and other government agencies to overcome the financial constraints for PPP project preparation. Reimbursement of the cost of project preparation will be sought from the winning bidder. PDF guidelines, which have been approved by the Provincial Cabinet, describe the detailed process for the utilization of the fund.

Project Preparation Guidelines: The Guidelines provide an overview of the life cycle of PPP projects, list the PPP modalities and infrastructure sectors covered, and explain why adequate project preparation is important. Thereafter, they outline a practice-oriented methodology for feasibility studies, and describe the various steps, tasks and processes required in their preparation.

Project Inception Guidelines: A practice-oriented methodology is described for the identification and screening of potentially suitable PPP projects, which can be used by line departments and local governments in-house without undertaking complex and time-consuming assessment studies requiring external support. This is followed by outlining the principles and procedure for drafting terms of reference (TOR) for the subsequent phases of project preparation and transaction execution, and selecting consultants to provide assistance during those two phases.

Transaction Execution Guidelines: The Guidelines describe a methodology for Government Agencies on how to select the Private Party for undertaking a PPP project.

1.2.2 INSTITUTIONAL ARRANGEMENTS

Under the Punjab PPP framework, comprehensive institutional framework has been established entrusting various roles and responsibilities at each level of the project life cycle from inception, preparation, approval, bidding and execution to project transfer. The Government has established the following entities as part of the PPP framework (Figure 1):

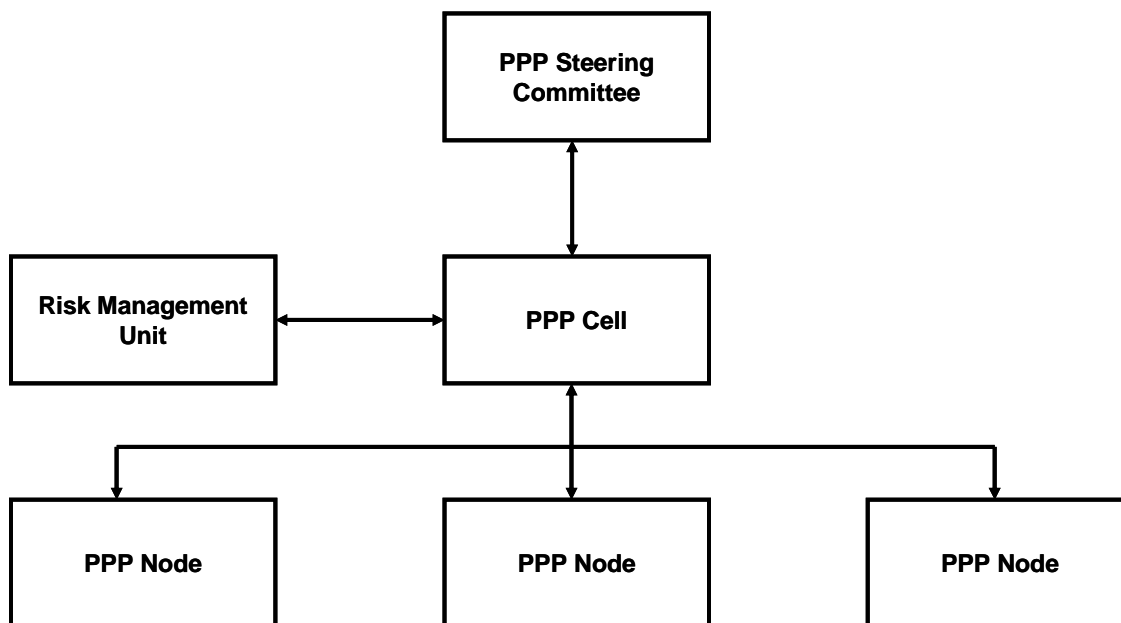
PPP Steering Committee: A high-level committee chaired by the Minister of Planning & Development has been notified.

PPP Cell: A dedicated Cell has been established in the Planning & Development Department to solely look into the PPP affairs in the Province.

PPP Nodes: Focal points are being established in Line Departments and government agencies to handle the PPP projects.

Risk Management Unit: The Unit is being established in the Finance Department to act as fiscal guardian and look into issues of project sustainability and fiduciary risks.

Figure 1: PPP Institutional Framework



2.0 ENVIRONMENTAL ASSESSMENTS UNDER PROJECT LIFE CYCLE

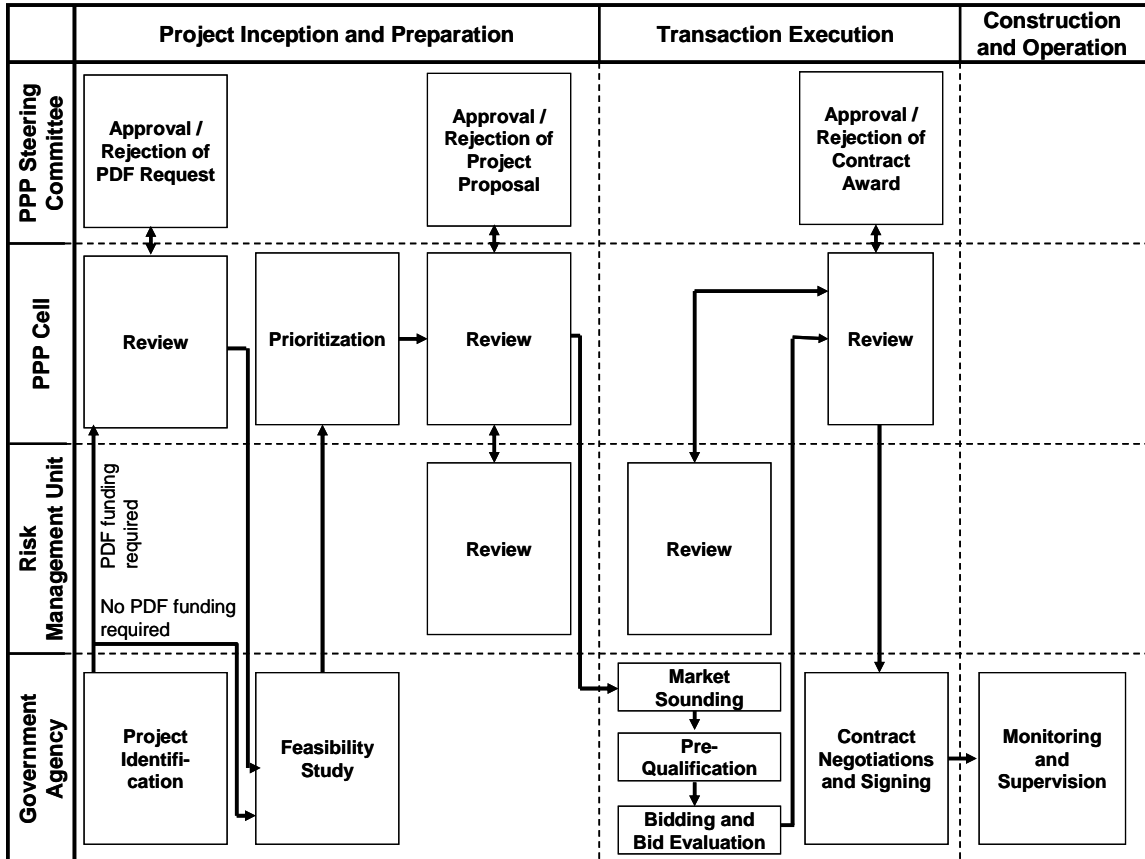
The following four main phases can be distinguished in the overall life cycle of PPP projects:

- (i) Project inception (identification and screening)
- (ii) **Project preparation (feasibility study); environmental assessment (EA) is an integral part of the feasibility study**
- (iii) Transaction execution (selection of the private party); and

- (iv) Construction, operation and transfer (development, delivery and exit)

A flow chart of the main activities during these phases is shown in Figure 1.

Figure 1: Flow Chart of Project-Related Activities



3.0 APPLICABILITY OF THE GUIDELINES

These Guidelines are applicable to all PPP projects in the following infrastructure sectors:

- (1) Canals or dams
- (2) Education facilities
- (3) Health facilities
- (4) Housing
- (5) Industrial estates

- (6) Information technology
- (7) Land reclamation
- (8) Power generation facilities
- (9) Roads (provincial highways, district roads, bridges or bypasses)
- (10) Sewerage or drainage
- (11) Solid waste management
- (12) Sports or recreational infrastructure, public gardens or parks
- (13) Trade fairs, conventions, exhibitions or cultural centers
- (14) Urban transport including mass transit or bus terminals
- (15) Water supply or sanitation, treatment or distribution; and
- (16) Wholesale markets, warehouses, slaughter houses or cold storages

4.0 CONDUCTING ENVIRONMENTAL ASSESSMENTS

The Environmental Assessment (EA) process was introduced in Pakistan through the Environmental Protection Ordinance 1983. The process was further strengthened under the Pakistan Environmental Protection Act 1997, which became operational under the Environmental Impact Assessment Regulations 2000. Despite a sound legal basis and comprehensive guidelines, evidence suggests that the EA process has not yet evolved satisfactorily in Pakistan. An evaluation of the EA process against systematic evaluation criteria, based on interviews with approval authorities, consulting firms and experts, reveals various shortcomings. These mainly include inadequate capacity of EA approval authorities, deficiencies in screening and scoping, poor EA quality, inadequate public participation and weak monitoring. Overall, EA is used presently as a project justification tool rather than as a project planning tool aimed at ensuring sustainable development. Whilst shortcomings are challenging, the Federal Government has recently shown a high degree of commitment to the environmental protection by making EA compulsory for all public sector projects likely to have adverse environmental impacts.

4.1 DEFINITION – WHAT IS ENVIRONMENTAL ASSESSMENT

EA is a study of the effects of a proposed action on the environment. In this regard the environment includes all relevant aspects of the natural and human resources.

EA evaluates the expected effects on human health, the natural environment and property. The study therefore requires a multi-

disciplinary approach. It should be done very early at the feasibility stage of a project to assess its environmental sustainability.

“Environmental assessment is a generic term used to describe a process of environmental analysis and planning to address the environmental impacts and risks associated with a project.

(ADB’s Safeguard Policy Statement June 2009)

EA attempts to weigh environmental effects on a common basis with economic costs and benefits and is a decision-making tool. The EA is a procedure used to examine the environmental consequences, both beneficial and adverse, of a proposed development project and to ensure that these effects are taken into account in project design. The EA should be viewed as an integral part of the project planning process.

4.2 OBJECTIVES OF ENVIRONMENTAL ASSESSMENT

1. To ensure that environmental considerations are explicitly addressed and incorporated into the project development decision making process
2. To anticipate and avoid, minimize or offset the adverse significant biophysical, social and other relevant effects of development proposals
3. To protect the productivity and capacity of natural systems and the ecological processes which maintain their functions
4. To promote development that is sustainable and optimizes resource use and management opportunities.

4.3 SCOPE OF ENVIRONMENTAL ASSESSMENT

As part of the feasibility study, an EA report should cover, but not be limited to, the following areas:

4.3.1 General

EA report should address all relevant issues and be in conformity with the applicable laws, regulations and guidelines.

4.3.2 Project Description

EA report should give an overview of the salient features of the project, along with its justification, as follows:

- Purpose of the report, including identification of the project and the proponent (including a contact person, and details of any consultants associated with the EA preparation), a brief description of the nature, size, and location of the project, and other pertinent background information.
- Scope and duration of the study, magnitude of effort, persons performing the study.
- Type and environmental category of the project.
- Objectives of the project.
- Alternatives considered, and reasons for their rejection.
- Location of the project.
- Size or magnitude of the operation, including capital cost, and associated activities.
- Proposed schedule for implementation.
- Description of the project, including drawings showing project layout, main components, etc. This information should have the level of detail expected in feasibility reports, in order to give a clear picture of the project, its context and its operations.
- Details of restoration and rehabilitation plans at the end of the project life.
- Government approvals and leases required by the project.

4.3.3 Policy, Legal and Administrative Framework

This section of the EA report should describe the policy and legal basis within which the project may be implemented. Regulations and standards applicable to the project should be referred to.

4.3.4 Description of Environment (Baseline Data)

- Collection, evaluation and presentation of baseline data on the relevant environmental characteristics of the project area. In addition to general information, the consultants should describe methodology for preparing

essential environmental data.

- The data should emphasize, but may not be limited to, the information about physical environment, including meteorology and climate , geology and soil, seismology , air and water quality , noise , topography and drainage patterns , hydrology and/or hydraulic regime, surface and ground water, and land use.
- The section on ecological resources should discuss forests / flora / vegetation profile, crop and horticulture activities, fauna, local livestock species, and protected and/or endangered wildlife species. The section on social and cultural resources should discuss the methodology of surveys, settlement pattern, political and administrative setup, population and communities, socioeconomic conditions, protective and sensitive areas, archeological and cultural sites, health and education facilities, industrial activities , physical and cultural heritage, utilities, road and railway links, tourism facilities and potentials, and other relevant aspects.

4.3.5 Socio-economic Analysis of Project Impacts

Existing socio-economic characteristics of the proposed project location should be identified. The impacts of the project on the socio-economic environment should then be analyzed. The analysis should include the use of land, the main economic activities such as tourism and agriculture, the income level in nearby communities, employment levels and the existence of archaeological or historical sites.

4.3.6 Environmental Impacts and Mitigation Measures

EA report should identify all negative and positive, direct and indirect, and short- and long-term impacts of the project during the pre-construction / design, construction and operation phases. The consultants should recommend appropriate mitigation and rehabilitation measures for any environmental damages. The consultants should attempt to identify creative measures that would have positive social implications, such as participatory tree planting that would also serve as job creation for affected communities. The consultants should also identify impacts on archeological sites, national and international heritage, national parks,

games reserve and endangered species, and propose appropriate mitigation measures. The consultants should also identify impacts and mitigation measures for topography, borrow open pits, waste disposal, geology, soil, surface and groundwater quality, and hydrology. Particular attention should be given to impacts and mitigation measures related to resettlement, community development and other social/cultural issues.

4.3.7 Public Consultations, Involvement and Disclosure

During the field surveys regular stakeholder consultations should be conducted and concerns expressed should be documented later on which will be addressed appropriately with them. The consultants should assist in inter-agency coordination, and public / NGO participation.

4.3.8 Environmental Management Plan

The consultants should prepare an Environmental Management Plan (EMP) including an implementation schedule and supervision program with associated costs and contracting procedures for the execution of environmental mitigation and social measures during the pre-construction and operational phases. The consultants should describe the objectives of the EMP, its key environmental / social components and role of the parties involved. The key components should focus on, but not be limited to:

- design recommendations
- topography
- geology and soil
- seismic activities
- flood hazards
- camp sites and borrow pits
- archeological sites
- land acquisition and resettlement
- local communities and their social and cultural heritage
- archeological sites
- waste disposal
- air and water quality including ground and surface water,
- noise
- flora including roadside vegetation cutting and plantation,
- fauna including wildlife

- endangered species and their protection
- traffic management
- use of fertile humus soil
- recommended environmental protection sign boards
- measures to mitigate health risks of workers

4.3.9 Conclusions and Recommendations

EA report should contain an adequate summary that covers project description, description of the environment, environmental impacts and mitigation measures, alternatives to the project, socio-cultural and socio-economic issues, public consultations, EMP, economic assessment, and principal conclusions and recommendations.

4.4 TERMS OF REFERENCE FOR ENVIRONMENTAL ASSESSMENTS

In this section, outline ToR for conducting EAs are described that should become part of the overall ToR for the feasibility study. but in few cases where feasibility study is prepared without EA in such cases separate terms of references may be prepared for conducting EAs. For instance in case of unsolicited proposal where the bidder has prepared the detailed feasibility study but has not worked on EA in such case independent EA shall be initiated if the executing agency is satisfied with rest of the feasibility study contents.

4.4.1 Project Background

This section should explain the project background, including the goals of the Government Agency leading to the execution of the project.

4.4.2 Project Objectives

This section should elaborate in detail the key objectives associated with the project, including its expected outcomes and benefits.

4.4.3 Scope of Services

The scope of services of the consultants conducting the EA should cover, but not be limited to, the following activities:

- Conduct review of literature, visit project area and establish baseline condition of the project

- Identify adverse environmental impacts associated with the project in terms of their nature, magnitude, extent and location, and timing and duration during the construction and operation stages
- Propose appropriate mitigation measures for any adverse environmental impacts based on exploring the possibility to achieve the project objectives by alternative ways, proposing changes in design, and improving monitoring and management practices (storage of construction materials, labor camps, waste disposal, disposal of construction debris, etc.)
- Prepare a comprehensive EMP to ensure the adequacy and effectiveness of the proposed management by clearly identifying the roles and responsibilities of the contractor, supervisory consultant, Government Agency and private party
- Demonstrate compliance of the project with the governing national laws and regulatory framework on environmental issues
- Suggest effective monitoring and evaluation mechanism, including reporting, during construction and operation of the project
- Assist the Government Agency in holding public consultations to delineate the appropriate boundaries of the EA, screen potential adverse environmental impacts, and design appropriate mitigation measures. Document the proceedings of the consultations along with the list of participants and photographs

4.4.4 Eligibility

The Government Agency should determine appropriate eligibility and qualification criteria for the consultants who will conduct the EA.

4.4.5 Time Schedule

The Government Agency should determine a reasonable timeframe to conduct the EA.

4.4.6 Deliverables

The Government Agency should determine the reporting pattern which may include:

- Inception report
- Monthly progress reports (in case of major assignments)
- Draft final report

- Final report

5.0 ROLE OF GOVERNMENT AGENCY AND PPP CELL

5.1 Government Agency

EA for any infrastructure PPP project should be done at the time of preparing the feasibility study. The government agency should make the TOR for the EA part of the consolidated ToR for the feasibility study. The consultants working on the feasibility study should prepare a separate EA report and present the EA conclusions and recommendations in the main feasibility report.

5.1.1 Unsolicited Proposal

In case of unsolicited proposal received by any Government Agency where the bidder has prepared the detailed feasibility study but did not conducted EAs in this scenario government agency after being satisfied that the other contents of the feasibility study submitted by the unsolicited bidder are acceptable will initiate EAs itself through independent and eligible consultants.

The role of Government Agencies following completion of feasibility studies including EA has been defined in depth in the policy documents described in Section 1.2.1 and should be followed accordingly.

5.2 PPP Cell

As soon as the feasibility study including EA has been completed, the Government Agency should submit it to the PPP Cell. The study should be scrutinized by the PPP Cell to ensure its completeness and high quality. The role of the PPP Cell in the subsequent activities is defined in depth in the policy documents described in Section 1.2.1.

6.0 ENVIRONMENTAL LAWS, GUIDELINES AND REGULATIONS

6.1 INTRODUCTION

The following sections provide a synopsis of environmental policies, legislation and guidelines to be followed while conducting EAs. These documents provide a framework for the preparation of EAs and formulation of EMPs.

6.1.1 NATIONAL ENVIRONMENTAL POLICIES

National Conservation Strategy

The Strategy is a policy document approved by the Federal Government in March 1992. It identifies 14 core areas including conservation of biodiversity. Its review in 2000 culminated in the approval of the National Environmental Action Plan by the Pakistan Environmental Protection Council under the chairmanship of the President of Pakistan in February 2001.

The Biodiversity Action Plan

The key to protecting the biological heritage of Pakistan lies in the involvement of local people and in the support provided by competent institutions for conservation and sustainable use. The Federal Government has recognized the importance of these measures in the preparation of the National Conservation Strategy and in becoming a signatory to, and ratifying, the Convention on Biological Diversity in 1994. Developing the Biodiversity Action Plan for Pakistan in 2000 has been the most significant direct step towards addressing the biodiversity loss.

6.1.2 NATIONAL ENVIRONMENTAL LAWS AND LEGISLATIONS

Pakistan Environmental Protection Act 1997

The Act is the basic legislative tool empowering the Federal Government to frame regulations for the protection of the environment.

The Act is broadly applicable to air, water, soil, marine and noise pollution, as well as the handling of hazardous waste. Penalties have been prescribed for those who contravene the provisions of the Act. The powers of the Federal and Provincial Environmental Protection Agencies have also been considerably enhanced under this legislation by giving them the power to conduct inquiries into possible breaches of environmental laws either on their own accord, or upon the registration of a complaint.

Pakistan Environmental Protection Agency Review of (IEE/EIA) Regulations 2000

The Regulations, prepared by the Pakistan Environmental Protection Agency (PEPA) under the powers conferred upon it by the Pakistan Environmental Protection Act, provide the necessary details on the preparation, submission, and review of the Initial Environmental Examination (IEE) and the Environmental Impact Assessment (EIA).

Categorization of projects for IEE and EIA is a key task. Projects have been classified on the basis of expected degree of adverse environmental impacts. Project types listed in Schedule-II of the Regulations are designated as potentially seriously damaging to the environment. Therefore, an EIA is mandatory for all such projects. Those listed in Schedule-I as having potentially less adverse effects require an IEE unless situated in an environmentally sensitive area.

National Environmental Guidelines Policy and Procedures for the Filing, Reviewing and Approval of Environmental Assessments, 2000

The Policy and Procedures, prepared by the PEPA under the powers conferred upon it by the Pakistan Environmental Protection Act, provide the necessary details on the preparation, submission, and review of the IEE and EIA.

They classify projects on the basis of expected degree of adverse environmental impacts and list them in three separate schedules. Schedule-A lists projects of potentially significant environmental impacts that require preparation of an EIA. Schedule-B lists projects that may not have significant environmental impact and therefore require an IEE.

Schedule–C lists projects that may not have any environmental impact and hence do not require an EIA or an IEE. Schedule –C projects are also subject to review if they are situated in an environmentally sensitive or critical area.

The Policy and Procedures also stipulate that all projects located in environmentally sensitive areas require neither an EIA nor an IEE.

6.1.3 REVISED NATIONAL ENVIRONMENTAL QUALITY STANDARDS

First promulgated in 1993, the last revision of the Standards took place in 2000. Providing the basic guidelines for liquid effluent and gaseous emissions of municipal and industrial origin to comply with, the Standards present the maximum allowable concentration for liquid effluent before its discharge into sea, inland water and sewage (a total of 32 parameters to comply with) and gaseous emissions in the ambient air from industrial sources (a total of 16 parameters to comply with).

6.1.4 INTERNATIONAL TREATIES

Pakistan is a signatory to various international treaties and conventions on the conservation of the environment and wildlife protection. The country is thus obliged to adhere to the commitments specified in these treaties.

International Convention on Biodiversity

The Convention was adopted during the Earth Summit of 1992 at Rio de Janeiro. It requires parties to develop national plans for the conservation and sustainable use of biodiversity, and to integrate these plans into national development programmes and policies. Parties are also required to identify components of biodiversity that are important for conservation, and to develop systems to monitor the use of such components with a view to promoting their sustainable use.

The Convention on Wetlands of International Importance 1971 (RAMSAR)¹

Pakistan is a signatory to this Convention. The principal obligations of contracting parties are:

- To designate wetlands for the list of wetlands of international importance.
- To formulate and implement planning so as to promote wise use of wetlands.
- To prepare an EA before transformations of wetlands, and to make national wetland inventories
- To train personnel competent in wetland research, management and wardening.
- To promote conservation of wetlands by combining far sighted national policies with coordinated international action, to consult with other contracting parties about implementing obligations arising from the convention, especially about shared wetlands and water system.
- To promote wetland conservation concerns with development aid agencies.
- To encourage research and exchange of data

So far 18 sites in Pakistan have been declared as wetlands of international importance in terms of RAMSAR.

6.1.5 RED LIST OF THE INTERNATIONAL UNION FOR CONSERVATION OF NATURE

The Red List includes all species that are under potential threat of extinction. These species have been categorized as endangered, vulnerable in decline, lower risk species and data deficient species that may be at risk of extinction in the wild. No faunal specie (observations) that fall under the IUCN Red List category were made during recent site surveys for the EA study.

¹ The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

6.1.6 GUIDELINES OF MULTILATERAL FINANCING INSTITUTIONS

World Bank Guidelines on Environment

The principal World Bank publications that contain environmental guidelines are listed below:

- Environmental Assessment Operational Policy 4.01, Washington, DC, World Bank, 1999
- Pollution Prevention and Abatement Handbook Towards Cleaner Production Environment Department, World Bank / United Nations Environment Programme, 1998
- Environmental Assessment Source Book, Volume I - Policies, Procedures and Cross-Sectoral Issues, World Bank Technical Paper Number 139, Environment Department, World Bank, 1991
- Environmental Assessment Source Book, Volume III– Guidelines for Environmental Assessment of Energy and Industry Projects, World Bank Technical Paper No. 154, Environment Department, World Bank, 1991.

These publications provide general guidelines for the conduct of an EA, and address the EA practitioners themselves as well as project designers. While the Source Book in particular has been designed for the World Bank projects, and is especially relevant for the impact assessment of large-scale infrastructure projects, it contains information which is also useful to environmentalists and project proponents.

Asian Development Bank's Guidelines on Environment and Resettlement

After extensive stakeholder consultations, in June 2009 ADB issued the Safeguard Policy Statement that *inter alia* covers environment and resettlement. The Statement reflects the latest international best practices and is consistent with the policies of other multilateral financing institutions.

Part 1 outlines the requirements that borrowers/clients are required to meet when delivering environmental safeguards for projects supported by ADB. It discusses the objectives and scope of application, and underscores the requirements for undertaking the EA process. These requirements include assessing impacts, planning and managing impact mitigations, preparing EA reports, disclosing information and undertaking consultation, establishing a grievance mechanism, and monitoring and reporting. The document also includes particular environmental safeguard requirements pertaining to biodiversity conservation and sustainable management of natural resources, pollution prevention and abatement, occupational and community health and safety, and conservation of physical cultural resources. The applicability of particular requirements is established through the EA process and compliance with the requirements is achieved through implementation of environmental management plans agreed to by ADB and the borrower/client.

Part 2 of the Statement outlines the requirements that borrowers/clients are required to meet in delivering involuntary resettlement safeguards to projects supported by ADB. It discusses the objectives, scope of application, and underscores the requirements for undertaking the social impact assessment and resettlement planning process, preparing social impact assessment reports and resettlement planning documents, exploring negotiated land acquisition, disclosing information and engaging in consultations, establishing a grievance mechanism, and resettlement monitoring and reporting.

6.1.7 THE WILD BIRDS AND ANIMALS PROTECTION ACT 1992

The Act provides for the protection of the fauna of the country

6.1.8 FOREST ACT 1927

The Act authorizes the Provincial Forest Department to establish forest reserves and protect forests.

6.1.9 CANAL AND DRAINAGE ACT 1873

The Act prohibits corruption or fouling of water in canals defined as channels, tubewells, reservoirs and water courses or observations of drainage.

6.2 FORMATS TO BE USED FOR THE ENVIRONMENTAL STUDIES:

The following tables should be used by the consultants for the environmental study of the project area:

Table 6.2.1

MONITORING / EVALUATION FORM

Name of Project: _____

Location of Project: _____

Nature / Type of Project: _____

Executing authorities / agencies: _____

| Proposed Actions | Issues Identified | Mitigation Measures | Results Indicator | Data Sources | Reporting Frequency | Responsibility |
|------------------|-------------------|---------------------|-------------------|--------------|---------------------|----------------|
| | | | | | | |
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| | | | | | | |
| | | | | | | |

Signature:

Name and designation of monitoring Officer:

Date:

Table 6.2.2

PRIMARY BASELINE DATA COLLECTION

| Category | yes | No | Likely | Not applicable | REMARKS Where possible, provide details (Expected number of households, area of land, types of structures likely to be affected, quantity and value of assets, nature of conflicts if any) |
|---|-----|----|--------|----------------|---|
| <i>Rapid Social Assessment and Consultation with the communities in the project area with particular attention to vulnerable groups</i> | | | | | |
| • Poverty group affected | | | | | |
| • Women headed households affected | | | | | |
| • Ethnic Minority Affected | | | | | |
| • Indigenous Peoples Affected | | | | | |
| • Other vulnerable groups ¹ affected | | | | | |
| • Is there any risk to smallholders in terms of loss of Livelihoods | | | | | |
| <i>Changes in water availability or water allocation</i> | | | | | |
| • Will there be an unscheduled or extended closure of the canal(s)? | | | | | If one or more of these will occur, the exact nature of the change including the identification of the affected households, should be determined and communicated to the affected communities during the consultations held during the rapid social assessment (item 3 above) |
| • Will there be changes in the area commanded by existing outlets? | | | | | |
| • Will there be a change in water allocation and availability to the existing command area? | | | | | |
| <i>Water supply for drinking and livestock</i> | | | | | |

¹This may include disabled, child labor, bonded labor, farm labor, etc.

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| <i>Surface water sources and utilization</i> | | | | | |
|--|--|--|--|--|--|
| • Are households dependent on canal water for drinking? | | | | | If there are no households dependent on canal water go to item 5b. |
| • Will access and availability of drinking water from the canals be disrupted by the project? | | | | | |
| • Will access and availability of drinking water be decreased by the project? | | | | | |
| • Is the quality of canal water suitable for drinking? | | | | | |
| • Are sources of water pollution identified? | | | | | If yes, have these been documented and has EPD action be sought? |
| <i>Groundwater sources and utilization</i> | | | | | |
| • Do all households in the project area have access to groundwater for drinking? | | | | | |
| • Are there any adverse trends in water availability or quality in the existing sources of groundwater for | | | | | |
| • Will any project actions affect groundwater recharge in the project area and adversely affect drinking water supplies? | | | | | |

Table 6.2.3

COMPILATION AND REVIEW OF SECONDARY BASELINE DATA

| Categories | No or Not Applicable | Yes or Likely | | | Description |
|--|----------------------|---------------|---|---|-------------|
| | | S | M | L | |
| <i>1. Environmental Assets, Resources and Conditions</i> | | | | | |
| • Protected areas, parks, reserves | | | | | |
| • Vegetation resources of special importance | | | | | |
| • Areas of special importance for wildlife | | | | | |
| • Endangered or rare species | | | | | |
| • Wetlands, water bodies – existing uses, functions | | | | | |
| • Grazing areas – use, condition | | | | | |
| • Forests – type, extent, uses | | | | | |
| • Waterlogging | | | | | |
| • Soil salinity or sodicity | | | | | |
| • Soil erosion risks | | | | | |
| • Flood risk | | | | | |
| • IPM program | | | | | |
| <i>2. Assessment and Screening - Potential Impacts of Project Activities</i> | | | | | |
| • Impacts on wetlands and water bodies | | | | | |

ENVIRONMENTAL ASSESSMENT GUIDELINES

| | | | | | |
|---|--|--|--|--|--|
| • Changes in water supply for drinking and livestock | | | | | |
| • Changes in water quality for users | | | | | |
| • Changes in surface and groundwater quality | | | | | |
| • Changes in vegetation of local importance | | | | | |
| • Effects on local forests | | | | | |
| • Effects on grazing lands | | | | | |
| • Effects on archeological or cultural heritage sites | | | | | |
| • Changes in flood risk | | | | | |
| • Changes in groundwater recharge | | | | | |
| • Disposal of drainage water | | | | | |
| • Hydrologic and water quality changes downstream | | | | | |
| • | | | | | |

S=Possible small or infrequent impact:
M=Likely medium or more frequent impact (requires mitigation); L=Definite large/frequent impact (requires assessment and mitigation)

Table 6.2.4

**CHECKLIST OF TYPICAL SOCIAL AND ENVIRONMENTAL IMPACTS
DURING EXECUTION OF PROPOSED PROJECT**

| Parameters of potential Environmental and Social Impacts | | | | | | | | | | | | | | | | | | | | |
|---|----------------------|--|--|--|--|--|------------------------|--|--|--|--------------------|--|--|--|--|--|--|--|--|--|
| | Physical Environment | | | | | | Biological Environment | | | | Social Environment | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| Proposed Project Action | | | | | | | | | | | | | | | | | | | | |
| <p><i>Describe Type of Project in this row – List actual proposed principal actions, one in each row of column 1. Then for each action place a <input type="checkbox"/> beneath the parameters where an impact is likely after analysis of the baseline data.</i></p> | | | | | | | | | | | | | | | | | | | | |
| • | | | | | | | | | | | | | | | | | | | | |
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Table 6.2.5

ADOPTED MITIGATION MEASURES

| Project Action | Parameter | Identified Impact | Adopted Mitigation Measure(s) |
|----------------|-----------|-------------------|-------------------------------|
| • | | | |
| • | | | |
| • | | | |
| • | | | |
| • | | | |
| • | | | |
| • | | | |
| • | | | |
| • | | | |
| • | | | |
| • | | | |

7.0 NATIONAL ENVIRONMENTAL SUSTAINABLE INDICATORS FROM NATIONAL ENVIRONMENT INFORMATION MANAGEMENT SYSTEM (NEIMS).

National Environment Information Management System (NEIMS) has proposed three types of environmental indicators which are core environmental indicators, key environmental indicators and sectoral environmental indicators. First two are inclusive to each other and last one is exclusive and additional indicators.

Tables I, III & III below present the final list of core, key and sectoral environmental indicators under pressure, state, impact and response framework (PSIR).

Table I: Core Environmental Indicators for Pakistan by PSIR Framework

| Theme | Sub-theme | Sr. No. | Key Environmental Indicators | PSR Framework | | | |
|-------|-------------------------|-----------------------|--|---|---|---|---|
| | | | | P | S | I | R |
| | | 28 | Land affected by wind and water erosion (% and hectares) | | | | |
| Water | Water Resources | 29 | Industrial and agricultural water consumption per GDP (AF/GDP million) | | | | |
| | | Groundwater Resources | 31 | Annual withdrawals of groundwater (MAF) | | | |
| | 32 | | Domestic consumption of groundwater per capital (M ³ /capita/annum) | | | | |
| | 33 | | Total fresh groundwater resources (MAF) | | | | |
| | 34 | | Annual groundwater recharge by dry and wet years (MAF) | | | | |
| | 35 | | Concentration of physio-chemical and bacteriological pollutants in groundwater at major locations (mg/litre) | | | | |
| | Surface Water Resources | 36 | Annual withdrawals of surface water(MAF) | | | | |
| | | 37 | Annual surface water consumption by major sectors (MAF and % distribution) | | | | |
| | | 38 | Annual industrial and municipal discharges into the surface water (million gallons) | | | | |
| | | 39 | Average annual surface water availability (MAF) | | | | |
| | | 40 | Annual per capita availability of surface water (M ³ /capita) | | | | |
| | | 41 | Concentration of physio-chemical and bacteriological pollutants in surface water (mg/litre) | | | | |
| | | 42 | % of population connected with oxidation ponds in rural areas and wastewater treatment plants in urban areas (%) | | | | |

ENVIRONMENTAL ASSESSMENT GUIDELINES

| Theme | Sub-theme | Sr. No. | Key Environmental Indicators | PSR Framework | | | |
|-----------------------------|------------------------------|--|--|---------------|---|---|---|
| | | | | P | S | I | R |
| | Marine Water | 43 | Industrial, agriculture and municipal discharges directly into marine water bodies (MAF) | | | | |
| | | 44 | Concentration of oil, N and P in the coastal waters (mg/litre) | | | | |
| | | 45 | % of population connected with oxidation ponds in rural areas and wastewater treatment plants in urban areas (%) | | | | |
| Biodiversity | Eco-systems | 46 | Inventory of ecological zones (numbers) | | | | |
| | | 47 | Important eco-systems under treat (locations, numbers, and hectares) | | | | |
| | | 48 | Total endemic terrestrial species by ecological regions (inventory) | | | | |
| | | 49 | Conservation areas by eco-systems (hactares) | | | | |
| | Flora | 50 | Total inventory of flora species (numbers) | | | | |
| | | 51 | Total number of endemic and threatened flora species (species inventory) | | | | |
| | Fauna | 52 | Total inventory of fauna species (number) | | | | |
| | | 53 | Total number of endemic and threatened fauna species (species inventory) | | | | |
| Energy | Non Renewable – Fossil Fuels | 54 | Annual fossil fuels supplies and consumption (TOE) | | | | |
| | | 55 | Total fossil fuels proven reserves by type (TOE) | | | | |
| | | 56 | Total fossil fuels imports (TOE) | | | | |
| | Renewable Energy | 57 | Total renewable energy production by type (TOE) | | | | |
| | Energy Efficiency | 58 | Manufacturing sector growth rate (%) | | | | |
| | | 59 | Energy shortage (TOE) | | | | |
| | | 60 | Annual total energy consumption by sectors (TOE and distribution by % and TOE consumption by sectors) | | | | |
| | | 61 | Annual energy consumption per capita (MBTU/capita/annum) | | | | |
| 62 | | Improvement in the energy efficiency per GDP (TOE/GDP) | | | | | |
| Minerals (excluding energy) | Minerals | 63 | Annual extraction of mineral resources by type (tones) | | | | |
| | | 64 | Life time of proven reserves by type (on the basis of present and future extraction trends in years) | | | | |
| Human Settlements | Demography | 65 | Population growth rates (national, rural and urban in %) | | | | |
| | | 66 | Population living below poverty line (national, rural, and urban in %) | | | | |
| | | 67 | % of population living in slum and marginal areas (national, rural, and urban) | | | | |
| | | 68 | Under 5 mortality rate (national, rural, and urban per 1000 births) | | | | |
| | Water Supply | 69 | Access to clean water (% of population served at national, rural, and urban) | | | | |
| | | 70 | Incidence of diarrhoea in children under 5 (%) | | | | |
| | | 71 | Access to sanitation services (% of population served at national, rural, and urban) | | | | |
| | Solid Waste | 72 | Total municipal solid waste generation (national, | | | | |

ENVIRONMENTAL ASSESSMENT GUIDELINES

| Theme | Sub-theme | Sr. No. | Key Environmental Indicators | PSR Framework | | | |
|-------------------------|-------------------|---------|--|---------------|---|---|---|
| | | | | P | S | I | R |
| | | | rural, and urban in tones) | | | | |
| | | 73 | Solid municipal solid waste collection (national, rural, and urban in tones) | | | | |
| | | 74 | Solid waste generation rate per capita (kg/capita/day) | | | | |
| | | 75 | Area contaminated by toxic waste (hectare) | | | | |
| | | 76 | Access to solid waste collection services (% of population served at national, rural, and urban levels) | | | | |
| | | 77 | Total and % of municipal solid waste safely disposed (national, rural, and urban in %) | | | | |
| | | 78 | Total generation of hazardous waste (national, rural and urban in tones) | | | | |
| | | 79 | Safe disposal of hazardous waste (national, rural, and urban in tonnes) | | | | |
| | | 80 | Total generation of hospital waste (national and urban in tonnes) | | | | |
| | | 81 | Safe disposal of hospital waste (national and urban in tonnes) | | | | |
| | Transportation | 82 | Number of vehicles in use by type per 1000 persons | | | | |
| | | 83 | % of urban population exposed to high concentrations of CO, SO ₂ , NO _x , PM ₁₀ and Pb (ug/m ³) | | | | |
| | Public Health | 84 | Prevalence of environmental related diseases by type (% of population effected by diseases) | | | | |
| | | 85 | % of population with access to basic health care facilities (%) | | | | |
| | | 86 | Health and nutrition expenditures (Rupees and % of GDP) | | | | |
| Environmental Economics | Economics | 87 | GNP per capita (US \$) | | | | |
| | | 88 | Environmental degradation cost per annum (Rupees) | | | | |
| | | 89 | Environmental protection budget as % of national budget (Rupees in million and %) | | | | |
| Natural Disasters | Natural Disasters | 90 | Frequency of natural disasters (number) | | | | |
| | | 91 | Cost and number of injuries and fatalities related to natural disasters (Rupees and number) | | | | |
| | | 92 | Number of human settlements and population vulnerable to natural disasters (number) | | | | |

Table II: Key Environmental Indicators for Pakistan by PSIR Framework

| Theme | Sub-theme | Sr. No. | Key Environmental Indicators | PSR Framework | | | |
|-------------------------|-------------------------|---------|--|---------------|---|---|---|
| | | | | P | S | I | R |
| Atmosphere | Air Pollution | 1 | Emissions of CO ₂ , 502, NA.CH ₄ , and PM Dy road vehicles and industry (tonnes per annum) | | | | |
| | Climate Change | 2 | Sea level rise at the coast of Pakistan (mm) | | | | |
| | | 3 | Number of people under threat due to sea level rise (number) | | | | |
| Land | Forest | 4 | Total area under Forest inclusive of AJK & NA (% and hectare) | | | | |
| | | 5 | Total area under protected forest (% and hectare) | | | | |
| | Agriculture | 6 | Arable land per capita (hectare/capita) | | | | |
| Water | Ground Water Resources | 7 | Total fresh ground water resources (MAF) | | | | |
| | Surface Water Resources | 8 | Average annual surface water availability (MAF) | | | | |
| | | 9 | Annual industrial and municipal discharges into the surface water: (million gallons) | | | | |
| Energy | Energy Efficiency | 10 | Energy shortage (TOE) | | | | |
| | | 11 | Annual energy consumption per capita (MBTU/capita/annum) | | | | |
| | | 12 | Improvement in the energy efficiency per GDP (TOE/GDP) | | | | |
| Human Settlements | Demography | 13 | Population growth rates (national, rural, and urban in %) | | | | |
| | | 14 | Population living below poverty line (national, rural, and urban in %) | | | | |
| | | 15 | Under 5 motality rate (national, rural, and urban per 1000 births) | | | | |
| | Water Supply | 16 | Access to clean water (% of population served at national, rural, and urban) | | | | |
| | Sanitation | 17 | Access to sanitation services (% of population served at national, rural, and urban) | | | | |
| | Solid Waste | 18 | Access to solid waste collection services (% of population served at national, rural, and urban) | | | | |
| | Public Health | 19 | Health and nutrition expenditures (Rupees & % of GDP) | | | | |
| Environmental Economics | Economics | 20 | Environmental protection budget as % of national budget (Rupees in million and %) | | | | |
| Natural Disasters | Natural Disasters | 21 | Number of human settlements and population vulnerable to natural disasters (number) | | | | |

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Table III: Sectoral Environmental Indicators for Pakistan by PSIR Framework

| Theme | Sub-theme | Sr. No. | Key Environmental Indicators | PSR Framework | | | |
|-------------------|------------------------------|---|--|---|---|---|---|
| | | | | P | S | I | R |
| Land | Forest | 1 | Annual fuel wood production (M3) | | | | |
| | | 2 | Annual fuel wood consumption (M3 per capita) | | | | |
| | | 3 | Area under Mangrove forests (% and hectare) | | | | |
| | | 4 | Area of the Mangrove forests under threat (% and hectare) | | | | |
| | | 5 | Area under Juniper forest (% and hectare) | | | | |
| | | 6 | Area of the Juniper forest under threat (% and hectare) | | | | |
| | | 7 | Annual area afforested (hectares) | | | | |
| | Rangelands | 8 | Area under rangelands (hectares) | | | | |
| | | 9 | Annual productivity of the rangelands (tonnes of biomass per hectare per year by classes of soil) | | | | |
| | | 10 | Introduction of high yield livestock varieties (number) | | | | |
| | Agriculture | 11 | Change in land use of class I, II, and III soils (hectares) | | | | |
| | | 12 | Area effected by soil contamination (% and hectare) | | | | |
| | | 13 | % of agricultural area adopted integrated pest management (% and hectare) | | | | |
| | | 14 | Area affected by desertification (% and hectares) | | | | |
| | | 15 | Annual area saved from desertification (hectares) | | | | |
| Water | Water Resources | 16 | Number of watercourses lined (number) | | | | |
| | | 17 | Irrigation water efficiencies (MAF/hectare) | | | | |
| | | 18 | Precision land levelling (hectares) | | | | |
| | Fresh Ground Water Resources | 19 | Annual fresh ground water consumption by major consumption sectors (MAF and % distribution) | | | | |
| | | Surface Water Resources | 20 | Increase in canal command area (hectares) | | | |
| | 21 | | Total watershed area (% and hectare) | | | | |
| | 22 | Area covered by watershed management (hectares) | | | | | |
| | Marine Water Resources | 23 | Change in the yield of marine species (% and tonnes) | | | | |
| Human Settlements | Demography | 24 | Population and population growth rate by important eco-systems (number and %) | | | | |
| | | 25 | National rural and urban densities (number of persons per hectare) | | | | |
| | | 26 | Compact urban development(persons/hectare in urban areas) | | | | |
| | | 27 | Planned distribution of urban population by metropolitan, secondary, and small cities (% distribution] | | | | |
| | Water Supply | 28 | Targets for the population coverage for clean water (% population targets by years) | | | | |
| | Sanitation | 29 | Targets for the population coverage for safe sanitation services(% population targets by years) | | | | |

ENVIRONMENTAL ASSESSMENT GUIDELINES

| Theme | Sub-theme | Sr. No. | Key Environmental Indicators | PSR Framework | | | |
|-------|----------------|---------|---|---------------|---|---|---|
| | | | | P | S | I | R |
| | Solid Waste | 30 | Number of settlements with sanitary landfills (number) | | | | |
| | | 31 | Solid waste recycling by type of waste (national, rural, and urban in tonnes) | | | | |
| | Transportation | 32 | % of population use public transport for intra urban commuting (%) | | | | |
| | | 33 | % of population use public transport for inter-settlements commuting (%) | | | | |

8.0 CONTENTS OF THE DETAILED ENVIRONMENTAL REPORT

The following topics should be covered in the detailed environmental assessment (EA) report:

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