



EIA Guidelines for

Transboundary Natural Gas Pipelines

in the Context of Pakistan



National Impact Assessment Programme

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Executive Summary

Introduction

These guidelines aim to help the relevant authorities and other stakeholders in identifying the most relevant environmental and social issues relating to transboundary natural gas pipelines, and for finding the best options for impact avoidance and mitigation. Whilst the focus for this specific guidance document is the preparation of the Environmental Impact Assessment (EIA) report, the bigger-picture goal is to ensure that the environmental management of transboundary gas pipeline projects is improved and that good practice in Environmental Management Plans (EMPs) is followed during the implementation of such projects.

Thus, these guidelines should support the relevant institutions especially Environmental Protection Agencies, Planning and Development Departments, financial lending institutions, consultants and civil society organizations in effectively guiding, undertaking and reviewing EIAs of transboundary gas pipelines.

The main audiences for these guidelines are:

- a) Proponents of gas pipeline projects, who need to understand the main environmental and social issues associated with their project, how they may be addressed and the cost implications for managing them. They may also use the guidelines to scope out the potential impacts and prepare the Terms of Reference for their environmental consultants.
- b) Consultants preparing EIA reports and EMPs.
- c) Provincial and Federal Government agencies involved in appraising and approving EIAs, issuing compliance certificates and monitoring environmental compliance and avoidance/mitigation effectiveness during construction, operation and decommissioning phases.

Transboundary EIA

The primary rules for conducting an EIA in any country are the respective EIA legislation and regulations applicable in that jurisdiction. It is necessary to clarify at this stage the often-used term “Transboundary EIA” (TBEIA). Most countries (in their legislation) and practitioners recognize that an EIA scope needs to be broadened if transboundary impacts are likely to occur. The key to ensuring this happens is that the Terms of

Reference (ToR) for the EIA stipulate the need for transboundary assessment. The term transboundary EIA is commonly used in cases of (mostly) large-scale projects such as dams, transport corridors, water transfer schemes, etc. that are likely to have impacts on other countries and where these countries jointly participate in the EIA. Transboundary EIA is thus not a separate assessment type, but refers merely to the geographical scope of the assessment. Marsden (2010) refers to TBEIA as “a process applied by one or more States to evaluate the significant environmental effects from proposals within their own territory (e.g. a power station) or which physically cross borders (e.g. a gas pipeline) and which may impact upon the territory of another State or States”. As with all EIAs, TBEIA is designed to provide better information for decision-makers, as well as involve stakeholders in the process (including the public and NGOs as well as relevant government departments).

The most prominent global legal instrument concerning the matter (the Espoo Convention), perhaps more accurately uses the term “EIA in a transboundary context” instead of transboundary EIA. However, whilst these terms are used interchangeably, we have chosen the title “EIA guidelines for transboundary natural gas pipelines” for this document.

Whilst TBEIA is generally understood to be an EIA for projects between countries, these guidelines recognize that it could equally be considered for assessing project impacts between provinces or regions within a country, when these provinces (as is the case in Pakistan) have some individual jurisdictions enabling them to take actions to remedy environmental harm suffered as a result of an impact originating in their own or another province.

Transboundary pipelines between Pakistan and neighbours

Pakistan relies heavily on imported oil and indigenous production of natural gas for its energy requirements. Oil and gas contribute almost 80% of the energy requirements in the country, whilst an estimated 3.5 million vehicles are running on natural gas. Despite large deposits of gas in Pakistan, the demand/supply trends point to an urgent need to increase natural gas supply, including importation. The Government of Pakistan is considering enhancing indigenous natural gas supplies through intensified exploration, and importing natural gas through pipelines from neighbouring countries.

Three pipeline projects have been considered as new supply options, namely 1) Iran – Pakistan – India; 2) Turkmenistan – Afghanistan – Pakistan – India; and 3) Qatar. The shortest was from Turkmenistan, but instability in Afghanistan makes this a less favorable option. The pipeline from Qatar will require an undersea conduit that will either traverse through the territorial waters of Iran or part of the Iranian coastline. Since Iran was not part of the project and it was trying to sell its gas to Pakistan, the pipeline from Qatar is currently regarded as a non-starter. This leaves Pakistan with one obvious option i.e. pipeline from Iran from its huge offshore South Pars gas field in the Persian Gulf.

Environmental impacts of natural gas pipelines

Natural gas is one of the world's most important and fast-growing energy sources. Gas is increasingly piped from well to port where it is frozen into a liquid, shipped to markets in refrigerated tankers, and warmed back into gas to be injected into local pipelines. Whilst switching from coal to gas in various parts of the world has some environmental advantages, there are many concerns about the impacts of gas pipelines. For instance, pipelines laid on the seafloor typically lead to the resuspension of sediments, resulting in organic particles traveling long distances via sea currents. The commissioning and de-commissioning of seafloor pipelines could be harmful to fish stocks and fisheries, whilst above-ground pipelines on land are barriers to wildlife and livestock movements. Pipelines crossing rivers can result in flow disruptions and increased sediments during trenching, whilst on farmland agricultural activities may be affected during and after the construction phase.

The transportation of pipes and other equipment from factories or import points (usually harbours) to the pipeline route, poses a series of challenges including disruption of traffic, deterioration of road surfaces, the need for new or improved access roads, dust and emissions from vehicles, and possibly the spread of sexually-transmitted diseases such as HIV and Aids.

Once constructed, buried and covered-over, pipelines pose fewer environmental problems, but they are vulnerable to damage by earthquakes and floods, as well as acts of sabotage. Whilst a damaged gas pipeline is usually repaired fairly quickly, gas emissions pose localized health risks, and nearby communities may experience a variety of inconveniences during monitoring and repair operations.

In the Pakistani context, there appear to very few true transboundary impacts linked to the construction, operation and decommissioning of natural gas pipelines. Throughout the consultations and literature research conducted in the compilation of these guidelines, it became evident that virtually all the impacts one could typically expect from this sector, are local in nature, even site specific. Five possible exceptions might be:

- The movement of labour teams, which cross borders as they dig the trenches, transport the pipes and other equipment, and lay the pipelines. In such a scenario, one might expect some social, health and cultural impacts because of inappropriate interactions with local communities. However, various experts in Pakistan were of the opinion that the probabilities of such impacts occurring are low since local teams are usually used, and hardly any construction staff cross into other countries during such projects. In the case of the Iran-Pakistan pipeline, each country is responsible for constructing the pipeline within its own territory. However, it is not inconceivable that a single contractor might in future be engaged to construct future pipelines, necessitating transboundary labour movement.
- The movement of sediment plumes across international boundaries when pipelines are laid on the sea floor.
- The spread of alien-invasive plants from one country to another is often facilitated by the movement of large machinery, as seeds lodged in tyre lugs or bulldozer tracks may become dislodged in new areas, thus spreading the distribution of plants into areas where they are not native.
- Gas plumes crossing boundaries in the event of damage to pipelines, either by natural events (e.g. earthquakes) or sabotage.
- The establishment of new roads to enable the construction and maintenance of pipelines in previously inaccessible areas, may result in land use changes in the country, and these in turn, may have indirect transboundary impacts in a neighbouring country.

Impact avoidance and mitigation

The appropriate siting of terminals and careful route selection are the first and most effective means of preventing or minimizing pipeline impacts from the outset, and these two aspects need to be the centerpiece of the EIA. For example, appropriate siting of the terminal on the coast is critical, since shorelines are usually valuable assets (dwellings, mangroves, fish and other seafood) and shipping traffic is a constant concern. Similarly, avoiding protected areas (marine or terrestrial, ecological or cultural) should be an underlying principle. The locality of key infrastructure near the gas source needs special attention in the EIA, since as much flexibility as possible is needed to ensure that pipeline routing avoids sensitive areas.

Siting of terminals and route selection are normally expected in the “Analysis of Alternatives” sections of the EIA report. Other key alternatives that require careful consideration include the establishment of threshold distances from towns, villages, farms, mosques, cemeteries, places of high biodiversity and cultural sites. Also, the use of alternative technologies such as directional drilling needs to be considered (e.g. for laying a pipe under a river), or the pipe may be attached to existing infrastructure such as a bridge. Another important principle is routing the pipeline alongside an existing development corridor (e.g. a highway), so that ‘greenfield’ and agricultural areas are avoided as far as possible, and the need for new service roads is minimized. Laying the pipeline alongside an existing road will likely also reduce the need for involuntary resettlement, which can require protracted negotiations and result in increased project costs.

From a social impact perspective, the use of local labour usually reduces inappropriate interactions between the workforce and local communities (especially problematic in remote rural areas), and culturally-acceptable measures need to be in place to limit the spread of STDs. Fortunately, Pakistan has a relatively good road network that enables the efficient movement of heavy vehicles, but trucks carrying abnormal loads (e.g. pipes) may slow down traffic, cause congestion and generally inconvenience the public. This problem will be more acute in hilly, remote areas with fewer tarred roads, so access routes need to be carefully selected and transport needs to be well planned.

Irrespective of whether impacts are likely to be social, cultural, health or biophysical, the EIA process must include effective, extensive and transparent public participation to enable affected communities and other stakeholders to participate meaningfully in decision making.

Conclusions and recommendations

Whilst the transboundary impacts of natural gas pipelines in the context of Pakistan appear to be less than originally expected, it must be borne in mind that there is limited experience with such projects between Pakistan and her neighbours. However, there are many transboundary natural gas pipelines elsewhere in the world, and a growing body of experience, including examples of poor, good and best practice. Also, there is considerable experience of this sector within Pakistan since many thousands of kilometers of domestic natural gas pipelines have been constructed in the country. These guidelines have drawn on local and international experience, and it is expected that they will be updated and revised as knowledge improves. As with all guidelines the best next step is to implement them, for pipelines within the national borders of Pakistan, and beyond.

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The NIAP is furthermore acknowledged as a unique initiative that uses a multi-pronged strategy to strengthen the system of impact assessment in Pakistan. The programme has undertaken interventions at the policy level, carried out capacity building among stakeholders, developed tools, procedures and mechanisms for improved impact assessment, increased understanding of the importance of impact assessment processes, and advocated the adoption of impact assessment at all levels.

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Glossary of terms

Alternatives: A possible course of action in place of another that would meet the same purpose and need. An alternative can include other locations/sites, routes, layouts, processes, designs, schedules and/or inputs. The ‘without project’ alternative provides a benchmark against which to evaluate changes; development should result in net benefit to society and should avoid negative impacts.

Ecosystem approach: As advocated by the Convention on Biological Diversity (CBD), the ecosystem approach recognises that people and their environment are part of the broader ecosystems on which they depend. Environmental management should therefore be implemented in an integrated way.

Environment: Includes all components of the environment, namely humans, flora, fauna, soil, climate, air, water, landscape, natural sites, material assets, cultural heritage and the interaction among these components.

Environmental assessment: A process that is used to identify, predict and assess the potential positive and negative impacts of a proposed development on the environment and to propose appropriate management actions that will enable the avoidance or minimisation of impacts.

Strategic Environmental Assessment (SEA): The application of impact assessment to policies, plans, and programmes. Impact assessments at strategic level encourage an ‘opportunities and constraints’ type approach to development, where such things as natural resources and ecosystem services at landscape scale define the ‘framework’ within which development can take place and the types of development that could be sustained.

Environmental Impact Assessment (EIA): The application of impact assessment to a specific project. Typically, an EIA is carried out on a project that is already defined (i.e. in feasibility stage).

Environmental Quality Objective: An EQO specifies a target for environmental quality. If EQOs are set by enforceable regulations, they are usually referred to as Environmental Quality Standards.

Impacts are effects on the environment:

Direct impacts take place at the same time and in the same space as the activity.

Indirect impacts occur later in time or at a different place from the activity.

Cumulative impacts are the combined or additive effects on the environment of individual projects over time or of several projects in one geographical area. They may seem to be insignificant when seen in isolation, but collectively they may have a significant effect.

Irreversible impact: An impact that cannot be reversed in time, it results in the irreplaceable loss of a resource. Issue: A context-specific question that asks ‘what, or how severe, will the impact of some activity/ aspect of the development be on some element of the environment?’

Monitoring: Actions taken to observe, take samples or measure specific variables in order to track changes, measure performance of compliance, and/or detect problems. The objective of monitoring should always be to improve management.

Notification: Notification is the formal process whereby States officially inform other States when they are planning to carry out activities that may cause significant adverse effects upon other States.

Offset: An offset replaces or provides ‘like for like or better’ substitutes for residual negative impacts on the environment. Such offsets could include formal commitment to managing substitute areas of comparable or greater value for conservation, entering into a secure and permanent conservation agreement with the conservation authority, setting aside protected natural areas, establishing a trust fund for conservation, thereby enabling land acquisition and/or management, etc. Offsets focus on areas of recognised value to conservation and on ensuring the persistence of landscape-scale processes.

Opportunity cost: The lost opportunities that might result from the implementation of a certain alternative. For example, a pipeline in a national park will likely reduce the tourism potential of the area.

Party: Means, unless the text indicates otherwise, a Contracting Party to a Convention, Agreement or Protocol.

Party of origin: Is a Party within whose territory and/or under whose jurisdiction a policy, plan, programme or project, is to be developed and implemented.

Affected party: Is a Party whose environment or other related interest is likely to be affected by a policy, plan, programme or project, envisaged and/or developed in a neighbouring country.

Precautionary principle: Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Public: Means one or more natural or legal persons and, in accordance with national legislation or practice, their associations, organizations or groups.

Risk: Likelihood of occurrence of an event and estimated magnitude/severity of its impact on the environment.

Scenario: A description of a plausible future condition that could influence the environment.

Scoping: Determination of the spatial and temporal boundaries and key issues to be addressed in an EIA. Its main purpose is to focus an EIA on a manageable number of important questions, and to ensure that only key issues and reasonable alternatives are examined.

Screening: A decision-making process to determine whether or not a development proposal requires an EIA, and if so, what level of assessment is appropriate. Screening is usually conducted by an environmental authority or financing institution.

Significance: Determination of severity of an impact taking into account objective or scientific data as well as societal values.

Uncertainty: The inherent unpredictability of response of the environment to an impact, the lack of knowledge and/or understanding of cause-effect-impact relationships between the development activity and the environment, and/or gaps in information that do not allow confidence in predictions of impacts.

Vulnerable communities: Those communities who rely heavily on those ecosystem goods and/or services likely to be affected or who live in dynamic, sensitive or harsh ecosystems, where extreme conditions make them particularly vulnerable to additional negative impacts.

Watercourse: Surface and groundwater body, flowing into a common terminus such as the sea, a lake or an aquifer.

Acronyms

ADB	<i>Asian Development Bank</i>
AIDS	<i>Acquired Immune Deficiency Syndrome</i>
BEPA	<i>Baluchistan Environmental Protection Agency</i>
BIMSTEC	<i>Bay of Bengal Initiative for Multisectoral Technical and Economic Cooperation</i>
BP	<i>Bank Procedures</i>
CBD	<i>Convention on Biological Diversity</i>
CCD	<i>Climate Change Division</i>
CITES	<i>Convention on the Illegal Trade in Endangered Species</i>
CLL	<i>Concurrent Legislative List</i>
EA	<i>Environmental Assessment</i>
ECO	<i>Economic Cooperation Organisation</i>
EIA	<i>Environmental Impact Assessment</i>
EMP	<i>Environmental Management Plan</i>
EPA	<i>Environmental Protection Agency</i>
EQO	<i>Environmental Quality Objective</i>
GEF	<i>Global Environment Facility</i>
GoP	<i>Government of Pakistan</i>
GoS	<i>Government of Sindh</i>
GDP	<i>Gross Domestic Product</i>
HIV	<i>Human Immunodeficiency Virus</i>
IAIA	<i>International Association for Impact Assessment</i>
I&APs	<i>Interested and Affected Parties</i>
IEE	<i>Initial Environmental Examination</i>
IFC	<i>International Finance Corporation</i>
ISO	<i>International Standards Organisation</i>
IUCN	<i>International Union for Conservation of Nature and Natural Resources</i>
LAA	<i>Land Acquisition Act</i>
LPG	<i>Liquid Petroleum Gas</i>
LNG	<i>Liquefied Natural Gas</i>
MoE	<i>Ministry of Environment</i>
NBSAP	<i>National Biodiversity Strategy and Action Plan</i>
NCEA	<i>Netherlands Commission for Environmental Assessment</i>
NCS	<i>National Conservation Strategy</i>
NEAP	<i>National Environment Action Plan</i>
NEP	<i>National Environmental Policy</i>
NEQS	<i>National Environmental Quality Standards</i>
NGO	<i>Non-Governmental Organisation</i>
NIAP	<i>National Impact Assessment Programme</i>
NOC	<i>Non-Objection Certificate</i>
OD	<i>Operational Directive</i>
OIC	<i>Organisation of Islamic Countries</i>
OMS	<i>Operational Manual Statements</i>
OP	<i>Operational Policy</i>

Acronyms

PCDP	<i>Public Consultation and Disclosure Plan</i>
PEIA	<i>Preliminary EIA</i>
PEPA	<i>Pakistan Environmental Protection Act</i>
PEPO	<i>Pakistan Environmental Protection Ordinance</i>
ROW	<i>Right of Way</i>
SAARC	<i>South Asian Association for Regional Cooperation</i>
SAIEA	<i>Southern African Institute for Environmental Assessment</i>
SAP	<i>Strategic Action Programme</i>
SEA	<i>Strategic Environmental Assessment</i>
SEPA	<i>Sindh Environmental Protection Agency</i>
SCADA	<i>Automated Control System</i>
STD	<i>Sexually Transmitted Diseases</i>
TAPI	<i>Turkmenistan-Afghanistan-Pakistan-India gas pipeline project</i>
TBEIA	<i>Transboundary Environmental Impact Assessment</i>
TDS	<i>Total Dissolved Solids</i>
TIA	<i>Transboundary Impact Assessment</i>
TOE	<i>Tons of Oil Equivalent</i>
ToR	<i>Terms of Reference</i>
UNDP	<i>United Nations Development Programme</i>
UNECE	<i>United Nations Economic Commission for Europe</i>
UNEP	<i>United Nations Environment Programme</i>
UNO	<i>United Nations Organisation</i>
WB	<i>World Bank</i>

Part 1 - Background

1.1 Introduction

As noted in the ToRs for the development of these guidelines, Pakistan is an energy deficient country with heavy reliance on imported oil and indigenous production of natural gas. Oil and gas are two of the key components of the energy mix contributing almost 80% share to the 64 million Tons of Oil equivalent (TOE) of energy requirements in the country. As per Pakistan Energy Book 2012, the energy supplies by source in Pakistan in 2010-11 was 47.6% from natural gas, 32% from oil, 11.8% from hydro, 6.7% from coal, 1.3% from nuclear and 0.5% from LPG (GoP 2012). Pakistan has an estimated 3.5 million vehicles running on natural gas - third largest fleet of natural gas vehicles in the world. Despite large deposits of gas considered to be enough to meet energy needs of the country in decades to come, the supply of natural gas has fallen miserably short due to poor management of a non-renewable source of energy resulting in major gas shortages in the country. If the demand / supply trend of the past few years continues, the Reserve to Production ratio will reduce significantly necessitating an urgent need to increase natural gas supply. In order to meet the growing demand and increase supply, the Government of Pakistan is considering the following two options 1) enhance indigenous natural gas supplies through intensified exploration; and 2) import natural gas through pipelines from neighbouring countries as well as Liquefied Natural Gas (LNG) (GoP 2005).

Pakistan has explored various options for transporting natural gas from the neighbouring countries. Three different pipeline options have been considered over the last couple of decades and feasibility studies have been prepared 1) Iran – Pakistan – India; 2) Turkmenistan – Afghanistan – Pakistan – India; and 3) Qatar. The shortest was from Turkmenistan, but instability in Afghanistan makes this a less favorable option. The pipeline from Qatar will require an undersea conduit that will either traverse through the territorial waters of Iran or part of the Iranian coastline. Since Iran was not part of the project and it was trying to sell its gas to Pakistan, the pipeline from Qatar is currently regarded as a non-starter. This leaves Pakistan with one obvious option i.e. pipeline from Iran from its huge offshore South Pars gas field in the Persian Gulf. The construction of this proposed pipeline will cost an estimated US\$ 7.5 billion.

Rationale - Need for Urgent Response

To meet the growing energy needs of a population of 180 million and to achieve and maintain 8% growth rate, a LNG terminal and one natural gas pipeline from Iran will be insufficient. The country will need another pipeline in the next ten to fifteen years and another in twenty years' time.

Hence the need arose for local/regional expertise to assess the environmental impacts associated with these transboundary pipelines which will run through rivers, protected areas and human settlements. Moreover, there are various risks (e.g. insurgency, protests, political opposition, geo-political shifts) associated with the regions the pipeline will traverse.

Whilst there are various guidelines available for large transboundary projects¹ and guidelines regarding natural gas pipelines² there are no specific guidelines for transboundary natural gas pipelines in a Pakistani or even South or West Asia context. Once developed, these guidelines will provide the much-needed support to national and provincial EPAs, financial institutions and civil society in guiding the management of environmental³ concerns associated with this mega initiative.

EIA was introduced as a requirement in Pakistan under Pakistan Environmental Protection Ordinance (PEPO) 1983. In 1997, PEPO was replaced by the Pakistan Environmental Protection Act 1997 (PEPA'97), which further strengthened EIA as a legal requirement and introduced IEE / EIA Review Rules 2000. To support EIA implementation in the country, various guidelines have been developed, including EIA Guidelines (1986), EIA Energy Sector Guidelines (1992), EIA Guidelines for Oil & Gas Exploration in Environmentally Sensitive Areas (1997). Guidelines for twenty-two sub-sectors were developed by Khyber Pakhtunkhwa EPA, and for three sub-sectors by Balochistan EPA. During 2014, other guidelines were being prepared for dams/hydro schemes and coal-fired power stations. Landmark projects like the oil and gas development in Kirthar National Park, as well as the NCEIA-led EIA mapping exercise, have highlighted that there is ample scope to strengthen EIA practice in Pakistan.

¹(e.g. European Commission Guide on Transnational Projects, Arctic and Caspian Sea EIA Guidelines, Espoo Convention Guidelines)

²(e.g. Oil and Gas UK, IFC and World Bank, London Energy Institute, Australian Code of Practice, Ontario Energy Board and a best practice 'handbook' (Goodland et al 2005))

³For the purposes of these guidelines, the term "environment" includes all components of the environment, namely humans, flora, fauna, soil, climate, air, water, landscape, natural sites, material assets, cultural heritage and the interaction among these components. Thus, these guidelines DO NOT refer separately to Social Impact Assessment, Health Impact Assessment etc.

This set of guidance aims to help the relevant authorities and other stakeholders in identifying the most relevant environmental and social issues and for finding the best options for management and mitigation. Whilst the focus for this specific guidance document is the preparation of the Environmental Impact Assessment (EIA) reports, the bigger-picture goal is to ensure that the environmental management of transboundary gas pipeline projects is improved and that good practice in Environmental Management Plans (EMPs) is followed during the implementation of such projects.

Thus, these guidelines should support the relevant institutions especially Environmental Protection Agencies, Planning and Development Departments, financial lending institutions, consultants and civil society organizations in effectively guiding, undertaking and reviewing EIAs of transboundary gas pipelines.

The main audiences for these guidelines are:

- Proponents of gas pipeline projects, who need to understand the main environmental and social issues associated with their project, how they may be addressed and the cost implications for managing them. They may also use the guidelines to scope out the potential impacts and prepare the Terms of Reference for their environmental consultants.
- Consultants preparing EIA reports and EMPs.
- Provincial and Federal Government agencies involved in appraising and approving EIAs, issuing compliance certificates and monitoring environmental compliance and avoidance/mitigation effectiveness during construction, operation and decommissioning phases.

1.2 How to use the guidelines

These guidelines are organized in six parts. Part one presents the background information about the development of transboundary natural gas pipelines in Pakistan and the typical components of such projects. Part two contains a review of selected international and donor guidance that is pertinent to transboundary EIA in the context of gas pipelines. This is so that the guidelines are based upon best practice and so that they complement existing standards and safeguards of lending agencies such as the World Bank, IFC and the ADB, and that there is no contradiction in the advice given.

Part three deals with the EIA process and the legislation and regulations in Pakistan whilst part four provides framework guidance, stressing some key principles that EIAs (including those in a transboundary context) should adhere to. It also includes advice on how impacts should be assessed for construction, operational and decommissioning phases of a pipeline, since each phase has very different impacts. Part five outlines the requirements for Scoping, EIA and EMP reports.

Finally, part six focuses on transboundary communication and information exchange between States or provinces.

The eleven Annexes provide more detailed information including sample Terms of Reference for an EIA for a transboundary natural gas pipeline project, the contents list for an EIA report, an EMP and a Disaster Management Plan, and templates for reviewing scoping studies, EIAs and EMPs. The final annex lists the persons consulted during the compilation of these guidelines.

1.3 Overview of natural gas supply and use in Pakistan

Pakistan is an emerging economy of around 180 million people with limited home-drilled traditional energy resources like oil and gas. Therefore around 30 percent of the energy requirements are imported resulting in spending over US\$ 14.5 billion per annum (Pakistan Energy Yearbook 2012).

1.3.1 Availability of resources

In Pakistan, natural gas was first found in 1952, with a discovery in the province of Balochistan near Sui. Therefore in Pakistan, natural gas is often referred as Sui gas.

Government's policies have resulted in natural gas becoming the leading contributor to the country's energy mix. Its contribution in the energy mix has increased from 40 percent in 1999-2000 to 50 percent in 2010-2011 (Malik and Sukhera 2011).

The use of natural gas as a vehicle fuel has seen substantial growth in the last decade. As a result Pakistan is a leading CNG consuming country in the world where around 2.7 million vehicles use CNG as a fuel (Pakistan State Oil 2014). Also the Pakistan's power generation sector dependency on the use of natural gas as a fuel is significant. The country is generating 32 percent of its electricity from natural gas (Mahmood et al. 2013). Therefore natural gas shortages consequently end up as an energy crisis causing multiple social challenges.

The total proven reserves of natural gas are around 32 trillion cubic feet (TCF) in 2005. Following are the major gas fields in Pakistan (refer Figure: 1.1 and 1.2).

- Adkhi
- Badim
- Bhit gas field
- Khasan gas field
- Kandanwari gas field
- Kandkhot field (13 TCF, $347 \times 10^9 \text{m}^3$)
- Khan field
- Mari field
- Miano gas field
- Mizra field
- Sawan gas field
- Sui gas field (2 TCF; $54 \times 10^9 \text{m}^3$)
- Toot gas field
- Ul Haq field (1 TCF; $27 \times 10^9 \text{m}^3$)
- Zamzama field

As mentioned above, over the years, especially from 2001-2007, the local natural gas consumption has increased from 0.786 TCF to 1.223 TCF (Malik and Sukhera 2011). Although new gas fields have been discovered in Pakistan there is still pressure on the local gas reserves which are depleting and will be exhausted in 16 years provided the present demand and supply remains unchanged (Mahmood et. Al 2013). Therefore, the Government of Pakistan is cognizant of the gas shortages and is exploring the prospects of importing natural gas from the Middle East and Central Asian Republics, which have abundant natural gas reserves.

There are many public and private sector companies engaged in the exploration of natural gas and oil in Pakistan. However, for transmission and distribution, the following two public utility companies are currently the only operators in Pakistan:

1. Sui Southern Gas Company Limited (Areas of franchise are the Province of Balochistan and Sindh Province), and
2. Sui Northern Gas Pipelines Limited (Responsible for the Provinces of Khyber Pakhtunkhwa, Punjab and the State of Azad Jammu & Kashmir).

Together these two companies maintained a transmission and distribution network of over 139,804 kilometers in 2012. There are around 6.7 million natural gas consumers in Pakistan (Pakistan Energy Yearbook 2012, p.72).

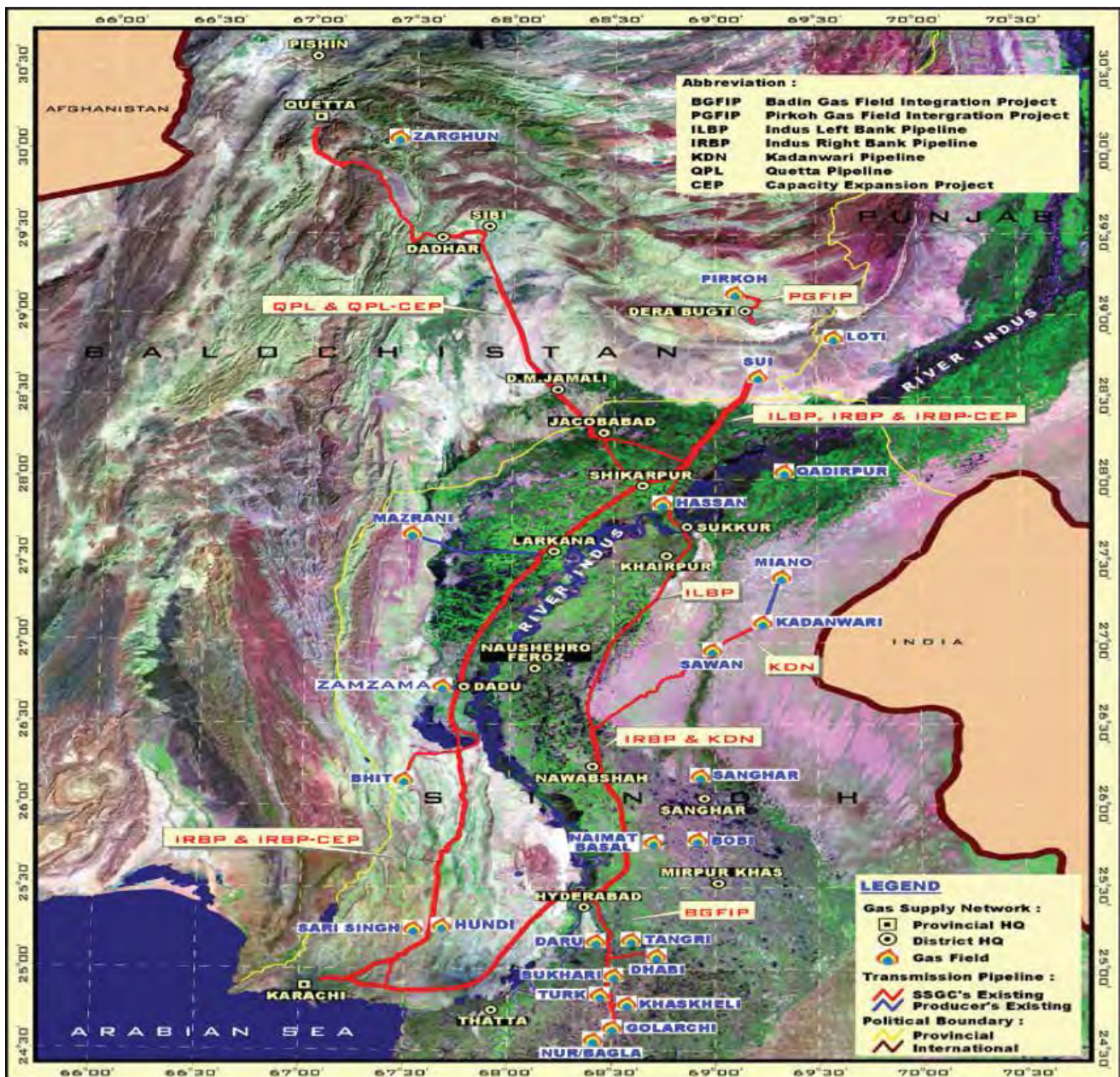


Figure: 1.1 – Gas Infrastructure and Gas Fields in Southern Pakistan (SSGC 2012)

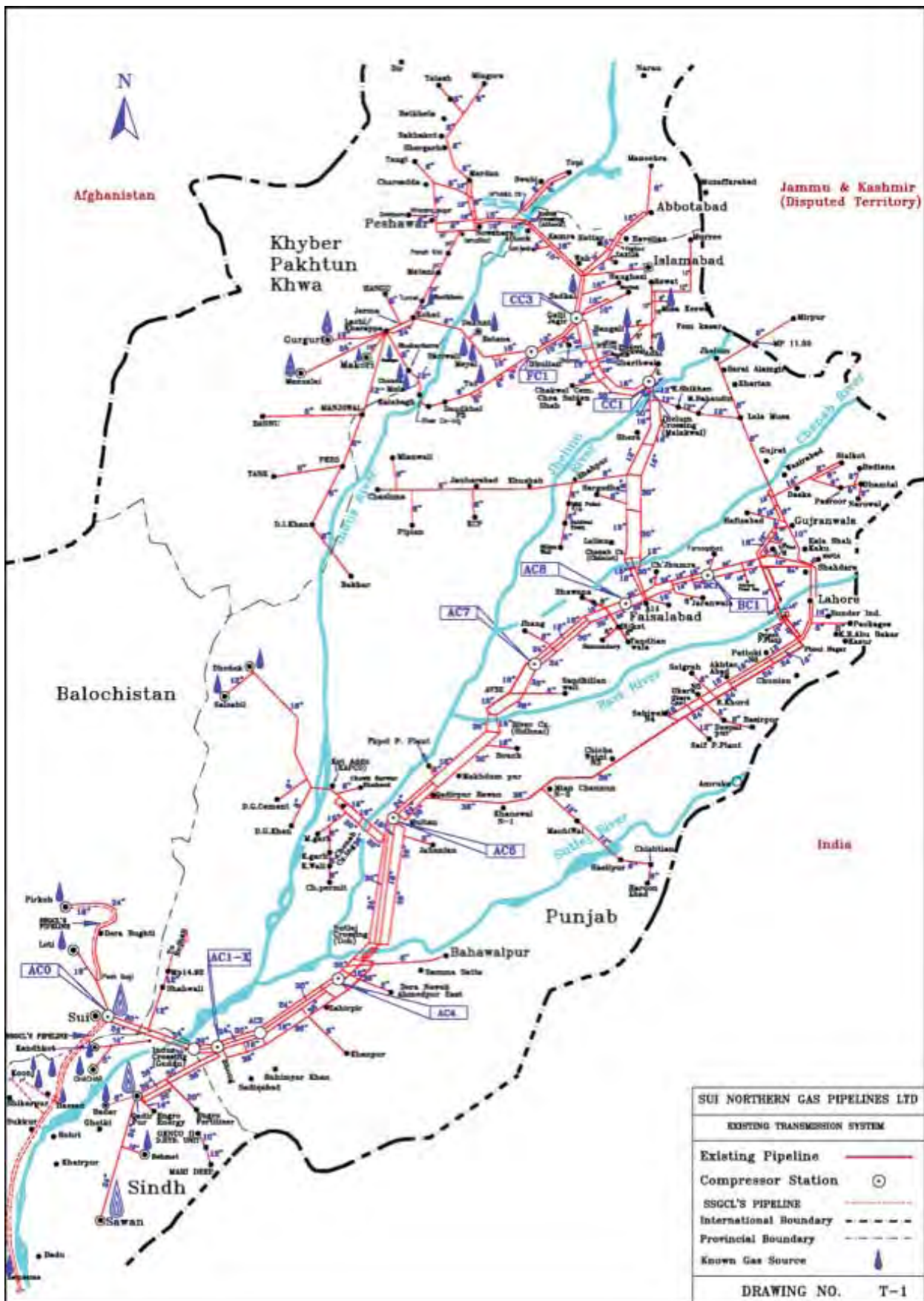


Figure: 1.2 – Gas Infrastructure and Gas Fields in Northern Pakistan (SNGPL 2013)

1.3.2 Regional and national pipeline networks

Presently no transboundary natural gas pipeline network exists in South Asia. There are a proven 243-248 tcf natural gas reserves in the Caspian region. Whilst there is an increase in gas demand in India, due to the high infrastructure costs and geo-political situation in the region, no transboundary natural gas pipeline has been able to reach India from Central Asia (Hill and Spector 2001). Whereas in case of Central Asia, China and the Middle East (refer Figure: 1.3) there are a number of transboundary natural gas pipelines in operation, notably:

1. Turkmenistan - Uzbekistan - Kazakhstan – Russia pipeline operational since 1967, and
2. Turkmenistan - Uzbekistan - Kazakhstan – China pipeline operational since 2009.

As the regional economies of China, India and Pakistan continue to grow, these countries are considering the prospects of importing natural gas from the Central Asian Republics. In this regard, two major pipelines routes are under consideration:

1. Iran – Pakistan (IP) pipeline, and
2. Turkmenistan – Afghanistan – Pakistan – India (TAPI).

1.4 Institutions for gas power development in Pakistan

There are various Government departments and agencies as well as private sector companies working on gas power development in Pakistan. Government is responsible for giving policy direction, issuance of exploration licenses, monitoring and enforcement, regulatory controls and transmission and distribution. Private sector companies are mainly involved in oil and gas exploration, establishing and operating refineries, and marketing. The following are relevant institutions involved in the gas power sector in Pakistan:



Figure: 1.3 – Existing and Proposed Transboundary Natural Gas Pipelines

1. Ministry of Planning and Development
2. Ministry of Petroleum and Natural Resources
3. Ministry of Water and Power
4. Oil and Gas Regulatory Authority
5. Pakistan Petroleum Limited
6. Hydrocarbon Development Institute of Pakistan
7. Interstate Gas Systems
8. Sui Southern Gas Company Limited
9. Sui Northern Gas Pipelines Limited
10. Oil and Gas Development Company Limited
11. OMV Group
12. United Energy Pakistan Limited
13. BHP
14. ENI
15. Mari Gas Company Limited and
16. MOL

1.5 Policy for gas pipeline projects

There is no national policy for gas pipeline projects, however according to the Pakistan Environmental Protection Act (PEPA) of 1997, there are oil and gas exploration guidelines. There is also a policy pertaining to the allocation and management of gas resources in Pakistan (currently under review).

1.6 Types and components of natural gas pipelines

Gas pipelines can be above or underground, each with advantages and disadvantages. Since the 1950s, pipelines were built above ground, even in harsh terrain such as permafrost and muskeg. Modern pipelines are buried, with the welds thoroughly inspected beforehand. Inner and outer pipeline coatings are increasingly effective in improving protection and longevity of the steel pipe. Corrosion of steel is prevented by removal of water and salts. Cathodic protection is becoming standard while fiber-optics detect even minor leaks very early. New, well built pipelines rarely leak or rupture. Trenching for buried pipelines is an obvious impact, but burial and rehabilitation helps restore land use, thus reducing long-term impact, the risk of sabotage, and ruptures from traffic crashes. Above-ground pipelines can impede the passage of humans, livestock, vehicles, and wildlife, and removes the often 50 m-wide right of way (ROW) from other land-use.

Typically natural gas travels from the wellhead to end consumers through a series of pipelines. These pipelines include flow lines, gathering lines, transmission lines, distribution lines, and service lines that carry gas at varying rates of pressure.

The higher the pressure of gas in a pipeline, the more potentially dangerous an accident could be with that pipeline.

1. Flow lines:

Flow lines connect to a single wellhead in a producing field. Flow lines move natural gas from the wellhead to nearby storage tanks, transmission compressor stations, or processing plant booster stations.

2. Gathering Lines

Gathering lines collect gas from multiple flow lines and move it to centralized points, such as processing facilities, tanks, or marine docks.

3. Transmission Pipelines

Transmission pipelines carry natural gas across long distances and occasionally across interstate boundaries, usually to and from compressors or to a distribution center or storage facility.

4. Distribution Pipelines

Distribution pipelines, also known as "mains," are the middle step between high pressure transmission lines and low pressure service lines. Distribution pipelines operate at an intermediate pressure.

5. Service Pipelines

Service pipelines connect to a meter that delivers natural gas to individual customers.

1.7 Sequence of activities for constructing, operating and decommissioning of a natural gas pipeline

The following table provides an overview of the activities one would typically expect during the process of planning, constructing, operating and decommissioning a natural pipeline, whether it is a transboundary project or not. In addition, an estimation is provided as to the labour and machinery requirements for each phase.

Table 1.1: typical activities during laying, operating and decommissioning a gas pipeline

Activity	Methods	Labour	Equipment / resources
Route alignment and planning	Mapping of terrain of the preferred alignment, assess geophysical and topographic characteristics and map sensitive zones along the route. Based on this, GIS generates preferred route(s).	Minimal	Remote sensing
EIA	See national legislation for standards and process – at minimum, the EIA must confirm the best route alternative and suggest impact avoidance and mitigation measures	EIA team (8-12 EAP's)	10-15 months, light transport, helicopter
Establish Right of Way (ROW)	EIA will have established land status (owners) and land use. Negotiate ROW (offsets & compensation) ROW usually not applicable for an undersea pipeline	As above	As above
Preparation of construction strip	Strip for 1 pipeline ~ 45m wide in agricultural land and ~32m in forests. In difficult sections (e.g. water bodies), a narrower strip is possible. Preparation of the strip requires removal of vegetation and construction of temporary facilities. Temporary fences may be needed to keep out livestock and people. Strip preparation generally not conducted for an undersea pipeline	10-15 people per 10km section	Bulldozers, vehicles, temp accommodation, temp power supply, water, food etc.
Removal of soil layer and leveling of terrain	Topsoil from the trench is removed and stored separately from other excavated material – so it can be used for re-vegetation after the pipe is laid and the trench back-filled. Not applicable for an undersea pipeline	As above	As above
Arranging and aligning the pipes in the construction strip	Steel pipes usually 12m in length are transported to site on specialized heavy trucks from nearby storage areas and unloaded using mobile cranes. Pipe sections are usually connected before trench excavation. Boats used in the case of an undersea pipeline	As above	Low-beds/large trucks, cranes – rest as above
Preparation of the pipes	Pipes are inspected and cool-bent <i>in situ</i> as needed.	As above	As above
Trench digging	A trench around 2.5m deep, 1.9m wide at the base and 10m wide at the surface, is dug. If blasting is required, the location of the "microblasts" is determined taking into account the results from the geological surveys. Trenches usually not dug for an undersea pipeline (pipeline laid on sea floor)	As above	Excavators, vehicles, temp accommodation
Crossing of obstacles	Tunnels under paved motor roads, railway lines or rivers are excavated through horizontal drilling. The underground crossing should be as close as possible to 90° so as to minimize impact area. Not applicable for an undersea pipeline	As above	As above, plus specialized drill machines
Welding, insulation and corrosion protection	Electric arc welding, mainly automated, is used. Welding joints are inspected using radiographic methods and ultrasound. Thereafter, exposed steel sections are cleaned and covered with a protective coating. Thermo-contracting sealing rings are placed over the frontal welding connections. Pipes have internal anti-corrosion coating.	Fewer workers – but specialized welders	Welding equipment, compressors, accommodation etc. as above
Pipe testing	After sections of pipes are laid, they are filled with potable-quality water and placed under great pressure to test their integrity. The amount of water required depends on pipe distance. Water is sourced locally and delivered in tankers.	Small number of specialized staff	Water, tankers, pumps, compressors, accommodation etc. as above
Laying the pipes in the trench	The pipes are buried at 1 to 2 metres depth, depending on circumstances. In the case of an undersea pipeline, the pipeline is usually laid on sea floor.	10-15 people per 10km section	Cranes. Accommodation etc. as above
Backfilling	The trench is backfilled using a bulldozer. Topsoil (placed to one side earlier), provides the final covering of the scar. To safeguard the laid pipe, trench segments may not be left open overnight. Not applicable for an undersea pipeline	As above	Bulldozers. Accommodation etc. as above
Installation of shut-off valves	In-line compression facilities (compressors, a pressure management vent, power generators and a water management system, including an onsite evaporation pond) are installed where needed (close together where the pipeline is more vulnerable – e.g. attached to a bridge)	Specialised team, mostly engineers, mechanics	Construction & excavation equipment, Accommodation etc. as above
Re-cultivation of construction zone	The topsoil probably already contains a seed bank, but additional seeds (e.g. grass) may be sown (do not introduce alien species). Not applicable for an undersea pipeline	Minimal	Seeds and fertilizer
Operating the gas pipeline	The pipeline is monitored by an Automated Control System (SCADA), which accurately detects faults. Specialised teams repair faults (or sabotage), maintain equipment and facilities. Regular ground and occasional aerial inspections are conducted.	Minimal (more for repair teams)	Computerised control room, vehicles, helicopter
Decommissioning the gas pipeline	Useful pipeline life is ~50 years. Decommissioning alternatives are either leaving the pipeline but dismantling the facilities, or removing everything. If leaving the pipeline intact, the following major types of activities will arise on-site: Degasification; Cleaning of the pipeline by water rinsing; Filling of the pipeline with water or inert gas; Sealing; Dismantling of the facilities. If removing everything is chosen, the following major types of activities will arise: Degasification; Dismantling of the facilities; Excavation works; Dismantling of the pipeline; Restoration of the ground base and re-cultivation. The EIA must guide the decision on the appropriate alternative.	10-15 people per 10km section	Excavators, Low-beds/large trucks, cranes – rest as above. Also may need large volumes of water.

*EAP = Environmental Assessment Practitioner (also commonly referred to as EIA consultants)

Part 2 - International and regional safeguards regarding transboundary EIA

2.1 International conventions and transboundary agreements

The following international conventions to which Pakistan is a signatory may be relevant for transboundary natural gas pipeline projects:

- Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Ramsar, 1971 and its amending Protocol, Paris, 1982.
- Convention Concerning the Protection of World Cultural and Natural Heritage (World Heritage Convention), 1972.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Washington, 1973.
- Convention on the Conservation of Migratory Species of Wild Animals, Bonn, 1979.
- Convention on Biological Diversity, Rio de Janeiro, 1992.
- United Nations Framework Convention on Climate Change, Rio De Janeiro, 1992.
- Water sharing with India.
- 1992 Water Accord.

2.1.1 Espoo Convention

The 1991 Espoo Convention on Environmental Impact Assessment in a Transboundary Context is a modern dynamic international treaty, designed to adapt to changing and more complex circumstances (Koivurova and Pölönen 2010). It was negotiated under the auspices of the United Nations Economic Commission for Europe (UNECE) and signed in Espoo, Finland, in 1991. The Convention entered into force in 1997, while the SEA

Protocol to the Convention was signed in 2003. Kazakhstan, Kyrgystan, Tajikistan and Russia are Parties to the Espoo Convention, and Uzbekistan is preparing to ratify (Maarsden 2011).

The Espoo Convention regulates situations where a significant adverse transboundary impact is likely to be caused to a state's environment by a proposed activity in another contracting state (the origin state). The Convention requires the parties to cooperate with each other before the activity is undertaken. In order for this procedure to function effectively, the Espoo Convention requires the states to establish national EIA procedures that allow for the integration of foreign impacts and foreign stakeholders. The origin state is first required to notify the potentially affected state of the likely significant adverse transboundary impact and to provide basic information regarding the proposed activity. The affected state must next confirm that it wants to participate in the procedure. The origin state is then obligated to study the transboundary impacts together with the affected state and allow the public of that state to participate in the process on the same terms as its own public would be entitled to. After the EIA, the affected state has an opportunity through consultations with the origin state to comment on the proposed activity. The final decision taken on the proposed activity in the origin state must take due account of the comments from the potentially affected state and its public. A note prepared by the Espoo Convention Secretariat lists (inter alia) the following examples of "complex activities":

- Pipelines, roads or other linear infrastructure projects that are part of an energy or transport network crossing several Parties;
- Large energy projects that could affect sub-regional policies.

Koivurova and Pölönen (2010) state that one of the reasons why the Espoo Convention Secretariat prepared the note is the challenge faced in organizing the transboundary EIA for the proposed Baltic Sea Gas Pipeline (BSGP), which would cross the jurisdictions of five Baltic Sea littoral states and potentially affect the entire Baltic Sea.

2.1.1 South Asian Association for Regional Cooperation

Ali (2013) reports that regional cooperation in South Asia is a relatively recent phenomenon. While East Asia was busy working on visa-free trade zones through organizations such as ASEAN, much of South Asia was embroiled in conflicts. It was not until 1980 that the idea of establishing a separate organization focused on South Asian cooperation was moved forward (ibid). The preconditions for establishing the South Asian Association for Regional Cooperation (SAARC) were quite confining in terms of what could be achieved but similar to those of several other organizations for regional cooperation conceived at the time. Five key principles define all SAARC activities:

- Respect for sovereignty, territorial integrity, political equality and independence of all member states.
- Non-interference in internal matters.
- Cooperation for mutual benefit.
- All decisions to be taken unanimously and the need for a quorum of all eight members.
- All bilateral issues to be kept aside and only multilateral (involving many countries) issues to be discussed without being prejudiced by bilateral issues.

SAARC was formally established as a permanent organization in 1985, with a secretariat hosted in Kathmandu, Nepal. Its seven original members - Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka - agreed to admit Afghanistan as an eighth member in 2007 (ibid). The above authors report that the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) was formed partly as a response to the perceived inefficacy of SAARC due to repeated deadlocks between India and Pakistan. The BIMSTEC agreement also includes Myanmar and Thailand, with which India has strong trade ties. Energy and some environmental areas of cooperation, such as fisheries, are proposed subjects of activity, in addition to a broader trade and infrastructure cooperation agenda. However, there is still modest progress on ecological cooperation, although the Asian Development Bank has engaged with BIMSTEC to support infrastructure linkages, particularly in the transport sector, whereby environmental planning criteria may be more directly incorporated (ibid).

On the western frontier, the Economic Cooperation Organization (ECO) has a specific directorate pertaining to minerals, energy, and environment. This organization was established in the same year as SAARC (1985) by Iran, Pakistan, and Turkey with the goals of promoting economic, cultural, and technical cooperation. With the dissolution of the Soviet Union, several Central Asian states joined ECO, and the organization now comprises 10 member states. All members are Muslim majority states and six of the 10 are landlocked. ECO is a forum for Afghanistan and Pakistan to have more direct communication facilitated by Central Asian partners and is considered a counterweight to the dominance of India in communications within SAARC. However, Iran's involvement in the organization and the fact that its secretariat is based in Tehran make it difficult to gain much interest from international donors despite some important proposed initiatives related to regional ecotourism and energy infrastructure collaboration (ibid).

Ali (2013) notes that one possible connection that could be made between ECO and SAARC was suggested by then Pakistani Prime Minister Yousuf Raza Gillani at the SAARC summit in 2011 and involved the road link between Tajikistan and Pakistan to connect South Asian markets to SAARC countries. This broader vision would also tie in with the "New Silk Road" initiative that U.S. Secretary of State Hillary Clinton announced at a regional meeting in Chennai in 2011. The goals of the Silk Road vision were elaborated by State Department official Geoffrey Pyatt in an official policy speech at a conference in Tokyo in June 2012, in which he noted that in addition to the expansion of merchandise flow, the vision involves cooperation "through energy, water, transport, and infrastructure - which includes roads, bridges, electrical transmission grids, railways and pipelines - to connect goods, services, and people" (ibid). Within the ecological arena, SAARC has a programme of work on environment and energy that includes the aims of establishing a specific Convention on Environmental Cooperation, which was reaffirmed in the Thimphu Declaration on Climate Change (2010). However, the SAARC makes no mention of transboundary EIA but it has frequently reiterated the need to strengthen and intensify regional cooperation to preserve, protect and manage the diverse and fragile eco-systems of the region including the need to address the challenges posed by climate change and natural disasters.

2.2 Lending and donor agency requirements

2.2.1 World Bank Environmental and Social Assessment Guidelines

The environmental regulations and guidelines of the World Bank (WB) are spelled out in the WB Operational Manual comprising documents relating to Operational Policy (OP) and Bank Procedures (BP). These were originally issued in the form of Operational Manual Statements (OMS), the majority of which were later, after updating, issued as Operational Directives (OD). The applicability of OPs considering natural gas pipelines, and how an EIA needs to respond, are given in Table 2.1.⁵

2.2.2 Asian Development Bank Environmental and Social Assessment Guidelines

ADB's safeguard policy (2009) framework consists of three OPs on the environment, involuntary resettlement and Indigenous Peoples. These are accompanied by Operations Manual sections on Environmental Considerations in ADB Operations; Involuntary Resettlement; and Indigenous Peoples. All three safeguard policies involve a structured process of impact assessment, planning, and mitigation to address the adverse effects of projects throughout the project cycle. The safeguard policies require that (i) impacts are identified and assessed early in the project cycle; (ii) plans to avoid, minimize, mitigate, or compensate for the potential adverse impacts are developed and implemented; and (iii) AP are informed and consulted during project preparation and implementation.

The applicability of OPs considering natural gas pipelines, and how an EIA needs to respond, are given in Table 2.2.⁶

Part 3 - National requirements relating to EIAs

3.1 National policies, laws and regulations

There are many national policies with relation to environmental protection but the National Environmental Policy (NEP) developed by the Ministry of Environment (MoE), Government of Pakistan (GoP) is of principal relevance. It provides an overarching framework for addressing the environmental issues which Pakistan is facing, particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of biodiversity, desertification, natural disasters and climate change. The policy also gives directions for addressing cross-sectoral issues as well as the underlying causes of environmental degradation and for meeting of international obligations. The NEP, while recognizing the goals and objectives of the National Conservative Strategy (NCS), the National Environmental Action Plan (NEAP) and other existing environment related national policies, strategies and action plans, provide broad guidelines to the Federal and Provincial level government for addressing environmental concerns and for ensuring effective management of their environmental resources.

The goal of this policy is to protect, conserve and restore Pakistan's environment in order to improve the quality of life of the citizens through sustainable development. The objectives of the policy are:

- Conservation, restoration and efficient management of environmental resources;
- Integration of environmental considerations in policy making and planning processes;
- Capacity building of government agencies and other stakeholders at all levels for better environmental management;
- Meeting international obligations effectively in line with the national aspirations; and
- Creation of demand for environment through mass awareness and community mobilization.

⁵Modified from ILF 2012

⁶Modified from ILF 2012

Table 2.1: Applicable World Bank Operational Policies

Applicable World Bank Operational Policy	EIA response
Environmental Assessment- OP 4.01 Besides identifying the general policy of the WB about the EIA, this document lays down the procedures and guidelines for conducting EIA of the projects including the aspects to be considered in EIA, public consultation and information disclosure procedures. It also provides environmental screening guidelines for classifying the projects into various categories (A, B, C and FI).	EIA must include: a) Project alternatives analysis; b) EMP which emphasizes impact avoidance and mitigation.
Natural Habitats- OP 4.04 Bank does not support projects that involve the significant conversion of critical natural habitat. If natural habitats would be significantly converted, acceptable mitigation measures are included in design: minimizing habitat loss and establishing and maintaining ecologically similar protected area.	As above
Pest Management- OP 4.09 This policy deals with the use of pesticides and provides the guidelines related to Integrated Pest Management (IPM). Use of a pesticide is contingent on an assessment of associated risks (made in context of project's EA) taking into account proposed use and the intended users. The following criteria applies to the selection and use of pesticides: a) have negligible adverse health effects; b) effective against target species, c) minimal effect on non target species and environment, d) takes into account need to prevent development of resistance in pests.	EIA must discourage use of pesticides and herbicides.
Indigenous Peoples- OP 4.10 This policy contributes to the Bank's mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of Indigenous Peoples. For all projects that are proposed for Bank financing and affect Indigenous Peoples, the Bank requires the borrower to engage in a process of free, prior, and informed consultation. Such Bank-financed projects include measures to (a) avoid potentially adverse effects on the Indigenous Peoples' communities; or (b) when avoidance is not feasible, minimize, mitigate, or compensate for such effects.	This OP may be triggered in remote rural areas. In most Pakistani urban landscapes, tribes are now culturally mixed and/or integrated with the local town population.
Physical Cultural Resources- OP 4.11 The Bank assists countries to avoid or mitigate adverse impacts on physical cultural resources (objects, sites, structure, group of structures, landscape etc.) from development projects that it finances. The impacts on physical cultural resources resulting from project activities, including mitigating measures, may not contravene either the borrower's national legislation, or its obligations under relevant international environmental treaties and agreements.	The EIA must include a specialist cultural resources study, and make clear recommendations for avoiding all important cultural resources, whether visible or buried.
Involuntary Resettlement- OP 4.12 This OP seeks to avoid or minimize involuntary resettlement. If resettlement is unavoidable, it should be planned and implemented in a sustainable manner providing sufficient compensation to the affected people (AP) who must be consulted meaningfully. APs must be helped to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement. The policy covers the compensation to be paid for i) relocation or loss of shelter ii) loss of assets or access to assets or iii) loss of income sources or means of livelihood, whether or not the affected persons must move to another location or iv) the involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons.	The EIA must include comprehensive public participation and disclosure that (<i>inter alia</i>) identifies APs and carefully considers resettlement avoidance and mitigation measures. Thereafter, there must be negotiation with APs aimed at achieving a satisfactory and sustainable settlement. A detailed Resettlement Policy framework (RPF) must be developed.
Gender and Development OP 4.20 The objective of this OP is to assist member countries to reduce poverty and enhance economic growth, human wellbeing, and development effectiveness by addressing the gender disparities and inequalities that are barriers to development.	The EIA must include a gender study to ensure that the project does not result in women (in particular) being disadvantaged.
Forests- OP 4.36 This OP deals with the health of forests, provides guidelines relating to the management of the forests and the welfare and rights of the people dependent upon forests.	The EIA must identify all major habitat types along the pipeline route and highlight local use of natural resources (incl forests).

Table 2.2: Applicable World Bank Operational Policies

Applicable ADB Operational Policy	EIA response
<p>Safeguard Requirements 1: Environment</p> <p>Besides identifying the general policy of the ADB about EIA, this OP lays down the procedures and guidelines for conducting EIAs and the aspects to be considered in EIA, EMP, habitats, health and safety, public consultation and information disclosure procedures, grievance mechanism etc. It also provides environmental screening guidelines for classifying projects into various categories (A, B, C, F1).</p>	<p>EIA must include:</p> <ul style="list-style-type: none"> a) Project alternatives analysis; b) EMP which emphasizes impact avoidance and mitigation.
<p>Safeguard Requirements 2: Involuntary Resettlement</p> <p>This OP spells out ADB requirements when involuntary resettlement is triggered (when full/partial or permanent or temporary physical displacement occurs). Full compensation, assistance and benefits for the displaced persons should be considered in the project planning and design.</p>	<p>The EIA must include comprehensive public participation and disclosure that (<i>inter alia</i>) identifies APs and carefully considers resettlement avoidance and mitigation measures. Thereafter, there must be negotiation with APs aimed at achieving a satisfactory and sustainable settlement. A detailed Resettlement Policy framework (RPF) must be developed.</p>
<p>Safeguard Requirements 3: Indigenous Peoples</p> <p>This policy contributes to the Bank's mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of Indigenous Peoples. For all projects that are proposed for Bank financing and affect Indigenous Peoples, the Bank requires the borrower to engage in a process of free, prior, and informed consent. Such Bank-financed projects include measures to (a) avoid potentially adverse effects on the Indigenous Peoples' communities; or (b) when avoidance is not feasible, minimize, mitigate, or compensate for such effects.</p>	<p>This OP may be triggered in remote rural areas. In most Pakistani urban landscapes, tribes are now culturally mixed and/or integrated with the local town population.</p>

3.2 Constitutional Provision

The Eighteenth Amendment Bill, 2010 was passed by the National Assembly (Lower House) of Pakistan on April 8, 2010 and by the Senate (Upper House) on April 15, 2010. Thereafter it was formally approved by the President of Pakistan on April 19, 2010 making it an Act of Parliament. Amongst the most important provisions of the Constitution (Eighteenth Amendment) Act are those relating to amendment of the Fourth Schedule of the Constitution, which contained the Federal Legislative List (Part I and Part II) (FLL 1 and FLL 2) and Concurrent Legislative List (CLL). By omitting the CLL and amending FLL Part I and FLL Part II, the 18th Amendment has fundamentally altered the division of legislative powers between Parliament and the Provincial Assemblies, resulting in a significant increase in the extent of Provincial autonomy.

'Environmental pollution and ecology' was one of the subjects in the CLL which now stands in the legislative domain of the Provincial Assemblies. This has far-reaching implications for environmental governance in the country, not only in terms of future law-making, but also for implementation of existing environmental laws, rules and regulations and Pakistan's obligations under multi-national agreements.

Prior to the passing of 18th Amendment, 'Environmental pollution and ecology' was mentioned at entry no. 24 of the CLL in the Fourth Schedule of 1973 constitution. This enabled both the Federal Parliament and the Provincial Assemblies to make laws with respect to matters relating to environmental pollution. However due to geo-political situation of the country in 1970s, the first environmental protection ordinance was enacted in 1983 through a Presidential Order (Decree). Nevertheless, the Federal Parliament, making use of the powers vested through the 1973 constitution, enacted the Pakistan Environmental Protection Act (PEPA) in 1997. This superseded and repealed the Pakistan Environmental Protection Ordinance (PEPO) promulgated in 1983.

3.3 National EIA Policy and Administrative Framework

The Pakistan National Conservation Strategy (NCS) that was approved by the federal cabinet in March 1992 is the principal policy document on environmental issues in the country (EUAD/ IUCN, 1992). The NCS outlines the country's primary approach towards encouraging sustainable development, conserving natural resources and improving efficiency in the use and management of

resources. The NCS has 68 specific programmes in 14 core areas in which policy intervention is considered crucial for the preservation of Pakistan's natural and physical environment. The core areas that are relevant in the context of the proposed project are pollution prevention and abatement, restoration of rangelands, increasing energy efficiency, conserving biodiversity, supporting forestry and plantations and the preservation of cultural heritage.

Two organizations, the Pakistan Environmental Protection Council (PEPC) and the Pakistan Environmental Protection Agency (Pak- EPA) and Provincial EPAs are primarily responsible for administering the provisions of the Pakistan Environmental Protection Act, promulgated by the Government of Pakistan in 1997 through an Act of Parliament.

The PEPC is an apex body which oversees the functioning of the Pak-EPA. It is chaired by the Prime Minister of Pakistan. Its members include representatives of the government, industry, non-governmental organizations and the private sector.

The functions of Pak-EPA are:

- To implement and administer the Pakistan Environmental Protection Act (PEPA) of 1997;
- To adopt effective measures for implementation of national environmental policies;
- To publish an annual report on the status of environment in the country;
- Enforcement of National Environmental Quality Standards (NEQS) 2000;
- To promote research in science and technology which may contribute to the prevention of pollution and protection of environment;
- To promote public awareness and education in the environment sector; and
- The agency can inquire or investigate any environmental issue at its own discretion or upon complaint from any person or community.

The roles of Provincial EPAs are:

- Inquire or investigate any environmental issue at its own discretion or upon complaint from any person or community within its jurisdiction;
- Advise proponents regarding environment studies according to Schedule I and II of the PEPA 1997;
- Impose penalties upon law violators; and
- Issuance of NOC for an Initial Environmental Examination (IEE) or EIA.

Thus the Federal and Provincial EPAs are required to ensure compliance with the PEPA 1997 and establish monitoring and evaluation systems.

3.3.1 Environmental Protection Act, 1997

As mentioned above, the PEPA was enacted in 1997. The Act No. XXXIV 1997 states that it is *"An Act to provide for the protection, conservation, rehabilitation and improvement of the environment, for the preventions and control of pollution, and promotion of sustainable development"*.

The PEPA, 1997 empowers the Pak-EPA to:

- Delegate powers, including those of environmental assessment to the provincial EPAs;
- Identify categories of the projects to which the IEE/EIA provisions will apply;
- Develop guidelines for conducting IEEs and EIAs and procedures for the submission, review and approval of the same;
- Develop environmental emission standards for parameters such as air, water and noise pollutants; and
- Enforce the provisions of the Act through environmental protection orders and environmental tribunals headed by magistrates with wide-ranging powers including the right to fine violators of the Act.

Under the provisions of the 1997 Act, the Pak-EPA has empowered four provincial EPAs to manage the environmental concerns of their respective provinces. The provincial EPAs can frame environmental regulations tailored to the requirements of their Province provided these regulations meet or exceed the minimum standards set by the Pakistan EPA. They are also required to review and approve IEEs/EIAs of all the development projects undertaken in their respective provinces, including those projects which are implemented by the Federal Government agencies/departments. After the 18th constitutional amendment PEPA 1997 now applies to Islamabad Capital Territory (ICT) and have been adopted by the Provinces until they pass their respective environmental protection laws and regulations.

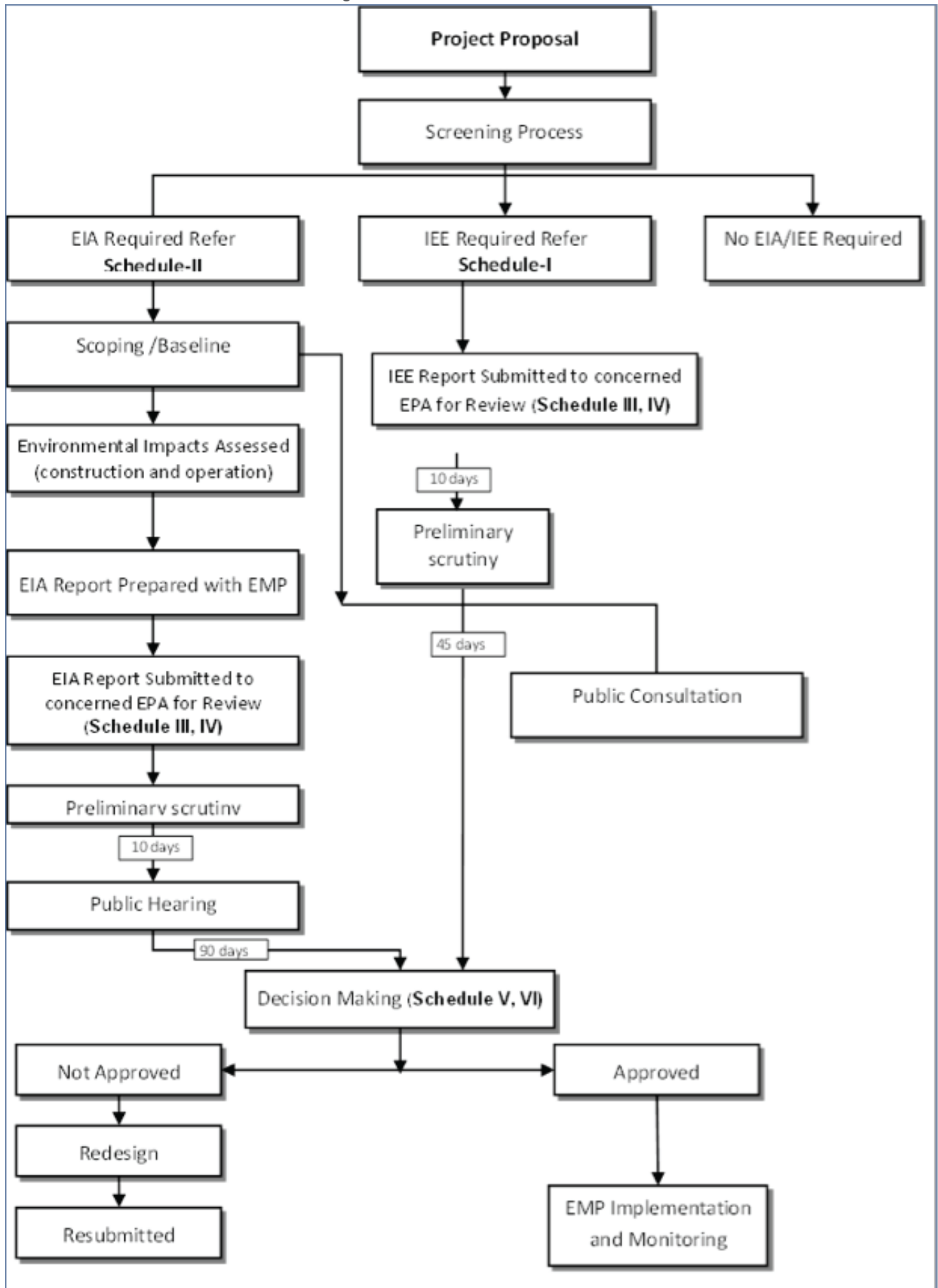
3.3.2 Regulation for Environmental Assessment

The overview of the procedure for submitting the EIA Report in Pakistan as per PEPA 1997 and its review process is shown in the Figure 3.1 below.

Under Section 12 (and subsequent amendment) of the 1997 Act, a project falling under any category specified in Schedule II require the proponent to file an EIA with the Federal agency or the relevant Provincial agency. For instance, in the case of Iran-Pakistan Gas Project, Sindh Environmental Protection Agency (SEPA) and Balochistan Environmental Protection Agency (BEPA) are the main stakeholders for issuance of the Non-Objection Certificate (NOC). Since the proposed natural gas pipeline projects, whether Iran – Pakistan (IP) and/or Turkmenistan–Afghanistan–Pakistan–India (TAPI) are major developments that traverse environmentally sensitive areas, they fall under Schedule II of PEPA 1997, which means an EIA is required to be submitted by the project proponent.

According to the PEPA 1997 (refer Figure: 3.1), the relevant EPA(s) upon receiving the EIA from the proponent will confirm within ten (10) working days that their submitted report meets the review prerequisites. During this time, should the concerned EPA require the proponent to submit any additional information; it will return the EIA to the proponent for revision, clearly listing those aspects that need further discussion. Subsequently, the relevant EPA will make every effort to complete an EIA review within 90 days of filing.

Figure 3.1: EIA/IEE Process in Pakistan



3.3.3 Requirements for stakeholder consultation and public hearings

The process of public consultation and disclosure is defined in the 'Guidelines for the Preparation and Review of Environmental Reports' and the 'Guidelines for Public Consultation'." (Policy & Procedures)-PEPA-1997. Concerned environmental protection agencies (Sindh and Balochistan) have the responsibility to provide information to the public through public hearings, press releases, placing documents in the libraries etc. Public participation and discussions are mandatory when an EIA is conducted.

The process of public participation or consultation is defined in PEPA 1997. According to this, the concerned EPAs have the responsibility to provide information to the public through public hearings, press releases and sharing the EIA documentation. Thirty (30) days notice period is given to stakeholders to furnish their concerns regarding the project. Pakistan has witnessed a number of cases where active public participation with the support of media and NGOs has resulted in amendments in the original project design to safeguard natural environment.

3.4 National guidelines for Environmental Assessment

The Pak-EPA has published a set of environmental guidelines for EIAs and EMPs for different types of development projects. Notable sectoral guidelines in these regards are those of:

- Major Thermal Power Stations
- Major Chemical & Manufacturing Plants
- Housing States & New Town Development
- Industrial States
- Major Roads Guidelines
- Sewage Schemes
- Oil & Gas Exploration and Production
- Wind Power Projects

However, there are no guidelines for transboundary natural gas pipeline projects.

3.5 National Environmental Quality Standards, 2000

In 1993, the then Ministry of Environment (now Ministry of Climate Change) established the National Environmental Quality Standards (NEQS) and issued a Statutory Notification (S.R.O) and in 2000 the Ministry approved and issued some amendments in its previous notification. The amendments were related to municipal and liquid industrial effluents and industrial gaseous emission. The NEQS 2000 specify the following standards:

- Maximum allowable concentration of pollutants (32 parameters) in municipal and liquid industrial effluents discharged to inland waters, sewage treatment facilities, and the sea (three separate sets of numbers);
- Maximum allowable concentration of pollutants (16 parameters) in gaseous emissions from industrial sources;
- Maximum allowable concentration of pollutants (two parameters) in gaseous emissions from vehicle exhaust; and
- Maximum allowable noise levels from vehicles.

The above NEQS were silent about the standards for ambient air and drinking water quality and have therefore recently been developed and approved by the Ministry of Environment. These standards specify the following:

- Maximum allowable concentration of ambient gaseous and particulate matter (10 parameters) to be implemented in two stages i.e. effective from July 2010 and January 2013; and
- Standards for drinking water quality covering bacterial, physical, chemical, organic and radioactive parameters.

These standards also apply to the gaseous emissions and liquid effluent generated by generators. The NEQS for vehicles will apply during the construction as well as operation phase of the natural gas pipeline

3.6 Other relevant national legislation

In addition to the PEPA 1997 and NEQS 2000, the following Federal and Provincial legislation has relevance to natural gas pipeline projects.

1. National Resettlement Policy and Ordinance

At present, the only legislation relating to land acquisition and compensation is the Land Acquisition Act (LAA) of 1894. The LAA is, however, limited to a cash compensation policy for the acquisition of land and built-up property, and damage to other assets, such as crops, trees, and infrastructure. The LAA does not consider the rehabilitation and resettlement of disrupted population and the restoration of their livelihoods.

2. Provincial Wildlife (Protection, Preservation, Conservation and Management) Acts, Ordinances and Rules (Act, 1972)

In addition to empowering the Provincial wildlife departments to establish game reserves, parks, and wildlife sanctuaries, these Acts regulate the hunting and disturbance of wildlife.

3. Sindh Wildlife Protection Ordinance, 1972

The Sindh Wildlife Protection Ordinance was approved in 1969. Under this Ordinance, three types of protected areas; National Park, Wildlife Sanctuary and Game Reserve are designated for protection, conservation, preservation and management of wildlife.

This law declares any such area and its wildlife the sole property of the State, but these areas are accessible to the public for recreation, education and research. No hunting, shooting, trapping or killing is allowed without obtaining a special permit to do so within specific conditions and time limitations.

4. Balochistan Wildlife Protection Act, 1974

The Balochistan Wildlife Protection Act, 1974 was passed by the Provincial Assembly of Balochistan in 1974. This Act is applicable to the whole of the Balochistan Province for the protection, conservation, preservation and management of wildlife.

5. Antiquities Act, 1975

The Antiquities Act relates to the protection, preservation and conservation of archaeological/historical sites and monuments. It prohibits the construction or any other damaging activity, within 200 m of such sites unless prior permission has been obtained from the Federal Department of Archaeology and Museums. The Antiquities Act also binds the project proponents to notify the department should anything of archaeological

value be excavated during construction.

6. The Sindh Cultural Heritage (Preservation) Act, 1994

This provincial Act empowers the Government of Sindh (GoS) to preserve and protect any declared premises or objects of archaeological, architectural, historical, cultural, or national interest.

7. Provincial Local Government Ordinances, 2001

These ordinances were issued following the devolution process that started in early 2000s. These establish regulations for land use, the conservation of natural vegetation, air, water, and land pollution, the disposal of solid waste and wastewater effluents as well as matters related to public health and safety.

8. Regulation of Mines and Oil Fields and Mineral Development Act, 1948

This legislation provides regulatory procedures for the quarrying and mining of construction materials on state-owned as well as private land.

9. Forest Act, 1927

This Act provides rules and regulations for the protection of forests, control of timber and other forest-produce, village forest and social forestry. The Act is being revised as the law was framed for regulating forests all over India. It was adopted as it is after the creation of Pakistan and it continues to remain in force without assessing whether it fulfils current requirements or not.

This act empowers the concerned agency to declare protected and reserved forests, empowers forest settlement officers to acquire land over which right was claimed, powers to stop ways and water-courses in reserved forests, healing of claims relating to shifting cultivation, power to issue and publish notification to reserve trees, power to make rules for protected forests, power to declare forest no longer reserved, order on rights of pasture or transit forest-produce, record keeping by the forest settlement officer, commutation of right to appeal, time limit for resolution of claims and appeals, notification of acts prohibited in such forests (unlawful cutting of trees), awarding penalties on violations.

10. National Forest Policy, 2001

The National Forest Policy deals with the Renewable Natural Resources (RNR) of Pakistan such as forests, watersheds, rangelands, wildlife, biodiversity and their habitats. It aims to eliminate the causes of depletion to such resources through the active participation of various concerned stakeholders and government departments.

Some of the main elements of this policy include reducing the impact of socio-economic causes such as population planning, providing substitutes to firewood, poverty alleviation, reducing political interference in the forest and wildlife departments, renovating and invigorating institutions of RNR (local governments i.e. districts), policies for fragile eco-systems (mountain forests, mangroves), development of riverain forests, maintaining irrigated plantations, preservation of unique forests (e.g. Juniper forest Balochistan), protection of wildlife, rangelands and desert eco-systems, planting of trees and fodders on farmlands and general monitoring and evaluation.

11. Petroleum Act 1934

The Petroleum Act, 1934 regulates the import, transport, storage, production, refining and blending of petroleum, as well as specifying the nature and condition of all containers and pipelines in which petroleum may be transported.

12. Mineral Gas Safety Rules 1960

These rules provide for the compression of natural gas for the purpose of storage and filling or distribution of Compressed Natural Gas (CNG). Under these rules the location, construction and operation of a pipeline and all works connected with a CNG refuelling station must be in accordance with the license granted by the chief inspector of explosives.

13. Mineral and Industrial Gases Safety Rules 2010

These rules provide specification, standards, import and manufacturing and manners of installation of all sorts of compressed/liquefied gas containers (cylinders and vessels), petroleum storage tanks, compressors, dispensers, piping, fittings, allied equipment, and all kinds of safety devices.

14. Factories Act, 1934

The clauses of this Act relevant to natural gas pipelines are those that concern the health, safety and welfare of workers, disposal of solid waste and effluent and damage to private and public property. The Factories Act also provides regulations for handling and disposing of toxic and hazardous materials.

15. Pakistan Penal Code, 1860

The Pakistan Penal Code deals with offences where public or private property and/or human lives are affected due to the intentional or accidental misconduct of an individual or body of people. In the context of environment, the Penal Code empowers the local authorities to control noise, noxious emissions and disposal of effluents. The NEQS enforced by the EPAs

supersede the application of this legislation on industries and municipalities.

16. Explosives Act, 1884

Under the Explosives Act, project contractors are bound by regulations on handling, transportation and using explosives during quarrying, blasting, and other purposes.

The Act also regulates the manufacture, possession, use, sale, transport, import or export of dangerous explosives. It also sets out the rules for granting or refusing licenses. It provides the right to appeal as well as making rules for inspection, search, detention, removal of any explosives being manufactured or possessed in violation of the Act, notification and inquiries into any serious accidents, punishment for certain offences and arresting the offenders.

International Treaties and Conventions:

Since Pakistan is a member of a number of international organizations like United Nations Organization (UNO), Organization of Islamic Countries (OIC), South Asian Atlantic Regional Corporation (SAARC), Economic Corporation Organization (ECO), and a signatory of international frameworks it has to follow the international protocols and obligations related to environmental protection.

The following treaties are of importance in the context of transboundary natural gas pipelines;

1. Bonn Convention-The Convention on Conservation of Migratory Species of Wild Animals, 1979

The Convention requires the countries to take action to avoid endangering migratory species. Species covered in the Convention should be given special attention during the EIA and monitoring, and impacts should be mitigated to acceptable levels.

2. The Rio Declaration, 1992

The Rio Declaration comprises twenty seven principles which address such issues as sustainable development (integration of environmental protection into the development process); common but differentiated responsibilities to conservation, protection and restoration of the earth's ecosystems; public participation and information access at the national level, reduce and eliminate unsustainable patterns of production and consumption.

3. Convention on Wetlands (RAMSAR Convention), 1971

The broad aim of the Convention on Wetlands (RAMSAR, Iran, 1971) is to halt the worldwide loss of wetlands and to conserve those that remain through wise use and technology transfer. Contracting Parties have made commitments to:

- Designate at least one site that meets the RAMSAR criteria for inclusion in the list of Wetlands of International Importance;
- Protect the ecological character of listed sites;
- Include wetland conservation within their national land-use planning; and
- Establish nature reserves on wetlands and promote training.

4. Basel Convention-Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989

This convention is usually known as Basel Convention and its aim is to reduce the movements of hazardous waste between the nations especially the movement from developed countries to under developed countries. The Convention is also intended to minimize the amount and toxicity of wastes generated to ensure their environmentally sound management as closely as possible to the source of generation and to assist developing countries in environmentally sound management of the hazardous and other wastes they generate.

This convention outlines the categories of wastes to be controlled, lists of hazardous characteristics (explosives, flammable liquids etc.), disposal operations, different tests to be conducted, information to be provided on the movement documents.

5. Convention on International Trade of Endangered Species of Flora and Fauna (CITES)-1979

The principal obligations of contracting parties to the CITES are to safeguard the trade in rare or endangered species and to restrict the import and export of listed species. According to this convention species threatened with extinction may not be transported between countries except for conservation purposes such as captive breeding.

This convention deals with the taxonomy of species (class, order, family, scientific and common names), biological parameters (distribution, habitat, population status-trends, geographic trends, role of species in its eco-system and threats faced), utilization and trade practices at national level, legal international trade, Illegal trading, potential trade impacts, captive breeding, conservation and management on national and international level, legal statuses, species management (population monitoring, protection of habitat, domestic measures) and information on similar species.

6. United Nations Convention on the Law of Sea-(UNLOS-1982)

This law defines the rights and responsibilities of nations in their use of the World's Oceans, establishing guidelines for businesses, the environment and the management of marine national resources.

The convention sets limits on coastal navigation, defines exclusive economic zones, continental shelves, deep seabed mining, the exploitation regimes, technological aspects, universal participation in the convention, pioneering investors, ensure protection of the marine environment, marine scientific research and settlement of disputes.

Part 4 - Guidance for assessing environmental impacts of natural gas pipelines

This section examines some of the more important principles pertaining to EIA, the kinds of impact one would typically expect for natural gas pipeline projects, and options for avoiding or mitigating negative impacts.

4.1 Principles for environmental assessment and management

The following principles of international environmental and natural resources law should help to guide the practical application of EIA for natural gas pipelines.

4.1.1 Precautionary principle

The precautionary principle, which is generally understood as a means of overcoming the problem of scientific uncertainty as to the environmental impacts of particular activities, is now very widely employed in international instruments concerned with environmental protection. Essentially, it requires that, where there is a risk of serious environmental damage, States must take measures to anticipate and to prevent or minimise such damage, despite a lack of full scientific certainty as to its cause, seriousness or inevitability. Any formulation of the precautionary principle is, therefore, a tool for decision-making in a situation of uncertainty. Principle 15 of the Rio Declaration provides:

'In order to protect the environment, the precautionary principle shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.'

The precautionary principle is very closely linked to EIA in two distinct ways. First of all, EIA procedures are commonly understood to be one of the principal means of giving practical effect to the precautionary principle. Secondly, the precautionary principle should inform the practical application of EIA techniques. Specifically, a lack of scientific certainty as to the likelihood or the

potential seriousness of a particular impact should not be used as grounds for excluding such an impact from the scope of the study required under EIA.

4.1.2 Ecosystems approach

Traditionally, international law, and the environmental protection rules contained therein, have been concerned with protecting different use interests in a particular resource rather than with the protection of the ecological systems dependent on them. However, in recent years many international instruments concerned with the environment have moved beyond the traditional obligations to include 'purely' environmental obligations, including provisions requiring the adoption of a more ecosystems-oriented approach to environmental protection. For example, the 1997 UN Watercourses Convention requires the Parties to act to protect and preserve international watercourse ecosystems and includes related obligations to prevent, reduce and control watercourse pollution, to prevent the introduction of alien species, and the protection and preservation of the marine environment [Articles 20-23]. In its Partial Award in the Indus Water Kishenganga Arbitration (Pakistan v. India), (18 February 2013), the Permanent Court of Arbitration has recently strongly endorsed the existence of a requirement to ensure ecological flows under generally applicable customary international law. Relying on the principle of sustainable development and the duty to prevent significant transboundary harm, the Court found that 'India's duty to ensure that a minimum flow reaches Pakistan also stems from the [1960 Indus Waters] Treaty's interpretation in the light of customary international law'. In so doing, it declared that '[i]t is established that principles of international environmental law must be taken into account even when ... interpreting treaties concluded before the development of that body of law'. The ecosystem approach is advocated by the Convention on Biological Diversity (CBD). It recognises that people and biodiversity are part of the broader ecosystems on which they depend, and that they should thus be assessed in an integrated way.

4.1.3 Inter-State equity

Whilst the principle of equitable and reasonable utilisation is the overarching cardinal principle of international law, the concept is deliberately vague and can only be determined in each individual case in the light of all relevant factors. Therefore, in the interests of ensuring that any planned project is equitable and reasonable in the circumstances, the EIA exercise should be structured so as to address any of the above factors which might arise in the case of that particular project.

4.1.4 Social equity

In addition to ensuring equity between States, it is now firmly established in the international discourse on the human right to natural resources that States must ensure that individuals and communities have access to ecological services that are adequate for human dignity, life and health [UN Committee on Economic, Social and Cultural Rights, General Comment No. 15 (2002)]. Clear emphasis is placed upon the obligation of States to provide adequate resources (especially water) to 'individuals and groups who have traditionally faced difficulties in exercising this right', including women, children, rural and deprived urban areas, indigenous peoples, nomadic and traveller communities, refugees, asylum-seekers, internally displaced persons and returnees, prisoners and detainees, and groups facing difficulties with physical access, such as older persons and persons with disabilities, etc. Therefore, it is important that the EIA to be conducted address any risks regarding the continuing supply of access to resources to vulnerable individuals and communities which might arise in the case of the particular project.

4.1.5 Consideration of alternatives

Good planning and EIA should clearly identify and select those alternatives that offer the greatest overall benefits and avoid undesirable impacts for the good of society, not only in the country envisaging the development but also for people in neighboring countries. Decision making, too, should strive to this end. This principle is especially important in the context of transboundary impacts, as countries share many important ecosystems and they have an obligation to their neighbors to avoid unnecessary impacts.

4.1.6 Mitigation strategies

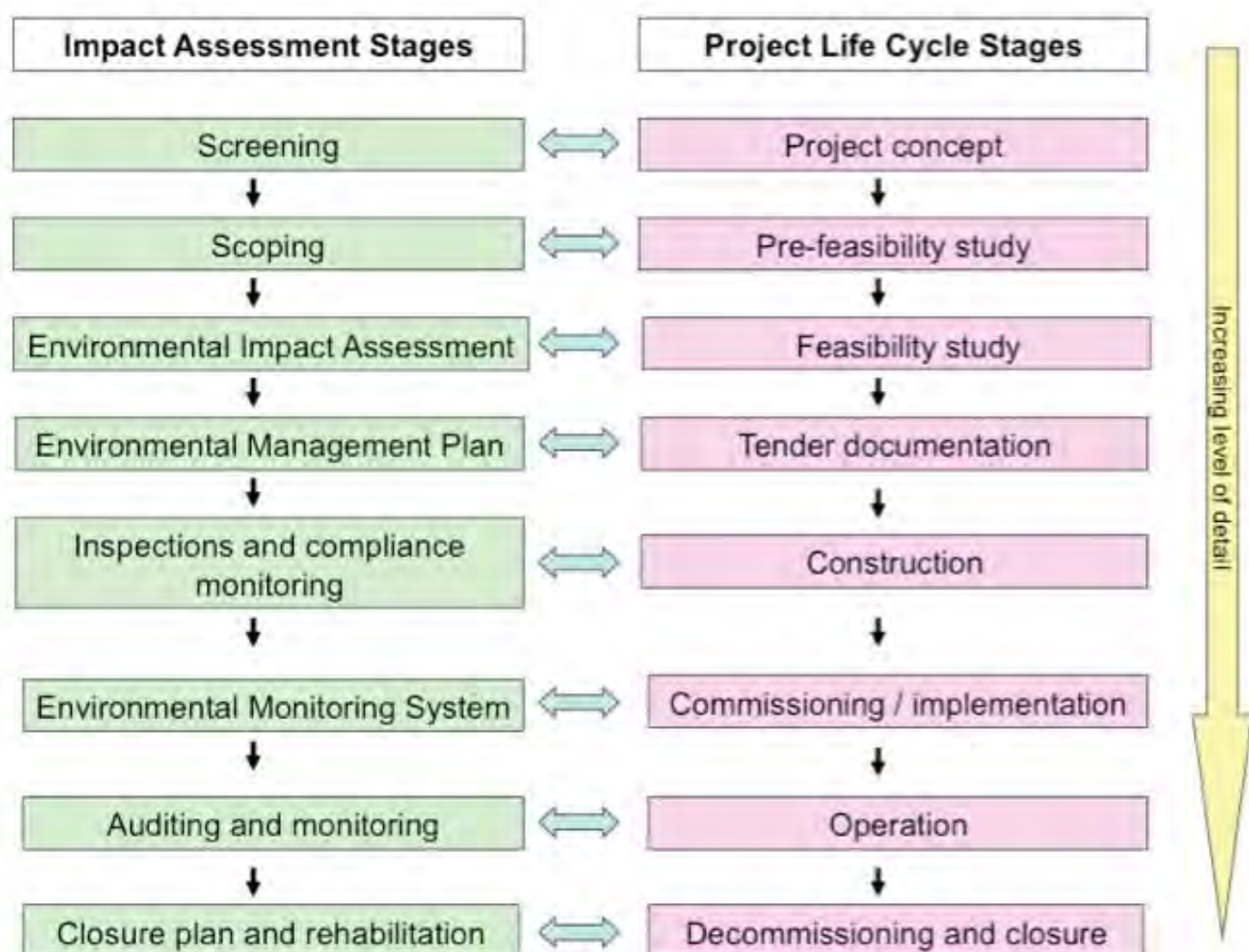
There is a hierarchy of possible mitigation strategies, the preference is on avoiding or preventing impacts, and/or reducing or minimising them.

Since it is crucial to select the most environmentally acceptable pipeline route in order to avoid and/or mitigate negative impacts, timing the EIA correctly relative to project planning is essential. Many developers try and speed up the EIA process by commissioning an EIA while the project is still at pre-feasibility level. This means that there is a disconnect between the level of assessment (detailed) and the level of project planning and design (conceptual). It is meaningless to do a detailed assessment of a concept plan, or, conversely, to do a scoping report for a project which is already at final design (Figure 4.1).

Table 4.1 Illustration of various levels of mitigation, with avoidance being the first choice (source: adapted from UNEP 2002).

Mitigation strategy	Mitigation options	Rating and criteria
Avoidance	Alternative pipeline routes/sites and technologies to eliminate impacts.	Preferred option; re-design of intervention if significant impacts are to be expected.
Minimisation	Actions during pipeline design, construction, operation and decommissioning to minimise impacts. Burying the pipeline rather than above ground.	Preferred option, better within-project alternatives to be explored.
Compensation	Used as last resort to offset impacts.	Undesirable, only compensate if no alternatives can be found which avoid or at least minimise impacts.

Figure 4.1: Links between the EIA process and a typical pipeline project life cycle (source: Brownlie et al 2006)



4.1.7 Polluter pays principle

The polluter pays principle, simply put, means that the financial costs of pollution or environmental damage, or of measures to avoid or mitigate such pollution or damage, should be borne by the person responsible for causing such pollution or damage. According to principle 16 of the Rio Declaration, 'national authorities should endeavor to promote the internalization of environmental costs ... taking into account the approach that the polluter should, in principle, bear the costs of pollution ...', while the formulation of the principle adopted in European Union law provides that 'natural or legal persons ... who are responsible for pollution must pay the costs of such measures as are necessary to eliminate that pollution or to reduce it so as to comply with the standards or equivalent measures laid down ...'.

4.2 Assessing environmental impacts⁷

Goodland (2005) reports that the environmental impacts of gas pipelines are generally small compared to those associated with oil. Also, nearly all LNG tankers are new and safe and accidental gas leaks and LNG spills are rare, making the contrast between oil and gas projects stark (ibid). He reports that the climate change impacts of methane leakage from aging gas pipelines is one of the biggest impacts, even though gas is not as damaging as oil with regard to changing the climate. He suggests that prudent impact assessment can ensure that gas pipelines are relatively benign.

4.2.1 Construction impacts (direct, indirect and cumulative)

The speed at which pipelines are built is one of the more serious constraints in preventing impacts (Goodland 2005). Most big infrastructure takes many years to plan and build. Completion of pipelines, on the other hand, often takes 24 to 36 months. This means it is even more important for the EIA of pipelines to begin as soon as the prefeasibility planning starts. Route selection, the main means of reducing impacts, is often one of the first items planned by the engineers, so there is even less time for the EIA.

The following tables provide a summary of the main impacts one could expect from transboundary natural gas pipelines in the Pakistani context. Avoidance and mitigation options are also suggested.

⁷Health and safety of workers in the workplace is not included in these guidelines, as HSE is usually governed by other legislation (e.g. labour laws).

4.2.1.1 Compromised pipeline safety

Impact	Avoidance or mitigation options
Acts of sabotage may destroy pipelines and associated infrastructure, placing people and the environment at risk.	<ul style="list-style-type: none"> a) Establish community-based “early warning” systems, relying on low-level intelligence gathering on possible sabotage plans, thus enabling pre-emptive measures (e.g. more regular patrols). b) Install SCADA monitoring system to identify and isolate a sabotaged pipeline/facility. c) In areas vulnerable to security breach/terrorism, the following additional protective measures may be considered: <ul style="list-style-type: none"> o Additional depth of cover; o Pipeline marker tape; o Above ground sign posts exhibiting pipeline depth; o Protective concrete coated slabs; o Increased pipe wall thickness; o Video Surveillance; o Security Patrols; o Emergency Response Teams; and o Fire Brigade and Ambulance Unit. d) Support community projects to improve community acceptance (and thus protection) of the pipeline and associated infrastructure. e) Hire community members along the route to provide ongoing surveillance. f) Enable gas off-take to communities, thus promoting a sense of ownership and protectiveness over the pipeline and associated infrastructure. g) Stockpile spare parts/pipes and equipment at regular intervals to enable speedy pipeline repairs.
Seismic events may compromise the pipeline and cause safety risks.	<ul style="list-style-type: none"> • Conduct literature research and geological survey as part of baseline - to identify fault lines/seismic active zones. • Plan and optimize route alignment to avoid or minimize exposure to fault lines. • Where fault zones are to be crossed, specially design those sections of pipeline to ensure sufficient strength. • Install additional safety valves in high-risk seismic areas.
Floods may compromise the pipeline and cause safety risks.	<ul style="list-style-type: none"> • Conduct literature research and terrain survey as part of baseline - to identify high-risk flood and/or erosion zones. • Plan route alignment to avoid or minimize exposure to high-risk zones. • Construct flood management infrastructure (e.g. walls, berms, gabions). • Over rivers, either bury the pipeline well below the river bottom, use reliable existing infrastructure (e.g. bridges) or place pipeline on pillars. • Install additional safety valves in high-risk seismic areas.
Unstable substrates/ areas subject to extreme weather events (e.g. coastline) may compromise the pipeline and cause safety risks.	<ul style="list-style-type: none"> • Siting the terminal at the safest locality on the coast, or offshore in a floating facility is crucial to reduce impacts. Shorelines are usually valuable assets but vulnerable environments, as they are often exposed to extreme weather, whilst undersea pipelines may be at risk from shipping. • Coastal bathymetry, tides, currents, population centers, shipping traffic, and sensitive areas must be assessed early in the EIA in order to advise on the safest alternative. • Once beginning and end-points of a pipeline are agreed upon, there is great flexibility in routing the pipeline to avoid sensitive areas between the two ends.

4.2.1.2 Livelihood loss

Impact	Avoidance or mitigation options
Overabstraction of water resources (for construction, labour camps, pipe-testing), negatively affecting farming and rural livelihoods.	<ul style="list-style-type: none"> • Conduct water availability study during baseline survey. • Alter route alignment if water unavailability is a fatal flaw or import water from nearest available and sustainable source. • Negotiate water offtake with communities/authorities (as applicable). • Desalinate saline groundwater/seawater rather than using scarce freshwater.
Temporary closure of (unpaved) roads to enable trenching and pipe installation. ⁸	<ul style="list-style-type: none"> • Undertake traffic study as part of EIA baseline survey, and select road crossings that have the least impact on traffic/public transport. • Construct temporary by-passes to enable traffic flow. • Cross roads at 90° to reduce road surface damage.
Disruption of traditional work/livelihood activities due to lure of well-paid short-term construction employment opportunities.	<ul style="list-style-type: none"> • Undertake a socio-economic baseline survey and specialist study as part of the EIA, to understand the background situation and assess the extent to which local communities are vulnerable to disruption and distortion. • Engage with community leaders so that any changes are at a pace and scale acceptable to them – they may propose terms and conditions. For example, avoid recruiting local labour during the season when they would be planting or harvesting crops.
Economic distortion in remote rural areas due to short term cash injection from temporary jobs.	<ul style="list-style-type: none"> • As above; also • In some areas/cultures, communities may prefer other forms of payment rather than cash (e.g. upgrading their water and sanitation infrastructure, fixing their roads, installing mobile communication facility).
Open trenches may pose safety risks to livestock, thus affecting livelihoods.	<ul style="list-style-type: none"> • The EIA must map livestock distribution, density and their typical daily movements. • Temporary fences (e.g. a two-strand mobile electric fence) could be erected and moved on a daily basis. • In high-risk areas, trenches must not be left open overnight.
Pollution of soil and water from inappropriate waste dumping, concrete mixing, etc. (causing opportunity cost).	<ul style="list-style-type: none"> • Waste management must be included in the EIA, with the objective of ensuring that all types of waste are correctly handled and transported, and deposited in a repository that is designated for that type of waste. Especially avoid dumping hazardous waste in a general landfill. • When servicing machinery, ensure waste oils, grease and filters are placed in sealed containers and then preferably taken to recycling facilities or designated repositories.
Scarring and infrastructure reduces aesthetic appeal of areas – reducing tourism options.	<ul style="list-style-type: none"> • Avoid routing pipelines in important tourism areas. • If routing in such areas is unavoidable, ensure that the trench is covered over and re-vegetated in such a way that the scar is not noticeable, and avoid placing service roads in such cases. • If there is a distinct “High Season”, avoid construction during this period – rather construct the pipeline during a tourism off-peak period.

⁸In the case of paved (tar) roads, pipeline tunnels should be excavated through directional drilling

4.2.1.3 Reduced health, safety and gender equality

Impact	Avoidance or mitigation options
Increased road accidents because of increased traffic and more heavy (slow moving) vehicles.	<ul style="list-style-type: none"> Undertake traffic study as part of EIA baseline survey, and select transport routes that have the least impact on traffic/public transport and that are properly constructed to support heavy vehicles. Schedule transport so as to use busy routes during times (e.g. at night/early morning) that are not/less used by other traffic. Ensure heavy trucks do not drive in convoy, so that it is easier for faster traffic to overtake. Ensure project vehicles are roadworthy, air-conditioned, well marked and drivers are qualified, sober (and not under the influence of drugs) and adhere to traffic rules. Solicit support from traffic officials to direct traffic in problematic areas (e.g. through towns and busy intersections). Announce the movement of convoys over the radio so that road users are forewarned and thus able to use alternative routes.
Dust and air pollution from earthmoving, vehicle movement, construction activities, generators.	<ul style="list-style-type: none"> On unpaved roads, reduce vehicle speeds so less dust is generated. In soils/substrates that are particularly dusty, water (if readily available) could be used to suppress dust. Ensure earthmoving vehicles and generators have appropriate exhaust systems/mufflers to reduce pollution and noise.
Pollution of soil and water from inappropriate waste dumping, concrete mixing, etc. (causing illness)	<ul style="list-style-type: none"> Waste management must be included in the EIA, with the objective of ensuring that all types of waste are correctly handled and transported, and deposited in a repository that is designated for that type of waste. Especially avoid dumping hazardous waste in a general landfill. When servicing machinery, ensure waste oils, grease and filters are placed in sealed containers and then preferably taken to recycling facilities or designated repositories.
Inappropriate interaction between “foreign” (male) workforce and local communities (e.g. women) – could result in STDs.	<ul style="list-style-type: none"> Employ locals wherever possible. Include clauses in employment contracts that clearly require foreign workers to be respectful of local cultures and customs, especially with respect to treatment of women and girls. Create awareness amongst the workforce on the dangers of STDs and how they can be avoided. Immunize staff as appropriate before they enter the country/region (e.g. against STDs). Provide adequate and appropriate entertainment for the workforce so that they are happy in their base-camp (e.g. television, table tennis, football). Engage with local communities along the proposed route, and request their input into how best interactions between them and the workforce should be handled. Provide condoms to workers.
In politically-unstable areas, pipeline construction may attract acts of terrorism, thus endangering nearby communities.	<ul style="list-style-type: none"> Establish community-based “early warning” systems, relying on low-level intelligence gathering on possible sabotage plans, thus enabling pre-emptive measures (e.g. more regular patrols). Install SCADA monitoring system to identify and isolate a sabotaged pipeline/facility. In areas vulnerable to security breach/terrorism, the following additional protective measures may be considered: <ul style="list-style-type: none"> Additional depth of cover; Pipeline marker tape; Above ground sign posts exhibiting pipeline depth; Protective concrete coated slabs; Increased pipe wall thickness; Video Surveillance; Security Patrols; Emergency Response Teams; and Fire Brigade and Ambulance Unit. Support community projects to improve community acceptance (and thus protection) of the pipeline and associated infrastructure. Hire community members along the route to provide ongoing surveillance. Enable gas off-take to communities, thus promoting a sense of ownership and protectiveness over the pipeline and associated infrastructure. Stockpile spare parts/pipes and equipment at regular intervals to enable speedy pipeline repairs.
Open trenches may pose safety risks, especially to children and the elderly.	<ul style="list-style-type: none"> The EIA must map human habitation and density and understand people’s typical daily movements (e.g. to schools, shops, clinics), so that high risk areas can be avoided. Temporary fences (e.g. a two strand mobile electric fence) could be erected and moved on a daily basis, or hazard tape strung alongside the trench to make it visible to passers-by. Temporary walkways could be placed over trenches to enable safe pedestrian passage. Local radio stations could be used to alert people to trench digging activities. In high risk areas, trenches must not be left open overnight.

4.2.1.4 Biodiversity loss

Impact	Avoidance or mitigation options
Habitat loss from land clearing for access roads, accommodation camps, lay-down areas and pipeline strip.	<ul style="list-style-type: none"> • Maximum utilization of existing roads and already cleared areas (use existing development corridors). • Undertake a biodiversity study as part of EIA baseline survey, and avoid important biodiversity areas (e.g. National Parks). • Using hazard tape, delineate areas to be cleared (to reduce excessive clearing). • Restrict the use of the new access road to the general public after the pipeline has been laid – or close and rehabilitate the road (inspections could be by helicopter). The point here is that a new access road in an otherwise inaccessible area, suddenly makes the area more accessible, and natural habitats automatically more vulnerable.
Habitat fragmentation (e.g. cleared strip – and maintained as clear).	<ul style="list-style-type: none"> • Avoid routing pipelines through habitats (e.g. forests and wetlands) that are vulnerable to fragmentation. • Preferable route pipelines along existing development corridors (e.g. roads).
Disruption of wildlife breeding/migration.	<ul style="list-style-type: none"> • Avoid routing pipelines through important wildlife areas (e.g. national parks). • Preferably route pipelines along existing development corridors (e.g. roads). • If pipelines are to be located in wildlife-rich areas, avoid trenching during periods when wildlife (e.g. frogs, tortoises and other animals) is known to move to or from breeding areas.
Alteration or disruption of natural water flow (e.g. streams).	<ul style="list-style-type: none"> • Wherever possible, either trench under a river using directional drilling, or locate the pipe on an existing structure (e.g. bridge). • If trenching through a river is unavoidable, do this during the low-flow season, and dig the trench and bury the pipe as quickly as possible.
Increased sediments in water bodies due to soil/substrate disturbance caused by trenching/piling.	<ul style="list-style-type: none"> • As above.
Increased sediments in water column due to seabed disturbance caused by pipe laying.	<ul style="list-style-type: none"> • Avoid routing pipelines through important marine biodiversity or fish spawning areas (e.g. marine parks, coral reefs, turtle breeding areas). • Lay pipelines during calm weather periods or when ocean currents are weakest. • Disrupt the seafloor as little as possible during pipe-laying (e.g. do not trench, but rather lie the pipe directly on the sea floor – usually the pipeline will gradually settle into the substrate by itself because of its weight).
Loss of wildlife due to harvesting (bush meat, trade).	<ul style="list-style-type: none"> • Avoid routing pipelines through important wildlife areas (e.g. national parks). • Include clauses in employment contracts that clearly declare wildlife harvesting impermissible, and lay down heavy penalties (e.g. dismissal) should harvesting be done. • Provide adequate and appropriate food and remuneration so that wildlife harvesting is unnecessary. • Delineate the area along the servitude that workers may move around in – beyond that should be out of bounds. • Create awareness amongst the workforce on the importance of biodiversity and the need for conservation. • Coordinate with wildlife authorities to maintain surveillance and law enforcement.
Deforestation for fuelwood.	<ul style="list-style-type: none"> • Avoid routing pipelines through natural forests or woodlands. • Include clauses in employment contracts that clearly declare wood harvesting impermissible, and lay down heavy penalties (e.g. dismissal) should harvesting be done. • Provide adequate and appropriate fuel (for cooking and warming) so that wood harvesting is unnecessary. • Delineate the area along the servitude that workers may move around in – beyond that should be out of bounds. • Create awareness amongst the workforce on the importance of trees and the need for conservation. • Coordinate with forestry authorities to maintain surveillance and law-enforcement.
Disruption to wildlife from blasting.	<ul style="list-style-type: none"> • Avoid routing pipelines through important wildlife areas (e.g. national parks). • Preferably route pipelines along existing development corridors (e.g. roads) where blasting is less likely to be necessary than in 'greenfield' areas. • If pipelines are to be located in wildlife-rich areas, avoid trenching during periods when wildlife is breeding.
Pollution of soil and water from inappropriate waste dumping, concrete mixing, etc. (causing wildlife mortalities).	<ul style="list-style-type: none"> • Waste management must be included in the EIA, with the objective of ensuring that all types of waste are correctly handled and transported, and deposited in a repository that is designated for that type of waste. Especially avoid dumping hazardous waste in a general landfill. • When servicing machinery, ensure waste oils, grease and filters are placed in sealed containers and then preferably taken to recycling facilities or designated repositories.

4.2.1.4 Biodiversity loss

Road-kills from increased traffic.	<ul style="list-style-type: none"> • Avoid routing pipelines through important wildlife areas (e.g. national parks). • If pipelines are to be located in wildlife-rich areas, avoid construction (and thus additional transportation) during periods when wildlife (e.g. frogs, tortoises and other animals) is known to move to or from breeding areas. • Ensure project vehicles are roadworthy (especially good lights and brakes) and drivers are qualified, sober (and not under the influence of drugs) and adhere to traffic rules. • Educate truck drivers about the importance of biodiversity so that they are conscious of the need to avoid killing wildlife. • Avoid driving during dawn and dusk – a period where visibility is usually poor.
Bush-fires from careless camp management, welding, angle-grinding, cigarette butts, etc.	<ul style="list-style-type: none"> • Establish clear 'house rules' aimed at preventing fires, attach these as part of employment contracts, and institute heavy penalties (e.g. dismissal) for breach of rules. • Provide adequate and appropriate equipment to combat fires (e.g. fire extinguishers) and facilities for cigarette butts and other combustible items. • Delineate the area along the servitude that workers may move around in – beyond that should be out of bounds. • Create awareness amongst the workforce on the importance of preventing fires.
Spread of Alien-invasive species (plant seeds lodge in earthmoving equipment and drop off in new areas).	<ul style="list-style-type: none"> • Before any earthmoving equipment is brought to site, wash it carefully and/or clean with compressed air to ensure that any plant seeds are removed (especially from wheels, caterpillar tracks, chassis and suspension system, but seeds may also lodge elsewhere on the equipment).

General comment: Contractors usually know and care less about the environment than the project proponent, and they usually operate to tight deadlines. Thus, EMPs must be specific and realistic about what contractors must adhere to. The EMP can be accompanied by additional information and guidelines, and contractors can also be provided with a customized training course to help them adhere to environmental conditions.

4.2.1.5 Loss of archaeological resources and cultural integrity

Impact	Avoidance or mitigation options
Damage to archaeological assets from land clearing for access roads, accommodation camps, lay-down areas and pipeline strip, as well as blasting.	<ul style="list-style-type: none"> • Maximum utilization of existing development corridors (e.g. roads) so as to avoid impacting undeveloped areas. • Undertake an archaeological study as part of EIA baseline survey, and avoid important archaeological areas (e.g. historical sites, places with fossils). • Delineate the area along the servitude that workers may move around in – beyond that should be out of bounds. • As soon as an item of archaeological interest is discovered, cease all excavation/blasting and alert the appropriate authorities.
Damage to historical buildings (e.g. cracking) due to vibrations from increased traffic and heavy vehicle movements.	<ul style="list-style-type: none"> • Undertake a heritage study as part of EIA baseline survey, and select transport routes that have the least impact on such sites. • Ensure heavy trucks drive as slowly as possible in the vicinity of such sites.
Disappearance of artifacts through illegal collecting.	<ul style="list-style-type: none"> • Avoid routing pipelines through important archaeological areas (e.g. historical sites, places with fossils). • Include clauses in employment contracts that clearly declare artifact collecting impermissible, and lay down heavy penalties (e.g. dismissal) should collecting be done. • Delineate the area along the servitude that workers may move around in – beyond that should be out of bounds. • Create awareness amongst the workforce on the importance of conserving archaeological and historical assets. • Coordinate with heritage authorities to maintain surveillance and law-enforcement.

4.2.1.6 Damage to roads and other infrastructure

Impact	Avoidance or mitigation options
Deterioration of roads from heavy vehicles.	<ul style="list-style-type: none"> • Undertake infrastructure, traffic and logistics study as part of baseline survey, and select access routes accordingly. • Impose load and speed restrictions on heavy vehicles. • Repair damaged roads after use.

4.2.1.7 Transboundary impacts

Impact	Avoidance or mitigation options
Movement of labour across boundaries, with possible cross-border spread of STDs.	<ul style="list-style-type: none"> • Employ locals wherever possible. • Include clauses in employment contracts that clearly require foreign workers to be respectful of local cultures and customs, especially with respect to treatment of women and girls • Create awareness amongst the workforce on the dangers of STDs and how they can be avoided. • Provide adequate and appropriate entertainment for the workforce so that they are happy in their base-camp (e.g. television, table tennis, football). • Engage with local communities along the proposed route, and request their input into how best interactions between them and the workforce should be handled. • Provide condoms to workers.
Movement of heavy machinery across borders, with possible spread of alien-invasive plants.	<ul style="list-style-type: none"> • Before any earthmoving equipment is brought to site, wash it carefully and/or clean with compressed air to ensure that any plant seeds are removed (especially from wheels, caterpillar tracks, chassis and suspension system, but seeds may also lodge elsewhere on the equipment).
Movement of marine substrate sediments when undersea pipelines.	<ul style="list-style-type: none"> • Avoid routing pipelines through important marine biodiversity or fish spawning areas (e.g. marine parks, coral reefs, turtle breeding areas). • Lay pipelines during calm weather periods or when ocean currents are weakest. • Disrupt the seafloor as little as possible during pipe-laying (e.g. do not trench, but rather lie the pipe directly on the sea floor – usually the pipeline will gradually settle into the substrate by itself because of its weight).

4.2.2 Operational impacts (direct, indirect and cumulative)

4.2.2.1 Compromised pipeline safety

Impact	Avoidance or mitigation options
Acts of sabotage may destroy pipelines and associated infrastructure.	<ul style="list-style-type: none"> Establish community-based “early warning” systems, relying on low-level intelligence gathering on possible sabotage plans, thus enabling pre-emptive measures (e.g. more regular patrols). Install SCADA monitoring system to identify and isolate a sabotaged pipeline/facility. In areas vulnerable to security breach/terrorism, the following additional protective measures may be considered: <ul style="list-style-type: none"> Above ground sign posts exhibiting pipeline depth; Video Surveillance; Security Patrols; Emergency Response Teams; and Fire Brigade and Ambulance Unit. Support community projects to improve community acceptance (and thus protection) of the pipeline and associated infrastructure. Hire community members along the route to provide ongoing surveillance. Enable gas off-take to communities, thus promoting a sense of ownership and protectiveness over the pipeline and associated infrastructure. Stockpile spare parts/pipes and equipment at regular intervals to enable speedy pipeline repairs.
Seismic events may compromise the pipeline and cause safety risks.	<ul style="list-style-type: none"> Install SCADA monitoring system to identify and isolate a damaged pipeline/facility.
Floods may compromise the pipeline and cause safety risks.	<ul style="list-style-type: none"> As above.
Unstable substrates/ areas subject to extreme weather events (e.g. coastline) may compromise the pipeline and cause safety risks.	<ul style="list-style-type: none"> As above.

4.2.2.2 Livelihood loss

Impact	Avoidance or mitigation options
Pipeline servitudes may be out-of-bounds for cultivation and livestock, thus affecting livelihoods.	<ul style="list-style-type: none"> Establish credible criteria for excluding livestock and cultivation from the pipeline servitude, so that people are not unreasonably excluded from using these areas productively. Engage communities in a dialogue on this issue – perhaps allowing access/utilization in return for surveillance and monitoring.

4.2.2.3 Reduced health, safety and gender equality

Impact	Avoidance or mitigation options
Acts of sabotage may destroy pipelines and associated infrastructure, placing people at risk.	<ul style="list-style-type: none"> Establish community-based “early warning” systems, relying on low-level intelligence gathering on possible sabotage plans, thus enabling pre-emptive measures (e.g. more regular patrols). Install SCADA monitoring system to identify and isolate a sabotaged pipeline/facility. In areas vulnerable to security breach/terrorism, the following additional protective measures may be considered: <ul style="list-style-type: none"> Above ground sign posts exhibiting pipeline depth; Video Surveillance; Security Patrols; Emergency Response Teams; and Fire Brigade and Ambulance Unit. Support community projects to improve community acceptance (and thus protection) of the pipeline and associated infrastructure. Hire community members along the route to provide ongoing surveillance. Enable gas off-take to communities, thus promoting a sense of ownership and protectiveness over the pipeline and associated infrastructure. Stockpile spare parts/pipes and equipment at regular intervals to enable speedy pipeline repairs.
Restored gas supply after a shut-down for repairs/maintenance catches homeowners unaware, resulting in explosions/fires, causing injury/death.	<ul style="list-style-type: none"> Use local radio or community structures to inform communities about the repair work, and especially to warn them about turning off their appliances (e.g. cookers), so that the sudden restoration of gas does not take them unawares.

4.2.2.4 Biodiversity loss

Impact	Avoidance or mitigation options
Habitat loss and fragmentation (e.g. cleared strip – and maintained as clear).	<ul style="list-style-type: none"> Rehabilitate servitudes so that they re-vegetate to as near as possible their original habitat.

4.2.2.5 Loss of archaeological resources and cultural integrity

None obvious

4.2.2.6 Damage to roads and other infrastructure

None obvious

4.2.2.7 Transboundary impacts

None obvious

4.2.3 Decommissioning and/or abandonment impacts (direct, indirect and cumulative)

As gas fields reach the end of their economic life specific parts of the pipeline naturally become redundant, and with no potential future use, they need to be decommissioned. Since many decades will have elapsed between the original construction and the decommissioning phases, a new EIA must be done for the decommissioning of a pipeline.

In most countries with mature gas industries (e.g. UK and Norway), the decommissioning of pipelines is considered on a case-by-case basis (Oil & Gas UK 2013). The three basic options are:

- Leave in situ - minimal intervention
- Leave in situ - major intervention
- Removal by reverse S-lay
- Leave in situ – minor intervention
- Removal by reverse reeling
- Removal by cut and lift

The decommissioning of any large pipeline usually involves a combination of pipe removal and abandonment-in-place. A key factor influencing the choice between the various options is present and future land use, with other criteria being safety, health, environmental impacts, cost and technical feasibility. Since less than 2% of the North Sea pipelines have been decommissioned so far, there is very limited experience of decommissioning larger diameter sub-sea pipelines and it is difficult to quantify the environmental impact of such decommissioning (ibid). In spite of this, Oil and Gas UK regard the best option as leaving a pipeline in place, either on the seabed, or left buried below the sea floor. In Australia, the industry code of practice (for terrestrial pipelines) supports the idea of leaving pipelines in the ground, as this is generally a better option environmentally than digging it up and disposing of the old pipes. However, there seems to be consensus that associated infrastructure (booster pumps, valves, etc.) should be removed.

The tables below assume that a decision is taken to actively remove the pipeline, so the impacts listed in these tables will mostly not be relevant if the pipeline is left in the ground. Since the physical act of removing a pipeline is essentially the reverse operation of pipeline construction (topsoil removal, backhoe excavation of the subsoil to a depth at least even with the top of the pipe, pipe removal, backfilling and compaction of the trench, replacement of the topsoil, revegetation and relinquishing the Right of Way), the impacts of decommissioning in this scenario are very similar to those of construction.

4.2.3.1 Compromised pipeline safety

Not applicable

4.2.3.2 Livelihood loss

Impact	Avoidance or mitigation options
Temporary closure of (unpaved) roads to enable re-opening of the trench (under that piece of road) and pipe removal.	<ul style="list-style-type: none"> Construct temporary bypasses to enable traffic flow.
Disruption of traditional work/livelihood activities due to lure of well-paid short-term employment opportunities during decommissioning.	<ul style="list-style-type: none"> Engage with community leaders so that any changes are at a pace and scale acceptable to them – they may propose terms and conditions. For example, avoid recruiting local labour during the season when they would be planting or harvesting crops.
Economic distortion in remote rural areas due to short term cash injection from temporary jobs.	<ul style="list-style-type: none"> As above, also in some areas/cultures communities may prefer other forms of payment rather than cash (e.g. upgrading their water and sanitation infrastructure, fixing their roads, installing mobile communication facility).
Open trenches may pose safety risks to livestock, thus affecting livelihoods.	<ul style="list-style-type: none"> Temporary fences (e.g. a two strand mobile electric fence) could be erected and moved on a daily basis. In high-risk areas, trenches must not be left open overnight.
Scarring and infrastructure reduces aesthetic appeal of areas – reducing tourism options.	<ul style="list-style-type: none"> Ensure that the trench is covered over after pipeline removal, and re-vegetated in such a way that the scar is not noticeable. If there is a distinct “High Season”, avoid pipeline removal during this period – rather remove the pipeline during a tourism off-peak period.

4.2.3.3 Reduced health, safety and gender equality

Impact	Avoidance or mitigation options
Increased road accidents because of increased traffic and more heavy (slow moving) vehicles (that are transporting old pipes to disposal points).	<ul style="list-style-type: none"> • Select transport routes that have the least impact on traffic/public transport and that are properly constructed to support heavy vehicles. • Schedule transport so as to use busy routes during times (e.g. at night/early morning) that are not/less used by other traffic. • Ensure heavy trucks do not drive in convoy, so that it is easier for faster traffic to overtake. • Ensure project vehicles are roadworthy, air-conditioned, well marked and drivers are qualified, sober (and not under the influence of drugs) and adhere to traffic rules. • Solicit support from traffic officials to direct traffic in problematic areas (e.g. through towns and busy intersections). • Announce the movement of convoys over the radio so that road users are forewarned and thus able to use alternative routes.
Dust and air pollution from earthmoving, vehicle movement, construction activities, generators.	<ul style="list-style-type: none"> • On unpaved roads, reduce vehicle speeds so less dust is generated. • In soils/substrates that are particularly dusty, water (if readily available) could be used to suppress dust. • Ensure earthmoving vehicles and generators have appropriate exhaust systems/mufflers to reduce pollution and noise.
Pollution of soil and water from inappropriate waste dumping (causing illness).	<ul style="list-style-type: none"> • Waste management must be included in the decommissioning EMP, with the objective of ensuring that all types of waste are correctly handled and transported, and deposited in a repository that is designated for that type of waste. Especially avoid dumping hazardous waste in a general landfill. • When servicing machinery, ensure waste oils, grease and filters are placed in sealed containers and then preferably taken to recycling facilities or designated repositories.
Inappropriate interaction between “foreign” (male) workforce and local communities (e.g. women) – could result in STDs.	<ul style="list-style-type: none"> • Employ locals wherever possible. • Include clauses in employment contracts that clearly require foreign workers to be respectful of local cultures and customs, especially with respect to treatment of women and girls. • Create awareness amongst the workforce on the dangers of STDs and how they can be avoided. • Provide adequate and appropriate entertainment for the workforce so that they are happy in their base-camp (e.g. television, table tennis, football). • Engage with local communities along the pipeline route, and request their input into how best interactions between them and the workforce should be handled. • Provide condoms to workers.
Open trenches may pose safety risks, especially to children and the elderly.	<ul style="list-style-type: none"> • Temporary fences (e.g. a two-strand mobile electric fence) could be erected and moved on a daily basis, or hazard tape strung alongside the trench to make it visible to passers-by. • Temporary walkways could be placed over trenches to enable safe pedestrian passage. • Local radio stations could be used to alert people to trench reopening activities. • In high-risk areas, trenches must not be left open overnight.

4.2.3.4 Biodiversity loss

Impact	Avoidance or mitigation options
Habitat loss from land clearing for access roads, accommodation camps, lay-down areas and pipeline strip.	<ul style="list-style-type: none"> • Maximum utilization of existing roads and already cleared areas. • Using hazard tape, delineate areas to be cleared (to reduce excessive clearing).
Disruption of wildlife breeding/migration.	<ul style="list-style-type: none"> • If pipelines are located in wildlife-rich areas, avoid pipeline removal during periods when wildlife (e.g. frogs, tortoises and other animals) is known to move to or from breeding areas.
Alteration or disruption of natural water flow (e.g. streams).	<ul style="list-style-type: none"> • Do not remove pipes that are under streams and rivers – rather fill them with sand/concrete and seal at either end.
Increased sediments in water bodies due to soil/substrate disturbance caused by trenching/pipe removal.	<ul style="list-style-type: none"> • As above.
Increased sediments in water column due to seabed disturbance caused by pipe removal.	<ul style="list-style-type: none"> • Avoid routing pipelines through important marine biodiversity or fish spawning areas (e.g. marine parks, coral reefs, turtle breeding areas). • Lay pipelines during calm weather periods or when ocean currents are weakest. • Disrupt the seafloor as little as possible during pipe-laying (e.g. do not trench, but rather lie the pipe directly on the sea floor – usually the pipeline will gradually settle into the substrate by itself because of its weight).
Loss of wildlife due to harvesting (bush meat, trade).	<ul style="list-style-type: none"> • Include clauses in employment contracts that clearly declare wildlife harvesting impermissible, and lay down heavy penalties (e.g. dismissal) should harvesting be done. • Provide adequate and appropriate food and remuneration so that wildlife harvesting is unnecessary. • Delineate the area along the servitude that workers may move around in – beyond that should be out of bounds. • Create awareness amongst the workforce on the importance of biodiversity and the need for conservation. • Coordinate with wildlife authorities to maintain surveillance and law-enforcement.
Deforestation for fuelwood.	<ul style="list-style-type: none"> • Include clauses in employment contracts that clearly declare wood harvesting impermissible, and lay down heavy penalties (e.g. dismissal) should harvesting be done. • Provide adequate and appropriate fuel (for cooking and warming) so that wood harvesting is unnecessary. • Delineate the area along the servitude that workers may move around in – beyond that should be out of bounds. • Create awareness amongst the workforce on the importance of trees and the need for conservation. • Coordinate with forestry authorities to maintain surveillance and law-enforcement.
Pollution of soil and water from inappropriate waste dumping.	<ul style="list-style-type: none"> • Waste management must be included in the decommissioning EIA, with the objective of ensuring that all types of waste are correctly handled and transported, and deposited in a repository that is designated for that type of waste. Especially avoid dumping hazardous waste in a general landfill. • When servicing machinery, ensure waste oils, grease and filters are placed in sealed containers and then preferably taken to recycling facilities or designated repositories.
Road-kills from increased traffic.	<ul style="list-style-type: none"> • If pipelines are to be removed in wildlife-rich areas, avoid decommissioning (and thus additional transportation) during periods when wildlife (e.g. frogs, tortoises and other animals) is known to move to or from breeding areas. • Ensure project vehicles are roadworthy (especially good lights and brakes) and drivers are qualified, sober (and not under the influence of drugs) and adhere to traffic rules. • Educate truck drivers about the importance of biodiversity so that they are conscious of the need to avoid killing wildlife. • Avoid driving during dawn and dusk – a period where visibility is usually poor.
Bush-fires from careless camp management, welding, angle-grinding, cigarette butts, etc.	<ul style="list-style-type: none"> • Establish clear 'house rules' aimed at preventing fires, attach these as part of employment contracts, and institute heavy penalties (e.g. dismissal) for breach of rules. • Provide adequate and appropriate equipment to combat fires (e.g. fire extinguishers) and facilities for cigarette butts and other combustible items. • Delineate the area along the servitude that workers may move around in – beyond that should be out of bounds. • Create awareness amongst the workforce on the importance of preventing fires.
Spread of Alien-invasive species (plant seeds lodge in earthmoving equipment and drop off in	<ul style="list-style-type: none"> • Before any earthmoving equipment is brought to site, wash it carefully and/or clean with compressed air to ensure that any plant seeds are removed (especially from wheels, caterpillar tracks, chassis and suspension system, but seeds may also lodge elsewhere on the equipment).

4.2.3.5 Loss of archaeological resources and cultural integrity

None obvious

4.2.3.6 Damage to roads and other infrastructure

Impact	Avoidance or mitigation options
Deterioration of roads from heavy vehicles	a) Impose load and speed restrictions on heavy vehicles. b) Repair damaged roads after use.

4.2.3.7 Transboundary impacts

Impact	Avoidance or mitigation options
Movement of labour across boundaries, with possible cross-border spread of STDs.	<ul style="list-style-type: none"> • Employ locals wherever possible. • Include clauses in employment contracts that clearly require foreign workers to be respectful of local cultures and customs, especially with respect to treatment of women and girls. • Create awareness amongst the workforce on the dangers of STDs and how they can be avoided. • Provide adequate and appropriate entertainment for the workforce so that they are happy in their base-camp (e.g. television, table tennis, football). • Engage with local communities along the pipeline to be decommissioned, and request their input into how best interactions between them and the workforce should be handled. • Provide condoms to workers.
Movement of heavy machinery across borders, with possible spread of alien-invasive plants.	<ul style="list-style-type: none"> • Before any earthmoving equipment is brought to site, wash it carefully and/or clean with compressed air to ensure that any plant seeds are removed (especially from wheels, caterpillar tracks, chassis and suspension system, but seeds may also lodge elsewhere on the equipment).
Movement of marine substrate sediments when undersea pipelines are removed.	<ul style="list-style-type: none"> • As noted earlier, removing a pipeline is much worse environmentally, than simply leaving it on the seafloor. • If the pipeline must be removed, do so during calm weather periods or when ocean currents are weakest. • Disrupt the seafloor as little as possible during pipe removal.

Part 5 - Guidance for Scoping, EIA and EMP reports

Since there are many guidelines available globally and within Pakistan about how to conduct scoping, do an EIA, and compile an EMP, there is little gained from repeating or duplicating them in this document. Moreover, the steps followed are the same or very similar, whether the project is a pipeline, a road, a dam or whatever.

Instead, various other sections of this guideline document provide some specific information and guidance relevant to scoping and the conducting of EIAs for transboundary natural gas pipelines, and for compiling EMPs.

For example, sections 1.5 and 1.6 elaborate on the types and components of a typical natural gas pipeline, and the sequence of activities for constructing, operating and decommissioning a pipeline. Part 4 highlights the principles that underpin EIA best practice, and section 4.2 provides detail as to the impacts one could expect during the construction, operational and decommissioning phases of a pipeline.

Annex 3 sets out draft Terms of Reference for an EIA for a transboundary natural gas pipeline, annex 4 outlines what a typical EIA report should include, and annex 5 provides an outline for a Disaster Preparedness Plan. Finally, annex 8 is a template for reviewing a Scoping Study, annex 9 for reviewing an EIA report, and annex 10 is a template for an EMP.

Collectively, these tables and annexes should be of great use to the authorities who guide and review Scoping reports, EIAs and EMPs, project proponents who commission and pay for these studies, and the consultants who undertake them.

Part 6 - Guidance for transboundary notification and communication

Strictly speaking, the legal requirement for transboundary notification and the need for transboundary communication, are linked to projects undertaken in one country, but with impacts being felt in another country. Typical examples would be dams, power stations, industrial parks or agriculture projects on river systems. In the case of transboundary natural gas pipelines in the Pakistani context, all the countries through which the pipeline passes, are co-developers in the project. The EIAs are mostly conducted within the confines of each country, based on the laws of that country, and under the authority of national institutions for the portion of the pipeline that traverses through that country. Thus, the most likely scenario is three separate EIAs, one per country, for a pipeline that crosses three countries. Another scenario is that the co-implementing countries may commission one EIA for the entire pipeline, and they would form a technical committee (e.g. their respective EPAs) to oversee the process. This scenario would be expected if the project was formulated as a single project with one major financier (e.g. a development bank) and/or if was being developed under a regional agreement (e.g. SAARC).

Thus, the procedural requirements of inter-State notification and the exchange of technical information within EIA, as envisaged by the Espoo Convention, are probably not applicable in the context of natural gas pipelines that are co-developed by neighbouring countries. Nevertheless, it is worth noting that certain procedures may need to be followed in the envisaged mega-projects designed to bring gas from source to market in the South Asia Region.

As noted earlier, EIA is a technical process comprising, inter alia, the presentation of the technical details of the planned project, the preparation of a study on its environmental and social impacts, public consultation, the identification of measures to avoid or mitigate the anticipated impacts, etc. The EIA process generates technical information, which needs to be shared with stakeholders (including the authorities and the public) in all the affected countries.

Notification is the formal process whereby States officially inform other States when they are planning to carry out activities that may cause significant adverse effects upon other States. Notification must be done using specific templates to ensure consistency in the information being communicated, and the responses thereto.

Whether the EIA is being conducted within individual countries, or if it is one large, integrated EIA for the whole project, it makes sense that the Terms of Reference(s) for the EIA(s) is/are shared between the participating countries with a view to refining and/or endorsing them. The outcome of this step is that all countries have reached consensus on the way forward for the EIA. Each State should designate a contact point within the Mandated Agency (e.g. from within the EPA) for a particular project, and this person must stay in routine contact with the Mandated Agency of other States regarding the availability of EIA-related documents, the proposed consultation process, and other relevant issues. In particular, it is helpful at this stage to identify appropriate and effective means of communicating with I&APs in the various States. For more guidance on public participation, see volume 2 and the Calabash Resource materials available on <http://www.saiea.com/calabash/Index.html>.

All the countries involved in the project should agree on the most effective means of collecting and assessing public comments. Whilst the period set aside for public consultation may differ from country-to-country, best practice suggests that 60 days should be the minimum, so that affected persons have enough time to consider the issues, and communicate their concerns. Where communities are primarily rural with limited education, more time may be required.

Depending on the structure of the EIA (i.e. one integrated EIA or many country-specific EIAs), the collaborating countries may agree to circulate the draft EIA report(s) to their counterpart EPAs so that they can benefit from “transboundary” comments. This is in addition to comments being obtained from I&APs within the individual countries, where issues are much more local in nature.

Best practice is that the Mandated Agency in each country considers public comments during the official evaluation of the EIA.

The period and methodology for the evaluation of the draft EIA report is usually specified in the country’s own legal requirements. The Tb-EIA Guidelines provide templates for evaluating scoping reports, SEA and EIA reports, and Environmental Management Plans (EMPs) – see appendices 8, 9 and 10. An important consideration is whether an EIA should be evaluated by an external (independent) team since this would help improve objectivity (and reduce bias). External evaluation is generally a good option when a project is likely to have transboundary impacts and/or is controversial. In accordance with the Polluter Pays Principle, the costs of external evaluation should be borne by the proponent.

When the EIA has been completed and evaluated, the Mandated Agency of each country should inform the other countries of the final approval of the project and of how comments from I&APs were taken into account. A copy of the final version of the EIA report should be placed on the appropriate website(s) so that it is accessible to I&APs.

Part 7 - Conclusion

In the Pakistani context, there appear to very few true transboundary impacts linked to the construction, operation and decommissioning of natural gas pipelines. Virtually all the impacts one could typically expect from this sector, are local in nature, even site specific. Five possible exceptions might be:

- The movement of labour teams, which cross borders as they dig the trenches, transport the pipes and other equipment, and lay the pipelines. In such a scenario, one might expect some social, health and cultural impacts because of inappropriate interactions with local communities. However, various experts in Pakistan were of the opinion that the probabilities of such impacts occurring are low since local teams are usually used, and hardly any construction staff cross into other countries during such projects. In the case of the Iran-Pakistan pipeline, each country is responsible for constructing the pipeline within its own territory. However, it is not inconceivable that a single contractor might in future be engaged to construct future pipelines, necessitating transboundary labour movement.
- The movement of sediment plumes across international boundaries when pipelines are laid on the sea floor.
- The spread of alien-invasive plants from one country to another is often facilitated by the movement of large machinery, as seeds lodged in tyre lugs or bulldozer tracks may become dislodged in new areas, thus spreading the distribution of plants into areas where they are not native.
- Gas plumes crossing boundaries in the event of damage to pipelines, either by natural events (e.g. earthquakes) or sabotage, and
- The establishment of new roads to enable the construction and maintenance of pipelines in previously inaccessible areas, may result in land use changes in the country, and these in turn, may have indirect transboundary impacts in a neighbouring country.

The appropriate siting of terminals and careful route selection are the first and most effective means of preventing or minimizing pipeline impacts from the outset, and these two aspects need to be the centerpiece of the EIA. For example, appropriate siting of the terminal on the coast is critical, since shorelines are usually valuable assets (dwellings, mangroves, fish and other seafood) and shipping traffic is a constant concern. Similarly, avoiding protected areas (marine or terrestrial, ecological or cultural) should be an underlying principle. The locality of key infrastructure near the gas source needs special attention in the EIA, since as much flexibility as possible is needed to ensure that pipeline routing avoids sensitive areas.

From a social impact perspective, the use of local labour usually reduces inappropriate interactions between the workforce and local communities (especially problematic in remote rural areas), and culturally-acceptable measures need to be in place to limit the spread of STDs. Fortunately, Pakistan has a relatively good road network that enables the efficient movement of heavy vehicles, but trucks carrying abnormal loads (e.g. pipes) may slow down traffic, cause congestion and generally inconvenience the public. This problem will be more acute in hilly, remote areas with fewer tarred roads, so access routes need to be carefully selected and transport needs to be well planned.

Irrespective of whether impacts are likely to be social, cultural, health or biophysical, the EIA process must include effective, extensive and transparent public participation to enable affected communities and other stakeholders to participate meaningfully in decision making.

As with all guidelines the best next step is to implement them, for pipelines within the national borders of Pakistan, and beyond.

Annex 1- About the National Impact Assessment Programme

The National Impact Assessment Programme (NIAP) is a 4.5 years (2010 – 2014) programme which aims to contribute to sustainable development in Pakistan by strengthening the EIA regime and introducing SEA in all development planning. Improving the functioning of the EIA process will lead to environmentally sustainable development at the project level, while the introduction of SEA will ensure the long-term sustainability and effectiveness of development planning. The Project is funded by the Embassy of the Kingdom of the Netherlands. The technical guidance for the Project is provided by the Netherlands Commission for Environmental Assessment.

The NIAP is a unique initiative that uses a multi-pronged strategy to strengthen the system of impact assessment in Pakistan. The programme will undertake interventions at the policy level; carry out capacity building among stakeholders; develop tools, procedures and mechanisms for improved impact assessment; increase understanding of the importance of impact assessment processes; and advocate the adoption of impact assessment at all levels.

Scope

The project will be implemented at the national and provincial levels, as well as in Gilgit-Baltistan, and Azad Jammu and Kashmir. While federal government departments are key partners, they will implement the programme across the country through their respective provincial and regional offices.

Programme approach

The programme approach includes an analytical inception stage, during which the status of EIA practice will be analyzed and opportunities for SEA will be identified. The implementation stage will concentrate on the development of tools, along with capacity building, and conducting pilot SEA and EIA exercises to demonstrate the value of the process.

Programme implementation

The NIAP is headed by a National Programme Director, appointed by the Planning Commission. A Programme Advisory Committee oversees and guides programme activities, and monitors progress. A Programme Coordination Unit, housed at the Planning Commission, is responsible for internal planning, monitoring and reporting. Programme Implementation Units (PIU) have been established at the Pakistan Environmental Protection Agency, the Environment Wing of the Climate Change Division (previously Ministry of Environment), and IUCN Pakistan. PIUs were also established at provincial, AJK and GB EPAs.

For more information please visit:

www.niap.pk

Annex 2 - Regulations and Guidelines⁹

Regulations and Guidelines produced under PEPA 1997

1. National Environmental Quality Standards (Self-Monitoring and Reporting by Industries) Rules, 2001
2. Self-Monitoring and Reporting by Industries Rules, 2001
3. National Environmental Quality Standards (Environmental Laboratories Certification) Regulations, 2000
4. National Environmental Quality Standards for municipal and liquid industrial effluents discharged into inland waters, sewage treatment facilities, and the sea water, vehicular emissions, gaseous emissions, noise.
5. Environmental Samples Rules, 2001
6. Provincial Sustainable Development Fund Board (Procedure) Rules, 2001
7. The Pollution Charge for Industry (Calculation and Collection) Rules, 2001
8. Environmental Tribunal rules, 1999
9. Pakistan Environmental Protection Agency (Review of IEE/EIA) Regulations, 2000
10. Provincial Sustainable Development Fund (Utilization) Rules, 2003
11. Hazardous Substances Rules, 2003 (Draft)
12. Project Implementation And Resettlement Of Affected Persons Ordinance 2001 (Draft)
13. Hospital Waste Management Rules, 2005.
14. National Biosafety
 - Biosafety brochure
 - Pakistan Biosafety Rules 2005
 - National Biosafety Guidelines
 - Performa for Movement of Regulated Materials

15. Guidelines for Disposal of CFLs Light Bulbs

16. Regulation Prohibiting Manufacture, Import, Sale And Use Of Non-Degradable Plastic Bags And Other Plastic Products

Environmental Guidelines and Checklists by Khyber Pakhtunkhwa-EPA

1. Brick Kiln Units
2. Construction or Expansion of Bus Terminal
3. Carpet Manufacturing Units
4. Canal Cleaning
5. Flour Mill
6. Forest Harvesting Operations
7. Forest Road Constructions
8. Housing Schemes
9. Marble Units
10. Petrol and CNG Stations
11. Poultry Farms
12. Rural Schools and Basic Health Units
13. Sanitation Schemes
14. Sound Plantation
15. Stone Crushing Units
16. Tourist Facilities in Ecologically
17. Sensitive Areas
18. Tube-well Construction for Agriculture and Irrigation Purposes
19. Urban Areas Road Construction
20. Watercourses Construction and Lining
21. Water Reservoirs in Arid Zones
22. Water Supply Schemes
23. Solid Waste Management (Draft)

⁹Obtainable from Pakistan EPA. <http://www.environment.gov.pk/info.htm>

**Environmental Guidelines and Checklists
by Balochistan - EPA**

- Dairy Farms and Slaughter Houses

**Draft Sectoral Guidelines and Upstream
Petroleum Sector - Onshore**

Financial Assistance to NGOs

- Guidelines for Financial Assistance

National Directories

- National Directory of Environmental Consulting Firms
- National Directory of Institutions Offering Specialized Programs on Environment in Pakistan

Annex 3 - Draft TOR for an EIA consultant team

**TERMS OF REFERENCE
ENVIRONMENTAL IMPACT ASSESSMENT
REQUIREMENTS FOR THE
TRANSBOUNDARY NATURAL GAS PIPELINE
PROJECT
Issued by**

Date.....

1. INTRODUCTION AND OBJECTIVE

These TOR are specifically for the EIA, but the EIA consultants must be fully aware of what their techno/economic counterparts will be doing in order to enable the teams to work closely with each other. Also, the EIA team will need early access to some of the data being gathered and information on the options being developed by the techno/economic team (e.g. soil stability, topography, demographics, physical infrastructure, rivers, vegetation, etc.). In some instances, it might be practical for the two teams to coordinate their fieldwork such that logistical arrangements are simplified and resources used optimally.

2. ENVIRONMENTAL IMPACT ASSESSMENT REQUIREMENTS

2.1 Introduction

Provide project rationale

2.2 Project Components

Describe project components

The EIA will cover inter alia, the following aspects relating to the above project:

Construction of the pipeline, installation of safety valves, booster pumps, offtake infrastructure, the construction of ancillary structures, labour camps, lay-down areas and the service road;

- the impact of the pipeline and its associated infrastructure on biodiversity (i.e. impacts of ROW clearance, bulk earthworks and civils for all construction sites, blasting, earthmoving, transportation, breaching of rivers);

- the impact of the pipeline on land use, human health and livelihoods (resettlement and compensation);
- the impact of increased water use for pipe testing and other requirements;
- the potential for the introduction and spread of alien plant species;
- the potential to lose, marginalize or fragment populations of rare and endangered plant and animal species;
- solid and liquid waste disposal – especially the impact of liquid pollution such as hydrocarbon products, suspended sediment, solvents, paint, chemicals, concrete slurry, sewage etc.;
- the impact of all hazardous and non-hazardous waste from construction, such as building rubble, waste concrete, paint and chemical containers, scrap metal, paper, glass and plastic, domestic waste, office waste, workshop waste, contaminated soil and so on;
- the impact of transport and construction on sites of archaeological, cultural, religious and historical importance;
- the impact of the pipeline and its associated infrastructure on other development and planning initiatives in the region including conservation, tourism, agriculture, etc.;
- the impact of secondary developments, knock-on effects, synergistic effects on the ecology and socio-economics of the region;
- the impact on socio-cultural aspects of local people around the project;
- resettlement of the affected population and/or adoption of avoidance or compensatory measures;
- presence of construction workforce (and especially their interactions with local communities and off-site impacts);
- the impact of construction of access roads to the pipeline route on natural areas and archaeological sites;
- the impact of heavy vehicles on other road users;
- deterioration of roads from use by heavy and other vehicles, as well as dust and noise.

Operation and maintenance of the pipeline

- The safety of nearby communities in case of acts of terrorism (pipeline is a target)
- The loss of livelihoods if agriculture and access in the ROW is disallowed
- Noise from helicopters and vehicles during routine inspections, maintenance and repairs
- Impact on “sense of place” through maintenance of a cleared ROW.

Decommissioning of the pipeline

As noted elsewhere in these guidelines, there are various options regarding the decommissioning of a natural gas pipeline, and a decision as to which option will be chosen, will likely only be made decades from now. Thus, there is little point in including decommissioning in this EIA. Instead, a separate decommissioning EIA should be done when the pipeline reaches the end of its life.

2.3 Standard

The EIA process and report must both be acceptable to the Pakistani government, (governments of other countries if a single EIA is being conducted for the transboundary pipeline), as well as to a standard that can be used as part of a bankable document to raise international finance for the project (e.g. compliant with the World Bank or Asian Development Bank Operational Directives and Guidelines). The Consultant must ensure that his/her EIA process and report will withstand scrutiny from international NGOs and other agencies with an interest in the project and/or that have a specific bias regarding local/regional socio-economic and political issues.

2.4 Legal Framework

Pakistan has EIA legislation in place regarding large-scale projects such as the planned natural gas pipeline, and the country’s provinces have additional legislation. There are also a number of policies and guidance documents that must be taken into account in conducting the EIA. See section x of the guidelines for details.

Note: If a single EIA is being conducted for the transboundary pipeline, then the laws, policies and guidelines of all the affected countries must be considered.

The EIA needs to contain a review of the current and impending legal requirements relevant to this project which include, inter alia, the following:

- the Constitution of the country(ies)
- relevant legislation regarding inter alia, water management, conservation, planning, fisheries, archaeological sites, Environmental Impact Assessment, pollution control and waste management, wetlands management, stakeholder engagement, public disclosure and access to information, land and occupancy rights (including use of natural resources)
- The country’s obligations under the relevant regional and international conventions including but not limited to:
 - SAARC
 - UN Conventions on shared river management and water use, climate change, biodiversity, wetlands management, combating desertification and protection of archaeological sites and cultural heritage, and
- any other relevant legislation, policy or regulations.

3. Scope of work

The EIA will be conducted in the following two phases:

- Scoping – which will enable the client, authorities and the Consultants to fine tune these TOR. One of the most critical aspects of scoping is comparing alternative routes, as choosing the best route (from an environmental perspective) will significantly improve the possibility of avoiding and/or reducing the main environmental impacts.
- Environmental Impact Assessment including guidelines to develop a project-specific Environmental Management Plan and Disaster Preparedness Plan.

3.1 Scoping

It is recommended that the Scoping Report be based on:

- Existing literature, data, maps and analytical documents pertaining to the project area.
- Initial consultation with Interested and Affected Parties (I&APs) and key stakeholders.
- Discussions with the techno/economic consultants, particularly with regards to design options and operational issues.
- Expert opinion and professional judgment within the consultant team.
- Analysis of environmental laws, regulations and policies.
- Analysis of the lending agency guidelines.
- Preliminary definition of the areas that will be influenced by the project.
- Route selection analysis.

The main objective of the Scoping Report is to advise on the best route alternative (from an environmental perspective), refine the TOR and to develop a comprehensive and realistic Work Plan that is likely to deliver the required outputs.

The route selection, revised TORs and Work Plan will be endorsed by the relevant authorities after a thorough, interactive review.

3.2 Environmental Impact Assessment¹⁰

Phase 2 is the EIA phase, which shall provide meaningful input, based on scientific fact or best available knowledge, into the decision making process regarding the construction and operation of the project. The EIA will not provide an assessment of decommissioning impacts, as decommissioning will likely only be an issue far into the future. However, the EIA will provide some advice in this regard (based on current knowledge of international best practice). As noted earlier, the aim of the EIA is to provide decision-makers and stakeholders with a comprehensive evaluation of the impacts of the project on the environment, as well as the effects of the environment on the project, to a high level of confidence. The EIA report must be a stand-alone document, which can be included in the overall bankable feasibility study report for the project.

The report will also have to conform with the relevant lending agency guidelines, as well as the applicable Operational Directives, especially those relating to Involuntary Resettlement, Indigenous Peoples and EIA.

In order to assess the baseline situation, preferable route alternative and the possible impacts of the project, the consultant is required to utilize and where necessary update previous studies to a sufficient level of detail on the following:

- climate, including future climatic change scenarios;
- hydrology, including scenarios reflecting land use and climate change (it is necessary to consider a complete hydrological cycle);
- groundwater study – only to the detail required to determine the effects of additional water requirements on the water table;
- terrestrial flora and fauna (occurrence, status, trends), including the potential for the spread of invasive and alien species, rare and threatened species and habitats in the local/regional context;
- terrestrial fauna: identification of migratory routes crossing the river in the stretch to be flooded;
- land use in the pipeline area;
- archaeology, cultural history and sites of spiritual significance in all areas to be affected;
- a Cumulative Effects Assessment of the project;
- a fully quantified cost-benefit analysis using recognised methods of resource economics
- a Health Impact Assessment, particularly relating to STDs;
- Ethnographic study of local people surrounding the project;
- a detailed Social Impact Assessment including:
 - number of households to be resettled
 - population and demographic profile
 - subsistence agriculture (livestock and cultivation)
 - use of natural products in sustaining rural livelihoods
 - employment and job seekers
 - tourism facilities
 - housing and accommodation
 - health and education levels of local people.

¹⁰Note that these TORs assume a terrestrial project. They will need amending for a marine project

The specialist studies and all documentation relating to the public consultation process must be included in a separate volume or volumes. All maps must be in GIS format, linked to those used in the techno-economic study. The same base-maps must be used for both the techno/economic and EIA studies, so that there are no inconsistencies as regards mapping. This is an example of why there must be maximum interaction and coordination between the two studies.

Completing the work as required needs a multi-disciplinary team. It is suggested that at least the following disciplines be included:

- Team leader (essential that this person has broad understanding of EIA, and a proven ability to integrate specialist studies)
- Economist (with special knowledge of resource economics)
- Social scientist (may need translators?)
- Geomorphologist
- Archaeologist
- Biologist/ecologist (botanical, zoological)
- Human health specialist (with special knowledge of STDs)

As noted earlier, it is expected that the consultants who undertake this EIA, will include as much local expertise as possible (i.e. Pakistani experts).

The consultants must adopt an integrated systems approach to the EIA study. The aim of this approach is to ensure that the complex inter-relationships which exist in the environment (both biotic and abiotic) are clearly understood at local, national and regional levels. The key drivers of the system and the indicators must be identified. It will only be possible to properly predict the impacts of the proposed project once the affected ecosystems have been comprehensively described. The impacts should be evaluated in terms of their local, regional, national and international importance. The positive and negative impacts should be assessed in terms of the magnitude, significance, frequency of occurrence, duration and probability.

The confidence level in each prediction must be stated. In the initial stage of the EIA, a summary table showing the impacts and their ratings must be provided, together with general recommendations for avoidance and/or mitigation. The later stages of the EIA will provide much more detailed information for the preferred option.

The study should consider secondary, synergistic and cumulative effects where relevant and should consider at least a 20-year time frame.

The environmental study must also include guidelines for an Environmental Management Plan, to be developed in a future phase. This plan has to take into account desired outcomes (e.g. ongoing land use) and the required institutional capacity for implementation.

Possible fatal flaws must be identified as soon as they are identified (refer to earlier comment about route selection).

3.2.1 Public Participation Programme

The completion of this EIA must include a comprehensive public participation programme. The requirements set out below should be viewed as the minimum requirements that must be met. In summary, the aim of public participation is to obtain broad public opinion of the project and to ensure that the concerns of the I&APs are adequately addressed in the EIA and, where possible and relevant, in the EMP.

The I&APs must include the relevant government agencies, power and pipeline utilities, NGOs, the interested public, the affected parties in the region and specifically in the project area. The consultant must ensure that sufficient capacity building is undertaken (if necessary) with the local communities prior to any formal consultation programme taking place, to allow the affected parties to make informed decisions about their future and what the project means for them and their wellbeing.

It is essential that the public participation programme build trust between the project and I&APs so that I&APs are motivated to participate fully in the process. As noted elsewhere in these guidelines, the community may be involved as labour/service provision during construction, and as monitors/early warning system during the operational phase. Thus, it is prudent to interact positively and transparently with this, from the word 'go'.

The Consultant shall in this regard draw up a detailed Public Participation and Disclosure Plan,¹¹ which shall include, but not be limited to the following:

- capacity building programmes;
- a timetable for communication;
- draw up a comprehensive list of Interested and Affected Parties;
- develop Public Briefing Documents, Invitations to Participate, web sites, posters, newsletters, media broadcasts, newspaper and magazine articles etc.;
- advertise the project and the Public Participation Process in all major and relevant local newspapers and other media (e.g. through a website and radio announcements) as appropriate;
- hold public meetings in all the major towns/cities/villages along the route;
- hold focus group meetings with local traditional leaders, religious leaders, villagers and farmers groups;
- hold interactive workshops with other leading institutions and researchers working in the area;
- compile minutes of the meetings and send to all participants;
- organise appropriate feedback mechanisms for public comment;
- compile detailed Issues/Response Report which will show how public concerns have been/will be addressed in the EIA Report.

4. Environmental Management Plan

This EIA will include the compilation of an EMP, which must include avoidance/mitigation/enhancement measures for all significant impacts.

5. Process and milestones

Add timeframe and deliverable dates.

¹¹In accordance with the IFC Good Practice Manual for Doing Better Business through Effective Public Consultation and Disclosure, and taking account good practice guidelines issued by SAIAs Calabash Project .

Annex 4 - Outline of a typical EIA report¹²

Volume 1: EIA Report

Executive Summary

1. Context of the Project

- 1.1 Presentation of the Project and its justification
- 1.2 Related Projects and Development
- 1.3 Presentation of the project developer and the EIA Consultant(s)
- 1.4 Project developer Commitments
- 1.5 Structure of the EIA Report

2. Policy, Legal and Institutional Framework

- 2.1. Corporate Environmental and Social Policies
- 2.2. Policy and Legal Framework
- 2.3. International Conventions, Treaties and Agreements
- 2.4. Pakistan Government Institutional Framework
- 2.5. International Policies, Guidelines and Standards (if applicable)
- 2.6. Project Environmental and Social Standards

3. Project Description and Alternatives

- 3.1 Presentation of the Project and Description of Strategic Alternatives
 - 3.1.1 Project Rationale and Background
 - 3.1.2 Project Location
 - 3.1.3 Project Infrastructure
- 3.2 Comparison and Selection of within-project alternatives
 - 3.2.1 Methodology
 - 3.2.2 Comparison and Selection of Alternative
- 3.3 Description of the Selected Alternative
 - 3.3.1 Technical Description of the Selected Alternative
 - 3.3.1.1 Pre-Construction Activities
 - 3.3.1.2 Construction Activities
 - 3.3.1.3 Operation Activities
 - 3.3.1.4 Decommissioning, closure and post-closure Activities (if applicable)
 - 3.3.2 Detail Design
- 4.0 Description of the Environment
 - 4.1 Setting the Study Limits
 - 4.2 Physical Components
 - 4.2.1 Climate/Meteorology (including climate change)
 - 4.2.1.1 Methodology
 - 4.2.1.2 Description

4.2.2 Topography

4.2.3 Geology/Seismology

4.2.4 Soils

4.2.5 Natural Hazards

4.2.6 Hydrology

4.2.7 Erosion and Sedimentation

4.2.8 Surface and Groundwater Quality

4.2.9 Mineral Resources

4.2.10 Noise and Vibration

4.2.11 Air Quality

4.2.12 Mapping

4.3 Biological Components

4.3.1 Terrestrial Ecology/Wildlife

4.3.2 Forest/Vegetation Cover

4.3.3 Aquatic/Marine Biota and Habitats

4.3.4 Wetlands

4.3.5 Protected Areas

4.3.6 Biodiversity

4.3.7 Mapping

4.4 Socio-Economic Components

4.4.1 Administrative Organizations and Limits

4.4.2 Land Use

4.4.3 Social Profile

4.4.3.1 Communities

4.4.3.2 Demography

4.4.3.3 Education

4.4.3.4 Housing Conditions

4.4.3.5 Vulnerable Groups

4.4.3.6 Ethnic Groups

4.4.3.7 Gender Situation

4.4.3.8 Religion

4.4.3.9 Political and Social Organizations

4.4.4 Health Profile

4.4.4.1 Mortality and Morbidity

4.4.4.2 Incidence of Infectious Diseases

4.4.4.3 Incidence of Chronic Diseases

4.4.4.4 Diet and Nutrition

4.4.4.5 Mental Health and Well Being

4.4.4.6 Health Seeking Behavior

4.4.4.7 Access to Health Services

4.4.4.8 Access to Drinking Water, Sanitation and Waste Management

4.4.5 Economic Profile

4.4.5.1 Employment

4.4.5.2 Traditional Production System

4.4.5.3 Household Income

4.4.5.4 Cost of Living

4.4.5.5 Land Ownership

4.4.5.6 Local Business

4.4.5.7 Existing Productive Activities (e.g., Fisheries, Agriculture, Forestry, Mineral Resources, Tourism, etc.)

4.4.5.8 Others

¹²Based on the outline contained in the Pakistani Hydro Dams guidelines compiled by David Annandale.

4.4.6 Infrastructure Facilities	5.3.1.2 Surface Water Quality
4.4.6.1 Roads	5.3.1.3 Groundwater Quality
4.4.6.2 Navigation and Ports	5.3.1.4 Erosion and Sedimentation
4.4.6.3 Airports	5.3.1.5 Water Resources
4.4.6.4 Transmission Lines	5.3.1.6 Fish and Fish Habitat
4.4.6.5 Electricity	5.3.1.7 Ecosystem
4.4.6.6 Pipelines	5.3.1.8 Terrestrial Mammals, Amphibians and Reptiles
4.4.6.7 Hospitals and Health Care Centers	5.3.1.9 Others
4.4.6.8 Schools and Educational Centers	5.3.2 Social Impact Assessment
4.4.6.9 Day Care Centers and Kindergartens	5.3.2.1 Communities and Services
4.4.6.10 Temples	5.3.2.1.1 Pre-Construction
4.4.6.11 Cemeteries	5.3.2.1.2 Construction
4.4.7 Water Sources, Use and Supply	5.3.2.1.3 Operation
4.4.8 Energy Sources, Use and Supply	5.3.2.1.4 Decommissioning, closure and post-closure (if applicable)
4.4.9 Mapping	5.3.2.2 Economic Development
4.4.10 Concerns of Local Communities	5.3.2.3 Employment
4.5 Cultural Components	5.3.2.4 Education and Training
4.5.1 Archaeology	5.3.2.5 Resettlement, Land Acquisition and Compensation
4.5.2 Temples, Monuments	5.3.2.6 Demographic Changes
4.5.3 Minority Groups	5.3.2.7 Public Health and Nutrition
4.5.4 Mapping	5.3.2.8 Occupational Health and Safety
4.6 Visual Components	5.3.2.9 Gender
4.6.1 Aesthetic	5.3.2.10 Ethnic Groups
4.6.2 Point of Interests	5.3.2.11 Vulnerable Groups
4.6.3 Landscape	5.3.2.12 Changes in Land Use
4.6.4 Mapping	5.3.2.13 Traditional Livelihoods and Productive Systems
5.0 Impact Assessment and Mitigation Measures	5.3.2.14 Access to Natural Resources (e.g., NTFP, Water Sources, Hunting Areas, etc.)
5.1 Impact Assessment Methodology	5.3.2.15 Local Business
5.1.1 Scope of Assessment	5.3.2.16 Existing Productive Activities (Fisheries, Agriculture, Forestry, Mineral Resources, Tourism, etc.)
5.1.2 Geographical Scope: Study Area Boundaries	5.3.2.17 Communication and Transport
5.1.3 Temporal Scope	5.3.2.18 Water Sources and Water Supply
5.1.4 Methodology	5.3.2.19 Vulnerability to Natural Hazards and Climate Change
5.1.4.1 Assessment and Mitigation	5.3.2.20 Others
5.1.4.2 Thematic Presentation	5.3.3 Cultural Impact Assessment
5.1.4.3 Site Specific Presentation	5.3.3.1 Archaeology
5.1.5 Mapping	5.3.3.1.1 Pre-Construction
5.1.6 Modeling Requirements	5.3.3.1.2 Construction
5.1.6.1 Air Quality	5.3.3.1.3 Operation
5.1.6.1.1 Methodology	5.3.3.1.4 Decommissioning, closure and post-closure (if applicable)
5.1.6.1.2 Results	5.3.3.2 Cultural Heritage
5.1.6.1.3 Mapping	5.3.3.3 Traditional Values and Lifestyles
5.1.6.2 Surface Water Quality	5.3.3.4 Others
5.1.6.3 Groundwater Quality	5.3.4 Visual Impact Assessment
5.1.6.4 Noise	5.3.4.1 Aesthetic
5.1.6.5 Others	5.3.4.1.1 Pre-Construction
5.2 Identification of Impacts	5.3.4.1.2 Construction
5.3 Impacts, Mitigation Measures and Residual Impacts	
5.3.1 Biophysical Impact	
5.3.1.1 Air Quality	
5.3.1.1.1 Pre-Construction	
5.3.1.1.2 Construction	
5.3.1.1.3 Operation	
5.3.1.1.4 Decommissioning, closure and post-closure (if applicable)	

5.3.4.1.3 Operation	Appendices: (for example, could be a separate Volume)
5.3.4.1.4 Decommissioning, closure and post-closure (if applicable)	
5.3.4.2 Point of Interests	
5.3.4.3 Particular Landscape	
5.3.4.4 Others	Appendix 1: Mapping
6.0 Risk Assessment	Project Description
6.1 Context of the Qualitative Risk Assessment	Description of the Environment
6.2 Methodology	Impacts and Mitigation Measures
6.3 Results of the Qualitative Risk Assessment	Appendix 2: Description of the Project
6.3.1 Pre-Construction Phase	Flow Diagrams
6.3.2 Construction Phase	Layouts
6.3.3 Operation Phase	Others
6.3.4 Decommissioning, closure and post-closure Phase (if applicable)	Appendix 3: Specialist Reports
6.4 Results of the Quantitative Risk Assessment	Topography and Erosion Study
7.0 Cumulative Impact Assessment	Socio-Economic Study
7.1 Methodology and Approach	Others
7.2 Determination of Valued Ecosystem Components	Appendix 4: Modeling Reports (if required)
7.3 Determination of a Spatial and Temporal Framework	Air Quality
7.4 Cumulative Impact Assessment	Surface Water Quality
7.5 Development of a Management Framework	Groundwater Quality
8.0 Environmental Management and Monitoring Plan	Noise
	Others
Only a Summary of the EMP should be presented in that section to ensure that the EMP is in line with the impact assessment and proposed mitigation measures. The full EMP should be presented in Volume 2.	Appendix 5: Public Consultation and Disclosure, Minutes of Meetings
8.1 Summary of the EMP	
8.2 Reference to EMP	
9.0 Public Consultation and Disclosure	
9.1 Introduction	
9.2 Methodology and Approach	
9.3 Summary of Consultation Activities Undertaken	
9.4 Results of Consultation during Project Scoping	
9.5 Results of Consultation during preparation of EIA Report	
9.6 Results of Consultation on First Draft EIA Report	
9.7 Results of Consultation during EIA Review	
9.8 Recommendations for Ongoing Consultations	
10.0 Development Plans	
10.1 Summary of Development Plans (if required)	
10.1.1 ROW Management Plan	
10.1.2 Resettlement Action Plan	
10.1.3 Stakeholder Engagement Plan	
10.1.4 Livelihood Restoration Plan	
10.1.5 Community Development Plan	
10.1.6 Vulnerable Groups Development Plan	
10.1.7 Others	
10.2 Reference (if other volumes or specialist reports are prepared for this EIA Report)	

Annex 5 - Outline of a typical Environmental management plan¹³

PART I GENERAL MATTERS

- 0.0 Terms and Definitions
- 1.0 General Overview
- 2.0 Project developer's environmental and social policies and commitments
- 3.0 Legal Requirements and Environmental and Social Policies and Commitments
- 3.1 Applicable Laws
- 3.2 Contractual and Corporate Commitments
- 3.3 Governing Parameters
- 4.0 ESMMP Organizational Structure, Roles and Responsibilities
- 5.0 Authorities and other Stakeholders

PART II PLANS AND PROGRAMS

- 6.0 Construction Phase
- 6.1 Description of Construction Works
- 6.2 Management and Monitoring Plans
- 6.2.1 Site or Area Specific Plans
- 6.2.2 Thematic Plans and Programs
- 7.0 Operational Phase
- 7.1 Description of Operations
- 7.2 Management and Monitoring Plans
- 7.2.1 Site or Area Specific Plans
- 7.2.2 Thematic Plans and Programs
- 8.0 Decommissioning, Closure and Post-closure
- 8.1 Description of Decommissioning, Closure and Post-closure
- 8.2 Management and Monitoring Plans
- 8.2.1 Site or Area Specific Plans
- 8.2.2 Thematic Plans and Programs

PART III: PROCEDURES AND SUPPORT PROGRAMS

- 9.0 Management Procedures
- 9.1 Competence, training and awareness
- 9.2 Internal and External Communication
- 9.3 Documentation (GIS, GPS, photos, video recording, forms and reports, etc.)
- 9.4 Control of Documents
- 9.5 Operational Control
- 9.6 Emergency preparedness and response
- 10.0 Checking
- 10.1 Monitoring, measurements
- 10.2 Evaluation of Compliance
- 10.3 Non-compliance, corrective action and prevention action
- 10.3.1 Non-compliance Level and Communication

- 10.3.2 Non-compliance procedure
- 10.4 Control of Records
- 10.5 Internal Audit
- 10.6 External Audit
- 11.0 Management review
- 12.0 Cross Reference of ISO 14001: 2004 Requirements and Sections in the ESMMP
- 13.0 Cross Reference to Standards

Volume 3: Development Plans (if required)

- Watershed Management Plan
- Biomass Removal Plan
- Resettlement Action Plan
- Stakeholder Engagement Plan
- Livelihood Restoration Plan
- Community Development Plan
- Vulnerable Groups Development Plan
- Others

¹³Based on the outline contained in the Pakistani Hydro Dams guidelines compiled by David Annandale.

Annex 6 - Outline of a Disaster Preparedness Plan

1 Introduction

Pipelines are vulnerable to multiple threats and hazards. These include natural hazards such as earthquakes; severe weather (e.g. floods); landslides and volcanic eruptions. Additionally, there are man-made hazards such as civil unrest and/or terrorism. Preparing for such disasters is critical for ensuring the safety and security of people, facilities and businesses.

PURPOSE

To provide guidance to _____ (facility name) on emergency policies and procedures to protect the lives and property of residents, staff and visitors.

SITUATION AND ASSUMPTIONS

A. Authorities

Insert contact details of the following:

- Agency responsible for managing the pipeline
- Police
- Hospitals
- EPA
- Military

B. Situation

Provide maps of the sections of the pipeline that are the most vulnerable to the various types of disasters.

C. Assumptions

- The possibility exists that an emergency or disaster may occur at any time.
- In the event an emergency exceeds the facility's capability, external services and resources may be required (including transboundary).
- Depending on the scope of the event and the type of assistance needed, local, state and provincial departments and agencies may be unable to respond immediately.
- Nearby care facilities must to be prepared to care for patients for seven to ten days.

CONCEPT OF OPERATIONS

The care facility should have an emergency action plan in place capable of providing for the safety and protection of residents, staff and visitors.

A. Pre-Emergency

1. Evaluate the pipelines' potential vulnerabilities. (See Attachment A.)
2. Review, exercise and re-evaluate existing plans, policies and procedures.
3. Develop Mutual Aid Agreements with institutions in neighbouring countries, through which the pipeline passes. Review and update the Agreements regularly. (Keep a copy of Agreements)
4. Review and update inventory/resource lists.
5. Determine communication systems. (e.g. cellular phones may be best in the event of a power loss).
6. Ensure the availability and functioning of emergency warning / public announcement system.
7. Test reliability of emergency telephone roster for contacting personnel and activating emergency procedures.
8. Install and maintain emergency generators.
 - a. Identify power needs based on which equipment and appliances are necessary for the safety and security of residents, staff and visitors.
 - b. Have a licensed electrician install the generator.
 - c. Develop procedures for testing generators and equipment supported by emergency generators.
 - d. Maintain 7-10 day supply of emergency fuel. Establish a delivery agreement with a supplier.
 - e. Document all testing procedures.
9. Ensure a 7 to 10 day supply of food and water for residents and staff. (Have at least 5 litres of water, per person, per day on hand)
 - a. Arrange for a private contact to supply back-up resources.
 - b. Rotate supplies and check expiration dates regularly.
10. Schedule employee training on the operations of the emergency plan.
11. Enhance emergency education.
 - a. Distribute preparedness checklists.
 - b. Post display of evacuation routes; alarm and fire extinguisher locations; and emergency contact telephone numbers, in key installations.
 - c. Provide demonstrations on warning systems and proper use of emergency equipment for the staff, residents, and residents' families.
 - d. Encourage personal preparedness for all staff.
12. Conduct fire drills at a minimum of once per quarter per shift. (Check fire regulations in your community for local, federal and state compliance requirements.)
 - a. One drill is required per quarter for each shift at varied times.
 - b. Document each drill, instruction or event to include date, content and participants involved.
 - i. Identify and document any problems associated with the drill.
 - ii. Develop and implement an improvement plan for problems associated with the drill.

13. It is recommended that at least one drill be conducted on an annual basis to exercise all aspects of the emergency action plan. Document drills with critiques and evaluations.
 14. Develop and maintain Standard Operating Procedures (as Attachment C to this document) to include:
 - a. Task assignments (by title, not individual names)
 - b. Security procedures
 - c. Personnel call down lists
 - d. Emergency supplies; storage, maintenance and use
 15. _____ (location) is the designated Command Post (CP) and will serve as the focal point for coordinating operations. If evacuation is necessary, the alternate location will be _____ (location).
 16. Ensure all staff is trained on the disaster plan to execute the activities of the Command Post. All staff should know the location of the Disaster Preparedness Plan.
 17. Plan for evacuation and relocation of residents.
 - a. Identify the individual responsible for implementing facility evacuation procedures.
 - b. Identify residents who may need more than minimal assistance to safely evacuate (including Hospice) and ensure staff is familiar with individual evacuation plans for those residents.
 - c. Identify and describe transportation arrangements that will be used to evacuate residents. (Attach copies of documents to this plan as Annexes.)
 - d. Describe transportation arrangements for logistical support to include moving and protecting records, medications, food, water and other necessities.
 - e. Identify facilities and include in the plan a copy of the Agreement or MOU with a facility to receive residents. (Attach copies of documents to this plan as Annexes.)
 - f. Identify evacuation routes that will be used as well as secondary routes should the primary routes be impassable.
 - g. Determine and specify the amount of time it will take to successfully evacuate all patients to the receiving facility.
 - h. Specify the procedures that ensure facility staff will accompany evacuating residents and procedures for staff to care for residents after evacuation.
 - i. Identify procedures to keep track of residents once they have been evacuated. Include a log system.
 - j. Determine what items and how much each resident should take.
 - k. Plan for evacuation and shelter of pets and service animals.
 - l. Establish procedures for responding to family inquiries about evacuated residents.
 - m. Establish procedures to ensure all residents and staff are out of/away from the facility and accounted.
 - n. Determine when to begin pre-positioning of necessary medical supplies and provisions.
 - o. Specify at what point Mutual Aid Agreements for transportation and the notification of alternative facilities will begin.
 18. Identify contact information for community resources available to provide emergency services during a disaster. These may include: volunteers, churches, clubs and organizations, emergency medical services, law enforcement, fire departments, businesses, hospitals, and local government departments and agencies.
 19. Establish a plan for donations management. Delineate what is needed; where items will be received and stored; and who will manage donation management operations.
- B. Preparedness**
- Upon receipt of a warning of an emergency, the facility Administrator or appropriate designee(s) should:
1. Notify staff in charge of emergency operations to initiate the disaster plan. Use Notification Check List or Emergency Call Down Roster. Advise personnel of efforts designed to guarantee resident and staff safety.
 2. If potential disaster is weather related, closely monitor weather conditions and update department directors as necessary.
 3. Inform key agencies of any developing situation and protective actions contemplated.
 4. Review Disaster Preparedness Plan, including evacuation routes, with staff and residents.
 5. Prepare the _____ (location) for Command Post operations and alert staff of impending operations.
 6. Contact residents' families. Coordinate dissemination of messages.
 7. Control facility access.
 8. Confirm emergency staff availability. Facilitate care of their families.
 9. Pre-arrange emergency transportation of non-ambulatory residents (dialysis residents, etc.) and their records.
 10. Check food and water supplies.
 11. Monitor radio.
 12. Have a plan in place for pharmaceuticals _____ with (pharmacy name) and an alternate source to determine emergency operations in the event of halted deliveries or the need for backup.
 13. Warn staff and residents of the situation and expedient protective measures. Schedule extended shifts for essential staff. Alert alternate personnel to be on stand-by.
- C. Response**
- In response to an actual emergency situation, the facility Administrator will coordinate the following actions:
1. Complete the actions of Pre-emergency and Preparedness outlined above.

2. Activate the Disaster Preparedness Plan and conduct Command Post operations, including communications, message control and routing of essential information.
3. Ensure communications with residents' families and physicians.
4. Determine requirements for additional resources and continue to update appropriate authorities and/or services.
5. Coordinate actions and requests for assistance with local jurisdiction emergency services and the community.
6. Ensure prompt transfer and protection of resident records (in case of evacuation).
4. Assign a coordinator for the delivery of residents' medical needs.
5. Assign a coordinator accountable for residents, their records, and needed supplies.
6. Assign responsibility for maintaining facility safety, including securing necessary equipment and alternative power sources.
7. Regularly review inventory of vehicles and report to administrative services.
8. Coordinate the emergency food services program.
9. Ensure availability of special resident menu requirements and assess needs for additional food stocks.
10. Assign a coordinator to ensure the cleanliness of all residents and provision of residents' supplies for 7 to 10 days.
11. Coordinate the inspection of essential equipment (wet/dry vacuums)
12. Provide security of facility/grounds. Limit access to facility as necessary.
13. Coordinate provision of assistance to Maintenance and Housekeeping Departments.
14. Supervise notification of families on emergency operations.
15. Facilitate telecommunications and oversee release of information.

D. Recovery

Immediately following the emergency situation, the facility Administrator should take the provisions necessary to complete the following actions:

1. Assess the event's impact upon the pipeline/other facility, residents and staff members.
2. Coordinate recovery operations with the local Emergency Management Agency and other local agencies to restore normal operations, to perform search and rescue, and to re-establish essential services.
3. Provide crisis counseling for residents and families as needed.
4. Provide local authorities a master list of displaced, missing, injured or dead; and notify the next of kin.
5. Provide information on sanitary precautions for contaminated water and food to staff, volunteers, residents and appropriate personnel.
6. If necessary, arrange for alternate housing or facilities.

Organization and responsibilities

The facility Administrator is responsible for the overall direction and control of facility emergency operations, receiving requested assistance from the heads of each internal department, the local Emergency Management Agency, local Fire Department, local Police Department, private and volunteer organizations and various local and state departments and agencies.

Duties and activities that should be directed or assigned by the Administrator are:

1. Coordinate the development of disaster preparedness plans and procedures.
2. Coordinate the activation, and oversee the implementation, of disaster preparedness plans and procedures.
3. Direct Command Post operations.

Attachment A: Hazard Assessment

Evaluate your facility and the surroundings for vulnerability to each of the identified natural hazards. Directions: Using the rating system identified below, enter the appropriate number for your estimate of Potential Damage, Frequency of Event, and Secondary Problems. Then, multiply each figure by the following figure to get the Total Score. (Scores may range from 1 to 125 points.)

Potential Damage: Range 1 - 5

- 1 = No damage or surface damage. Any damage repaired by simple clean-up.
- 2 = Minor damage. May need to hire someone to fix it, but it won't disrupt day-to-day operations.
- 3 = Moderate damage. Need to hire someone to fix it. Will cause some disruption to staff and/or residents but will be able to stay in the facility (or will be displaced for only a few days).
- 4 = Significant damage. Will need to be out of the facility for a week or more for clean-up and/or repairs.
- 5 = Destroyed or nearly destroyed. Must find a new long-term or permanent location.

Frequency: Range 1 - 5

- 1 = Has not occurred in last 100 years.
 2 = Happens at least once every fifty years.
 3 = Happens at least once every ten years.
 4 = Happens at least once every five years.
 5 = Annual event, or more often.

Secondary Problems: Range 1 – 5

Remember, secondary effects include loss of services such as power and phone services. It may affect roadways and access to other areas of the city. Secondary effects may interfere with food and medical supplies being delivered to the area.

- 1 = No secondary effects or problems likely.
 2 = At least one secondary effect, short-term in nature.
 3 = Multiple secondary effects. May last 2 or 3 days.
 (Begins to be a problem.)
 4 = Significant secondary effect(s). May last a week. (Is a problem.)
 5 = Significant secondary effects last more than a week.
 (Long-term and/or big problem.)

Example:

HAZARD	POTENTIAL DAMAGE	FREQUENCY	SECONDARY PROBLEMS?	TOTAL SCORE
Flood	3 (Moderate damage)	4 (Happens about every 5 years)	2 (Would probably cause problems, but short-term)	24

Out of a possible 125 points, this would be considered a pretty low risk.

Score your hazards now. Multiply the number you provide for “Damage” by “Frequency” and then by “Secondary Problems” to get the total score.

HAZARD	POTENTIAL DAMAGE	FREQUENCY	SECONDARY PROBLEMS?	TOTAL SCORE
Earthquake				
Terrorism				
Flood				
Landslide				
Severe Weather				
Etc.				

Once you have completed the scoring, look at the Total Scores. The highest number indicates what you think may be your highest risk(s).

Annex 7 - Stakeholders consulted during the formulation of these guidelines

#	Name	Designation	Organisation
Meetings in Islamabad (Federal Capital)			
1	Mr. Ahmad Saeed	Project Manager NIAP	IUCN - Pakistan
2	Mr. Muhammad Javed Malik	Member (F&A)	Planning Commission, Government of Pakistan
-	Mr. Abdul Hamid Marwat	Chief (Environment)	Ministry of Planning & Development, Government of Pakistan
3	Mr. Asif Shuja Khan	Director General	Pak-EPA
-	Mr. Naseer Khan Kashani	Director General	Balochistan-EPA
-	Mr. Ijlal Hussian	EIA Expert NIAP	NIAP/Pak-EPA
4	Mr. Ahmed Kamal	Member (Planning)/DRR	National Disaster Management Authority (NDMA), Government of Pakistan
5	Mr. Mobin Saulat	Managing Director	Inter State Gas Systems (Pvt.) Limited
-	Mr. Falak Taj	General Manager (Technical)	Inter State Gas Systems (Pvt.) Limited
6	Mr. Hidayat Hasan	Environmental Consultant	Hagler Bailly Pakistan (Pvt.) Limited
7	Dr. Muhammad Bashir Khan	Director General	Khyber Pakhtunkhwa – EPA
Meetings in Lahore (Punjab)			
8	Mr. Qamar Shah	Coordinator Oil & Gas	ILF Pakistan (Pvt.) Limited
-	Mr. Azhar Saif	Chief Engineer	ILF Pakistan (Pvt.) Limited
9	Mr. Farooq Hameed Sheikh	Director General	Punjab – EPA
-	Mr. Naseem-ur-Rehman	Director EIA	Punjab – EPA
10	Mr. Asif Akbar Khan	General Manager (Projects)	Sui Northern Gas Pipelines Limited
11	Mr. Irfan-ul-Haq	General Manager/Head (Environment Section)	NESPAK

-	Mr. Muhammad Usman Tarar	Senior Engineer	NESPAK
-	Mr. Kamran Yousaf Kazi	Chief Engineer	NESPAK
12	Mr. Mahr Khalid Mehmood	Director (Environment)	National Transmission & Dispatch Company Limited
-	Ms. Samina Bilal	Assistant Director (Environment)	National Transmission & Dispatch Company Limited
Meetings in Karachi (Sindh)			
13	Mr. Waqar Hussain Phulpoto	Director (Technical)	Sindh – EPA
-	Ms. Sunila A. Wassey	Assistant Director	Sindh – EPA
14	Mr. Anees Ahmed Ansari	Resident Director	Pakistan GasPort Limited (Associated Group)
15	Mr. Mohammad N. Sharafat	Oil & Gas Consultant	MNS Karachi
16	Mr. Shoaib Warsi	Senior General Manager (Transmission)	Sui Southern Gas Company Limited
17	Mr. Mahmood Akhtar Cheema	Country Representative	IUCN – Pakistan
-	Ms. Fauzia Bilqis Malik	Programme Coordinator	IUCN – Pakistan
-	Mr. Ghulam Qadir Shah	Natural Resource Management Coordinator	IUCN – Pakistan

Feedback workshop participants

Sr. No	Name	Organisation	Contact/Email
1	Mr. Haider Raza	Gilgit-Baltistan EPA	-
2	Mr. Muhammad Bashir Khan	P&DD, Govt. of AJ&K	directorajkepa@gmail.com
3	Mr. Kaleemullah Khan	Balochistan EPA	Kaleem_niazimama@yahoo.com
4	Dr. Zahoor Bazai	University of Balochistan	z_bazai@yahoo.com
5	Mr. Abdul Qayyum Ch.	AJ&K EPA	-
6	Ms. Rafia Mahmood	Consultant NIAP – IUCN	Raffia.mahmood@niap.pk
7	Ms. Nadia Akhtar	Dept. of Env. Sc., International Islamic University, Islamabad	nadia@iiu.edu.pk
8	Dr. Aurangzeb Khan	AJ&K EPA	aurangzeb_nrm@yahoo.com
9	Mr. Zirgham Nabi Afridi	Hagler Bailly Pakistan	zafridi@haglerbailly.com.pk
10	Mr. Qasim Khan	Inter State Gas System	qasim.khan@isgs.pk
11	Mr. Naveed Ahmad	Inter State Gas System	naveed.ahmad@isgs.pk
12	Mr. M. Asif Hussain	Inter State Gas System	muhammad.hussain@isgs.pk
13	Mr. Eisa Bin Bashir	Ministry of Water & Power, Govt. of Pakistan	eisa@ppib.gov.pk
14	Mr. Iftikhar Ahmad	Ministry of Petroleum & Natural Resources, Govt. of Pakistan	051-9207724
15	Mr. Muhammad Azam	Director General (Oil), Ministry of Petroleum & Natural Resources, Govt. of Pakistan	051-9202906
16	Mr. Hamid Sarfraz	Dev-Consult	hsarfraz@devconsult.pk
17	Mr. Mahmood Akhtar Cheema	Country Representative IUCN – Pakistan	mahmood.cheema@iucn.org
18	Mr. Muhammad Azhar Khan	Assistant Director, Sindh EPA	muhammadazhar10044@gmail.com
19	Dr. Ashique Ali Langah	Director, Sindh EPA	alangha@yahoo.com
20	Mr. Farrukh Majeed	Sui Northern Gas Pipelines Ltd.	farrukh.majeed@sngpl.com.pk
21	Mr. M. Farooq Qamar	ADGM(Tech), Inter State Gas System	muhammad.qamar@isgs.pk
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Feedback workshop participants

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26	Ms. Khadija Amir	Quaid-e-Azam University, Islamabad	khadija.amir12@gmail.com
27	Ms. Aden Khan	Pak-EPA	-
28	Ms. Qudsia Shabbir	CCD – IUCN	-
29	Ms. Sameerah Yunis	Assistant Director Pak-EPA	sameerahyunis@gmail.com
30	Ms. Nazia Batool	Deputy Director Pak-EPA	naziasultan@gmail.com
31	Ms. Nazia Zakir	Consultant	naziazakir@gmail.com
32	Mr. Asif Sahibzada	CCD	dd.ppm@mocc.gov.pk
33	Prof. Shafique Rehman	University of Peshawar	03005833796
34	Dr. Zahiuddin Khan	IESE, National University of Sciences & Technology	03335488553
35	Dr. Mahmood A. Khwaja	SDPI	051-2278134
36	Mr. Ijlal Hussian	NIAP-IUCN	-
37	Mr. Farhan Gohar	NIAP-IUCN	-
38	Dr. Muhammad Irfan Khan	International Islamic University, Islamabad	03009779205
39	Mr. Hamza Khalid Butt	Consultant IUCN	-
40	Ms. Abida Ayub	NIAP- Punjab EPA	abida.ayub@niap.pk
41	Mr. Ahmad Saeed	Project Manager NIAP – IUCN	ahmad.saeed@iucn.org

Annex 8 - Scoping Study Review Template

Name of the project	
Country where the project is to be located	
Name of company which compiled the Scoping Report	
Date that the Scoping Report was completed	
Name of evaluator(s)	
Address of evaluator	
Date of evaluation	

Notwithstanding requirements under the national legislation of the State of Origin and the minimum requirements for notification the Mandated Agency may wish to use this indicative check list. It allows the evaluator to assess the Scoping Report in a systematic and structured way both in terms of process and content. An explanation of the grading system used in the evaluation is provided in section 2 below and a summary of the findings of the evaluation is presented in section 3. This is followed by the detailed evaluation form, which is divided into the following sections:

1. Methodology utilised in compiling the Scoping report
2. Legal, Policy and Administrative Requirements
3. Description of the project
4. Assessment of alternatives to the project
5. Description of the environment
6. Description of impacts
7. Consideration of measures to mitigate impacts
8. Non-technical summary
9. General approach

EXPLANATION OF EVALUATION NOTATION

For each question posed in the Evaluation Form, the evaluator considers whether the information is relevant to the project and it is marked Y (yes) or N (no).

If the information is relevant, the evaluator reads the relevant sections of the EIA report and specialist studies and establishes whether the information provided is:

- Complete or comprehensive (C): all information required for decision-making is available. No additional information is required even though more information might exist.
- Acceptable or adequate (A): the information presented is incomplete, but the omissions do not prevent the decision-making process from proceeding.
- Inadequate (I): the information presented contains major omissions. Additional information is necessary before the decision-making process can proceed.

SUMMARY APPRAISAL OF THE SCOPING REPORT

	Judgement (C/A/I)	Comments
a) Scoping Process		
b) Public consultation process		
c) Description of the project		
d) Assessment of alternatives		
e) Description of the environment		
f) Identification of key issues of concern		
g) Terms of Reference for EIA and scope of specialist studies		
h) Non-technical summary		
i) General approach and presentation		

CONCLUSION

The overall grading of the Scoping Report is as follows:

☐

Excellent: The Scoping Report contains everything required for decision-making on the project. There are no gaps.

☐

Good: The Scoping Report contains most of the information required as far as it is relevant in the particular circumstances of the project; any gaps are relatively minor.

☐

Satisfactory: The information presented is not complete; there are significant omissions but in the context of the proposed project, these are not so great as to prevent a decision being made on whether the project should be allowed to proceed.

☐

Inadequate: Some of the information has been provided, but there are major omissions; in the context of the proposed project these must be addressed before a decision on whether the project should be allowed to proceed can be taken.

☐

Poor: The information required has not been provided or is far from complete and, in the context of the proposed project, the omissions must be addressed before a decision on whether the project should be allowed to proceed can be taken.

Key questions	Yes	No	Partially	Don't know
Does the Scoping Report comply with the Terms of Reference ¹⁴ ?				
Does the Scoping Report comply with the legal requirements for EIA in the country?				
Did the scoping process include genuine public participation?				
Did the Scoping Report highlight the most important issues?				
Is the Scoping Report of acceptable quality?				
Has the scope of the project changed as a result of the scoping process?				
Will the Scoping Report help to make a more informed decision about the project?				

DETAILED EVALUATION

	Relevant Yes/No	Judgement (C/A/I)	Comments
1 SCOPING PROCESS			
1.1 Has the screening, scoping and EIA process been described?			
1.2 Is the scoping process compliant with the minimum legal requirements for scoping, if such legal requirements exist, or where none exist, does the scoping process conform with relevant national policies or guidelines etc., or where none exist, other accepted guidelines for scoping e.g. World Bank, IFC, EU?			
1.3 Have all the relevant communications with the Authorities regarding the screening and scoping process been included in the appendices (including for example the approval of the consulting team, notification of the authorities and their acknowledgement, any conditions for the study received from the authorities etc.)?			
1.4 Is the level of appraisal (scoping) in sync with the project development phase i.e. scoping should occur at the project pre-feasibility stage?			
2 SCOPING METHODOLOGY			
2.1 a) Does the report set out the assumptions, limitations and constraints of the study?			

¹⁴In some countries or cases, there are no TORs prior to Scoping, as the Scoping process contributes to the setting of TORs for the EIA

	Relevant Yes/No	Judgement (C/A/I)	Comments
2.2 Does the report clearly explain the methodology used in the scoping process e.g. literature reviews, baseline monitoring, initial field work and data collection?			
2.3 Has the project scope been clearly defined in terms of the geographic extent, sphere of influence, all associated project components, trans-boundary impacts and time frame?			
2.4 Does the Scoping Report identify the key issues relevant to the project?			
2.5 Does the Scoping Report identify major gaps and data deficiencies and are specialist recommended for addressing these gaps or data deficiencies?			
2.6 Does the Scoping Report include the Terms of Reference (ToR) for the EIA including detailed scopes of work for the specialist studies?			
2.7 Has the Scoping Report been submitted for independent peer review and will the review report be attached as an appendix to the final document?			
3 PUBLIC CONSULTATION AND DISCLOSURE			
Legal compliance			
3.1 Did the public consultation and disclosure (PCD) process follow the legally required process, or where no such process is prescribed in legislation, does the PCD process conform with relevant national policies or guidelines etc., or where none exist, other accepted guidelines for PCD e.g. World Bank, IFC, EU?			
3.2 Were the I&APs informed of the relevant legislation, their environmental rights and the modalities of their engagement?			
Identification of Interested and Affected Parties			
3.3 Is there a register for I&APs?			
3.4 Were/are I&APs allowed to register throughout the process?			
3.5 Are the procedures for registering as an I&AP open, transparent and appropriate for the affected communities?			
3.6 Have all relevant government authorities at national, regional and local level been identified?			
3.7 Have representatives from all relevant NGOs, CBOs, rate payers associations, Chambers of Commerce, agricultural cooperatives, faith groups and other representatives of civil society been identified?			
3.8 Have all the parties whose lives and livelihoods may be directly affected by the project been identified?			
3.9 Have the representatives of relevant labour unions been identified?			

	Relevant Yes/No	Judgement (C/A/I)	Comments
3.10 Have members of the media been identified?			
3.11 In the case where trans-boundary impacts may occur, have representatives from government, media, land owners, communities and relevant representatives of civil society in the neighbouring country been identified?			
Notification process			
3.12 Have all the project notices pertaining to registration as an I&AP, public meetings, open houses etc. been advertised in local and national newspapers?			
3.13 Has the project been advertised on radio?			
3.14 Have special provisions been made to inform those without the necessary electronic equipment (TV, radio, computer), connectivity (phone, internet, cellular) and literacy or language skills, about the project and all relevant meetings?			
3.15 Have notices been posted on site and in several public places?			
3.16 Have all the notices been posted or announced in the locally understood languages?			
3.17 Was a Background Information Document (BID) or other form of information pamphlet or poster disseminated or made easily available to all I&APs?			
3.18 Did the BID (or other notification method) include basic information about the project, its location (on a map), motivation for the project, the proponent, project timing and the scoping process?			
3.19 Did the BID provide I&APs with a means to submit comments and concerns to the scoping team?			
3.20 Were any other forms of communication used such as via the web, letters, questionnaires etc.?			
3.21 Was the notification period for public meetings, open houses or other PCD meetings adequate?			
Consultation			
3.22 Were public meetings held in the main centres as well as on or near the site?			
3.23 Were focus group meetings held?			
3.24 Were any open house displays or exhibitions held?			
3.25 Did the project team make themselves available for one-on-one meetings with I&APs?			
3.26 Was special provision made to consult with marginalised groups, women, youth, unemployed, etc.?			
3.27 Were capacity building programmes required to enable informed stakeholder involvement and are they described in the Scoping Report?			

	Relevant Yes/No	Judgement (C/A/I)	Comments
3.28 Did the I&APs receive sufficient information about the project and its potential impacts to enable them to make an informed and objective decision about the project?			
3.29 Were the I&APs informed as to when and how they would have further opportunities to comment on the project?			
3.30 Was the period allowed for I&APs to comment on the Scoping report adequate?			
3.31 Did the comment period avoid main holidays?			
3.32 Was there any intimidation by the Client and/or his representatives at any of the public meetings?			
Reporting			
3.33 Does the report clearly explain the methodology used in the PCD process?			
3.34 Does the main Scoping Report provide a summary of all the issues and concerns raised?			
3.35 Are the minutes or records of the meetings included in the Scoping Report together with the attendance registers?			
3.36 Are the original written submissions of the I&APs included in the report?			
3.37 Are copies of all the notices and BID included in the report?			
3.38 Were the I&APs given an opportunity to comment on the Scoping Report?			
3.39 Is there an issues and response table indicating where issues raised by the I&APs have been addressed, and if not addressed, providing a reason why not?			
4 LEGAL, POLICY AND PLANNING REQUIREMENTS			
4.1 Have the relevant international treaties, conventions and agreements been listed with reference to where and how these obligations have been met on this project?			
4.2 Have the relevant policies of the country been listed with reference to where and how the obligations have been met on this project?			
4.3 Have the relevant laws and regulations of the country been listed, with reference to project compliance?			
4.4 Have other relevant permits, licenses, authorisations etc. which may be required for project approval been listed?			
4.5 Have the relevant standards and guidelines for compliance been listed?			
4.6 Have local, regional and national plans e.g. SEAs, structure plans, integrated development plans, environmental management frameworks, zoning plans, biodiversity plans etc. been reviewed in order to place the project into context?			

	Relevant Yes/No	Judgement (C/A/I)	Comments
5 DESCRIPTION OF THE PROJECT			
Land requirements			
5.1 Has the land ownership status been described?			
5.2 Has the land required for all phases of the project and any associated services, been described and clearly shown on an appropriately scaled map?			
5.3 For a linear project, has the land corridor and need for earthworks been described and shown on an appropriately scaled map?			
5.4 Have the areas which will only be temporarily affected during construction been described and shown on a map?			
Project description			
5.5 Has the project been described (location, size, layout, design, main components etc.) at a pre-feasibility level of detail, with the aid of appropriate maps, photos and images?			
5.6 Have any additional project components, which are not included in this scoping study but which will require authorisation from the relevant authority, been identified and a justification provided as to why they have been excluded (e.g. access roads, power lines, borrow pits etc.?)			
5.7 Has the need and desirability of the project been well motivated?			
5.8 Have the main processes of the project been described, together with a motivation as to how they comply with BATNEEC and BEO principles?			
5.9 Have the construction phase activities and methods been described?			
5.10 Has the relationship of this project to other planned or existing projects nearby been described in terms of potential cumulative, antagonistic and synergistic effects?			
5.11 Have other activities or developments which may be required as a consequence of this project been identified e.g. upgrading of sewage plants, additional houses, schools, clinics, additional water supplies and/or power generation capacity etc.?			
5.12 Has the project timetable been clearly set out for each project phase: construction, operation, decommissioning and closure?			
5.13 Have the social issues related to the project been described e.g. estimated number of employees, percent from local community, transportation, accommodation, support services, recreation facilities, employment structures, skills breakdown, training, skills transfer etc. for each project phase?			

	Relevant Yes/No	Judgement (C/A/I)	Comments
Waste and emissions			
5.14 Have the sources and types of waste likely to be generated during different scenarios for construction and operation been identified e.g. air emissions, process effluent, runoff, noise and vibrations, odour, liquid and solid waste?			
5.15 Does the report discuss ways in which the wastes can be reduced, recycled or re-used?			
5.16 Have the ways in which wastes will be stored, handled or treated prior to disposal been explained?			
5.17 Has the receiving environment where such waste will be disposed, been identified and described?			
Project inputs			
5.18 Have the resources and materials needed for construction and operation, been identified e.g. water, power, lubricants, raw materials, ore, structural components, fill, etc.?			
5.19 Have the means of transporting materials, products, workers and visitors to and from the site during construction and operation, been explained?			
6 ALTERNATIVES			
6.1 Were strategic alternatives to the entire project considered in the Scoping Report (e.g. demand management instead of a new power station; renewable power supplies rather than fossil fuels)?			
6.2 If strategic alternatives were considered, are evaluation criteria listed and the reasons provided for selecting the proposed alternative?			
6.3 If alternatives are described, have their main environmental impacts been compared clearly and objectively with those of the proposed project?			
6.4 Has a prediction of the likely future environmental conditions in the absence of the project been developed (no go option)?			
6.5 Does the Scoping Report identify and assess various 'within-project' alternatives (e.g. site, route, design, technology, etc.)?			
6.6 Does the Scoping Report list the evaluation criteria used to compare the alternatives identified and have the reasons for selecting one or more alternative to study further in the EIA been provided?			
6.7 Does the Scoping Report indicate whether inputs from the I&APs were instrumental in identifying new alternatives or selecting existing alternatives?			

	Relevant Yes/No	Judgement (C/A/I)	Comments
7 DESCRIPTION OF THE ENVIRONMENT			
7.1 Have the areas expected to be significantly affected by the various aspects of the project been indicated with the aid of suitable maps?			
7.2 Have the land uses on the project site(s) and in the surrounding areas been described together with an indication of their sensitivity to the proposed project? Photos, maps and images should be used to show the various land uses in relation to the project.			
7.3 Have the <i>biophysical</i> components of the environment likely to be affected by the project been identified and described in sufficient detail for a Scoping Report?			
7.3.1 Climate (wind, precipitation, temperature, evaporation etc.)			
7.3.2 Geology (rock type, structure, geochemistry etc.)			
7.3.3 Soils (agricultural and rehabilitation potential)			
7.3.4 Topography (slopes, erosion, screening)			
7.3.5 Surface hydrology (flood lines, runoff, flows, supply, users, wetlands, dams, lakes)			
7.3.6 Groundwater (aquifers, yields, permeability, users, gradients etc.)			
7.3.7 Hydrochemistry (organic, inorganic, physical)			
7.3.8 Air quality (ambient and seasonal, dust, gas and odour)			
7.3.9 Flora (vegetation types, diversity, endemic, endangered, alien and invasive spp)			
7.3.10 Terrestrial fauna (populations, diversity, endemic, endangered, alien and invasive spp)			
7.3.11 Freshwater and/or marine aquatic ecology (populations, diversity, endemic, endangered, alien and invasive spp)			
7.4 Have the <i>social</i> components of the environment likely to be affected by the project been identified and described in sufficient detail for a Scoping Report			
7.4.1 Social structure of local community			
7.4.2 Demographics			
7.4.3 Skills			
7.4.4 Employment			
7.4.5 Community facilities and services			
7.4.6 Amenities			
7.4.7 Settlement patterns			
7.4.8 Aesthetics (visual, noise, odour, sense of place, air quality, quality of life etc.)			
7.4.9 Health			
7.4.10 Other (please specify)			

	Relevant Yes/No	Judgement (C/A/I)	Comments
7.5 Have the <i>cultural</i> components of the environment likely to be affected by the project been identified and described sufficiently for the prediction of impacts?			
7.5.1 Sites of spiritual and/or religious significance			
7.5.2 Sites of cultural significance			
7.5.3 Sites of historical significance			
7.5.4 Archaeological sites			
7.6 Have the <i>economic</i> components of the environment likely to be affected by the project been identified and described in sufficient detail for a Scoping Report?			
7.6.1 Local, regional and national economic indicators			
7.6.2 Multiplier effect			
7.6.3 Forward and backward linkages			
7.6.4 Local spending			
7.6.5 Sectoral strengthening			
7.6.6 Import and export potential			
7.6.7 Tax base and revenue generation			
7.6.8 Resource economics			
7.6.9 Cost-benefit analysis			
7.7 Have the authors of the Scoping Report adequately consulted the latest literature and/or unpublished reports and/or data relevant to the study and cited their sources?			
8 DESCRIPTION OF IMPACTS			
8.1 Have the direct and indirect/ secondary effects of constructing, operating and, where relevant, after use or decommissioning of the project been clearly explained (including both positive and negative effects)?			
8.2 Does the Scoping Report provide a brief description of how the project activities may affect the environment, including a qualitative assessment of the nature, duration, magnitude, extent and significance of the impacts on:			
8.2.1 Air quality (dust, gas, odour)			
8.2.2 Climate change scenarios			
8.2.3 Topography			
8.2.4 Surface water resources			
8.2.5 Ground water resources			
8.2.6 Water quality (surface and ground water)			
8.2.7 Soils			

	Relevant Yes/No	Judgement (C/A/I)	Comments
8.2.8 Noise			
8.2.9 Landscape			
8.2.10 Vegetation			
8.2.11 Terrestrial fauna			
8.2.12 Aquatic ecology (freshwater and marine)			
8.2.13 Historic and cultural heritage			
8.2.14 Land use			
8.2.15 People and communities			
8.2.16 Health			
8.2.17 Sense of place (visual impact, project suitability and compatibility)			
8.2.18 Transportation and traffic			
8.2.19 Local, regional and national economic indicators			
8.3 Have trans-boundary impacts been identified?			
8.4 Are cumulative impacts considered?			
8.5 Have the constraints of the environment on the construction and operation of the project been considered i.e. are there any environmental constraints to development?			
9 MITIGATION			
9.1 Does the Scoping Report provide any information about possible mitigation measures that might be considered to mitigate negative impacts and enhance project benefits?			
10 NON-TECHNICAL SUMMARY			
10.1 Is there a non-technical summary that will easily be understood by a lay person?			
10.2 Does the summary include a brief explanation of the overall approach to the assessment and the way forward for the EIA?			
10.3 Does the summary contain a brief but concise description of the project and the environment?			
10.4 Does the summary clearly identify the main potential positive and negative impacts?			
10.5 Does the summary provide an overview of the recommendations of the Scoping Report, including further specialist studies, baseline monitoring etc. which may be required?			
10.6 Does the summary provide a list of the key issues and concerns raised by the I&APs?			

	Relevant Yes/No	Judgement (C/A/I)	Comments
11 GENERAL APPROACH			
Organisation of the information			
11.1 Is the information logically arranged in sections?			
11.2 Is the location of the information identified in an index or table of contents?			
11.3 When information from external sources has been introduced, has a full reference to the source been included?			
11.4 Does the report or appendices contain the Terms of Reference for the scoping study?			
11.5 Are the credentials (including professional certification status if appropriate) of the scoping team presented, with a clear indication of their respective contributions?			
Presentation of the information			
11.6 Has information and analysis been presented so as to be comprehensible to the non-specialist, using maps, tables and graphical material as appropriate?			
11.7 Are the maps at an appropriate scale, show co-ordinates, north sign, contours, drainage, settlement, landmarks, administrative boundaries etc. in relation to the proposed project site?			
11.8 Has superfluous information (i.e. information not needed for the decision) been avoided?			
11.9 Have prominence and emphasis been given to severe adverse impacts, to substantial environmental benefits, and to controversial issues?			
11.10 Is the information objective?			
11.11 Are all the supporting studies and appendices present?			

Annex 9 - EIA Review Template

Name of the project	
Country where the project is to be located	
Name of proponent	
Name of company which compiled the EIA report	
Date that the EIA report was completed	
Name of evaluator(s)	
Date of evaluation	

PREAMBLE AND GUIDE TO THE EVALUATION DOCUMENT

STRUCTURE OF EVALUATION FORM

Notwithstanding requirements under the national legislation of the State of Origin and the minimum requirements for notification the Mandated Agency may wish to use this indicative template. It allows the evaluator to assess the report in a systematic and structured way both in terms of process and content. An explanation of the grading system used in the evaluation is provided in section 2 below and a summary of the findings of the evaluation is presented in section 3. This is followed by the detailed evaluation form, which is divided into the following sections:

1. Methodology used in compiling EIA report
2. Legal, Policy & Administrative Requirements
3. Description of the project
4. Assessment of alternatives to the project
5. Description of the environment
6. Description of impacts
7. Consideration of measures to mitigate impacts
8. Non-technical summary
9. General approach

EXPLANATION OF EVALUATION NOTATION

For each question posed in the Evaluation Form, the evaluator considers whether the information is relevant to the project and it is marked Y (yes) or N (no).

If the information is relevant, the evaluator reads the relevant sections of the EIA report and specialist studies and establishes whether the information provided is:

- Complete or comprehensive (C): all information required for decision-making is available. No additional information is required even though more information might exist.
- Acceptable or adequate (A): the information presented is incomplete, but the omissions do not prevent the decision-making process from proceeding.
- Inadequate (I): the information presented contains major omissions. Additional information is necessary before the decision-making process can proceed.

NARRATIVE REPORT

Introduction

Methodology for the evaluation

As stated above, one of the main purposes of an evaluation is to determine whether the information provided in the EIA reports is adequate to make an informed decision. With this goal in mind, the modus operandi of the evaluator is to concentrate on the information provided in the report, as this is the sole basis on which the I&APs and the competent authority can make their decisions. Thus, as a matter of principle the evaluator does not engage with the proponent, the EIA consultants, the I&APs or the competent authority during the review process. The comments made below therefore are confined to what is written in the EIR.

It should be noted that the evaluation focuses on the content of the main report as this is the document which will be read by most of the stakeholders and decision-makers. However, the specialist reports are also examined to ensure that their findings are sound and their conclusions have been accurately reflected in the main report.

SUMMARY OPINION

	<i>Judgement (C/A/I)</i>	<i>Comments</i>
EIA Process		
Description of the project		
Assessment of alternatives to the project		
Description of the environment		
Description of impacts		
Consideration of measures to mitigate impacts		
Non-technical summary		
General approach and presentation		

CONCLUSION

The overall grading of the EIA report for decision-making is as follows:

☐

Excellent: The EIA report contains everything required for decision-making on the project. There are no gaps.

☐

Good: The EIA report contains most of the information required as far as it is relevant in the particular circumstances of the project; any gaps are relatively minor and an informed decision can be made.

☐

Satisfactory: The information presented is not complete; there are significant omissions but in the context of the proposed project, these do not prevent a decision being made on whether the project should be allowed to proceed or not (i.e. in the case of the latter decision, there is enough information for decision-makers to reject a project).

☐

Inadequate: Some of the information has been provided, but there are major omissions; in the context of the proposed project these must be addressed before a decision on whether the project should be allowed to proceed can be taken (i.e. the Precautionary Principle must be applied).

☐

Poor: The information required has not been provided or is far from complete and the EIR should be rejected

<i>Key questions</i>	<i>Yes</i>	<i>No</i>	<i>Partially</i>	<i>Don't know</i>
Does the EIA report comply with the Terms of Reference?				
Does the EIA report comply with the legal requirements for EIA in the country?				
Did the EIA process include genuine public participation?				
Were the consultants unduly influenced by the proponent or the Authorities?				
Did the EIA report focus on the most important issues?				
Is the EIA report of acceptable quality?				
Will the EIA report help to make a more informed decision about the project?				

Recommendations

Add your text

DETAILED EVALUATION FORM

	Relevant Yes/No	Judgement (C/A/I)	Comments
1 METHODOLOGY			
1.1 Does the report set out the assumptions and limitations of the study?			
1.2 Does the report clearly explain the methodology used in the EIA, public participation process and in each specialist study?			
1.3 Does the report indicate what data are inadequate or absent?			
1.4 Did the EIA process include genuine stakeholder consultation?			
1.5 If so, were the general public and/or affected communities included in the consultation?			
1.6 Were capacity building programmes required to enable informed stakeholder involvement?			
1.7 Are they described?			
1.8 Have the views of stakeholders been meaningfully incorporated into the findings of the EIA?			
1.9 Does the report include lists of interested and affected parties consulted, as well as their original submissions and comments?			
2 LEGAL, POLICY AND ADMINISTRATIVE REQUIREMENTS			
2.1 Have the relevant international treaties, conventions and agreements been listed with reference to where and how these obligations have been met on this project?			
2.2 Have the relevant policies of the country been listed with reference to where and how the obligations have been met on this project?			
2.3 Have the relevant laws and regulations of the country been listed, with reference to project compliance?			
2.4 Have the relevant standards and guidelines for compliance been listed?			
2.5 Has the EIA administrative process been described together with project compliance?			
3 PROJECT DESCRIPTION			
Land requirements			
3.1 Has the land ownership status been described?			
3.2 Has the land required for the project and any associated services, been described and clearly shown on an appropriately scaled map?			
3.3 For a linear project, has the land corridor and need for earthworks been described and shown on an appropriately scaled map?			

	Relevant Yes/No	Judgement (C/A/I)	Comments
3.4 Has the re-instatement after use of temporary landtake been described?			
3.5 Have local, regional and national plans e.g. SEAs, structure plans, integrated development plans, environmental action plans, zoning plans been reviewed in order to place the project into context?			
Project description			
3.6 Have all the project components been described, including e.g. a process flow sheet, water balance, suitable diagrams and layout plans?			
3.7 Is there a life cycle analysis?			
3.8 Have the technologies to be used been described, with a motivation as to how they comply with BATNEEC and BEO principles?			
3.9 Have the social issues related to the project been described e.g. number of employees, percent from local community, transportation, accommodation, support services, recreation facilities, employment structures, skills breakdown, training, skills transfer etc.?			
Waste and emissions			
3.10 Have the sources, types and quantities of waste generated during different scenarios for construction and operation been estimated e.g. air emissions, process effluent, runoff, noise and vibrations, odour, liquid and solid waste?			
3.11 Have the predictions in the report been scientifically calculated, with the results clearly presented for different scenarios?			
3.12 Has a risk assessment been performed, including the identification of exposure pathways, probability and consequences?			
3.13 Does the report discuss ways in which the wastes can be reduced, recycled or re-used?			
3.14 Have the ways in which wastes will be stored, handled or treated prior to disposal been explained?			
3.15 Has the receiving environment where such waste will be disposed, been identified and described?			
Project inputs			
3.16 Are the nature and quantities of materials needed during construction and operation, clearly indicated e.g. water, power, lubricants, raw materials, ore, structural components, fill, etc.?			
3.17 Have the sites from where these materials will be sourced, been identified and assessed in terms of impacts, in the EIA report?			
3.18 Have the impacts of transportation of all materials, personnel and visitors to the project site during construction and operation been assessed?			

	Relevant Yes/No	Judgement (C/A/I)	Comments
3.19 Have the means of transporting materials, products, workers and visitors to and from the site during construction and operation, been explained?			
3.20 Has the project timetable been clearly set out for each project phase: construction, operation, decommissioning and closure?			
4 ALTERNATIVES			
4.1 Were in project alternatives considered in the EA?			
4.2 If alternatives were considered, are the reasons for selecting the proposed alternative adequately described?			
4.3 If alternatives are described, have their main environmental impacts been compared clearly and objectively with those of the proposed project?			
4.4 Has a prediction of the likely future environmental conditions in the absence of the project been developed (no go option)?			
5 DESCRIPTION OF THE BASELINE ENVIRONMENT			
5.1 Have the areas expected to be significantly affected by the various aspects of the project been indicated with the aid of suitable maps?			
5.2 Have the land uses on the project site(s) and in the surrounding areas been described and their use and non-use values adequately assessed?			
5.3 Have the <i>biophysical</i> components of the environment likely to be affected by the project been identified and described sufficiently for the prediction of impacts?			
5.3.1 Climate (wind, precipitation, temperature, evaporation etc.)			
5.3.2 Geology (rock type, structure, geochemistry etc) and geomorphology)			
5.3.3 Soils (agricultural and rehabilitation potential)			
5.3.4 Topography (slopes, screening effects)			
5.3.5 Surface hydrology (flood lines, runoff, flows, supply, users, wetlands, dams, lakes)			
5.3.6 Groundwater (aquifers, yields, permeability, users, gradients etc.)			
5.3.7 Hydrochemistry (organic, inorganic, physical)			
5.3.8 Air quality (ambient and seasonal)			
5.3.9 Terrestrial and aquatic ecology (vegetation and animal types, diversity, endemism, rarity value, alien and invasive spp)			

	Relevant Yes/No	Judgement (C/A/I)	Comments
5.3.10 Other (specify)			
5.4 Have the <i>social</i> components of the environment likely to be affected by the project been identified and described sufficiently for the prediction of impacts?			
5.4.1 Social structure of local community			
5.4.2 Demographics			
5.4.3 Skills			
5.4.4 Employment			
5.4.5 Community facilities and services			
5.4.6 Amenities			
5.4.7 Settlement patterns			
5.4.8 Aesthetics (visual, noise, odour, sense of place, air quality, quality of life etc.)			
5.4.9 Health (including HIV/AIDS)			
5.4.10 Crime and community safety			
5.5 Have the <i>cultural</i> components of the environment likely to be affected by the project been identified and described sufficiently for the prediction of impacts?			
5.5.1 Sites of spiritual and/or religious significance			
5.5.2 Sites of cultural significance			
5.5.3 Sites of historical significance			
5.5.4 Archaeological sites			
5.5.5 Other (specify)			
5.6 Have the economic components of the environment likely to be affected by the project been identified and described sufficiently for the prediction of impacts?			
5.6.1 Local, regional and national economic indicators			
5.6.2 Multiplier effect			
5.6.3 Forward and backward linkages			
5.6.4 Local spending			
5.6.5 Import and export potential			
5.6.6 Tax base and revenue generation			
5.6.7 Resource economics			
5.6.8 Cost-benefit analysis			
5.6.9 Opportunity costs			
5.7 Have the authors of the EIA Report adequately consulted the latest literature and/or unpublished reports and/or data relevant to the study and cited their sources?			
5.8 Have the specialist studies been peer reviewed?			

	Relevant Yes/No	Judgement (C/A/I)	Comments
6 DESCRIPTION OF IMPACTS			
Impact identification			
6.1	Have direct and indirect/ secondary effects of constructing, operating and, where relevant, after use or decommissioning of the project been clearly explained (including both positive and negative effects)?		
6.2	Have the above types of impacts been investigated in so far as they affect the following:		
6.2.1	Air quality		
6.2.2	Surface Water Resources (flow and quality)		
6.2.3	Ground water		
6.2.4	Soils		
6.2.5	Noise and vibration		
6.2.6	Topography and geomorphology		
6.2.7	Vegetation		
6.2.8	Terrestrial Ecology and biodiversity		
6.2.9	Aquatic ecology		
6.2.10	Historic and cultural heritage		
6.2.11	Land use		
6.2.12	People and communities		
6.2.13	Health		
6.2.14	Sense of place		
6.2.15	Transportation and traffic		
6.2.16	A neighbouring country (transboundary impacts)		
6.2.17	Local, regional and national economic indicators		
6.2.18	Crime and community safety		
6.3	Is the investigation of each type of impact appropriate to its importance for the decision, avoiding unnecessary information and concentrating mainly on the 5 key issues?		
6.4	Are cumulative impacts considered?		
6.5	Has consideration been given to impacts which might arise from non-standard operating conditions, (i.e. equipment failure or unusual environmental conditions such as flooding), accidents and emergencies? (i.e. risk assessment)		
Magnitude of impact			
6.6	Are impacts described in terms of the nature and magnitude of the change occurring and the nature (location, number, value, sensitivity) of the affected receptors?		

	Relevant Yes/No	Judgement (C/A/I)	Comments
6.7 Has the timescale over which the effects will occur been predicted such that it is clear whether impacts are short, medium or long term, temporary or permanent, reversible or irreversible?			
6.8 Where possible, have predictions of impacts been expressed in quantitative terms? Otherwise, have qualitative descriptions been defined?			
6.9 Where quantitative predictions have been provided is the level of uncertainty attached to the results described?			
Data and methods			
6.10 Have the methods to predict the nature, size and scale of impacts been described and are they appropriate to the importance of each projected impact?			
6.11 Have the impacts of the environment on the construction and operation of the project been considered?			
Evaluation of impact significance			
6.12 Does the information include a clear indication of which impacts may be significant and which may not?			
6.13 Has the significance of effects been discussed taking account of appropriate national and international standards or norms, where these are available?			
6.14 Where there are no generally accepted standards or criteria for the evaluation of significance, is a clear distinction made between fact, assumption and professional judgement?			
6.15 Have the magnitude, location and duration of the impacts been discussed in the context of the value, sensitivity and rarity of the resource or environment?			
7 MITIGATION			
Description of mitigation measures			
7.1 Has the mitigation of negative impacts been considered and, where feasible, have specific measures been proposed to address each impact?			
7.2 Where mitigating measures are proposed, has the significance of any impact remaining after mitigation been described?			
7.3 Where appropriate, do mitigation methods considered include modification of project design, construction and operation, the replacement of facilities/ resources, and the creation of new resources?			
7.4 Is it clear to what extent the mitigation methods are likely to be effective?			
7.5 Has the EIA report clearly explained what the costs of mitigation are likely to be, and compared these to the benefits (including the costs of non-mitigation)?			

	Relevant Yes/No	Judgement (C/A/I)	Comments
Commitment to mitigation			
7.6 Have details of how the mitigation will be implemented and function over the time span for which they are necessary, been presented i.e. in an Environmental Management Plan?			
Monitoring proposal			
7.7 Has the EIA proposed practical monitoring arrangements to check the environmental impacts resulting from the implementation of the project and their conformity with the predictions made?			
7.8 Has the EIA proposed Limits of Acceptable Change that the developer can use to track impacts and trigger management intervention?			
7.9 Does the scale of any proposed monitoring arrangements correspond to the potential scale and significance of deviations from expected impacts?			
Environmental effects of mitigation measures			
7.10 Have any adverse environmental effects of mitigation measures been investigated and described?			
7.11 Has the potential for conflict between the benefits of mitigating measures and their adverse impacts been considered?			
8 NON-TECHNICAL SUMMARY			
8.1 Is there a non-technical summary that will easily be understood by a lay-person?			
8.2 Does the summary contain a brief but concise description of the project and the environment, an account of the main issues and mitigation measures to be undertaken, and a description of any remaining or residual impacts?			
8.3 Does the summary include a brief explanation of the overall approach to the assessment?			
8.4 Does the summary provide an indication of the confidence which can be placed in the results?			
8.5 Does the summary indicate whether the project is or is not environmentally acceptable?			
9 GENERAL APPROACH			
Organisation of information			
9.1 Is the information logically arranged in sections?			
9.2 Is the location of the information identified in an index or table of contents?			
9.3 When information from external sources has been introduced, has a full reference to the source been included?			
9.4 Does the report or appendices contain the Terms of Reference for the EA?			

	Relevant Yes/No	Judgement (C/A/I)	Comments
9.5 Are the credentials of the report authors and specialists presented, with a clear indication of their respective contributions?			
Presentation of information			
9.6 Has information and analysis been offered to support all conclusions drawn?			
9.7 Has information and analysis been presented so as to be comprehensible to the non-specialist, using maps, tables and graphical material as appropriate?			
9.8 Are the maps at an appropriate scale, show co-ordinates, north sign, contours, drainage, settlement, landmarks, administrative boundaries etc. in relation to the proposed project site?			
9.9 Has superfluous information (i.e. information not needed for the decision) been avoided?			
9.10 Have prominence and emphasis been given to severe adverse impacts, to substantial environmental benefits, and to controversial issues?			
9.11 Is the information objective?			
9.12 Are all the specialist studies and appendices present?			

Annex 10 - EMP Review Template

This review form is divided into the following sections:

1. Preamble
2. Environmental Management Plan - layout
3. Environmental Management Plan - general
4. Environmental Management Plan - specific plans and strategies
5. Monitoring programme
6. General

Instructions to reviewers:

1. For each question, we consider first whether the information is relevant to the project. If not, we mark it “no” and go to the next question.
2. If the information is relevant, we read that section of the EMP and establish whether the information provided is:
 - **Complete or comprehensive (C):** all information required for decision-making is available. No additional information is required even though more information might exist.
 - **Acceptable or adequate (A):** the information presented is incomplete, but the omissions do not prevent the decision-making process from proceeding.
 - **Inadequate (I):** the information presented contains major omissions. Additional information is necessary before the decision-making process can proceed.

Name of the project	
Country where the project is to be located	
Name of company which compiled the EMP report	
Date that the EMP report was completed	
Name of reviewer	
Address of reviewer	
Date of review	

Summary appraisal of the EMP report (to be completed only after the detailed assessment has been done)

	Judgement (C/A/I)	Comments
Is the report a stand alone document?		
Is the report structured in logical sections		
Linkages with the EA report – have all the key issues been addressed?		
Are there specific management plans and actions?		
Are the management actions practical, measurable, and auditable?		
Are the monitoring plans properly formulated?		
Are clear targets, standards and goals provided?		
General layout and user-friendliness		

Report graded as follows (tick the box of your choice):

☐

Excellent: The EMP contains everything required for decision-making on the project. There are no gaps.

☐

Good: The EMP contains most of the information required as far as it is relevant in the particular circumstances of the project; any gaps are relatively minor.

☐

Satisfactory: The information presented is not complete; there are significant omissions but in the context of the proposed project, these are not so great as to prevent a decision being made on whether the project should be allowed to proceed.

☐

Inadequate: Some of the information has been provided, but there are major omissions; in the context of the proposed project these must be addressed before a decision on whether the project should be allowed to proceed can be taken.

☐

Poor: The information required has not been provided or is far from complete and, in the context of the proposed project, the omissions must be addressed before a decision on whether the project should be allowed to proceed can be taken.

REVIEW CRITERIA FOR CONSTRUCTION ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANS

Ref.	Environmental management requirement	Relevant? Yes/No	Judgement (C/A/I)	Comments
1	Preamble			
1.1	Is there an introduction setting out: a) aims of the EMP; b) the structure of the EMP; c) useful contacts; d) applicable legislation, permit requirements, international obligations; e) glossary of terms; f) list of abbreviations; g) environmental and project background information?			
1.2	Is there a Table of Contents?			
1.3	Is the scope of the EMP clearly defined?			
1.4	Have the applicable standards, guidelines, limits of acceptable change been identified?			
1.5	Have the issues and concerns of the I&APs been included in the formulation of the EMP?			
1.6	Has the EMP been sent to the I&APs for comment?			
1.7	Does the EMP contain the HSE Policy of the developer?			
1.8	Does the EMP contain an organisational structure which clearly identifies the roles and responsibilities of the personnel involved in the construction of the project and which shows the reporting mechanisms for environmental management during construction?			
1.9	In particular, does the EMP set out the responsibilities for the Environmental Control Officer, including for example the need to sign off work procedures, the need to close out rehabilitated areas before final payment etc.			
1.10	Has the procedure for including the EMP in the contractors tender documents been set out?			

Ref.	Environmental management requirement	Relevant? Yes/No	Judgement (C/A/I)	Comments
1.11	Has the system for environmental adjudication of the environmental components of the tenders been set out?			
1.12	Does the EMP form part of a larger environmental management system e.g. ISO14001, NOSA etc.?			
2	Environmental Management Plan – layout			
2.1	For each impact identified in the EIA, the EMP must provide the following: a) a management objective; b) the management action; c) the target, standard or guideline to be achieved; d) the indicator of achievement; e) the responsible person; f) the frequency of such action (if repeated) or the date for completion (in the case of a one-off action).			
2.2	Separate EMPs must be formulated for: • The construction phase; • The commissioning phase; • The operational phase; • The decommissioning and closure phase.			
2.3	The EMP should have separate sections for discrete components of the project such as powerlines, workshops, construction camp, borrow pits, access roads, river crossings etc.			
3	Environmental management plan – general			
3.1	Is there a Code of Conduct and Induction Programme for all contractors and visitors to site?			
3.2	Is there an environmental awareness and training programme?			
3.3	Is there a specified EMP compliance auditing programme, including site checklists?			
3.4	Is there provision for periodic review and update for projects with a construction period of over 6 months?			

Ref.	Environmental management requirement	Relevant? Yes/No	Judgement (C/A/I)	Comments
3.5	Is there a plan to develop detailed standard operational procedures?			
3.6	Is there a set timetable for EMP reporting, document distribution and document control?			
3.7	Are the incentives and penalties clearly set out?			
3.8	Is there an EMP for site establishment and programming, including the siting and establishment of camps, laydown areas, access roads, fuel depots, concrete batch plants, fencing and security etc.?			
3.9	Are the issues relating to civil works addressed (i.e. bulk earthworks, foundations, drainage systems etc.)?			
3.10	Are there management plans for workshops, vehicle and equipment maintenance, including field servicing and repairs?			
3.11	Is there a management plan for construction personnel (i.e. employment procedures, housing, transportation, recreation facilities etc.)?			
3.12	Is there a management plan for the closure of all construction sites, including camps, waste disposal sites, access roads, temporary water supply infrastructure etc.?			
4	Environmental management plan - Specific plans and strategies			
4.1	<p>Are there detailed plans or strategies in place to address the following:</p> <ul style="list-style-type: none"> a) vegetation clearance; b) topsoil management; c) spoil management; d) erosion control and slope stabilisation; e) rehabilitation of disturbed areas; f) species protection; g) noise management; h) air quality, particularly dust, gas and odour; i) water quality; j) stormwater control and runoff; k) effluent management; l) hazardous waste management (including transportation, storage, handling and disposal); m) non-hazardous solid waste management (including transportation, storage, handling and disposal); n) non-hazardous liquid waste management (including transportation, storage, handling and disposal); o) sanitation; p) land management; q) archaeological, heritage and cultural 			

Ref.	Environmental management requirement	Relevant? Yes/No	Judgement (C/A/I)	Comments
4.1	r) visual impact management; s) traffic management; t) tracks and access roads; u) disruption of essential services and public conveniences; v) risk management, including emergency plans and on-site remediation; w) public consultation and disclosure plan; x) communications and complaints procedures; y) vibration and blasting management z) recruitment of labour; aa) work hour plan; bb) borrow pits; cc) and any other aspects identified in the EIA requiring management.			
4.2	Is there a resettlement plan?			
4.3	Is there a compensation plan for loss of residences, amenity, agricultural land, property, and livelihood options?			
4.4	Is there an HIV/AIDS awareness programme in place?			
4.5	Is there a health and safety awareness programme in place amongst the local community?			
4.6	Are there emergency procedures in place for disasters such as spills, fires, explosions, floods, accidents, dam failures etc.?			
5	Monitoring Programme			
5.1	Have monitoring programmes, setting out: what has to be monitored, where it has to be monitored, by whom, how often, the monitoring/sampling protocols to be followed, the collection, labelling, storage and transportation of samples, and the sampling laboratories to be used (including an indication of whether the laboratory is certified or not), been drawn up for: a) soil; b) surface water; c) ground water; d) dust; e) gases; f) noise; g) vegetation; h) terrestrial fauna (indicator species); i) aquatic biota; j) radiation; k) rehabilitated areas;			

Ref.	Environmental management requirement	Relevant? Yes/No	Judgement (C/A/I)	Comments
5.1	l) presence of invasive species; m) erosion; n) visual impact; o) Local spending; p) Clinic use; q) School development; r) Crop production; s) Economic development in the villages; t) Health monitoring; u) And any other impact identified in the EA that needs to be monitored.			
5.2	Has a procedure been set out detailing the contents of the monitoring reports and the format required for the presentation of monitoring data?			
6	General			
6.1	Has the EMP been clearly laid out?			
6.2	Are diagrams, tables, maps and other illustrative materials used where appropriate?			
6.3	Is the quality of the above-mentioned illustrative material sufficient to add value to the EMP e.g. is the map scale suitable? Are the units provided in the tables?			
6.4	Are references provided and correctly acknowledged?			
6.5	Is the English (Urdu?) and grammar of a good enough quality to be understood?			
6.6	Has the report been laid out logically in sections?			
6.7	Is the EMP consistent with the EIA and with the final project design?			
6.8	Does the EMP comply with internationally recognised standards of best practice?			

General Comments:

Annex 11 - Bibliography

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