

## **PART – 1 EXECUTIVE SUMMARY**

Pakistan is a land of diverse landscapes in the South Asian region with varied terrain and elevation extremes between lowest being the Indian Ocean at 0m and highest being the world's 2<sup>nd</sup> highest mountain – K2. Its landscape diversity translates into 4 distinct seasons despite being mostly arid. The country's population in mid-2004 was estimated at 148.72 million at an annual growth rate of 1.9% – a major source of pressure on Pakistan's natural resource base. The labour force is estimated at 45.05 million and wide-ranging structural reforms, prudent macroeconomic policies, financial discipline and consistency in policies have translated into significant economic growth in the past 5 years. However, Pakistan's performance on its social indicators does not compare well with the average performance of middle-income countries. The cost of environmental related health services remains relatively high due to water borne disease incidence as well as close proximity of human habitats to the sources of emissions coupled with skewed distribution of sewage, sanitation and piped water access. Nevertheless, a comparison of various social indicators for the period since 1998-99 shows that indicators like the major source of drinking water, type of toilet used and sanitation have significantly improved. Despite this positive trend, environmental degradation, resource scarcity and inequitable distribution of resources have emerged as key factors for insecurity and at times violent conflicts.

The poverty-environment nexus has in gained particular interest in the recent years as poverty in Pakistan, like in many other middle income countries, plays an important role increasing the vulnerability of the poor to pollution and degradation. Significant strides have been made in Pakistan for forwarding the environmental agenda from being a stand-alone topic to one identifying itself as an integral element of the national mainstream development with the recently launched Mid Term Development Framework for 2005-2010 also lending itself to address sustainable environmental development as a vehicle for economic growth.

During the past 15 years, several policies, plans, programs and projects have been initiated for environmental protection and conservation in the sectoral areas of water and air pollution control, land use, forest management, energy efficiency, biodiversity conservation, and waste management, etc. In addition, Pakistan's role in the international community vis-à-vis its responsibilities for sustainable development has also become known through the Government's show of commitment for instance on biodiversity, drought and desertification, and climate change, etc. From formulating the National Conservation Strategy and its subsequent course correction through the Mid-Term Review, to becoming a signatory to many international conventions/protocols/agreements, Pakistan has emerged as an active and responsible player for environmental conservation. This responsiveness to global and national environmental challenges has been supported in many instance through legislation, policy making and creating institutional set up. Enactment of Pakistan Environmental Protection Act 1997, establishment of Pakistan Environment Protection Council, and setting up Pakistan Environmental Protection Agency with its provincial chapters remain some of the most noteworthy steps taken by the government to meet up its commitment on environment. A major shift in environmental protection, conservation, and sound management has been the process of institutionalizing environmental impact assessment (EIA). Although significant results have been achieved in promoting an EIA conscious process of development, much still needs to be done. The question of adequate capacities within public as well as private sectors remains a critical area of concern. Similarly, there is a general hesitation for facilitating public consultation although recognised as an important aspect of EIAs.

Despite an overall increase in environmentally aware stakeholders, Pakistan is faced with numerous challenges that have gained recognition in the past 2 decades. There are sectoral

gaps – capacity and knowledge – that limit the rate of success of initiatives for pollution control and environmental protection and management. Amongst these, the issues of water quality and availability and air quality stand out as the key environmental issues of concern. Pakistan is faced with severe water shortages and water quality issues. The orientation of the water management institutions and experts is largely toward harnessing the resource in the service of economic growth, and not towards its conservation or quality. In addition, severe levels of water pollution and unchecked industrial pollutants being released in water bodies have added an ‘immediate measure’ status to water management issues. Similarly, although making headway in addressing ambient air quality in the country, Pakistan is struggling with ineffective air quality management systems. Adding to this burden is the fact that at present there is no continuous monitoring station present in country and most of the data reported is obtained from mobile monitoring units or spontaneous onsite sampling with laboratories based results. A common issue for lack of compliance to water and air quality monitoring and maintenance has been limited resources and persistent information gap.

Other environmental sectors are also faced with similar resource crunch and information and data inadequacies that have been inherent to policy and program implementation. For instance, despite the commitment of government as well as private sector and civil society, a halt and recovery of the country’s forest resource is yet to come about. There are several dimensions to this continuing degradation. At policy level, the planning and decision making has been relatively strong however lack of monitoring and keeping a continuous check have compromised successful implementation of plans, programs and project.

On the other hand, given the number of constraints on the resource and research base, progress in areas directly related to desertification in Pakistan has been modest. A sound understanding of the causes of land degradation exists in Pakistan, but although various technologies and methodologies have been developed to deal with its major causes, their widespread dissemination remains limited. Other environmental sectors such as biodiversity conservation, have witnessed a major gap in capacity and limited technological advancement. For a program where the overall success rate depends on capacity and multi-sectoral commitment, biodiversity conservation remains an end for which the means are not readily available in a resource deficient country such as Pakistan. This has severely limited Pakistan’s ability to organize available resources in order to execute knowledgeable decisions regarding its biodiversity conservation.

Over fishing and polluted waters are the primary issues contributing to the reduction of productivity of the marine and inshore fisheries. The precarious condition of mangroves in coastal zone and the even more precarious status of certain aquatic wildlife are but a few glaring indicators of a rapid degradation rate. In absence of standards for clean up of contaminated sites and limits for disposal of waste on land, those industries which are causing contamination of land and water bodies through inappropriate waste disposal are not legally bound to clean the site unless ordered by judicial intervention to do so. This has created a large gap in actual adherence to waste management practices even though their recognition exists. Similarly, due to the lack a reliable waste inventory, there is very little practice at present for using tools such as EIA for hazardous waste management. Adding further burden, the energy transmission losses are extremely high in Pakistan despite the fact that it cannot afford the high cost of its imported oil. Against this backdrop of issues and stresses the energy planners and policy makers have achieved a considerable headway in addressing cleaner energy needs of the country. Pakistan has also ventured into relatively newer and more challenging issues such as climate variation. There is growing recognition that climate change is likely to reduce biodiversity, and the goods and services that ecosystem supply to Pakistan by several means such as increasing desertification in arid and semi-arid areas; increasing seawater intrusion of the Indus delta with a consequent; reduction in mangrove cover, and a loss of sandy beaches; increasing the threat of retreat of glaciers and an upwards shift in ecological zones in the; the desiccation and die-back of

forests; and reduction in agricultural production and fisheries. However, despite a growing recognition of existing and potential impacts of climate change, the topic is still viewed as a specific and narrow environmental concern to be dealt with by specialists, and not as a wider national development priority that cuts across many economic and policy sectors. Therefore, the acceptance or understanding of climate change imperatives remains limited as part of policy making, leading to a suboptimal and sporadic implementation of planned actions.

There is however, heightened recognition of areas where specific actions can directly influence the persisting gaps. These areas are specific to sectors as well as corporate environmental management. For instance in the water management arena the infrastructure for urban water treatment and wastewater treatment are of prime importance but they require very large investments and the reliability of the institutions holding charge do not guarantee success. Promotion of public private partnership in this area could be envisaged possibly by financing feasibility studies. In addition, it is possible to build on the existing facilities, by providing technical assistance to perfect the telemetry system. It should, however, be noted that the responsibility for operating the system was handed over to a private company. Similarly, since there are no regulations for right to water providing technical assistance for formulating these rights could be an immediate step. Improvement of water quality could be achieved only in the long term through mobilisation of public opinion. An action in the shorter term is to inform people about treating water at home, even providing low cost decontamination kits. In addition, it is recommended that industries should be encouraged to work towards achieving ISO 14000 Certification. To achieve this, industries have to follow standards for environmental management systems (EMS), and economic/market context of the ISO 14000 standards. In addition, ISO 14000 has the advantages of requiring compliance with national environmental legislations while also referring to management structure.

For the improvement of ambient air quality, there are several specific mitigation options available however a cost benefit analysis is required with a focus on collaborative approaches. Similarly, adding economic incentive base for air quality monitoring, reporting and cleaning initiatives remains a gap that requires strategic planning. An integrated approach to air quality improve will have to include transport sector as a key contributor to air pollution levels. Initiation of continuous air quality monitoring programs is an essential parameter for assessing increase and decrease in air quality standards. At the same time, although encouraging self-monitoring and reporting amongst industries and transport sector is a viable options, it has to be coupled with incentive measures. Pakistan can not afford to delay its international commitment and hence it is pertinent to develop a comprehensive action plan that integrates various aspects of air pollution control mechanisms and coordinates at an inter-sectoral level. In addition, air pollution issues need to be attended through Pakistan Clean Air Program which will serve as the long term strategic plan to combat air pollution in Pakistan. All air pollution control activities, actions and projects may fall under the program. For ensuring NEQS implementation, specific parameters related to air quality standards should be built into all monitoring and reporting processes. These standards must be elaborated with specific performance indicators. The self-monitoring and reporting initiative has been much applauded by industries and private sector stakeholders however to date a status report on this key pollution control and abatement strategy is not available. In the face of lack of information of the status of compliance of lack thereof proper judgement regarding scaling up of this strategy will remain ill-informed. Hence an immediate need is to monitor the status of self-monitoring and reporting by various stakeholders including industries and other private sector entities.

In the forestry sector, despite receiving considerable attention from policy makers and program planners, forestry sector in Pakistan by far remained under-developed. The need for creating an enabling environment to reap full benefit of policies and plans is stronger than ever before. With the advent of integrated forest management programs and the

corresponding requirements of quality data to facilitate analysis and thus inform policy processes, the statistical issues need a resolution in an amicable manner – one which bases itself on thoroughness, reliability and agreement on source and accuracy of information. There are a number of players whose coordinated involvement can resolve this long standing issue. Similarly, public awareness campaigns have been the key strategic initiative of environmental protection movement in Pakistan. However, there have been very little incentive based awareness raising. Innovations can be explored through establishing schemes such as 'friends of forests' awards in recognition of contribution made by various groups towards health, maintenance and regeneration of forest resources.

Under land use there have been sporadic initiatives for promoting effective management. However, with the growing list of issues associated with land use and care, it is the need of the hour to coordinate land management strategies. Developing a holistic action plan for land conservation hence is a pertinent option worth further exploration. Land use regulatory procedures with strict monitoring and compliance checks are an urgent need. Similarly, town and urban planning and development needs to be align with land degradation and salinity and sodicity issues.

For addressing biodiversity conservation needs of Pakistan, there have been notable multi-stakeholder initiatives such as trophy hunting, which have proven their effectiveness and acceptance. It is therefore worth investing in scaling up of efforts such as these to enlarge the bracket of beneficiaries. By the virtue of multi-sectoral nature of biodiversity, there are many stakeholders involved in its conservation. Of special importance are the sectoral line ministries who directly or indirectly deal with stresses of biodiversity losses and conservation. Similarly, research institutes play an important role in biodiversity monitoring and evaluation of health of ecosystems. While given a lower priority, local communities are yet another set of custodians of biodiversity as they are also the direct users. Another major group that has emerged as key environmental stakeholder is the civil society. Without focus on coordination amongst these stakeholders there is very little hope that efforts although designed in the best interest of biodiversity conservation may reap full benefits. Hence coordination and collaboration is of utmost significance.

For conservation and sustainable use of marine resources, management systems have to be supported by research and information. There is therefore need for research on various aspects. The important aspects that can not be neglected are appropriate size and siting of sanctuaries or protected areas; resources enhancement and habitat rehabilitation techniques; selective fishing management reference points; ecosystem modeling and policy and institutional support. Documentation and retrospective analysis of existing information and past studies (trawl surveys) is important for purpose of comparison and for the potential insights they provide for the management of coastal fisheries. Establishment of statistical baseline information should be consistent with Monitor control and surveillance. Ultimately the development of aquaculture techniques should given top priority. The most useful technique would be to establish hatcheries and besides fish production juveniles can be produced and added to natural population.

For waste management a comprehensive strategy is required to ensure scientific management of hazardous waste – one which over the years aligns itself with the liberalised economic policies and related growth in industry to cover all aspects of waste management cycles starting from generation of waste to its handling, segregation, transportation, treatment, and disposal. This strategy should also target waste minimisation/reduction as its primary focus. In addition, any recycle/reuse effort may in fact earn net revenue on the waste generation. There is need to constantly upgrade waste inventory so that appropriate waste management strategies can be incorporated in waste management plans. Although substantial progress has been made in imparting training and capacity building to relevant stakeholders and institutions, additional capacity at provincial EPA and district environmental

departments is needed to deal with analytical and monitoring requirements regarding tracking of hazardous waste movement and management. In addition training is also required for critical industrial sectors generating hazardous waste to address their responsibility in handling, storage, transportation, treatment and disposal of hazardous waste. In order to have a satisfactory, efficient, and a sustainable system of solid waste management, proper planning, implementation, and management systems must be incorporated in framing the national policy for solid waste management for the country. Present and future ways to manage solid waste stream need consideration of various aspects. These may include setting targets for waste reduction; setting fees and tax incentives to promote market mechanisms to effect source reduction; establishing mandatory standards and regulation; and promoting education and voluntary compliance with policies by business and consumers. The tehsil municipal administrations could be entrusted with the responsibility for solid waste management. However, it must be noted that most of the urban local bodies, barring a few progressive ones, are unable to provide the desirable level of conservancy services. There is a need to empower the local bodies by giving them independence, authority, and power to impose taxes, duties, tolls, and fees for services including public health, sanitation, conservancy, and solid waste management.

## **Recommendations for Energy and Renewables**

### **Renewable subsidies**

Specific steps for energy and renewable sources have also been identified as recommendations for developing this sector future. Renewable energy sources although beneficial are largely too expensive to experiment let alone to scale up for consumer attraction. Creating viable subsidies for import of raw material and technology transfer is therefore a key area to address through policy and research and development. Promoting incentive based private sector partnership for this purpose should be explored.

Since climate change is a relatively new and more challenging environment sector, the need for sustained capacity building in Pakistan would require many parallel actions: the development of suitable technical training and academic courses in related disciplines; the involvement of greater institutional participation in planning, research, and project implementation; institutional reforms within relevant government administrative agencies to effectively support climate change initiatives; and greater awareness and information dissemination to attract private sector interest in targeting investment opportunities, including those provided by international financing mechanisms such as the GEF and CDM. The creation of an endogenous capacity within the Ministry in the form of a competent Climate Change Cell, the development of an annual plan of activities and targets, external technical and financial support, and the independent monitoring that is inherent in such assistance, would all collectively help improve both the decision-making process in the government as well as help propagate such changes down the line to other participants and stakeholders. However, optimal technology transfer can only take place when an enabling environment consisting of a sound policy regime, supportive institutional and legislative infrastructure, and a domestic constituency of interested stakeholders exists. However, pilot phase, demonstration-sized technology programs, of which some notable examples already exist, can be readily undertaken to initiate a longer-term, commercial-scale technology collaboration. These kinds of pioneering efforts are critical in building up local awareness, expertise, and investment interest and their support pipeline must be immediately widened to allow a more diverse range of activities to take place, especially given the long gestation periods involved in the maturing and proliferation of such technologies locally. ALGAS and subsequent work has identified and highlighted many areas for such collaborative projects with high benefit-cost ratios, especially in renewable energy and industrial and appliance efficiency improvements. As a beginning, climate change programs must enlarge their focus

to specifically include vulnerable groups, and gender equality criteria must be built into planning and project formulation. In the longer term, Pakistan is shifting its focus equally towards addressing adaptation and vulnerability issues, in which donor agencies can play a particularly important role. Ultimately, a balance must be achieved between globally relevant mitigation priorities, for which international assistance would be readily available, and local adaptation needs, which would largely require strong domestic support.

There are aspects to the management, protection and monitoring of environment that require overarching institutional approach to developing environmental consciousness amongst stakeholders. Some of the recommendations hence point to the need for concerted efforts from different groups of environmental stakeholders including government, private sector, industrialists, and civil society. The past two decades have seen a worldwide move towards state of the environment reporting, a process for communicating information on conditions and trends in the environment, describing their context and significance. In Pakistan there is a need to first establish a natural resources inventory as well as reporting systems. Once these are in place, state of environment reporting and ultimately sustainable development reporting may be undertaken in Pakistan.

In order to establish environmental reporting systems in Pakistan, it is necessary to be aware of the potential problems related to data availability and reliability. While numerous environmental sampling initiatives exist, a closer look reveals that there is limited trust in the quality of sampling and analysis and a sporadic approach to information gathering. Regular environmental monitoring and reporting, GIS compilation of environmental resource inventories, comprehensive land surveys and titles, and monitoring public health and environmental sanitation have repeatedly been recognised as the prerequisites for informed policy-making.

There is a need to streamline data collection methods and systems as well as the agencies and organisations involved to ensure reliability, accuracy, and consistency as existing institutions and methods of data collection and processing have not been designed to measure progress towards goals of conservation strategy, not to mention sustainable development. The development of state of environment reporting systems will build on existing sectoral studies, reports, research methodologies, and data collection methods.

The 1995 Crater Brandon study on economy wide cost of environmental degradation received much applause as it opened avenues for linking environmental protection, conservation and management with economic costing and value. This not just provided impetus to environmental movement in several countries, including Pakistan, but it also directly contributed to strengthening policy making and public sector development plans with increased allocation of financial resources to environmental management.

Strengthening the role of local governments through providing them administratively powers to enforce legislation and to monitor natural resources at local levels is another viable strategy needs testing. The major gap between environmental quality monitoring and reporting has been centralisation of these operations at federal and/or provincial levels whereas much can be achieved through local level – district, tehsil/town – systems. Hence, involving the local government structures to adhere to achieving environmental quality standards in their respective areas can reap better results.

Institutionalisation of local governance structures into environmental management and care also require extensive input to capacity building. Moreover, elaboration of bi-laws and rules of business for district and further devolved levels of environmental and peripheral departments are urgently needed for these structures to play their envisaged role. It is the poor who are most likely to be affected by declines in environmental conditions, natural resource scarcity and hazards. Hence Pakistan needs a national sustainable development

strategy since the most significant improvements to the environment over the longer-term are likely to come about through a combination of poverty reduction and economic improvements.

The private sector has become a decisive factor in many spheres, influencing environmental performance and long-term environmental sustainability. International private resource flows to developing countries have contributed to this process as these flows became more than five times greater than ODA during the 1990s. Within the private sector (especially multinationals), there is a strategic shift from the traditional reactive approach to environmental protection (“do no harm”) toward the concept of sustainable development and corporate citizenship (“do most good”). Likewise, progressive investment bodies have moved from screening out bad practice, to seeking companies with positive roles to play in environmental conservation and social development. Environmental and social development issues are an integral part of this new approach. Pakistan needs to take account of this shift and benefit from it. Public-private sector partnerships, particularly for large infrastructure projects, are likely to increase in many countries, given the availability of private capital and governments' need to reduce public expenditure.